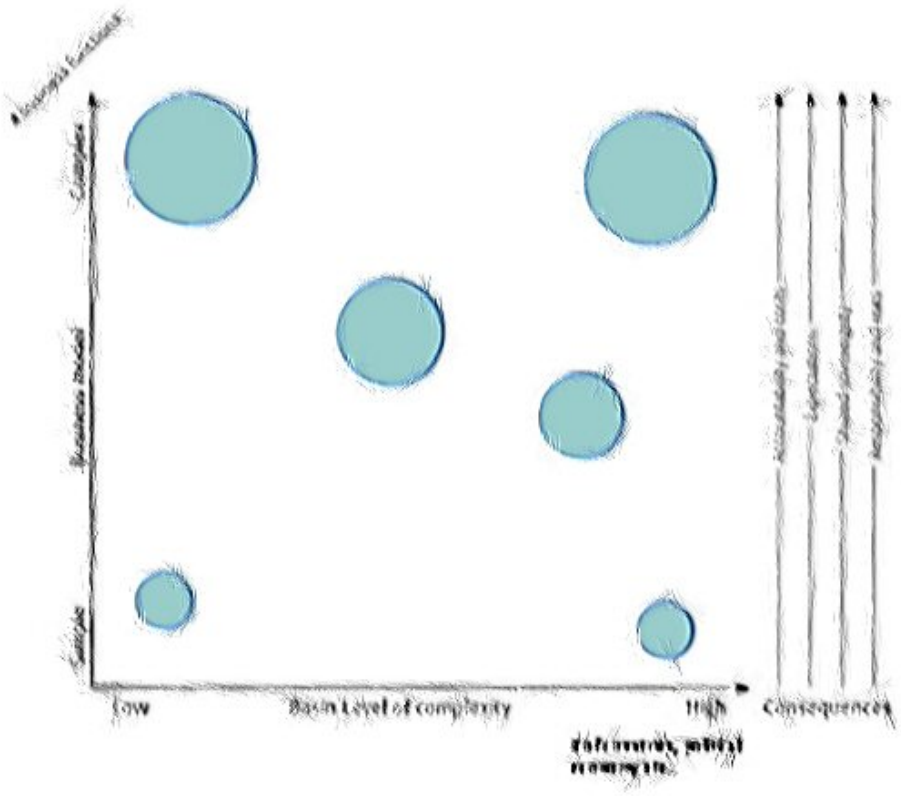
A Framework for Exploring Business Models for Shared Watercourse Institutions



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1. Context, problem description and objective

This paper explores different business models for shared watercourse institutions. Business models are defined as frameworks for creating economic, social, and environmental value in a shared watercourse context. The paper provides input to a broader research consultancy carried out by the Council for Scientific and Industrial Research (CSIR) of South Africa with contributions from the Stockholm International Water Institute (SIWI) of Sweden. The purpose of the research consultancy is to develop tools and approaches to strengthen river basin organisations (RBO) in the Southern Africa Development Community (SADC), to promote management and development of shared watercourses, and to facilitate the understanding and role of a Shared Watercourse Institution (SWI) in the water resources management system.

Shared watercourses present opportunities for the sustainable development in the SADC region. While the region has an urgent need to take advantage of these development opportunities, current SWIs remain ineffective. This is partly due to a lack of clarity in the roles and mandates of the SWI to promote cooperation and ensure development (Katerere/Hill/Moyo 2001). It is, therefore, argued that river basin organisations need to be strengthened and empowered to better execute the mandate trusted to them by watercourse states in accordance with the Revised Protocol on Shared Watercourses (SADC 2000), and its institutional framework for implementation (SADC 2007). Current SWIs in SADC differ significantly in their roles and the water management and development functions they carry out. There are examples of less complex bilateral SWIs, SWI with very specific mandates focussing on e.g. hydropower generation and examples of SWIs with complex mandates and specific functions.

The objective of this paper is to outline a method to analyse possible business models for SWIs to carry out their mandate both more effectively and in accordance with the SADC Protocol (2000), the SADC Treaty and the stated water resources management and development objectives of the water course states. The appropriate business model for a SWI should first be based on an analysis of its mandate, secondly on the water management and development functions needed to reach agreed objectives and finally on an analysis of different implementation models. The method incorporates an analysis of moving from simple to more complex situations including the number of functions to be carried out by the SWI, the number of countries involved, and political and economical differences between countries.

2. Analysing the mandate of shared watercourse Institutions in the SADC Water Protocol

When analysing appropriate business models for SWIs it is important to understand how the SADC countries interpret the word “mandate” for an SWI. SADC has put in place several strategic plans and programmes related to the use of shared waters to guide member states in achieving the overall SADC vision of “a common future, within a regional community that will ensure economic well-being, improvement of the standards of living and quality of life, freedom and social justice, and peace and

security for the peoples of Southern Africa". The SADC Water Protocol 2000 is the starting point for all water related plans and programmes in the region.

The SADC Regional Indicative Strategic Development Plan (RISDP) focuses on cooperation in infrastructure support and stresses the strengthening of shared watercourse management systems to promote the development of water infrastructure. The Regional Water Policy (RWP) provides an overall framework to achieve cooperation on shared watercourse systems. The Regional Strategic Water Infrastructure Development Program (RSWIDP) outlines actions in three areas: water for food security, energy security and water supply and sanitation (SADC 2007).

In this analysis we will focus on the fundamentals in the SADC Protocol (2000) which states that:

- Watercourse states should work to establish appropriate institutions, such as: watercourse commissions, water authorities or boards as may be determined (i.e. an SWI) .
- The responsibilities of such institutions shall be determined by the nature of their objectives which must be in conformity with the principles set out in the Protocol.

The SWIs, once established, are part of a broader SADC institutional framework. This framework is made up of the following organs:

- the Committee of Water Ministers;
- the Committee of Water Senior Officials;
- the Water Sector Co-ordinating Unit; and
- the Water Resources Technical Committee and sub-Committees.

The Committee of Water Ministers is, in turn, part of the SADC Directorate for Food, Agriculture and Natural Resources (FANR) that report and advise the Summit of SADC Heads of State and Governments . The SWI operate below this administrative superstructure. The mandate and objectives of the SWI are decided upon by the watercourse states independently. However, they should be in alignment with the overall objective and the key principles defined in the 2000 Protocol. We will therefore analyse further the key principles in the Protocol (2000) to better understand the anticipated mandate of an SWI.

The overall objective of the protocol is "to foster closer cooperation for judicious, sustainable and co-ordinated management, protection and utilisation of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation".

The Protocol continues to define key principles designed to ensure effective interaction between states in implementing the overall objective. Figure 1 (page 4) places the principles and objective in the SADC Protocol (2000) into a results hierarchy to clarify the concept.
Based on this analysis it is possible to separate core value principles from management principles as follows:

Value principles

1. recognise the unity of each shared watercourse,
2. the utilisation of shared watercourses shall be open to each watercourse state, and include agricultural, domestic, industrial, navigational and environmental uses,
3. respect the existing rules of customary or general international law,
4. respect the balance between resource development for a higher standard of living for their people and conservation and enhancement of the environment,
5. utilise a shared watercourse in an equitable and reasonable manner.

Management principles

1. undertake to harmonise the multiple uses of water to ensure and observe the objectives of regional integration and harmonisation of all state parties,
2. establish close co-operation with regard to the study and execution of all projects likely to have an effect on the regime of the shared watercourse,
3. exchange available information and data regarding the hydrological, hydrogeological, water quality, meteorological and environmental conditions,
4. take into account all relevant factors related to uses of water,
5. take all appropriate measures to prevent significant harm to other Watercourse States.

The five management principles focus on joint cooperation on pre-investment studies and investment projects, the harmonisation of water uses and the assurance that no significant harm is caused to watercourse states. The value principles and the management principles create together the foundation for reaching the higher order objective of management, protection and utilization of shared water courses and how that contributes to the long term SADC goal of regional integration and poverty alleviation (figure 1). In this context, the overall mandate of the SWI is defined as: to manage, protect and utilise shared watercourses based on agreed key values and management principles.

According to the SADC Protocol, watercourse states have therefore considerable flexibility to explore business principles and models for their SWI that fit their specific objectives and the unique natural, political and economical situation in which the shared watercourse sits.

The analysis of business models that follow will look at possible management and development functions and business principles of an SWI to support countries and stakeholders in the decision of an appropriate business model.

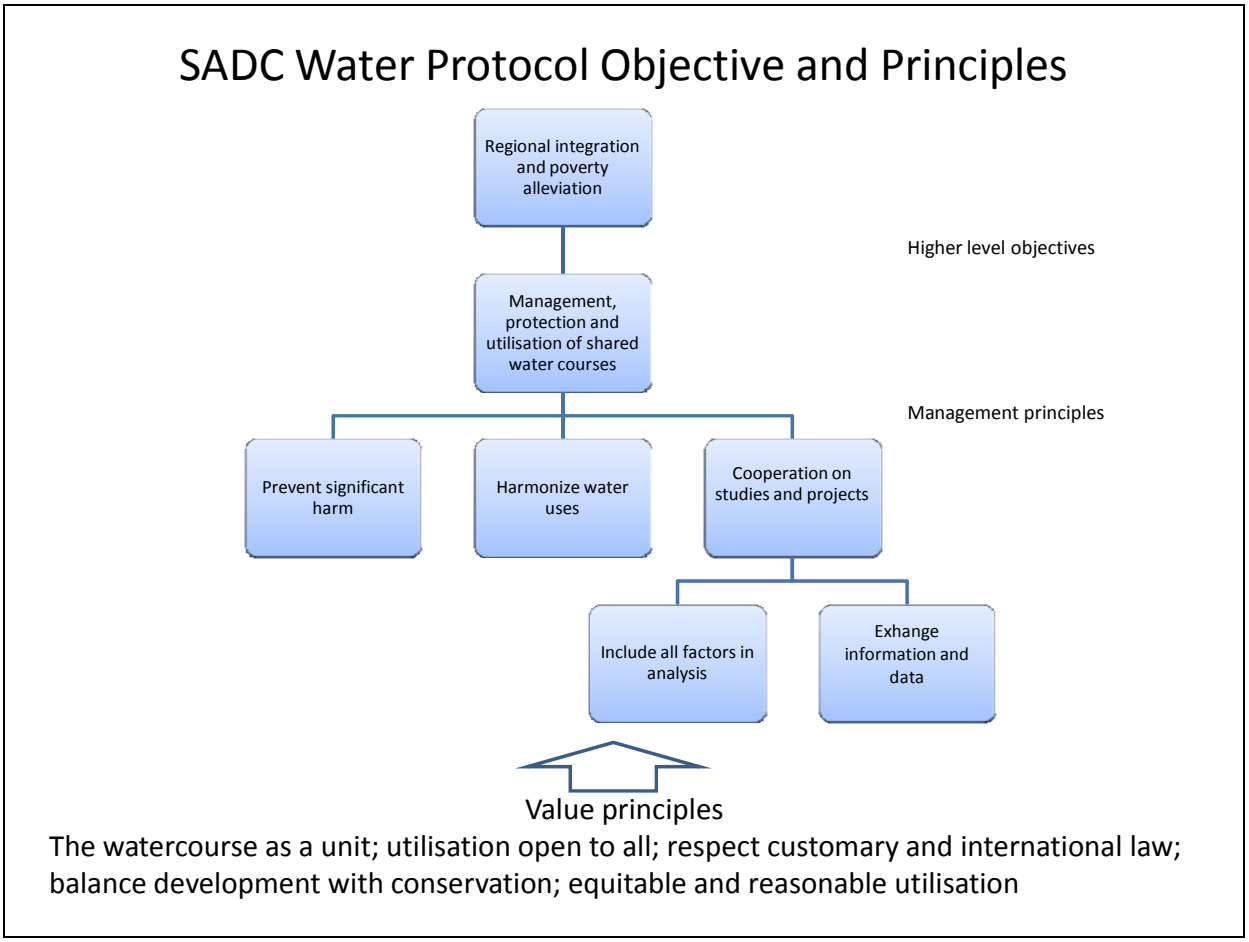

Figure 1. Causal chain of objectives and principles defining the mandate of a Shared Watercourse Institution (SWI), based on the SADC Water Protocol 2000.

3. Analysing operational functions for management and development of watercourses

Water management and development functions at the national level

CAPNET 2008 has analysed key performance indicators of RBOs (primarily at the national level) that link to a set of operational functions. The functions and associated indicators (table 1) are regarded in the study as the minimum action required for an RBO to meet basic water management objectives. CAPNET 2008 claims that good water resources management and development at the transboundary level depend on strong systems and structures in-country. In this paper we investigate the functions and roles of an SWI and have therefore placed less focus on the performance indicators. RBO functions and their objectives, according to CAPNET 2008, are: water allocation; pollution control; monitoring; basin planning; economic and financial planning; information management; and stakeholder participation (table 1).

Function	Water Management Objectives
1. WATER ALLOCATION Allocating water to major water users and uses, maintaining minimum levels for social and environmental use while addressing equity and development needs of society.	Major water users are known and are managed through a licensing (or permit) system. Water allocation is in line with sustainable use, economic efficiency and social equity principles.
2. POLLUTION CONTROL Managing pollution using *"polluter pays"* principles and appropriate incentives to reduce the most critical pollution problems and minimise environmental and social impact.	The extent of the pollution problem is known and progress being measured. Major polluters are known and are managed through a licensing (or permit) system.
3. MONITORING Implement effective monitoring systems that provide essential management data and identify and respond to infringements of laws, regulations and permits	The water allocation system is effective and there is compliance with permits. The Pollution control system is effective and there is compliance with permits. Knowledge of water resource availability is a basis for management.
4. BASIN PLANNING Prepare and regularly update the Basin Plan incorporating stakeholder views on development and management priorities for the basin, and using it to inform the annual work plans of the RBO.	Basin planning synthesises technical and social priorities for the basin and acts as a basis for action and accountability to the stakeholders.
5. ECONOMIC AND FINANCIAL MANAGEMENT Applying economic and financial tools for cost recovery and behaviour change to support the goals of equitable access and sustainable benefits to society from water use.	Improve water use efficiency through economic and financial instruments. Reduce pollution through economic and financial instruments.
6. INFORMATION MANAGEMENT Provide essential information necessary to make informed and transparent decisions for development and sustainable management of water resources in the basin.	Essential data is processed and packaged as information at the right level for specific managers and stakeholders to support transparent decision making and to gain commitment and political support for the decisions made.
7. STAKEHOLDER PARTICIPATION Implement stakeholder participation as a basis for decision making that takes into account the best interests of society and the environment in the development and use of water resources in the basin.	Effective cooperation between government agencies with responsibilities for water management or water use in the basin. Stakeholder participation is institutionalised in the management of the river basin.

Table 1. Functions for water resources management at the in-country level (CAPNET 2008)

Hooper (2006) emphasises the evolution of an RBO at the national level and stresses "learning by doing". He sees three stages in the evolution of an RBO – the "initial RBO", the "emerging auto–adaptive RBO" and the "mature and auto-adaptive RBO". Five functions are then linked to these stages as the RBO matures, develops and takes on more responsibilities. The stages and functions are summarised in table 2 below.

Functions	Initial RBO	Emerging auto–adaptive RBO	Mature and auto-adaptive RBO
1. Water (and natural) resource data collection and processing, modelling, planning, stakeholder consultation and issue clarification	X	X	X
2. Project feasibility, design, implementation, operation and maintenance, raising funds, community consultation, and awareness raising	X	X	X
3. Allocating and monitoring water shares, cost sharing principles		X	X
4. Policy and strategy development for economic, social and environmental issues			X
5. Monitoring water use, monitoring pollution and environmental conditions, oversight and review role for projects promoted by RBO partners.			X

Table 2. Functional stages in the evolution of an adaptive RBO at the in-country level (Hooper 2006 based on Comfort 1999 and World Bank 2006)

The analysis of the development of an RBO from an institutional and functional perspective is critical to understand when assessing the functions of an SWI. The development of RBOs, at both the national and transboundary level, takes a long time and it requires support to facilitate the development of strong organisations (Jägerskog/Granit/Risberg/Yu 2007, CAPNET 2008, Hooper 2006).

The functions listed in the table above are the key building blocks for successful management and development also at the transboundary level. Water allocation is a central function of an RBO, yet this function usually is not performed until the second stage in the evolution of an RBO when it has evolved into an "emerging auto-adaptive RBO" (Hooper 2006). Policy and monitoring functions require a "mature RBO".

Operational functions in a selection of national RBOs have been further analyzed to compare with the finding of CAPNET 2008 and Hooper 2006. The following RBOs have been analysed that respond to different levels of government:

- The Mahaweli Authority of Sri Lanka (MASL), Sri Lanka is an authority under the federal Ministry of Mahaweli.
- Tana Basin Water Resources Management Authority (Tana WRMA), Kenya is a regional office of a national government body.
- The Selangor Waters Management Authority (LUAS), Malaysia is a statutory agency at the regional government level.
- Lerma Basin Council and Santiago Basin Council (COGERH), Mexico is a company owned by the regional government.
- Fraser River Basin Council (FRBC), Canada is an NGO with representatives from four levels of government in its governing board together with stakeholders.

The basins have very different pre-conditions for implementing Integrated Water Resources Management (IWRM). The physical characteristics of the basins, the political support at all relevant levels, and the resources available – both financial and human – are all issues that affect how RBOs fulfil their objectives. All RBOs analysed here serve a wide range of functions that are detailed in their strategic plans. Due to a lack of resources, most must prioritise certain functions and have not been able to meet the agreed management objectives in full. Some functions from CAPNET's list (2008) are also carried out by other institutions in cooperation with the RBO or completely independent from the RBO (see table 3).

	Water Allocation	**Pollution Control**	**Monitoring**	**Basin Planning**	**Economic & Financial Mngmnt**	**Information Mngmnt**	**Stakeholder Participation**
MASL	**X**	x	**X**	**X**	**X**	---	**X**
Tana WRMA	x	**X**	**X**	**X**	x	x	**X**
LUAS	**X**	x	x		x	---	x
COGERH	x	---	x	x	**X**	---	x
FRBC	**O**	**X**	x	**X**	**O**	**X**	**X**

Table 3: X= function performed by RBO, x= function is to some extent performed or is performed in cooperation with other institutions, O= function is not carried out, ---= no information.

By using Hooper's (2006) stages of the evolution of an RBO we can see some coherence with the RBOs reviewed here (table 4). MASL is probably the RBO that is closest to being classified as mature. The other organisations often do not meet all the criteria defined for each stage. An interesting example is the FRBC, which is an old organisation that carries out most of the IWRM functions of an RBO. However, because of its status as an NGO it does not address water allocation and implementation of basin wide investments (Hooper 2006, Blomquist et al. 2005).

The length of time an RBO has been operational impacts how well the organisation can perform. Clearly defined goals and visions and strong coordination with other sectors also generally make an RBO operate more efficiently. The MASL, for example, was established to implement the Mahaweli Development Scheme and it has a very broad mandate to develop a large region in Sri Lanka. The Scheme has clearly defined goals and a strong support from the national authorities (CAPNET 2, 2008, Blomquist 2005, World Bank 2005). It is concluded that none of the five RBOs analysed fully carry out all of the functions for effective IWRM at the basin level (as defined by CAPNET 2008 and Hooper 2006). The MASL and Tana WRMA are the best performers.

Functions	Initial RBO	Emerging auto-adaptive RBO	Mature and auto-adaptive RBO
Water (and natural) resource data collection and processing, modelling, planning, stakeholder consultation and issue clarification	MASL, Tana, LUAS (to some degree)		FRBC
Project feasibility design, implementation, operation and maintenance, raising funds, community consultation and awareness raising	LUAS (have the legal right to use the funds collected, but it is now sent to national gov., Tana (community consultations)	FRBC (not an implementing organisation)	MASL
Allocating and monitoring water shares, cost sharing principles		MASL, Tana	COGERH (cost sharing developed for equitable use of water between social groups)
Policy and strategy development for economic, social and environmental issues			MASL, Tana (not started implemented) COGERH (only for water allocation so far), FRBC
Monitoring water use and shares, monitoring pollution and environmental conditions, oversight and review roles for projects promoted by RBO partners			MASL (LUAS - monitoring), FRBC

Table 4: Reviewed national RBOs according to Hooper's (2006) table for RBO evolution.

Water management and development functions at the shared watercourse level

As in the case of an in-country RBO, we will now analyse what additional functional elements are usually considered and applied from a generic point of view in the shared watercourse context. In this analysis we need to consider the regional setting in which the SWI will operate and how it will interplay with other key regional and national management and development objectives.

In a developing context such as SADC, the SWI would have important functions to determine water resources development options that stimulate cooperation and real development outcomes in accordance with agreed programs and policies. Philips et.al. (2008) have developed a conceptual framework called the Transboundary Waters Opportunity Analysis (TWO) which is a flexible tool to aid analysis and decision making at the level of basin states, within Regional Economic Communities, and for potential investors engaged in the identification and implementation of water management and development opportunities.

The conceptual framework consists of a matrix with four key development opportunities, and two main categories of sources of water to realise those opportunities. The four key development opportunity factors in the analytical framework are:

1) Hydropower production and power trading: The link between water management and hydropower for electricity production and power trade, to support economic development.
2) Primary production: Options related to improvements in primary production using Green and Blue Water resources, e.g. in agriculture for food and bio-energy production; and in forestry, where this is of particular importance in developing countries.
3) Urban and industrial development: The potential for an inter-sectoral reallocation of fresh water from uses with low economic returns to applications with higher returns, involving urban growth and industrial development.
4) Environment and ecosystem services: Ensuring key environment and ecosystem services for future generations. Two specific forms of economic ecosystem services addressed here relate to fisheries and tourism.

The two key categories of sources of water making up the framework are:
a) New Water: The potential for 'New Water' to be developed within the basin (i.e. for an increased volume of fresh water to be made available).
b) The efficient use and management of water: Options for improving the existing efficiency in the use of fresh waters by the basin States in trans-boundary basins (through e.g. institutional strengthening, joint management regimes and physical infrastructure).
c) Other sources: In river basins that are not closed blue water resources can be allocated or re-allocated to specific uses. Green water provides a major source of water to consider especially in the agriculture sector.

The TWO framework clarifies the role that water plays to promote social, economical and environmental objectives in a shared watercourse. It also points out the type of skills and functions a SWI must have in a transboundary context. The TWO framework highlights the benefits of inter-sectoral planning beyond the river basin and within Regional Economic Communities (REC) where that is possible. In the SADC, there are several sectors, including energy, fisheries, forestry, tourism, and trade, where management of shared watercourses should be addressed. The development of the Southern Africa Power Pool (SAPP), for example, provides positive lessons to be drawn upon and learn from (ibid). Cooperation through the SAPP has managed to integrate isolated energy networks, balance power production and facilitate development of new generation opportunities[1].

The following review of six shared watercourse institutions provide further insights on the importance of choosing a business model appropriate for the specific basin and region at hand. The six international basins discussed here are:

1. International Commission for the Protection of the Danube River (ICPDR). Contracting parties (include all countries in the basin): Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany, Hungary, Moldova, Montenegro, Romania, Slovakia, Slovenia, Serbia, Ukraine and the European Union. Basin size: 801,463 km²

[1] <http://www.sapp.co.zw/>

2. The Nile Basin Initiative (NBI). Contracting parties: Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Countries also part of the basin: Eritrea (observer).
   Basin size: 3 000 000 km^2
3. Mekong River Commission (MRC). Contracting parties: Laos, Thailand, Cambodia and Vietnam. Countries also part of the basin: China, Myanmar.
   Basin size: 795 000 km^2
4. Organisation pour la mise en valeur du fleuve Sénégal (OMVS). Contracting parties: Mali, Senegal and Mauritania. Countries also part of the basin: Guinea.
   Basin size: 300 000 km^2
5. Joint Estonian-Russian Commission on the protection and rational use of transboundary waters (ERJC). Contracting parties: Estonia and Russia.
   Basin size: 53 000 km^2
6. Zambezi River Authority (ZRA). Contracting parties: Zambia and Zimbabwe. Countries also part of the basin: Angola, Botswana, Malawi, Mozambique, Namibia and Tanzania.
   Basin size: 1 352 000 km^2

In the case of ZRA, only two of eight countries are members. The institution, from its inception, has focussed on common hydroelectric infrastructure and monitoring. This has not, to any large extent, been dependent on the other watercourse states. This confined mandate has been carried out with relative success by the authority. The ZRA is now taking on more responsibility and is part of the execution of the action plan for the Zambezi River Basin, which includes all the basin states[2] (Dombrowsky 2007, ZRA 2009, Bourgeois et al., 2003).

At the OMVS the member countries have shown a strong support for the institution and have substantially supported its activities financially. In recent years, progress has also been made to strengthen the cooperation with Guinea, the only non-member basin state, and projects are implemented jointly. The institution itself, with its support functions, has been set up in innovative ways with great flexibility. The OMVS shares the costs for regional jointly owned infrastructure, as well as the benefits gained. This fact, that a country jointly owns infrastructure placed within another state's territory, is remarkable when looking at SWIs. Because of the support given by the countries to the OMVS, it has been successful in attracting donor funding which has increased the ability to perform their functions and develop (Komakech, 2005).

The ICPDR was created in 1998 and is the implementing body of the Danube River Protection Convention. More than half of the countries are members of the EU and therefore obliged to follow the directives of the union. The water end environmental directives of the EU have become the driving force of the ICPDR. The non-EU member countries have through the ICPDR committed to implement the EU's

[2] ZRA, 2009: "*http://www.zaraho.org.zm/*". (Zambezi River Authority)

directives in the Danube Basin (ICDPR, 2007). The fact that about half of the member countries in the institutions have given up sovereignty on managing its water resources to another entity has not created management difficulties in the basin, instead the EU's frameworks have become the leading strategy for the institutions and basin as a whole.

The Nile Basin is a complex basin in a developing region marked by civil strife and underdevelopment across the ten countries within its boundaries. The Nile Basin Initiative (NBI) was established in 1999 as a regional partnership to promote a vision of sustainable utilisation of water resources and sharing benefits to all. The countries in the initiative have not yet agreed on a permanent Cooperative Framework Agreement (CFA) but cooperate within the framework of a transitional agreement allowing them to explore options of cooperative development. The NBI has set out to build trust amongst the riparian countries and promote cooperative multi-purpose investments in the area of energy and power trade, agriculture, watershed management, information sharing, monitoring, and the environment[3]. The NBI enjoys strong support from the international community with lead support from the World Bank. National contributions are still modest but will gradually increase (World Bank, 2008). A key challenge for the NBI is to demonstrate real benefits from cooperation. Some good achievements can be noted including the undertaking of Strategic Sectoral/Social and Environmental Assessment (Cooperative Regional Assessment) and several feasibility studies on hydropower generation and power trade and interconnection. Financing for these investments is now maturing. The NBI has created a framework for the countries to inform each other about planned development investments to ensure acceptance of development. A major institutional strengthening project was launched in 2008 (World Bank 2008).

The Joint Estonian-Russian Commission was established in 1997 and mostly works with monitoring and sharing of data on Lake Peipsi/ Chudskoe and the Narva River and reservoir. The commission previously dealt mostly with water quality and fisheries, but is now working towards a common water management plan. The reservoir provides water for a hydropower plant owned by Russia and two thermal plants owned by Estonia. The development needs and management of these plants are discussed between the countries through the commission. The commission does not have a common secretariat. Instead, each country has set up secretarial functions to assist their participation.[4]

These SWIs demonstrate that the business model chosen for a shared watercourse institution does not necessarily need to be complex to be functional. Some SWIs have a very ambitious list of objectives to carry out, but due to resource limitations these functions are not always met. In three of the studied basins, one or more riparian country is not a member of the SWI. This creates difficulties for the SWI to carry out functions that rely on participation from all basin riparians. This has been the situation for the MRC where China, the most upstream country, and Myanmar are not members

[3] www.nilebasin.org

[4] *Lake Peipsi/River Narva basin – working together on the new Eastern border of the EU*. Estonian Ministry of the Environment – power point presentation to the UNECE by Harry Liiv

of the commission. The MRC also has issues with its running costs. It is more or less totally dependent on outside funding. The portion contributed by the member countries is very small (World Bank, 2006, Komakech, 2005).

From the analysis of the transbooundary SWIs we conclude that the following functions, listed in table 5, could be considered important in a shared watercourse perspective.

Function	Objective
1. Visioning and trust building	To create a common framework for action and build trust between parties moving forward
2. Strategic planning and policy development	To ensure multi-sector linkages and prioritise key cooperative management and development activities
3. Pre investment work	To undertake cooperative strategic assessments, and pre- and feasibility studies, building the business case for investment
4. Joint infrastructure management/ development	Cooperative operation and management of joint infrastructure assets such as multipurpose hydropower facilities, flood and drought protection
5. Conflict resolution	To ensure a structured approach to problem solving in case of diverging views opposing management and development objectives, and clearing house for major in-country and multi-country investments. Prevention is better than conflict resolution,
6. Corporate management	To ensure professional executive management, governance, resource mobilisation capacity harmonisation of administrative systems across the SWI, financial management monitoring and evaluation, human resources management, and decision support systems (World Bank 2008, NBI PAD)
7. Capacity building	To level the playing field amongst riparian countries working together in a river basin context (World Bank 2008, NBI PAD)

Table 5. Additional key functions to consider in the context of a Shared Watercourse Institution.

In table 6 we have combined the functions in table 5 with the functions in table 1 and 2. The six analysed institutions fulfil all these functions to a varying degree.

Functions/SWI (nr of countries)	ICPDR (15)	NBI (10)[5]	MRC (4)	OMVS (3)	ERJC (2)	ZRA (2)
Visioning and trust building	X	X	X	X	X	x
Strategic planning and policy development	X	x	X	X	---	x
Pre-investment work	---	X	x	X	O	X
Joint infrastructure management/ development	x	X	---	X	O	X
Conflict resolution (between countries)	X		X	X	---	O
Corporate management	X	x	x	X	---	x
Water Allocation/ prior notification (between countries)	---	x	X	X	O	O
Stakeholder participation	X	X	O	X	X	x
Monitoring/pollution control	X		O	X	X	X
Information and communication	X	x	X	X	x	x
Capacity building of country institutions	---	x	---	---	O	---

[5] Eritrea is an observer to the NBI

Table 6: Common functions carried out by SWIs. X= function performed by SWI, x= function is to some extent performed or is performed in cooperation with other institutions, O= function is not carried out, ---= no information.

Through this analysis, a comprehensive list of business functions that could be considered for establishing or strengthening an SWI was produced (table 7). We have separated the list into two core business functions: 1) management of the shared watercourse to ensure ecosystem services and 2) development to promote the achievement of livelihood objectives and economic growth. These two groups of business functions represent the core elements of Integrated Water Resources Management (IWRM) IWRM stresses the river ba-in as the single management unit and the integration of freshwater using sectors and stakeholders across society. These two core business functions address the higher level objective found in the SADC Water Protocol 2000. Table 7 clarifies what type of shared functions an SWI could consider undertaking based on its specific objectives. With added functionality there is also an added cost and need to ensure cost recovery and good financial management.

Management function
1. Corporate management
2. Financial management - cost recovery
3. Monitoring and modelling (water and natural resources data and socioeconomic and legal developments)
4. Pollution control/monitoring
5. Information and communication
6. Stakeholder engagement
7. Conflict resolution
8. Visioning and trust building
Development Function
9. Strategic basin planning (input to regional planning)
10. Policy and strategy development (economic, social and environmental issues)
11. Water allocation (to sectors and/or users)
12. Pre investment work at multi-country level
13. Support to in-country development planning
14. Transaction advisory services
15. Operation and management of joint infrastructure

Table 7. Comprehensive list of shared water management and development operational functions to be considered to include when selecting an appropriate business model for an SWI depending on its stated mandate

All of the shared water management and development functions listed by CAPNET 2008, Hooper 2006 and this review may not be appropriate for an SWI to undertake. SWIs work in tandem with national and regional authorities and need to respect the administrative organisation and sovereignty of the countries they are serving. Hence the countries concerned need to define what should be undertaken jointly and what should be undertaken at the national level. Ultimately, this will be concluded, agreed and described in the mandate of the SWI.

4. The role of the client and the customer (stakeholder) in determining the operational functions of an SWI

Governments are the clients of an SWI. As clients, they determine the specific objectives they have in mind for their shared watercourse and the appropriate business model to achieve those objectives. The customers who benefit from services delivered by the SWI include citizens, private sector entities, and public institutions. They will implement change and therefore ensure that the SWI adds value from water management and use in the shared watercourse. The SWI also must facilitate their day–to-day business. The business model of the SWI needs to be developed in such a manner that it is regarded as strategic to the clients and the customers and hence involve them in the process. Too often an SWI is established without clear objectives and a thorough analysis of what value it adds to the management and development agenda in a shared watercourse. The SWI is then at risk to becoming an end-result in itself rather than the mean to ensure change and facilitate the way business is being conducted toward regional integration and poverty alleviation objectives (Katerere/Hill/Moyo 2001, CAPNET 2008).

With the two core functions (management and development) outlined in table 7, the next step we take is to focus on the needs of the clients and subsequently the customers to explore appropriate business model for an SWI in more detail.

The customers of the SWI operate in a national, regional and international context. Customary water law such as the UN Convention on the Law of the Non-navigational Uses of International Watercourses (McCaffrey 2001) guides governments at the international level. In RECs such as SADC, the Treaty, Protocols and Declarations of the commission will guide the behaviour of governments. At the national level there is an increasing recognition to integrate water resource planning and management into the national economic framework (Rogers 1997). At the local level, RBOs and water user associations often implement IWRM principles and involve stakeholder input in management and development decisions (GWP 2008). This group of customers (public administrations at the regional, national and local level) will ask questions when negotiating and determining the functions of an SWI to ensure that relevant value is created for them. Such questions could be:

- How do we define the basin boundaries?
- How much water is there in the basin and what are the impacts of climate change?
- Who owns the water?
- How do we ensure good water quality and key ecosystem services?
- How do we allocate water and who decides upon its use?
- How do we promote good development and management of the available water resource and by whom?
- How do we share benefits from development amongst all?
- What is water security for all basin states?
- What do we get if establish an SWI?
- What are the key development challenges and opportunities?

- What products and services are needed to promote good management and development of the available water?
    - Is someone else providing these services in the region or at the in-country level?
    - When do we get the services/benefits?
    - What does it cost?
- Who are the end users?
- What type of organisational structure do we need?
- How can we minimise asymmetry in the decision making (strong states versus weak states)?
- How do we build capacity amongst all stakeholders and level the playing field?

Customers who benefit from the services provided by an SWI are multifaceted and have different needs. They will both be concerned with good management of the resource as a public good (Jägerskog/Granit/Risberg 2007) as well as how to tap the development potential of water resources. These customers, made up of both public and private entities, may ask the following type of questions:

- Who are the decision makers that decide upon water allocations?
- Who is represented in the SWI?
- How are customers influencing and/or adapting to change?
- How are customers influencing the provider?
- Who is paying for different services?
- How are transactions made - public/private?
- How are the revenue streams flowing?
- What type of service do we get in order to implement management and development?

When customers and clients ask these types of questions, they negotiate future outcomes including how the basin will be managed and developed in a regional context. What they can expect to get in terms of livelihood improvements, the political implications of permitting some in-country decision making shift to collective management (and have less sovereignty), and the development benefits they gain from the public good all impact the decision (Jägerskog/Granit/Risberg/Yu 2007).

The expectations from clients and customers should be high when forming or reviewing the functions of an SWI. If the SWI does not deliver the agreed management and development objectives and add value, the SWI should be questioned. Is the right sort of regional function being developed considering available resources?

A lesser discussed but vital component of an SWI is the Intellectual Capital (IC) created. An SWI will develop IC over time but this is a costly process for the countries involved. IC is the collective knowledge of the individuals in an organisation or society[6]. IC includes in its broadest terms customer capital, human

[6]<www.BusinessDictionary.com, accessed 15 February, 2008>.

capital, structural capital, and intellectual property (ibid). Structural capital in terms of an SWI is the information, monitoring, forecasting and financial management systems created over time that stay in the organisation and that are easy to manage. The customer capital, on the other hand, is the value of relationships based on the loyalty of the customers (ibid) and the value they add to the services provided over time. For an SWI, that would include policy advice, water allocation services, benefit sharing and transaction advisory services, but also other intangible assets such as monitoring, forecasting and pollution control. Human capital created in the SWI is always owned by the individuals who have it and can easily disappear unless procedures and methodologies are recorded in the organisation (ibid). Intellectual property, documented or undocumented knowledge, creative ideas or expressions that have commercial value (ibid), is less of an issue in the context of an SWI that is managing and developing a public good since the outputs it delivers are owned by the public (Jägerskog/Granit/Risberg/Yu 2007) and would not create wealth in itself.

IC produced by an SWI should promote innovation towards improving livelihood opportunities through investment support. It also serves environmental management objectives. This is the true value created for the client and customer, but it comes at great cost. The questions considered by the clients and the customers (stakeholders) relate to the IC they create or assess. The understanding of the costs of creating these intangible assets need to be known to the stakeholders so that they make the correct choices and establish the most effective management and development functions to ensure value added.

5. Operational/business models of Shared Watercourse Institutions (SWI) in SADC

It is now possible to move forward to discuss possible business models for an SWI in the SADC context based on an overview of the expected mandate in the SADC Water Protocol 2000, an overview of potential SWI functions, client and customer (stakeholder) needs, intellectual capital and costs of organisation.

An SWI can have a strategic character backed up by a small organisation or it can have a more operational character backed up by a larger management organisation. It is possible to choose from business models scaled from simple to complex.

The business model will change depending on the level of functions chosen and the level of basin complexity. The SWI can move from being an advisory body to one that operates and manages joint infrastructure. It can include managing complex issues such as the impacts of droughts and floods and adapting to climate change. It can deal with asymmetries in economies, in the size of a country or a share of a basin. Common to most SWIs, however, are the management functions outlined in table 7. The more management and development functions added to a SWI the more complex the business model will be.

The basin level complexity is defined in its simplest term by the number of countries in the shared watercourse system. Complexity grows with the number of countries. Basin complexity may also be a function of management and development issues,

economic differences between countries, the presence of civil strife or in-country organisational capacity. The countries involved in defining or re-defining the business model for a SWI would be capable of assessing complexity both from a business model and basin complexity perspective when assessing the political economy of the countries involved.

Complexity will grow as the number of functions to carry out by the SWI increases and as the number of countries increases. The relationship is not linear. A complex basin that has many countries can have a simple business model. Similarly, a basin with few countries can have a complex business model in terms of the number of functions it is mandated to carry out.

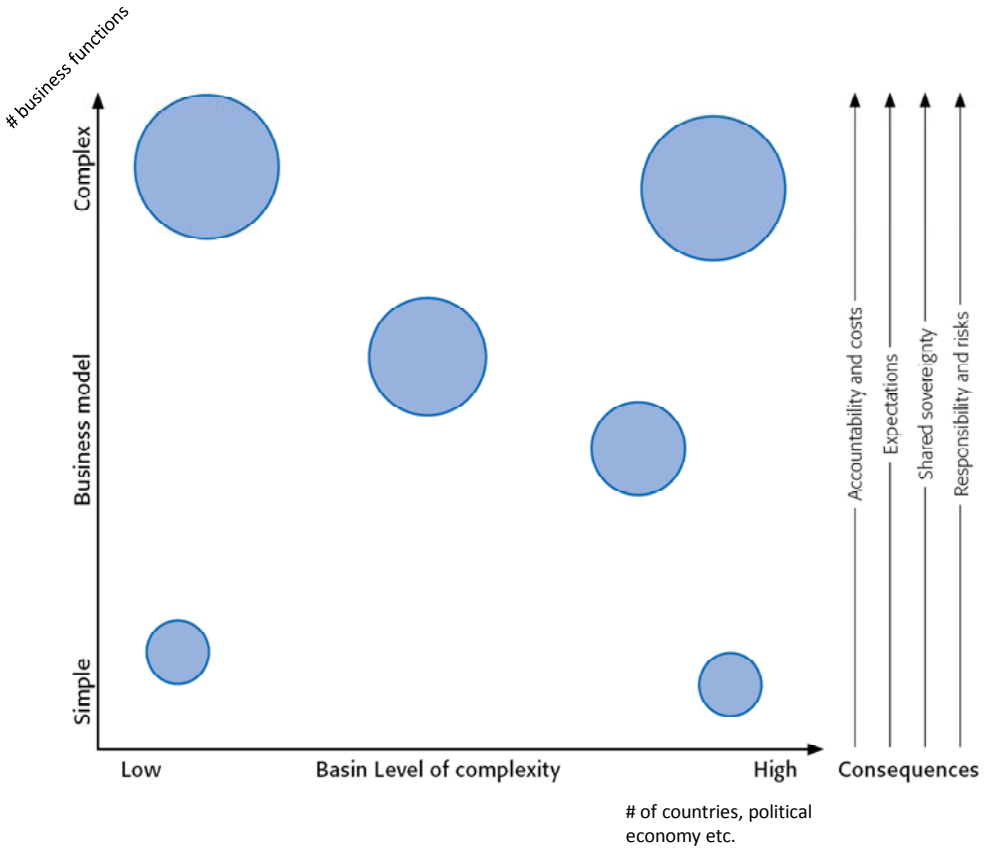

Figure 2. Selecting business models for managing and developing a shared watercourse. Based on the objectives agreed between riparian countries they can select a simple business model for a complex basin or a complex model for a basin with low complexity while assessing the consequences of the chosen model. Modelled after a CSIR/SIWI workshop Durban, South Africa, September 2008.

Allocation of water and sharing benefits at the regional level within a REC such as SADC is complex. The more complex a basin is and the more complex the chosen business model is, the larger the consequences will be. Figure 2 clearly illustrates this. As the complexity grows greater, so do the expectations from both clients and customers. The sovereignty that is given up also increases as does accountability, responsibilities, risks and costs of the SWI.

The shared watercourse institutions analysed in this report would fit into the matrix as shown in figure 3. There is no correlation between a successful SWI and a complex

institution. A SWI using a simpler business model may find it easier to secure resources to carry out its mandate and expectations from stakeholders would be lower and easier to meet. This may be a more desirable situation than creating high expectations from the SWI before the basin countries or the institution is ready or has the resources to deliver.

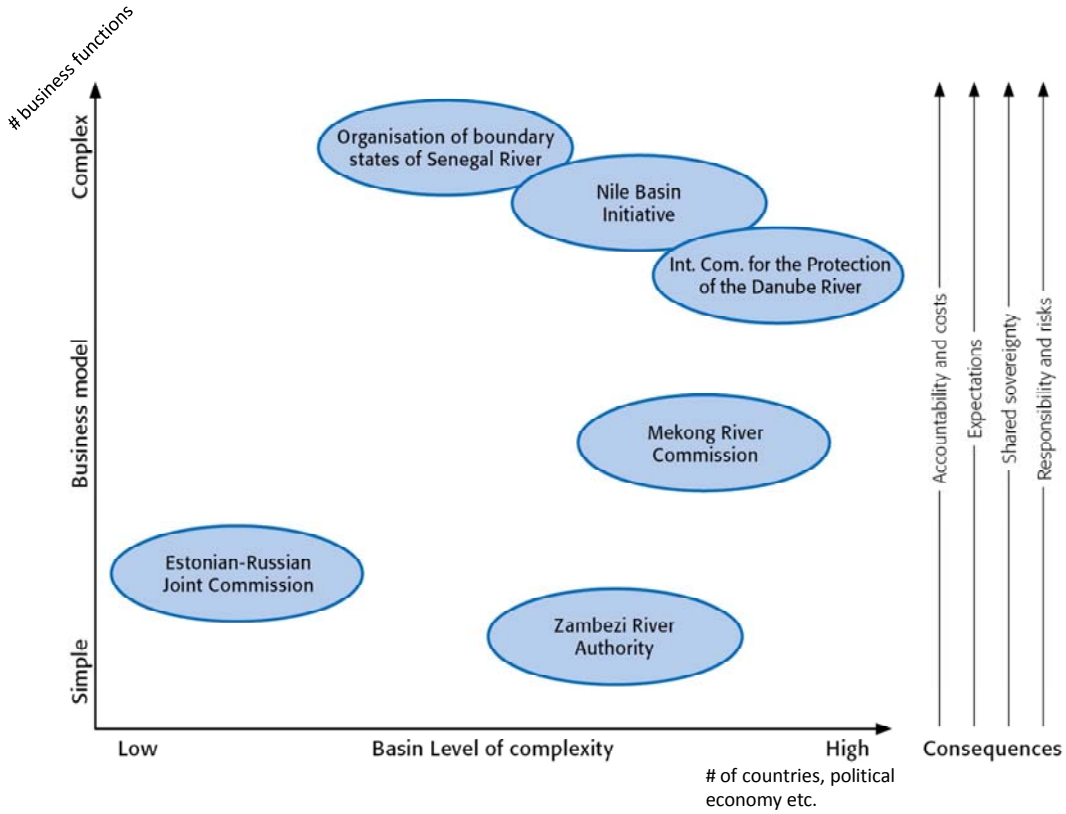

Figure 3. Scheme of the studied SWIs illustrating their current business functions in relation to basin complexity and consequences of each model chosen. The Zambezi River Basin is an example of a bilateral SWI in SADC.

Without exception, our analysis indicates that SWIs are managed by public administrations. The drawback of this situation is that customer value is may not always be at the forefront and regular audits of results achieved may not be effectively undertaken. The role of the private sector in development of public natural resources under transparent regulation is also not considered. Innovation in the management of water resources to achieve the mandate in the SADC Protocol 2000 is not materialising in a way that is needed to achieve the overall SADC vision of poverty alleviation and regional integration.

An alternative to a fully public administrative body would be to maintain the regulatory functions of the public administration but allow for operations to be outsourced and undertaken by private entities. In such a situation, accountability towards achieving agreed functional objectives would be easier to monitor and evaluate. If results are not met, the public body could report failure from a more straightforward business perspective. In theory, most functions listed in table 7 could

be undertaken by private operators, with the exception of conflict resolution (6), visioning and trust building (7). Private operators must, of course, be chosen in a transparent manner and according to procurement regulations agreed upon by the riparian countries, and be closely monitored by the authorities. As noted before, it is critical for a SWI to maintain the IC built over time and this is also true if an outsourcing model is chosen. The rationale for outsourcing management or development functions would be to achieve greater efficiency, innovation and customer satisfaction at a lesser cost. Outsourcing SWI management and development functions demand a well functioning SWI that has the ability to plan strategically, procure and manage service providers. analyse results and maintain its IC.

6. Conclusion – selecting business models for Shared Watercourse institutions

This paper presents a framework to support watercourse states in the establishment of appropriate business models for SWIs to meet agreed objectives and add value based on an analysis of the complexity of the river basin and desired operational functions to be undertaken at the international level. The framework demonstrates costs and consequences of different business models.

A shared watercourse is considered more complex when the number of countries grow, with increasing management and development issues in the basin, with the presence of civil strife, the level of in-country organisational capacity, and if there is different economic capacity in the riparian states. Complexity in terms of the business model is defined by the number of shared or joint functions an SWI will take on. The framework identifies two clusters of functions – management and development – and lists 15 operational functions within these clusters (table 7). The functions listed are common to many RBOs at the national level and for SWIs at the transboundary level. All water management and development institutions analysed in the paper are unique to their context and none implement all 15 operational functions identified.

Every SWI will create Intellectual Capital (IC) over time. IC in the context of a SWI focuses on structural, customer, and human capital. Structural capital includes the information, monitoring, forecasting and financial management systems created over time that stay in the organisation. Customer capital is the value of relationships that is based on the loyalty of the customers. Human capital stays with the individuals in an organisation but can, with good procedures, be transferred to the organisation. These assets are created at great cost and will determine the added value of the SWI to the regional development agenda.

The paper illustrates a business model for an SWI, that allows for greater involvement of the private sector in the management and development of a shared watercourse compared to the common model based on public management. Such a model would entail some outsourcing of functions to stimulate innovation, increase the focus on results, save costs, and add value to clients and customers. Outsourcing does not mean less focus on maintaining the core IC in the SWI. On the contrary, more strategic functions would be demanded by the SWI under an outsourcing model.

Watercourse states in SADC have several business models to choose from to fulfil their mandates and to build and maintain IC. The model they choose will depend on what they collectively agree to carry out. The mandate of the SWI will define what should be undertaken jointly by the SWI. The business model analysis presented will help countries assess costs, risks and consequences moving forward towards implementation.

It is concluded that watercourse states have considerable flexibility under the SADC protocol to define business models that fit their specific objectives. The natural, political and economical situation will determine what can be agreed to be collectively managed and developed. The overall SADC regional context and the internal capacity and political situation in nations cooperating need to be considered when selecting the appropriate business model to ensure that shared water management and development benefits are part of the broader in-country and regional development agenda. Active communication between country representatives and other stakeholders will be essential in determining the mandate and the linked business model of the SWI.

This paper advocates for simplicity in the organisation of an SWI from a functional and and, hence, business management perspective. The more complex a basin is and the more complex the chosen business model is, the larger the consequences will be in terms of expectations, costs, accountability, and risks. It is concluded that less complex SWIs can achieve major results within their agreed mandate and be perceived by clients and customers as being effective. On the contrary, a very complex business model chosen for a SWI will raise high expectations, be costly and if expectations are not met could result in lack in confidence amongst customers such as public and private agencies and other stakeholders. At the end countries cooperating will decide the level of engagement and what they will decide to carry out jointly when managing and development shared water courses. This analysis is intended to support in that decision making process.

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