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Transboundary river basin organizations in Africa: assessing the secretariat

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Abstract

Secretariats are an increasingly common feature in Africa's transboundary river basin organizations (RBOs). Non-secretariat-based forms of transboundary RBOs nonetheless also exist, and such forms of cooperation have often functioned effectively. These realities drive questions about the rationale and role for secretariats. This paper employs two approaches to compare secretariat-based RBOs vis-à-vis RBOs without secretariats in Africa. First, we compared the degree to which five governance instruments, determined to enable effective trans-boundary water management, are contained in treaties creating secretariat-based RBOs versus treaties creating non-secretariat-based RBOs. Second, the costs and benefits of six African transboundary RBOs – three with secretariat and three without – were compared based on a survey of regular costs and volume and number of projects. Key findings are that RBOs with secretariats have achieved stronger governance and secured more investment than RBOs without secretariats. Costs associated with operating secretariats appear justified by their benefits. These findings help to lay an improved basis for selecting desired models of RBOs in Africa's transboundary basins.

Keywords: Africa; Benefits; Costs; Effectiveness; RBO; Secretariat; Transboundary

1. Introduction

Secretariats are a growing reality in Africa's international river basin organizations (RBOs). Motivated by the need to improve coordination and enhance project implementation support ([INBO-GWP, 2012](#); [UN-Water, 2013](#); [Schmeier, 2015](#)), new RBOs are often formed with secretariats as their centre-piece, and existing RBOs that did not have secretariats are adding them to their organizations. In the last two decades, for example, the Limpopo Watercourse Commission (LIMCOM), the Zambezi Water-course Commission (ZAMCOM) and the Volta Basin Authority (VBA) were formed with secretariats ([LIMCOM, 2003](#); [ZAMCOM, 2004](#); [Mitchell, 2005](#)). Further, the Orange-Senqu River-~~Q~~4 Commission (ORASECOM) incorporated a secretariat in 2006, and the Permanent Okavango River Basin Water Commission (OKACOM) added a secretariat in 2007 ([OKACOM, 2009](#); [ORASECOM,](#)

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2015). The Southern Africa Development Community (SADC) intends to establish more secretariats for existing RBOs in the Inkomati, Pungwe, Save and Ruvuma Basins (SADC, 2014).

Despite the proliferation of RBO secretariats, non-secretariat RBOs have existed and functioned effectively. In the Inkomati Basin, for example, committee-based cooperation has performed adequately for more than two decades (Slinger et al., 2010). In the Kunene Basin, successive agreements have been signed and complied with since 1929 (KRAK, 2016⁵). In the Lake Tanganyika Basin, a committee-based framework fostered cooperation between 2003 and 2008, when a secretariat office was established in Burundi (Roy et al., 2011).

Rationales – and lack of rationales – for secretariat creation have received some attention (Merrey, 2009; INBO-GWP, 2012; UN-Water, 2013; Schmeier, 2015; Soderbaum, 2015; Wingqvist & Nilsson, 2015)¹. INBO-GWP (2012) and UN-Water (2013) highlight how secretariats enable efficiency gains in implementation of water cooperation. Schmeier (2015) underlines the role of secretariats in administration support, donor coordination, programme planning, data exchange and harmonizing water resource policies. Wingqvist & Nilsson (2015) suggest that a secretariat that plays a well-defined role enhances effectiveness of an RBO. In contrast, Merrey (2009) contends that the cooperative formats promoted in Africa have limited value and are only being sponsored as modern ‘best practice’ by influential western based funders. Soderbaum (2015) questions the benefits of secretariats in RBOs, and asserts that their mandates are better handled by multi-purpose regional organizations.

Somewhat surprisingly, despite the proliferation of secretariats in RBOs in Africa on the one hand and debates about the utility of RBOs on the other, systematic assessment of the role of secretariats in African RBOs is scant. Indeed, no study has developed and applied an analytical framework that assesses the added value and added costs associated with secretariat formation in RBOs.

This paper seeks to assess the value and cost-effectiveness of RBOs with secretariats vis-à-vis RBOs without secretariats. To do so, the paper compares the costs and benefits associated with RBOs that have secretariats with the costs and benefits associated with RBOs without secretariats. In what follows, section 2 provides a background to RBOs and transboundary water cooperation in Africa. Section 3 elaborates the methods used in this paper. Section 4 presents results on the costs and benefits of RBOs with and without secretariats. In section 5, findings on costs and benefits of secretariat and non-secretariat RBOs are discussed in a broader context. Section 6 concludes that secretariats add value to RBOs, but secretariat creation should ultimately depend on the aspirations of riparians in specific basins.

2. Background: RBOs and African transboundary water cooperation

The modern evolution of transboundary water cooperation has been considerable, from single purpose bilateral navigation treaties in Europe in the late 19th century to present day multi-purpose, multi-lateral and basin-wide RBOs (Kliot et al., 2001). Cooperation now frequently covers a diverse range of issues – water quality, water allocation, data sharing, environmental protection, benefit sharing and procedures for dispute resolution – and is increasingly oriented toward the holistic management of water resources

¹ A notable addition to this literature (e.g., Scudder, 1991⁸⁹; Chikozho, 2014⁵) has posed broader questions about the efficacy of transboundary water management bodies in Africa, irrespective of whether such bodies possess a secretariat. Q2: Q3

among basin states (Giordano et al., 2014). Either correlated with or because of the broadened nature of transboundary water cooperation, RBOs have proliferated in number and increased in scope in the second half of the 20th century.

Forms of transboundary water cooperation include cooperation without an RBO, cooperation with an RBO that does not have a secretariat, and cooperation with an RBO with a secretariat. Non-RBO cooperation is widely varied, ranging from ad hoc meetings focused only on information exchange to technical teams with specific mandates (Zeitoun & Mirumachi, 2008). RBO cooperation formats tend to fall into one of the three categories: a committee, a commission or an authority (Lautze et al., 2013). A committee is made up of representatives from riparians who meet at regular intervals to discuss basin issues. A commission is typically a more institutionalized organ with a monitoring and regulation mandate. An authority usually possesses development and implementation functions. Commissions and authorities usually possess full-time technical staff. As such, secretariats are a central part of authorities, can be found in some commissions, but are generally not found in committees.

RBO secretariats are quite common globally, as shown in the Transboundary Freshwater Dispute Database's (TFDD) River Basin Organization Design Database (RBODD). The RBODD comprises a subset of agreements from the TFDD, which is the largest repository of global water agreements housed in one extensive database, hosted by the Oregon State University. The RBODD is a repository of agreements creating transboundary RBOs. The database provides information on the type of cooperative format, year of establishment, names of riparians, governance instruments, and functions. The RBODD (2013) found that secretariats exist in almost 50% of RBOs. Secretariats are found in over half of RBOs in Africa and the Americas, while in Europe and Asia, secretariats are found in about 40% of RBOs.

In Africa, formalized transboundary cooperation dates back to the late 1800s. Through the end of the colonial period (~1960), there was minimal emphasis on robust basin-wide frameworks. From the early 1960s, however, agreements were crafted for Lake Chad (1964) and Niger (1964) that reflected a broader approach focused on RBOs with secretariats; the Organisation pour la mise en valeur du fleuve Sénégal (OMVS) in the Senegal (1972) would soon follow. The establishment of basin-wide multi-purpose RBOs with secretariats intensified from 2000 onwards, with institutions being formed such as ORASECOM, Nile Basin Initiative (NBI), Lake Victoria Basin Commission (LVBC), LIMCOM, VBA and ZAMCOM.

Proliferation of secretariats, especially in Africa and Asia, is linked with donor involvement. In the Okavango Basin, funds from the United States Agency for International Development (USAID) and Swedish International Development Cooperation Agency (SIDA) were instrumental in establishing the RBO and its secretariat (OKACOM, 2016⁵). In the Nile Basin, the NBI was established through World Bank engagement (Timmerman, 2005). In the Zambezi Basin, support from the World Bank, Gesellschaft für Internationale Zusammenarbeit (GIZ) and Danish International Development Agency (DANIDA) has enabled ZAMCOM to form and strengthen its secretariat (ZAMCOM, 2016⁶).

Concurrent with the growth of RBO secretariats, water cooperation has continued to be manifested through RBOs without secretariats. In the Kunene, the Joint Permanent Technical Committee (JPTC), initially established in 1969 by the governments of South Africa and Portugal, was re-established when the democratic governments of Angola and Namibia endorsed the previous agreements in 1990. In the Ruvuma, a Joint Water Commission (JWC) was formed in 2006 between Mozambique and Tanzania, without a secretariat. In the Cuvelai-Etosha Basin, a basin commission was formed in 2014 between Angola and Namibia.

On-the-ground effectiveness of RBOs in Africa, both with and without secretariats, produces divergent assessments. Some describe notable successes in the continent's RBOs (Sadoff & Grey, 2002; Turton, 2003; Klaphake & Scheumann, 2006). Sadoff & Grey (2002) highlight cooperation in the Lesotho Highlands Water Commission as fair and economically efficient. Turton (2003) contends that there is now conflict reduction and confidence building in the Okavango Basin because of OKACOM. Klaphake & Scheumann (2006) describe cooperation in the OMVS as mutually beneficial. However, other scholars contend that water cooperation in Africa remains ineffective (Uitto & Duda, 2002; Chikozho, 2014; Soderbaum, 2015). Uitto & Duda (2002) posit that the Lake Tanganyika Authority cooperation is weak due to lack of human, technical and financial capacity. Chikozho (2014) describes cooperation in the Nile Basin and Senegal as 'weak and ineffective' due to capacity constraints. Soderbaum (2015) characterizes cooperation under ZAMCOM as poor because of lack of political commitment from riparians.

While the points raised above indicate that cooperation is effective in some cases but not others, criteria against which effectiveness is assessed appear somewhat fuzzy. Sadoff et al. (2008) and Schmeier (2015) assert that RBO effectiveness is linked to the strength of governance institutions, especially knowledge management, participation of stakeholders, information exchange, monitoring and adaptive management. One might also suppose that RBOs can be said to be effective insofar as they contribute to the broader goals of riparians. In an African context, those broader goals can likely be defined as sustainable development. It seems, therefore, that RBOs in Africa can be considered effective insofar as they strengthen transboundary governance and contribute to sustainable development.

3. Methods

3.1. Conceptual framework

To evaluate the added value of secretariats, this paper sought to identify how the strength of governance instruments, activities, and costs differ between RBOs with secretariats and RBOs without secretariats. As noted above, stronger governance provisions have been a recognized tenet of RBO effectiveness. An RBO's activities received focus as they were presumed to contribute to a region's broader goals of sustainable development. Given the development needs in most of the continent, more activities were presumed to reflect more effective performance. Costs were assessed to account for the increased expenditures associated with any performance improvement.

In effect, this paper determined differences between RBOs with secretariats and RBOs without secretariats that are manifested in: (i) strength of transboundary governance embodied in treaties, and (ii) benefits generated as manifested in number and volume of activities.

The first approach examined the degree to which RBOs with secretariats and RBOs without secretariats are endowed with key governance provisions. Governance instruments in treaties that create RBOs with secretariats were compared with those in treaties that create RBOs without secretariats.

The second approach compared on-the-ground costs and benefits of RBOs with secretariats with those of RBOs without secretariats. Surveys were carried out in RBOs of each type to determine the regular RBO costs, and RBO benefits as reflected in number of activities.

The study is focused on Africa, for two reasons. First, the growth of secretariat centred cooperation on the continent is active and unlikely to abate, yet the rationale for this development may merit additional

elaboration. Second, water cooperation in Africa is particularly influenced by external actors, and such external influence may have a tendency to blunt more organic institutional development processes (Lautze & Giordano, 2005). As such, there may be a critical opportunity through this work to uncover RBO options that match best with a basin's conditions – regardless of international trends.

3.2. Data collection

3.2.1. Compiling treaties creating RBOs. Treaties examined for this paper were drawn from the TFDD's RBODD. There are forty African RBOs contained in the RBODD, and all were included in this study.

3.2.2. Surveys to assess RBO performance. Surveys were applied to basin-wide RBOs in six river basins. While the number of African transboundary RBOs has been estimated to be as high as forty (RBODD Schmeier, 2013), it is not clear that all of them are currently active. Further, the set of forty RBOs-Q4 reflects those operating at basin-wide level and within basins. As such, the six RBOs examined in this document may reflect at least 15% (6/40) of Africa's RBOs, and a greater proportion of Africa's basin-wide RBOs.

Three of the six RBOs possess a secretariat, and three do not. In the former group were RBOs applying to the Okavango, Orange-Senqu and Volta basins. In the latter group were RBOs applying to the Kunene, Inkomati and Ruvuma basins. Data was obtained through semi-structured questionnaires (see Appendix). For RBOs with secretariats, interviews were performed with the head of the RBO secretariat. For RBOs without secretariats, interviews were performed with the head of the transboundary coordinating body.

3.2.3. Data collected. Key parameters on which information on the costs and benefits of RBOs was sought pertaining to: RBO's period of existence, RBO operating costs, activities undertaken and the project budgets of such activities. Government representatives were consulted to validate the data on secretariat operating costs and undertaken activities. Documents (project reports, strategic plans, financial reports, etc.) on each RBO were obtained via e-mail to validate information on the activities undertaken and costs associated. Funders of RBO activities (government, donor agencies and development partners) were also consulted to validate completed (and ongoing) projects.

Collection of data was therefore an intensive exercise that required multiple interactions. It required making several calls to each key informant to request documents and acquire relevant information, which were often not readily available. Obtaining documents, and verifying information, especially project budgets, could take at least a week. In total, comprehensive acquisition of required data for one RBO took about a month.

3.3. Data formulation

3.3.1. Treaty classification. Classification of treaties was done according to the five governance instruments identified by Schmeier (2015): decision-making, dispute resolution, information sharing, monitoring and stakeholder involvement (Table 1).

Decision-making refers to the process of selecting a choice of action by RBO members. Decision-making is done through one of the three mechanisms of consensus, unanimity, or majority vote, or a combination of mechanisms. Dispute resolution mechanisms are internal tribunal, external tribunal and

Table 1. Categorization of governance instruments.

Governance Instrument	Description	Mechanisms
Decision-making	Five mechanisms are used to select a choice of action	Consensus Unanimous Majority Mixed Other
Dispute resolution	Three mechanisms are used to settle quarrels between members	RBO internal mechanism External mechanism involving third party Negotiation of the disputing parties, no RBO involvement
Information sharing	Dissemination of data, material or statistics to members. Three levels of information sharing exist	Institutional Bilateral External
Monitoring	Systematic measurement and observation of resource status. The scope of monitoring is categorized into two options	Compliance (with RBO agreement) Environmental (state of the basin)
Stakeholder involvement	Participation of interested parties in basin management. Six of types of participation have been identified	Information dissemination Consultation Inclusion in decision-making Participation in monitoring Observation during meetings Participation in projects

negotiation. An RBO can have more than one mechanism to allow for appeals. Information sharing is practised at an institutional, bilateral or external level. At institutional level, information is shared among all the riparians that are party to the RBO as an institution, while at bilateral level, information is shared between only two riparians in an RBO. At an external level, information is shared with other stakeholders outside the RBO. An RBO usually operates on one of the three. The scope of monitoring is either or both compliance or environmental. Stakeholder involvement has six mechanisms of participation – information dissemination, consultation, inclusion in decision-making, taking part in monitoring, invitations to observe during meetings and participation in projects. An RBO can use more than one mechanism.

3.3.2. Capturing costs and benefits through surveys. To identify costs and benefits of RBOs with secretariats and RBOs without secretariats, survey results were divided into costs and benefits. Costs refer to recurring costs (regular costs) required to sustain the basic operations of the RBO (GIZ, 2014). Other costs related to project implementation are excluded because they are not directly financed by the RBO, and are also variable. Costs were monetized in US Dollars (\$) using the June 2015 exchange rates. Benefits associated with RBOs were captured by activities undertaken.

3.3.3. Activities undertaken. Activities undertaken were captured through the financial value of an RBO's projects as well as project duration. Three steps were taken to compile the data. First, the budgets of each RBO's activities were recorded, and the aggregate value was determined for all activities undertaken by an RBO. Second, the duration of each activity was also captured and aggregate 'activity years'

– that is, the total of all the implementation periods (in years) of the activities in an RBO – was determined for each RBO. Third, activity years were divided by the number of years of RBO existence to produce a value of activity-years per year. This formulation was done to normalize for the reality that RBOs have been in existence for different numbers of years.

3.4. Analyses performed

Two types of analyses were performed. First, an analysis of the governance strength of each category of RBOs was done, based on examination of treaties. Second, costs and benefits associated with RBOs on the ground were examined.

3.4.1. The governance strength analysis. Governance strength in RBOs with secretariats was compared with that in RBOs without secretariats by evaluating presence of governance instruments in treaties. A treaty analysis was performed to assess the presence of the previously described five governance instruments in the RBOs. In each of the forty RBOs, the existence of the five governance instruments was recorded. The existence of each instrument was described as a percentage of the forty RBOs. Averages were created for RBOs with secretariats on one hand, and RBOs without secretariats on the other. A comparison of the two was then made.

3.4.2. The cost-benefit comparison. Three analyses were performed to compare costs and benefits of RBOs with secretariats and RBOs without secretariats, on the ground:

- What is the aggregate operational cost per year in RBOs with a secretariat versus RBOs without a secretariat? Annual regular costs were totalled separately for RBOs with secretariats on one hand, and RBOs without secretariats on the other. The aggregate costs were then compared.
- What are the average benefits per year in RBOs with secretariats vis-à-vis RBOs without secretariats? Benefits focused on number, value and duration of activities, as well as strength of governance processes. Specific analyses were as follows. The volume and value of all activities in secretariat-based RBOs and non-secretariat-based RBOs were compared. The aggregate activity years and activity years per year for RBOs with secretariats compared with RBOs without secretariats.
- Do benefits of RBO secretariats justify their costs? Analysis examined ‘value-for-money’ for the two categories of RBOs to reveal if benefits associated with secretariats are justified by their costs. The cost of RBO operation per year was considered against the accrued benefits – measured by the number of activities per year and activity value per year – in associated basins. A comparison is then made between the RBOs with secretariats and RBOs without secretariats.

4. Results

4.1. Governance strength

RBOs with secretariats are endowed with a more robust set of governance instruments than RBOs without secretariats (Table 2). All five governance instruments are found more frequently in treaties

Table 2. Treaty assessment.

Governance instrument	RBOs with secretariats	RBOs without secretariats
Decision-making		
Frequency of inclusion	83%	36%
Main mechanism(s)	Consensus	Consensus
Dispute resolution		
Frequency of inclusion	83%	45%
Main type(s)	Negotiation	Negotiation
Information sharing		
Frequency of inclusion	78%	41%
Main type(s)	Institutional	Institutional
Monitoring		
Frequency of inclusion	39%	18%
Main type(s)	Compliance, environmental	Compliance, environmental
Stakeholder participation		
Frequency of inclusion	50%	9%
Main type(s)	Information dissemination	Information dissemination

creating RBOs with secretariats, by a fairly large margin. Treaties that lay the foundation for RBOs with secretariats, therefore, appear designed for more comprehensive governance of transboundary waters.

Presence of explicit decision-making mechanisms is greater in treaties creating RBOs with secretariats (83%) compared to treaties forming RBOs without secretariats (36%). The decision-making mechanism most prevalent in both categories is consensus. In the Agreement on the Establishment of the Zambezi Watercourse Commission, for example, article 9.4 states that ‘all decisions of the technical committee shall be by consensus’ (ZAMCOM, 2004). A similar provision is made in article 3.9 of the Agreement for the Establishment of the Orange-Senqu River Commission (ORASECOM, 2000). A less notable mechanism in both categories is unanimity.

Dispute resolution mechanisms exist in 83% of RBOs with secretariats, but in only 48% of the RBOs without secretariats. Negotiation is the most prevalent mechanism in both RBO types. Internal tribunals are used less notably, but external tribunals are used substantially in RBOs without secretariats. In the Agreement for the Establishment of the Orange-Senqu River Commission for example, unresolved disputes will be taken to a SADC tribunal, whose decisions will be final and binding (ORASECOM, 2000).

Information sharing mechanisms exist in 78% of RBOs with secretariats, but in only 41% of RBOs without secretariats. Information sharing is predominantly at the institutional level for both RBO types. For example, in the Agreement for the Establishment of the Limpopo Watercourse Commission, all members are compelled to share hydrological and environmental information regularly (LIMCOM, 2003).

Monitoring mechanisms exist in 39% of RBOs with secretariats, and in 18% of RBOs without secretariats. The most prevalent focus of monitoring in RBOs with secretariats is compliance, which refers to the RBO member states’ compliance with the basin agreement and decisions made therein. In RBOs without secretariats, both compliance and environmental monitoring are equally prevalent. For example, the Inkomati Tripartite Permanent Technical Committee (TPTC) comprehensively provides for the establishment of ‘systems, methods and procedures’ for monitoring (TPTC, 2002).

Mechanisms for stakeholder participation exist in 50% of RBOs with secretariats, but only in 9% RBOs without secretariats. Participation is mostly restricted to information dissemination. For example,

in the Convention Establishing the Organization for the Development of the Senegal River, information on the state of the basin must be compulsorily accessible to the public (OMVS, 2016). In the Protocol for the Sustainable Development for Lake Victoria (East Africa Community [EAC], 2003), external actors can observe proceedings. Among the five governance instruments, the fact that stakeholder participation is the most rarely covered by RBOs without secretariats may be logical – the committee-based formats that such RBOs often take may indeed limit the degree to which participation can be accommodated.

4.2. On-the-ground cost-benefit comparison

4.2.1. Comparing costs. Costs of operating RBOs with secretariats are greater than costs of operating RBOs without secretariats (Table 3). Overall, regular costs are negligible for RBOs without secretariats, and notable in RBOs with secretariats². Difference in costs presumably results from the fact that RBOs without secretariats do not require office administration or salary expenditures.

Costs within secretariats also vary. VBA's operating costs stand at \$6 million per year, for example, while OKACOM's regular costs amount to only \$300,000. ORASECOM has the lowest operational costs, totalling only approximately \$167,000 annually. A major variable that influences the VBA's costs is its larger staff size, which in turn raises salary costs. Indeed, unlike OKACOM and ORASECOM that possess secretariats of five people or less, the VBA's full-time staff number approximately twenty.

4.2.2. Comparing benefits. RBOs with secretariats undertake a higher volume of activities than RBOs without secretariats (Table 4). The number of activities undertaken by RBOs with secretariats range from four to twelve³, while the number of activities undertaken by RBOs without secretariats range

Table 3. Costs of RBOs with Secretariats versus RBOs without Secretariats.

RBO	Year of RBO establishment	Establishment of secretariat	Riparians	Annual costs of running RBO (US\$)
OKACOM	1994	2007	Angola, Botswana, Namibia	300,000
ORASECOM	2000	2006	Botswana, Lesotho, Namibia, South Africa	167,352
VBA	2007	2007	Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Togo	6,000,000
Inkomati TPTC	2002	n/a	Mozambique, South Africa, Swaziland	Negligible
Kunene PJTC	1990	n/a	Angola, Namibia	Negligible
Ruvuma JWC	2000	n/a	Mozambique, Tanzania	Negligible

² Annual costs estimated at less than \$10,000 are described as negligible.

³ Some activities commenced prior to the formal establishment of a secretariat. Activities undertaken less than two years before the secretariat was formed are considered as part of secretariat activities because they were planned with the secretariat

Table 4. Activities in the RBOs.

	RBO	Years of formation	Activities undertaken (US\$)	Activity years	Activity years per year	Total value (million US\$)	Estimated value/year (million US\$)
With secretariat	OKACOM	1994 w/o secretariat; 2007 with secretariat	Institutional support (2008–2012): \$2,400,000. CORBWA (2010–12): \$475,000; IRBM (2004–2008): \$8,000,000; ERHP (2004–2012): \$3,500,000; SAREP (2010–2015): \$23million. MSIOA (2014–2016): \$800,000. SAP (2011–2015): \$6,000,000	33	4.1	44.2	5.5
	ORASECOM	2000 w/o secretariat; 2006 with secretariat	IWRM Plan (2004–2013) \$3,552,999. RBSP \$222,464. SAP (2009–2014) \$6,300,000. Institutional Strengthening \$387,666. RAK (2006–2009) \$444,928. TRSP (2008–2011) \$2,780,800. PIU (2006–2009) \$758,269. LBD (2011–2014) \$474,703. Sponges Protection (2013–2015) \$1,215,202. IWRM Demo (2013–2015) \$4,178,174. WC&DM (2011–2013) \$837,377	45	5.0	21.2	2.4
	VBA	2007	TDA (2008–2013) \$12,443,119, VBO (2009–2012) \$1,338,492, Institutional strengthening (2012–2015) \$577,782, HYCOS (2011–2015) \$1,338,492	18	3.6	15.7	2.0

(Continued.)

Table 4. (Continued.)

	RBO	Years of formation	Activities undertaken (US\$)	Activity years	Activity years per year	Total value (million US\$)	Estimated value/year (million US\$)
Without secretariat	Inkomati TPTC	1983	JIBS (1981) \$250,132, PRIMA 1 (2007–2012): \$8,204,465. TMRBS (2006–2008) \$2,565,443	10	0.3	11.0	0.33
	Kunene PJTC	1990	KTWSP (2009 to date) \$32,240,000.	6	0.2	32.2	1.3
	Ruvuma JWC	2006	SWSP \$5,000,000	4	0.4	5.0	0.6

from one to three. A total of twelve activities were undertaken in the context of ORASECOM, seven were undertaken through OKACOM and four were undertaken through VBA. In contrast, the Inkomati TPTC undertook three activities. Only one activity each was undertaken in the context of the Kunene Permanent Joint Technical Committee (PJTC) and Ruvuma JWC. For example, the Shared Waters Support Programme (SWSP) is the only activity undertaken in the context of Ruvuma JWC.

The number of activity years – that is, the aggregate number of years for which activities have run – is also greater for RBOs with secretariats. For the ORASECOM, the total number of activity years is forty-five, for the OKACOM it is 33 years, and for the VBA 18 years. Comparatively, the recorded activity years for RBOs without secretariats is much lower, with only 10 years for the Inkomati TPTC, six for Kunene PJTC and four for Ruvuma JWC.

Normalizing for the number of years an RBO is in existence confirms that the time-duration for activities associated with RBOs with secretariats is greater. For RBOs with secretariats, the activity years per year range from 3.6 to 5.0, a much higher rate than for RBOs without secretariats, where they range from 0.2 to 0.4. Project longevity is evidenced, for example, by the Integrated Water Resources Management (IWRM) Project administered by ORASECOM, implemented for more than 7 years.

Estimated value per year of RBO activities is also greater for RBOs with secretariats. The value per year is \$5.5 million in the OKACOM, \$2.4 million in the ORASECOM and \$2.0 million in the VBA. The value per year for RBOs without secretariats is comparatively much lower, being below half a million dollars in the Inkomati TPTC, just over the same mark in Ruvuma JWC, and \$1.3 million in the Kunene PJTC.

4.2.3. The bottom line: cost-benefit comparison. RBOs with secretariats appear cost-effective (Table 5). Comparison of activities against regular costs reveals that while regular costs are greater in RBOs with secretariats, they undertake more activities compared to RBOs without secretariat. For example, ORASECOM averages 1.3 activities per year at an annual cost of \$0.2 million and OKACOM averages 0.9 activities per year at an annual cost of \$0.3 million. By comparison, RBOs without secretariats impose minimal costs, but are associated with much fewer activities. The Kunene PJTC and Ruvuma JWC, for example, both average only 0.1 activities per year.

Table 5. Cost-benefit comparison of RBOs.

	RBO	Regular costs per year (US \$ million)	Activities/year	Value/year (million US\$)	Value/cost (US\$)
With secretariat	OKACOM	0.3	0.9	5.5	18.3
	ORASECOM	0.2	1.3	2.4	12.0
	VBA	6.0	0.5	2.0	0.3
Without secretariat	Inkomati TPTC	Negligible	0.0	0.3	
	Kunene PJTC	Negligible	0.1	1.6	
	Ruvuma JWC	Negligible	0.1	0.6	

establishment in sight. As such, one activity associated with ORASECOM is included for assessment. In the OKACOM, the secretariat agreement was signed in 2004, although the secretariat was not formally established until 2007; in this case, activities from 2004 were presumed to be associated with the secretariat.

Although regular costs associated with RBOs with secretariats are greater than those associated with RBOs without secretariats, such greater costs appear to facilitate more activities and higher investment. Secretariats are linked with higher value to cost ratios (Table 5). OKACOM mobilizes \$18.3 for each dollar directed to its RBO while ORASECOM mobilizes \$12 for every \$1. In comparison, the value-cost ratio for RBOs without secretariats is limited in all three RBOs: negligible costs bring low benefits. While one cannot clearly ascertain that these activities and investments produced positive outcomes on the ground, their existence is likely a step toward positive outcomes and as such likely constitutes a contribution toward basins' sustainable development.

5. Discussion

This paper reviewed some forty treaties and on-the-ground experiences in six African transboundary basins in order to assess the value that secretariats add to RBOs. The review of treaties clarified how the governance architecture of RBOs with secretariats compared with that of RBOs without secretariats. Examination of RBO performance revealed how the benefits of RBOs with secretariats – manifested in number, duration and monetary volume of activities – compare with those of RBOs without secretariats. This paper is believed to be the first to provide a systematic indication of the added value of secretariats in transboundary African RBOs.

The paper produced two major findings. First, secretariats add value to the RBOs and basins in which they operate. In particular, the presence of secretariats correlates with more activities, and of greater value. Furthermore, secretariats are associated with more robust governance instruments. The second, related finding, is that secretariats are cost-effective. Secretariats bring additional costs, but those costs are far outweighed by the investment that they appear to catalyse.

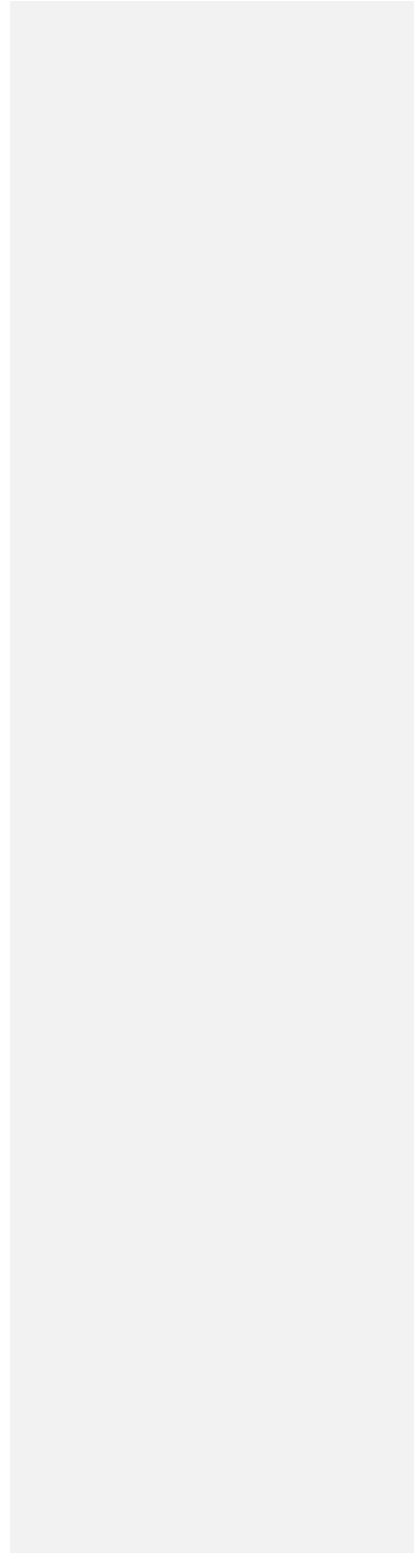
Our findings are broadly consistent with the findings of others. Our findings that secretariats add value and are cost-effective are consistent with [INBO-GWP \(2012\)](#) and [UN-Water \(2013\)](#), which contend that project implementation is enhanced by secretariats. Further, our identification of superior governance in RBOs that have secretariats is consistent with [Schmeier's \(2015\)](#) assertion that secretariats increase efficiency in planning, data exchange and riparian coordination⁴. Finally, [Wingqvist & Nilsson's \(2015\)](#) finding that secretariats are essential for RBO effectiveness is partly upheld by our second finding that secretariats are linked to stronger governance.

This paper's findings are nonetheless at odds with some others. [Merrey's \(2009\)](#) assertion that RBOs are ineffective is inconsistent with our findings that secretariats bring benefits to RBOs. [Soderbaum's \(2015\)](#) suggestion that RBO secretariats are not effective because of weak political clout is also contrasted by our findings. Furthermore, contentions in [Uitto & Duda \(2002\)](#) and [Chikozho \(2014\)](#) that African RBOs are largely ineffective – irrespective of their format – would appear to contrast with evidence that secretariat-based RBOs strengthen governance and facilitate transboundary projects.

Importantly, while the central findings of this paper highlight that secretariats do add value to RBOs, the desirability and nature of a secretariat should ultimately depend on the preferences of basin riparians. Indeed, secretariats must not be treated as a requirement – the presence and format of RBOs are rather

⁴ While the paper did not specifically measure planning efficiency, levels of data exchange or coordination, the contribution of secretariats towards such aspects of cooperation is supported by the greater presence of governing instruments in secretariat

RBOs compared to non-secretariat RBOs, for example information sharing and decision-making mechanisms.



context specific. While secretariats appear to strengthen governance and catalyse activity at a basin-level, not every basin may require intensive activity – or any activity – at a basin level. There is a need to fit form to function (Hearns et al., 2013). If there is a need for basin-level activity and engagement, secretariats may help catalyse projects toward this end. If riparians do not require basin-level activity or only require less intense forms of engagement, however, secretariats may not be needed. That said, many African basins are in need of technical investments. To the extent that secretariat-based RBOs may help catalyse investment, their formation can be considered to play a valuable role.

Three caveats should be flagged. First, it is not possible to conclusively determine whether activities and investments associated with RBO secretariats were secured because of secretariat presence, or due to other factors. It may indeed be possible that support and engagement has been channelled to certain basins, and that support is directed both to secretariat creation and other activities. If such were the case, secretariats would simply be created along with other investment rather than because of that investment. Moreover, it may be that more activities are found in basins with secretariats because secretariat formation was itself driven by the need to coordinate a high number of activities. As such, a causal relationship between secretariats and the suite of identified benefits cannot be definitively concluded at this point. Nonetheless, there is evidence that activities have clearly increased following secretariat establishment.

The second caveat is that the number of activities does not necessarily translate to the number of benefits realised. Several examples where such activities produced tangible benefits nonetheless exist. For example, in the Kunene, the transboundary water supply project is providing domestic and industrial water to about a million people in communities on either side of the Angola–Namibia border (Kiggundu, 2012). In the Orange, joint basin studies have led to greater consideration of the river's environmental flows (ORASECOM, 2011). And environmental concerns raised by the EPSMO project in the Okavango Basin cautioned against planned upstream water abstraction in Angola and Namibia and the riparians are now considering other benefit sharing options (OKACOM, 2010).

And third, this paper could not thoroughly explore the issue of scale, which may have influenced the evidenced variation in activities and investment. Project funders may indeed be drawn toward 'bigger' issues in large basins where their work is more visible, and where potential rewards of investment may be perceived to be greater. In this study, RBOs with secretariats were located in larger basins compared with RBOs without secretariats. However, the level of investment is not necessarily linked to the size of the basin. The Okavango Basin is smaller than the Orange Basin, but the former has attracted higher value activities nevertheless. This shows that the relationship between scale and investment is complex, and therefore may need to be fully addressed by a separate study.

6. Conclusion

Performance levels in RBOs with secretariats identified in this paper largely validate best-practice recommendations for secretariat creation in Africa's transboundary waters. While a broader sample of RBOs would have produced more conclusive confirmation of the value of secretariats, the depth of approach utilized in this paper far exceeds those of best practice guidance or speculative critiques on the topic. As such, the conclusions derived from this paper may be the most evidence-driven and credible on this issue.

Two issues require further reflection. First, the broader factors that enhance and constrain effectiveness of RBOs – with or without secretariats – could help control for such factors to better contextualize RBO efficacy. It may be, for example, that the RBOs with secretariats considered above were simply located in

basins where other factors fostered effective progress. Second, while the cost-effectiveness of RBOs with secretariats is acknowledged, the likelihood that the achievement is often donor driven may be problematic. In the event of a reduction of donor support, the sustainability of such success is compromised. Ideally, riparians would guarantee sustainable success if they progressed toward joint investment.

The paper's findings point to opportunities for further research in three specific areas. First, an investigation into the link between scale and investment may further nuance the relationship between basin size and project support. Second, a study of the impact of investments on the ground, that is positive outcomes, would be beneficial in quantifying the broader value of activities. In particular, clarifying the impact of elevating the importance of transboundary water management through secretariat creation, as opposed to national water management within riparians, may provide additional insights about the value of secretariats. And third, this paper applied a quantitative approach to identifying the value added of secretariat-based RBOs. There remains some scope for a complementary qualitative investigation to unearth additional insights.

In closing, recommendations to those engaged in transboundary water management in Africa's basins – regional economic communities, riparian governments, donors, others – are as follows:

- Consider creating secretariats in RBOs. Greater riparian investment in secretariats appears associated with greater rewards manifested in donor investment. Riparians may therefore consider contributions toward establishment and maintenance of RBO secretariats as seed funds toward something bigger.
- Identify other factors, besides the secretariat, that contribute to RBO effectiveness in order to help identify the RBO model most suited to each context. Effectiveness of an RBO is context specific and therefore, recognition of such contextual factors can enhance selection of optimal and cost-effective RBO models.
- Consider ongoing assessment of RBO performance in order to identify modifications that can improve or incentivize cost-effectiveness. A broader assessment of RBO performance – beyond the six that received focus in this document – can indeed reveal more conclusive insights about matching institutional form to basin context. Further, ongoing monitoring may help highlight key opportunities for institutional change in light of changing realities in basins over time.
- In the context of southern Africa, development needs and geographic realities point to an added value for secretariats in larger basins. Nevertheless, a thorough assessment of needs in the smaller basins such as Pungwe and Save, with a great majority of territory in just one country, may be necessary to inform decision-making on the utility of secretariat formation there.

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