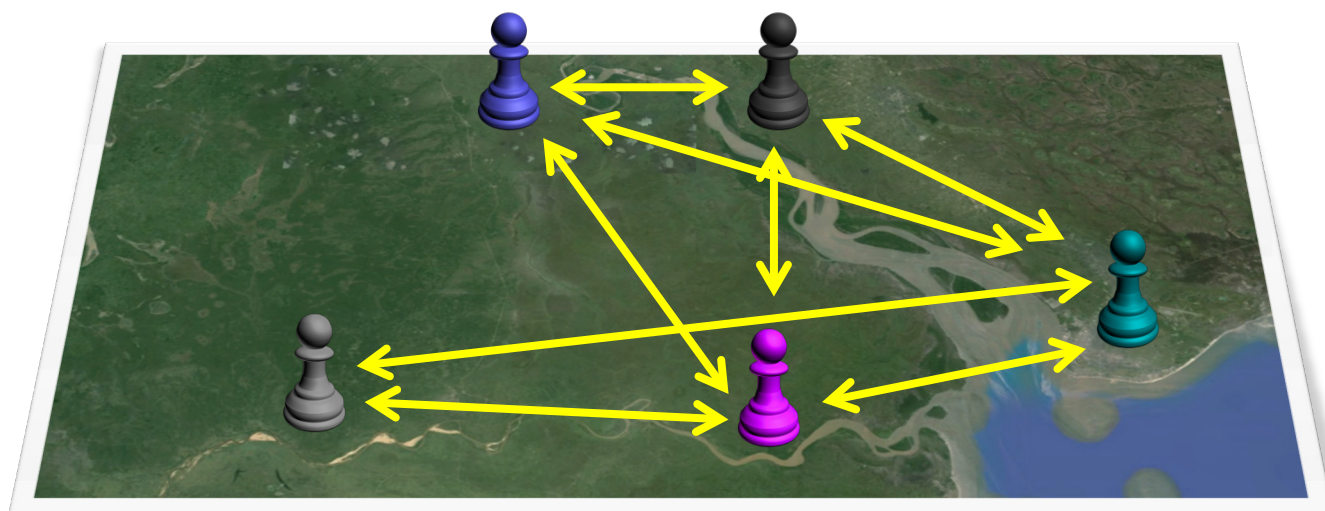# Strategic Choices for River Basin Planning
at ARA-Centro, Mozambique

A study performed under the project WatPLaG

This report has been produced within the project. Water Planning Tools to Support Water Governance. A collaborative project between Mozambique and the Netherlands (WatPLaG)

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Introduction

This report is the result of discussions with the partners of ARA Centro and UNESCO-IHE within the project about river basin planning and management in central Mozambique.

In June 2014, the director of ARA Centro and 3 employees visited the Netherlands within the framework of the WATPLAG project. On the first day of a 2 day workshop session the challenges of river basin planning at ARA Centro were discussed by making use of the LIBRA role play game. This session especially showed the importance of cooperation, coordination, and communication with other stakeholders within the river basins under the authority of the ARA Centro. On the second day the main challenges within the basin (water quantity/quality issues) and within the organization (resources, skills, capacity) were addressed. Also possible strategic choices for improving river basin management were inventoried (like mobile water metering).

Based on these discussions and the preparatory research in development of the workshop session, further research was done on water governance in Mozambique. This research in combination with the workshop sessions resulted in the following report.

The report will first give a short overview of the institutional arrangement of river basin governance in Mozambique. Next, the report continues in addressing that river basin planning happens under uncertainties. This means that river basin organization's need to strategically plan to deal with these uncertainties. A planning and decision making tools offered to balance the goals, capacities, and knowledge of the organization.

The report continues in discussing the challenges ARA Centro is facing in implementing its tasks within its mandate and the issues that are challenging its legitimacy.

Finally, the report offers some conclusions and recommendations for strategic river basin planning for ARA Centro.

Governance assessment

Decentralization of Water Governance

Institutional arrangement

The foundation legal document in for water management in Mozambique is the Water Law 16/91 of 1991. The Government of Mozambique embraced in the deveopment of this law, and its revisions, the concept of Integrated Water Resources Management. Which included a decentralization of water management. In this perspective of decentralization the ARAs (Regional Water Adminsitration) were developed. Several institutinoal bodies have been developed since then.
A full overview of the institutional framework is provided in Magaia (2009). Table 1 provides a brief overview of the main institutions involved in the water management sector.

Table 1 Main Institutions in Water Management and Governance in Mozambique (Inguane, Gallego-Ayala, & Juízo, 2014; Magaia, 2009)

Institution	Type of institution/geographic scope	Main role
National Water Council (NWC)[*]		
• Advisory body of the Council of Ministers on water related issues • Comprises one Technical Water Committee	Governmental advisory body/national scope	• Provide advice on inter-sector strategic aspects of water-related policies' implementation
National Directorate of Water		
• Under the Ministry of Public Works and Housing (MOPH)	Governmental institution/national scope	• Implementation and regulation of policies and strategies related to water resources management
Regional Water Administrations		
• RWAs comprise River Basin Management Units (RBMUs), which are branch offices of the RWAs at basin level	Public governmental institutions subordinated to MOPH through DNA/regionally confined scope	• Operational water resources management at regional level
River Basin Committees		
• Comprise small and large water users, local governmental agencies and civil society organizations	Consultative stakeholder forums/basin-confined scope	• Promote efficiency of water use and representation of users' interests in water management

*The NWC includes the Ministers of Agriculture, Ministry for Environmental Affairs Coordination (MICOA), Mineral Resources, and Energy and Health Ministry and is chaired by MOPH, assisted by its National Directorate of Water (Inguane et al., 2014)

Figure 1 shows the hierarchical relations between the various institations in water management in Mozambique
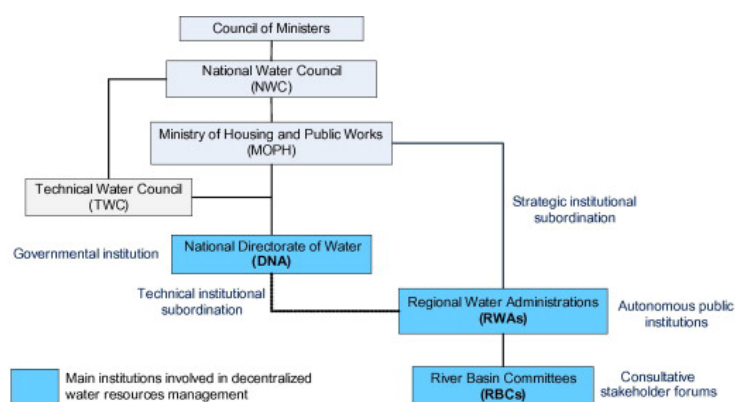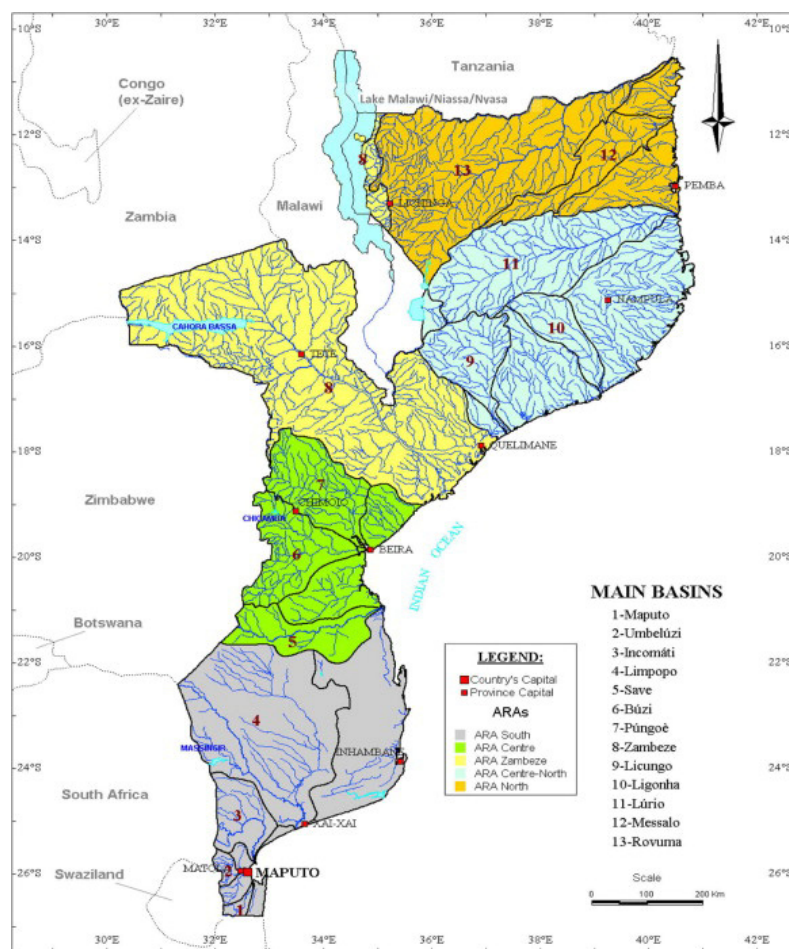

Source: Inguane et al. (2014)

Figure 1 Various levels of institutions within the institutional arrangement of water management in Mozambique.

Geographically, ARA Centro is situated in the centre of Mozambique (see Figure 2, ARA Centro is depicted in green). The river basin organization responsible for the management of three river

basins: the Save, Buzi, and Pungue. The Pungue is the largest basin and its upper catchment is situated in Zimbabwe.

Figure 2 Main river basins of Mozambique

ARA Centro is established in 1997 after the installation of the Water Law. With its 17 years of age it is still a young institution. Table 2 shows the main characteristics of ARA Centro.

Table 2 Main characteristics of ARA Centro

Year of establishment	Extension (km2)	Population along the RWA	Number of storage reservoirs with more than 1 Mm^3 capacity	Staff for each RWA	River Basin Committees
1997	103,000	2,961,170	4	149 (78 Gauge station readers)	• Pungue in 2004 • Sub Committee of Nhazonia (Upper Pungue) in 2011 • Sub Committee of Gorongosa (Lower Pungue) in 2013 • Buzi (ongoing process of establishment) • Save (not yet)

ARA-Centro mandate/functions

Since the 1991 Water Law was enacted, a number of reforms were introduced to the water sector in Mozambique, a.o. the creation of the ARAs (1997) and the establishment of the DNA (National Directorate Water) (Inguane et al., 2014). According to the legislation the ARAs are responsible for the implementation of IWRM at river basin level. They are responsible for the operational water management and to facilitate stakeholder participation. To fulfill this last duty The ARA have to establish River Basin Management Units (RBMUs), which in turn establish River Basin Committees (RBCs) to ensure stakeholder representation in the decision-making processes (up to the consultation level). The main functions of the ARAs are summarized in Table 3 (based on discussion with ARA Centro and Inguane et al. (2014)).

Table 3 Main functions of ARAs in Mozambique

Basin planning	• Development of basin monographs/plans
	• Update of basin plans engaging stakeholders
	• Forecast of basin surface water demand
Economic management	• Use of financial instruments (tariffs and charges)
	• Payment of water fees by economic water users
	• Update of water fees
Information management	• Standardization of hydrometric data collection and analysis instruments and software
	• Information dissemination to stakeholders
	• Existence of sufficient information to inform large investment in the basins (surface water)
Stakeholder participation	• Creation of consultative River Basin Committees
	• Capacity-building to RBCs' members
	• Regular meetings of RBCs on water management
Pollution control	• Identification of pollution (ex: water sampling, denouncement of users, etc.)
	• Issuance of pollution licenses or permits
Water allocation	• Registering of economic water users
	• Licensing of registered economic water users
	• Enforcement of water use licenses
	• Environmental water allocation
	• Instruments to manage water allocation (ex: Hydrologic modeling, GIS, etc.)
Water monitoring	• Execution of hydrologic and socioeconomic surveys for long-term planning
	• Update of hydrologic database to support water allocation planning
Flood and drought manage	• Flood and drought early warning system

Strategic choices for planning under uncertainty

Planning is all about making decisions to realize a certain future. The future however (or luckily) is uncertain. And the decisions we make today will affect the decisions that we make in future. For example, if we construct a dam in the Save, it will affect our future decisions, as the past decisions are not to be erased.

Not only the future is uncertain, but also the present. We have limited knowledge of our biophysical and our socio-economic environment. We thus need to make choices based on incomplete knowledge, or contested knowledge in an environment which we cannot control. And often we are not fully aware of the consequences of our choices.

The uncertainties for planning at an ARAs is aggravated by all kinds of uncertainties in the context of the choices made. What will be the goals and objectives of the national political level? What will local governments do?

Decision-making tool for strategic choices

Contextual Interaction Theory

Decisions are the result of an interaction process between the parties involved in decision-making. The Contextual Interaction Theory (Bressers, 2004; Evers, 2011) provides a systematic approach for analyzing these processes based on the actor characteristics of the involved parties. In this theory we assume that the context (other policies, biophysical information, etc.) only contributes to decision-making in how far they influence the motivations, perceptions, and capacity and power of the involved actors.

Figure 3 depicts a standard decision making process between two actors as an input output process.
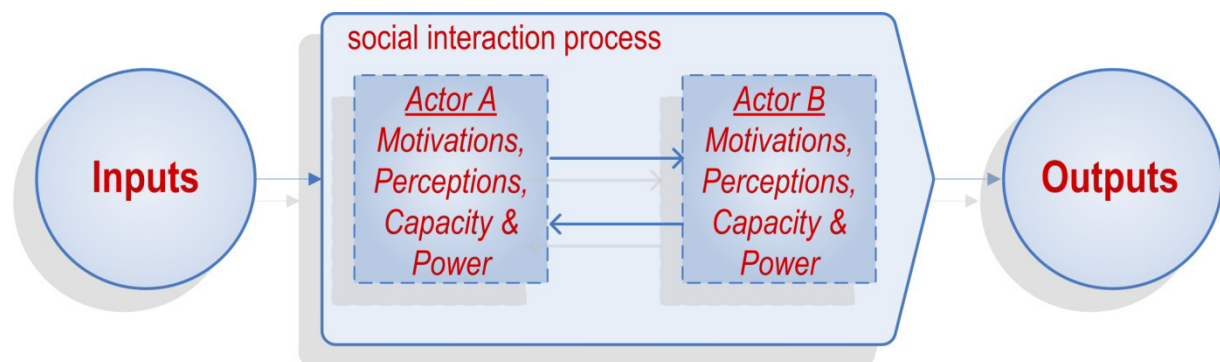
Source: Evers (2011)

Figure 3 Social interaction process as a standard input-output process

The actor characteristics motivations (simply what you *want*), perceptions (what you *think* or *know*), and capacity and power (what you *can*) do not stand alone. These influence each other. Ones perceptions of information, influences ones perceptions of the problem, this influences what you want (your proposed solutions) which might be limited by your capacity. So at the same time your capacity influences what you want, but also your perceptions of opportunities and threats in relation to perceived problems. BUt what you, want, know, and can is also influenced by the others in the decision making process. If the other over powers you, the *want* can become the *have to*. Discussions

and interactions can change your perceptions of the problem and the value of suggested solutions. But at the same time resources can be shared contributing in enhancing the capacities of all parties involved, so you can aim higher (*want* more).

Figure 4 depicts the relation and interaction between the actor characteristics and with the interaction process of decision-making. Please also not the layers over time, which represents that earlier decisions influence later decisions, but also influence the actor characteristics in later decision-making processes.
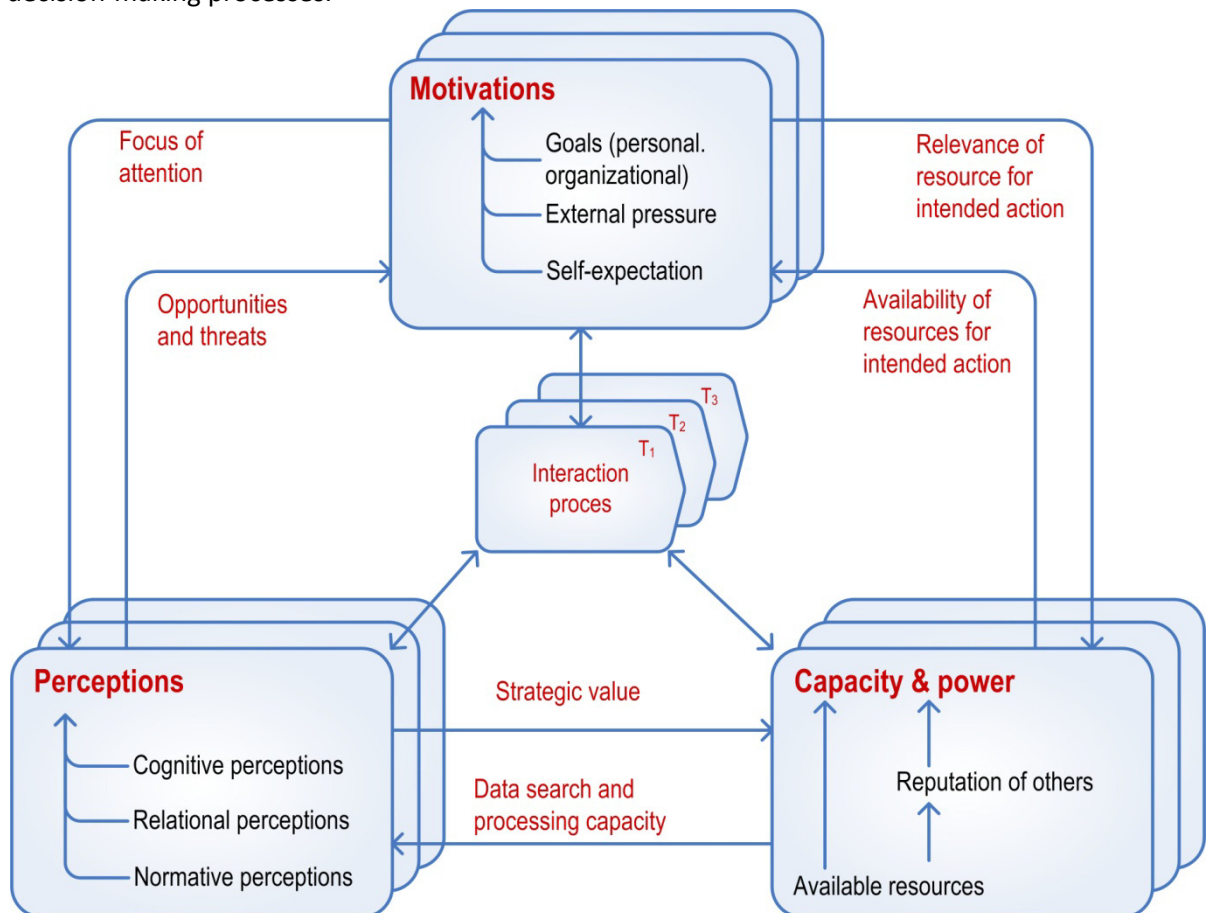
Source: Evers (2011)

Figure 4 Dynamic relation between factors influencing decision-making (Evers, 2011)

The CIT as a tool for decision-making

Realizing what factors influence your decision-making can contribute to making strategic decisions/choices. In short it is a matter of balancing your motivations, with your perceptions, and your capacity and power. If there is an imbalance decisions will be too ambitious (motivations are 'bigger' than capacity), or irrational (perceptions of goal-means relation are incorrect).

This balance within should be balanced with the motivations, perceptions, and capacities and power of other stakeholders in the decision-making AND implementation process, as many stakeholders power to obstruct policy implementation are after the decisions are made.

Balancing long-term goals with short/mid-term decisions and realizing development paths to realize those long term goals, and prioritizing what matters need the highest priorities within an institutions capacity is making strategic choices.

Strategically choosing is a balancing act for the ARAs, as next to what ARAs *want* there are many targets that come from higher level governments (the *want* becomes the *have to*).

The relation Effectiveness and Legitimacy

With effectiveness, we mean the ability of ARA CEntro to provide water management services to their stakeholders within their administrative area. Basically, providing the main functions.
With legitimacy we mean level of extent stakeholders regard the ARA as the authority for providing water services. Legitimacy is thus not only framed with the legislation of Mozambique, but is much more the result of the perceptions of the stakeholders about the authority of the ARA.
This legitimacy is developed by providing services, or in other words to effectively implement the basic functions within your mandate. When the ARA is able to provide services to the staekholders their legitimacy will increase, an increased legitimacy will strengthen the capacity of the ARA (its relative power, but also its ability to collect revenues), in both resources and power, which enables to more effectively implement its mandate. This circle however can be degrade in an negative feedback loop or develop in a positive feedback. Currently legitimacy and effectiveness are rather low, and the ARA needs strategies to move out of this negative loop.
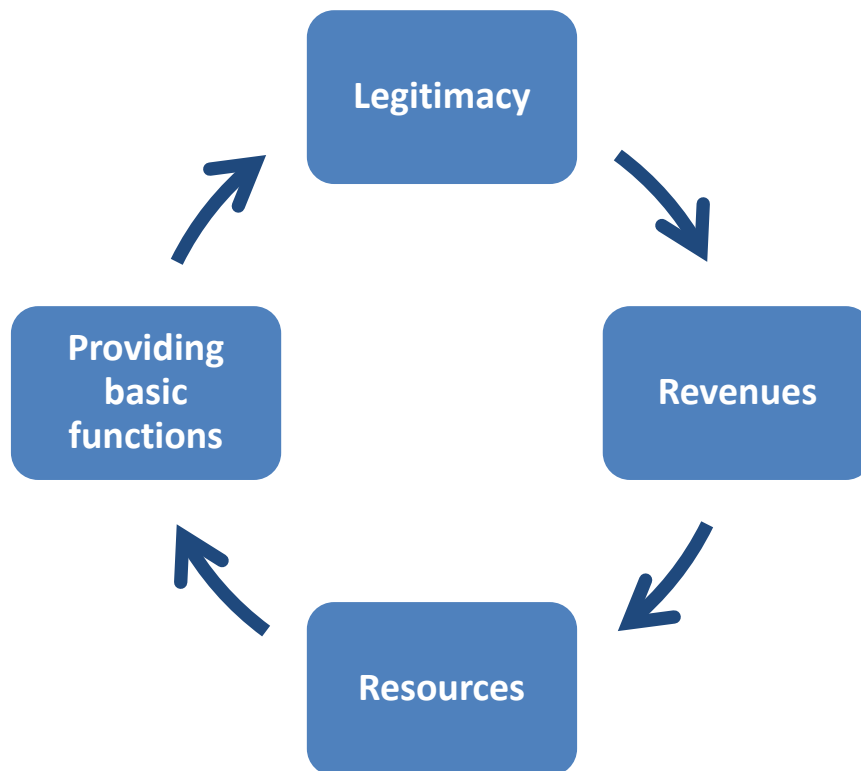

Figure 5 The relation between effectiveness and legitimacy

Challenges ARA-Centro is facing in effectively implementing mandate

In June 2014 the director and 3 employees of ARA Centro visited the Netherlands, and UNESCO-IHE. During the first day of this visit we played the role play game LIBRA (Developed by UNESCO-IHE). The goal of this game is create discussion among the player about the complexities in coordinating water resources management in a river basin. The game was used as a framework to discuss the difficulties ARA Centro is facing in implementing the basic functions of its mandates within its administrative territory. The second day this discussion was prolonged, and were addressed more specifically in relation to problems and possible solutions (for example: mobile canal control).

Table 4 shows a summary of the challenges ARA Centro is facing depicted within the framework of the basic functions described in Table 3.
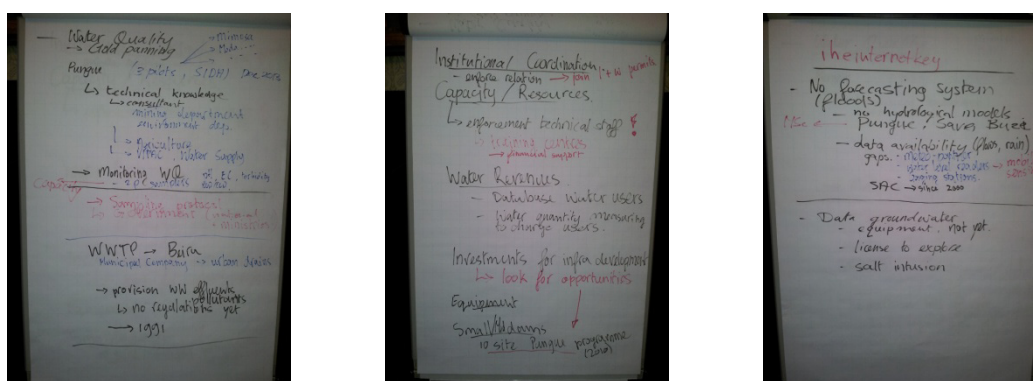

Figure 6 Flip over results from workshop June 2014 UNESCO-IHE

Table 4 Main ARA functions in which ARA Centro is facing challenges in implementation

Function component	Main functions
Basin planning	• Development of basin monographs/plans
	• Update of basin plans engaging stakeholders
	• Forecast of basin surface water demand
Economic management	• Use of financial instruments (tariffs and charges)
	• Payment of water fees by economic water users
	• Update of water fees
Information management	• Standardization of hydrometric data collection and analysis instruments and software
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Water allocation	• Registering of economic water users
	• Licensing of registered economic water users
	• Enforcement of water use licenses
	• Environmental water allocation
	• Instruments to manage water allocation (ex: Hydrologic modeling, GIS, etc.)
Water monitoring	• Execution of hydrologic and socioeconomic surveys for long-term planning
	• Update of hydrologic database to support water allocation planning
Flood and drought manage	• Flood and drought early warning system

The table shows that ARA Centro is facing difficulties in most of its basic functions of Basin Planning, Economic Management (especially collecting water revenues), Pollution Control, Water Allocation, and Water Monitoring (especially groundwater). This does not imply that it is doing well in the other areas, but these issues were regarded during the workshop session as the main issues.

Challenges ARA-Centro is facing in legitimacy

The basic message here is that legitimacy is not only acquired via legal arrangements, but even more so via delivery of services; or, the effective implementation of the tasks within ones mandate.

The decentralization process is a highly political process. ARA Centro, and the other stakeholders are in continuous reconfiguration of responsibilities and power balances. Further decentralization is limited by higher politics (due to funding and legislation), while at the same time the ARA Centro needs to acquire legitimacy among the local stakeholders.

Inguane et al. (2014) observed that in the beginning of the national water reform (1990s), central level water leadership showed a strong, widespread political willingness to transfer responsibilities to the RWAs. However, by that time they had not shown an adequate institutional commitment to devolve authority, power and financial resources to the ARAs. The ARAs have not fully achieved their expected autonomy, as they depend to a significant degree on central-level support for human and financial resources. Hence, their legitimacy is challenged.

To implement tasks, ARA Centro is dependent on resources, facilities, and infrastructure. ARA Centro has been working as an "isolated islands" in national water resources management due to the lack of an institutional-legal guidance framework to direct the implementation of decentralized water resources management (cf. Inguane et al., 2014). To improve its effectiveness and thus legitimacy the various ARAs could improve its cooperation and coordination (for example by sharing laboratory facilities) , or between the ARAs and the central level.

ASs shown by the legitimacy-effectiveness cycle earlier, the limited willingness of river basin water users to provide support as a source of revenue is also constraining the performance of ARA Centro. Resisting payment for water use has been higher in unregulated basins, because users can argue "the management of what?" Developing water regulating infrastructure provides thus legitimacy to the ARA. As it will increase their influence on water allocation and their ability to manage the water flows.

The changing roles and powers of local governments toward further decentralization and leadership in local development can be observed as one of the major prospects for the ARAs to thrive. Building strategic partnerships with these new influential actors could be a strategic path toward full legitimacy and support on the ground, especially by local government institutions. The materialization of that opportunity should be first supported by a determination among water managers as to what extent decentralization should be adjusted to the actual context, how the ARAs' structure should look, or how the inter-institutional linkages should function at the territorial and sectoral levels. ARA Centro should implement flexible formulas to take advantage of their surrounding environment and unique characteristics (Inguane et al., 2014).

The lack of service delivery is affecting the legitimacy of ARA Centro. One of the main issues here is the lack of skilled personnel. ARA Centro in cooperation with donors could further look for opportunities to increase the capacity and skills of its personnel.

In all these aspects ARA Centro needs to strategically choose in what aspects it will invest to increase its capacity and resources, performance, and legitimacy.

Conclusions and Recommendations

Despite all the challenges ARA Centro is facing it needs to be put forward that in the less than 20 years of existence many issues have been implemented well during the whole decentralization process of water management in Mozambique. But, many constraints in improving the performance of the ARA Centro remain.

It is foolish to think that all problems can be addressed at once and that all issues can be overcome in a similar time frame. For many issues ARA Centro is dependent on other stakeholders to either improve its performance or increase its legitimacy. The message here is to choose strategically.

Based on what ARA Centro *knows* (what are the main issues in the delta?, how does our water system work?, who is influencing the water resources?), what it *wants* (long term vision of the basin, short/medium term plans), and what it *can* (do we have enough qualified personnel, do we have access to facilities or data, can we make use of external funds?). The ARA needs to strategically choose how it can incrementally increase its performance and legitimacy and it resources. This means that the ARA should not waste too much (limited) resources that will not contribute to this increase of performance and legitimacy. The difficulty here is that it might feel as neglecting parts of your mandate, which will cost you legitimacy at those areas. But, doing everything half will also cause this. Therefore the ARA needs to choose what it will do well and what it will less focus on.

This needs to be in cooperation and coordination with higher level governments and with agreement of the stakeholders within the basins. It is therefore advised to ARA Centro to start developing Strategic River Basin plans in coordination with higher and lower level stakeholders, these strategic plans need to clearly formulate the goals of the ARA in the short term within its abilities, but these need to be within accordance with a longer term strategic plan for the next 25-50 years. The challenge here is that the ARA needs to be ambitious, but not too (because it is limited in what it can do) and it needs to seek discussion and negotiation with its stakeholders in order to clarify the strategic choices it is making. Because the future is unknown, making strategic choices is about dealing with uncertainty. Therefore another challenge is to decide how much certainty (knowledge) you need to have to make strategic decisions. This also means that strategic plans need to have a level of flexibility to adapt to a changing environment (biophysical, socio-economical, political, technical) when needed. Long term strategic plans, therefore need constant re-evaluation (does it still complies with what we want and what we know?), increased resources and capacity will increase what the ARA then can do within the next short term strategic plan. In this way the ARA can strategically increase its legitimacy as river basin manager.

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