

Good water governance and IWRM in Zambia: challenges and chances

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Abstract

The implementation of principles for water governance is widely accepted but challenging for the whole water sector of a developing country like Zambia, because of the legal and administrative changes and organizational requirements involved. In February 2010, a revised water policy for Zambia was approved by the Cabinet. The revised National Water Policy 2010 aims to improve water resources management by establishing institutional coordination and by defining roles as well as responsibilities for various ministries. Taking into account the previous political and administration changes, this paper points out the problems and challenges of the implementation of good water governance mechanisms in Zambia. Focusing on the Kafue River Basin, from which water is abstracted for a variety of conflicting purposes (like municipal supplies, industrial use, mining, irrigation of agricultural land, fishery activities, wetland reserves and hydropower production), the gaps in implementing good water governance and Integrated Water Resources Management (IWRM) in Zambia are identified, as well as the factors causing these gaps in the Zambian water sector. The paper finishes with an overview of the opportunities given by the new water policy through Water User Associations (WUAs) at a local level.

Keywords: Integrated water resources management; Kafue River; Water Governance; Zambia

1. Introduction

The implementation of principles for water governance is widely accepted but challenging for the whole water sector of a country because of the legal and administrative changes and organizational

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requirements it entails (e.g. Lemon, 2001; Keeley & Scoones, 2003; Gupta, 2007). While the implementation of the European Water Framework Directive is a challenge to European countries (Commission of the European Communities, 2003) the implementation of Integrated Water Resources Management (IWRM) is a challenge for developing countries like Zambia. Such an implementation requires a set of administrative systems called Water Governance (Global Water Partnership, 2000, 2003).

This paper points out the problems and challenges of the implementation of good water governance mechanisms in Zambia. It is based on a research project in the Kafue River Basin, which focused on identifying the gaps in implementing IWRM in Zambia, and the factors causing these gaps in the Zambian water sector. The conceptual analytical framework for IWRM by Hofwegen & Jaspers (1999) was adapted to conduct an institutional analysis.

A qualitative approach based on the Grounded Theory Methodology (GTM), comprising twenty-eight interviews with forty interviewees amongst six groups (Zambian ministries, water users, donor agencies, international organizations, non-governmental organizations, and independent consultants), was adopted (Salian, 2010). The interviews were collected based on theoretical sampling: the range and type of interviewees selected were determined when more information on a particular situation or issue arose from preceding interviews. In order to explore the broadest spectrum of water governance challenges, a semi-structured format was chosen for the interviews which were then transcribed, coded, and analyzed using the ATLAS.ti software. The interviews were also kept anonymous. In line with the methods fostered by GTM, a constant comparative analysis was performed. This included recursive analysis of the data collected with each interview, categorization of the material through coding carried out by two independent researchers, and unification of the codes in order to answer the original and upcoming research questions.

Section 2 of this paper illustrates the main challenges facing the proper implementation of IWRM, with specific attention to the degree of decentralization in allocating decisional power and the role of stakeholder participation in decision making. Section 3 illustrates the area of the study and the main features of the water resources system in Zambia. This is functional to contextualise the current institutional framework adopted for the management of water resources in Zambia and the water sector reform process, both of which are explored in Section 4. Section 5 looks into the challenges to water governance in Zambia, whilst the final section draws concluding remarks and recommendations.

2. Challenges to IWRM and good water governance

The Global Water Partnership (GWP) defines IWRM as ‘a process that promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems’ (GWP, 2000).

One of the core concepts of IWRM is to promote coordination and integration of various interest groups to achieve a more holistic cross-sectorial water management (Jønch-Clausen & Fugl, 2001). The concept proposes to make a clearer link between and better understanding of interactions between human and environmental requirements (Wallace *et al.*, 2003). In addition, it includes managing the actions of various interest groups in a manner that promotes sustainable development vis-à-vis improving their livelihoods without disrupting the water cycle (Jonker, 2002).

For a successful implementation of IWRM plans, effective governance strategies are crucial (Grigg, 1999; Keen, 2003; Wallace *et al.*, 2003; Koudstaal *et al.*, 1992, cited in Savenije & Van der Zaag, 2000). The GWP defines water governance as ‘the range of political, social, economic and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society’ (Rogers & Hall, 2003). The principles of good water governance are derived from those of good governance in general and are formulated around the concepts of equity, efficiency, decentralization, integrations, transparency and accountability (UN, 2003).

Changes in governance paradigms are always challenging for any nation, but for a developing country like Zambia the implementation of good water governance principles can face considerable obstacles. Although the principles of good water governance are widely accepted, critical issues regarding power and localization of authority in the field of water governance remain unaddressed and unelaborated (Gupta, 2007). The decentralization process, from a state-centred actor to non-state and state actors, requires many changes in institutional structures, as well as the reallocation of power and funds to provide the participation of various stakeholders in the governance of a country’s natural resources.

Consequently, the two main topics in implementing IWRM in a country’s policies are decentralization versus centralization, and the role of stakeholder participation in decision making.

2.1. Decentralization vs. centralization

The appropriate allocation of power to manage water resources has been widely discussed in the literature (Rondinelli & Chemma, 1984; Gupta, 2007). The argument in favour of centralization is that water needs to be controlled and held in public trust for the country to have the power to own the resource, for the purpose of equity. The counterargument for centralization is that it does not take local stakeholder knowledge and interests into consideration. Furthermore, centralization imposes a top-down hierarchy, where benefits arising from such arrangements are only gained by very few and undermine those with less power in the process (Rondinelli & Chemma, 1984).

According to this critique, a successful implementation of a new water governance system will only develop when the solutions are locally generated and implemented (Cosgrove & Rijsberman, 2000). Locally generated solutions ensure the greater ownership of the stakeholders involved in the process, rather than solutions derived from centralized technocratic institutions which are far removed from the actual issues on the ground.

But this view is not free from criticism. Decentralization is difficult to achieve due to power struggles and limited capacities to run such systems effectively. Often decentralized mechanisms tend to externalize upstream impacts that affect communities or regions downstream, which do not fall under its governance framework (Gupta, 2007).

2.2. Stakeholder participation

Modern discourses have emphasized the need to combat democratic deficit within societies (Gupta, 2007). These discourses promote the introduction of public participation in technocratic decision making in IWRM. For example, public participation was established in Europe by implementing the European Water Framework Directive (European Community, 2000, preamble 13 and 46, Article 14). The need for public participation derives itself from the principles of good governance and

IWRM (Commission of the European Communities, 2001). These have been elaborated by the GWP (2003):

The approach to achieve good water governance has to be open and transparent, coherent and integrative, inclusive and communicative as well as equitable and ethical. The performance of such arrangements must be accountable, efficient, responsive and sustainable.

The above normative approaches to such principles are ideal for improved water governance. However, criticism concerning stakeholder participation poses a number of challenges for its implementation. Gupta (2003) argues that the process of managing stakeholder participation leads to an increase in bureaucratization of existing systems and thus increases costs associated with planning processes. This argument is true for formal participation settings like hearings in the post-planning process but not for informal settings such as in the pre-planning process (Uhlandahl, 2009). The more important point of criticism is that the true costs of public participation are still not easy to assess (Andersson et al., 2005). While stakeholder participation offers, without doubt, the easiest way of solving conflicts directly (Uhlandahl, 2009), it does not guarantee constructive and sustainable solutions. Nevertheless, the costs for stakeholder participation are much higher in the pre-planning process of measures. But this can lead to much faster implementations of measures and to the reduction of costs in the post-planning process.

The involvement of stakeholders does not automatically lead to balanced solutions. The consideration of power play within the actors is important as well. State involvement often plays a big role in balancing the power play among stakeholders. Usually, poor or underprivileged stakeholders are marginalized and cannot participate effectively. This causes a loss in motivation wherein the stakeholders feel their inputs are sidelined against other powerful actors. The so-called ownership of such a process loses its value and the outcome can be unbalanced. This is often the case in a joint process where actual formulation is concentrated in a few hands, leading to the control and manipulation of such participatory processes. The introduction of participatory approaches tends to reduce these power vested in the state and would further accentuate the imbalance between stakeholders (Keeley & Scoones, 2003).

Additionally, the culture and economic context within which new policies are implemented can lead to uncertain and unintended outcomes. Such unpredictable outcomes could contradict the very objective of a participatory process (Lemon, 2001). Finally, this could result in different local policies, which can cause lack of their harmonization at regional and national levels.

3. Country context and a focus on the Kafue River

After copper, its most important natural resource, water is the most crucial natural resource in Zambia. The Fifth National Development Plan (2006–2010) states that water is one of the core factors for the economic growth of the country, and a vital and central element in pro-poor economic development by improving small-scale irrigation (GoZ, 2006). To date, Zambia remains one of the least developed countries in the world with a Human Development Index (HDI) of 0.395 (ranked 150th out of 169), with a high incidence of poverty (63.7% of the population is poor) and a life expectancy at birth of about 47.3 years (UNDP, 2010). These numbers underline the importance of poverty reduction for Zambia.

Despite Zambia's economy being heavily based on mining activities, thanks to the rich endowment of copper, the agricultural and hydropower sector play a key role in the development of the country and are recognized by the government as priority sectors. Currently, about 70,000 hectares (World Bank, 2009) are developed under formal irrigation (excluding land in non-equipped cultivated lowlands and wetland irrigation) and substantial developments are expected, particularly in the Kafue River Basin. The World Bank (2009) estimates that by 2012 about 15,000 more hectares will be irrigated (Table 1); moreover, the Sixth National Development Plan (SNDP) foresees the construction of thirty new irrigation schemes by 2015 that will increase the agricultural land under irrigation by 25,000 hectares. Also, the hydropower sector is considered to be the key to the Zambian economic development and the SNDP set the expansion of hydropower generation capacity as a national priority. In fact, the Zambian hydropower potential is widely untapped: the available capacity, recently increased to 1,890 MW after up-rating and rehabilitation of the Kariba North Bank, Kafue Gorge and Victoria Falls hydropower stations, falls short of meeting the current and future anticipated electricity demands. Therefore, massive developments are planned that could, in the long term, bring the total installed capacity in the country to 4,635 MW (GoZ, 2011).

Most of the Zambian surface water is found within the major rivers of the Zambezi, Kafue, Luangwa, Luapula and Chambeshi, and the lakes of Tanganyika, Bangweulu, Mweru, Mweru-wa-Ntipa, Kariba and Itzhi-Tezhi. The Kafue, second longest Zambian river, is essential since it comprises about 20% of the country's area and hosts more than 40% of its population (GoZ, 2008). Water from the Kafue River is abstracted for a variety of purposes including municipal supplies, mining activities, and small- and large-scale irrigation, primarily for sugar cane growers, maize and supplemental irrigation on winter wheat production (GoZ, 2008). Furthermore, the Kafue's waters are fundamental for the survival of the dense fishery activities, which serve as a livelihood for the people living in the basin, and the river comprises the two most important wetland reserves and Ramsar sites in the country (WWF, 2005). Figure 1 and Table 2 provide an illustration of the Kafue River and the main activities that benefit from its waters.

Recent independent studies (COWI, 2009; World Bank, 2009) concentrated on the water availability for two main economic activities in the basin, namely commercial agriculture and hydropower production, and concluded that the Kafue River will soon reach a state of economic water scarcity. Driven by a continuous economic growth and a steady increase in population, the pressure of different sectors on water resources is rising. Thus Zambia faces several challenges in harnessing the potential of the actually abundant water resources.

Table 1. Expected expansion of irrigated land. (Source: World Bank (2009)).

Province	2008 (ha)	Likely 2012 (ha)
Eastern	400	500
Lusaka	8,500	9,500
Southern	39,000	45,000
Western	100	250
Northern	1,500	3,500
Northwestern	300	300
Luapula	150	250
Copperbelt	4,400	6,800
Central	10,000	15,500
Total	66,358	81,600

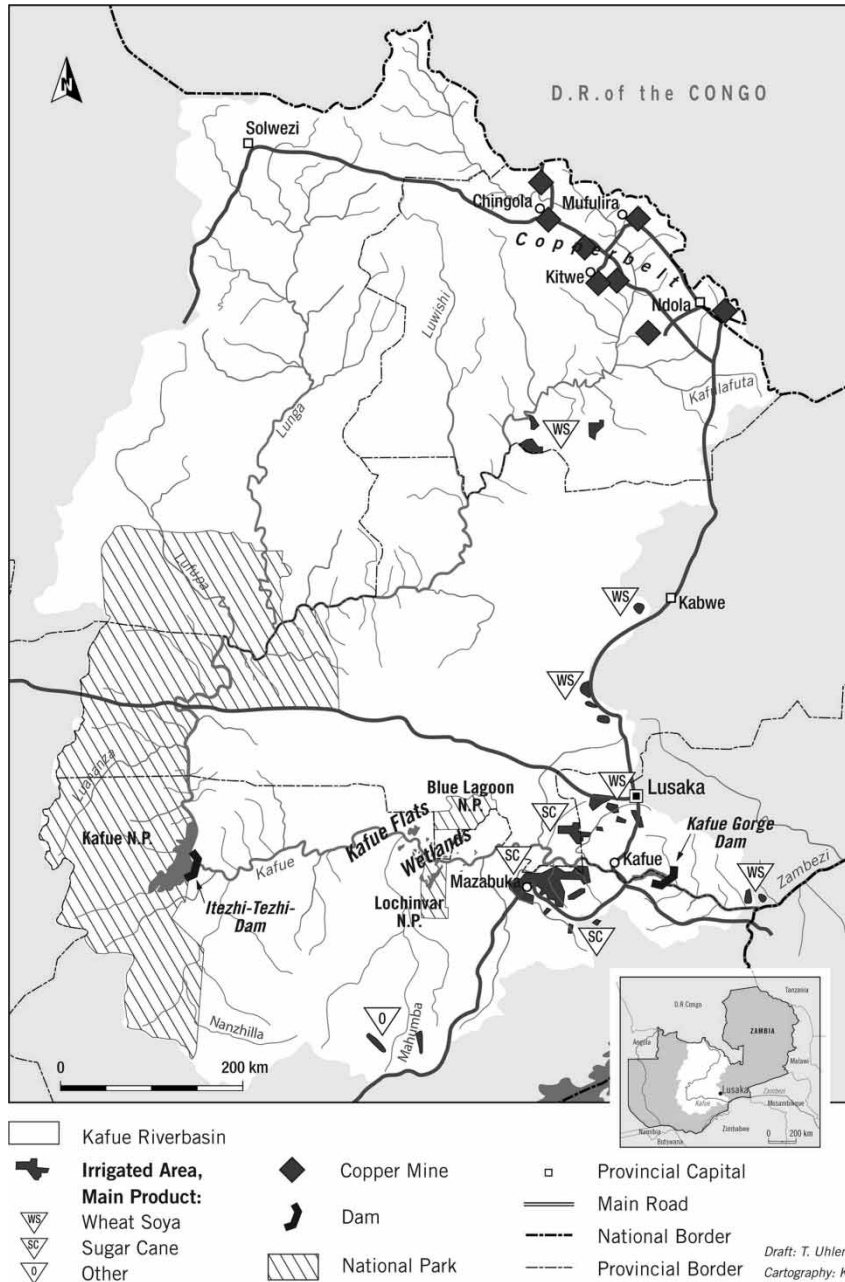


Fig. 1. The Kafue River Basin.

It is not only insufficient infrastructure investments to sustain the economic demand for water that are hindering the Zambian development but also a lack of proper governance in the water sector – the main factor causing a loss of the possible benefits that could be harnessed (Sievers, 2006; Chabwela & Haller, 2008).

Table 2. Water-related activities in the Kafue River Basin.

	Opportunities	Challenges
Mining	<ul style="list-style-type: none"> • Most of the copper mining activities take place in the Northern part of the basin, in the Copperbelt Province. • This area is one of the most active economic zones in Zambia. 	<ul style="list-style-type: none"> • High population density due to migratory workers. • Pollution of soils. • Water pollution linked to the heavy utilization of chemicals for the extraction of minerals and to the discharge of heavy metals from the tailings dams. • Runoff from open pit mines during rainy season.
Hydropower	<ul style="list-style-type: none"> • 990 MW out of the generation capacity is produced by the Kafue Gorge dam on the Kafue River. • Increasing demand for electricity drives the expansion plans for the hydropower sector. • The main hydropower projects are the Itezhi-Tezhi and the Kafue Gorge Lower stations. 	<ul style="list-style-type: none"> • The increased storage capacity will further hold more water for the production of electricity, thus essentially restricting water availability for other economic activities. • Environmental concerns related to the change in flooding pattern and associated change in vegetation cover and fauna.
Agriculture	<ul style="list-style-type: none"> • Though rainfed agriculture is dominant in Zambia, the Kafue waters are used to irrigate about 50,000 hectares of cropland. • In the lower Kafue, several commercial farms cultivate areas of about 33,000 ha (World Bank, 2009) to produce the majority of Zambia's sugar for local use and export. 	<ul style="list-style-type: none"> • The lower Kafue is reaching conditions of water stress. • The allocation of water between small-scale and commercial farmers appears to be a source of more and more conflict, mainly due to the massive water requirements needed for the irrigation of sugar cane by Zambia Sugar (GoZ, 2004b). • Nutrient-rich effluents are discharged back into the Kafue, contributing to the proliferation of many aquatic weeds.
Wetlands	<ul style="list-style-type: none"> • The Kafue Flats cover around 6,500 km² and are recognized as a major wetland resource in ecological terms for rare and endemic species. • The flats have traditionally supported the local population with land for cattle grazing, floodplain agriculture and fishing. • The flats include the two national parks of Lochinvar and Blue Lagoon. 	<ul style="list-style-type: none"> • The impoundment of water for hydropower generation has led to a reduction in the available surface area for grazing and for crop production. • A decline in the number of Kafue Lechwe (endemic antelope) has been registered since the construction of the Itezhi-Tezhi dam, concurrently caused by a change in habitat and increased poaching.

4. Water resources management in Zambia

4.1. Institutional and legal framework

Water management in Zambia had always been managed on a sectorial basis. All legislation and policies in the past tended to reflect a sectorial bias (COWI, 2009) and there have been limited approaches so far to the development of a comprehensive strategy for water resources management. Recognizing the inefficiency of sectorial water management, the Zambian government opted for a water sector reform following the IWRM approach, under the auspices of the Water Resources Action Program (WRAP).

Its implementation started in 2001 with the Ministry of Energy and Water Development (MEWD) in charge of the reform (GoZ, 2004a).

Currently, the Zambian water sector involves many different organizations and authorities at various levels, ranging from policy/legal formulation and implementation through service provision to consumption. Derived from the Water Act of 1949, the main ownership of water resources is vested in the President of Zambia. Various ministries, departments and agencies are separately tasked to administer these resources. The MEWD, with the Department of Water Affairs (DWA) and the Water Board have the overall responsibility for water resources management and development in Zambia. The functions of the DWA and the Water Board are detailed in Table 3.

The other institutions that are directly or indirectly involved in the water management fall into seven categories:

- Government ministries and departments:
 - the Ministry of Agriculture and Cooperatives (MACO) is responsible for monitoring the use of water for cropping activities;

Table 3. Functions of the department of water affairs and the water board.

	Department of Water Affairs (DWA)	Water Board
Water allocation	Investigation of water rights and gives advice to the Water Board.	Processes the water rights applications. Decides water allocations based on a preliminary investigation by the DWA.
Water charges	Provides advice to the Water Board on the determination of water charges in lieu of a proper pricing strategy document.	Provides advice to the Minister (MEWD) on the determination of water charges.
Policy function	Director of DWA has the role of advising and participating in the formulation of water-related policies. This function is carried out together with the Department of Planning and Information in the same Ministry.	The Secretary of the Water Board provides advice on the formulation of water-related policies.
Planning	Plans the development of water resources and conducts surveys to explore water resources availability, facilitating access to water. This function is carried out together with the Department of Planning and Information in the same Ministry.	Plans the issuance of water rights.
Quality	Undertakes water resources quality monitoring and evaluation.	Can call upon polluters to take adequate steps to prevent the fouling or pollution of water, and can penalize polluters.
Funding	Provides funding – under general budget provision from the Ministry of Finance – to carry out WRM functions.	Can provide supplementary funds (derived from water right charges) for the investigation of water rights and other activities of the Water Board (Appropriation-in-Aid).
Disputes solving	Technical support function in case of disputes over water resources.	The secretary of the Water Board is called to testify over all issue of dispute over water resources in court.
Information Management	Assessment and surveying of water resources, both surface and groundwater.	Compiles the Water Rights Database.

- the Ministry of Livestock and Fisheries is responsible for monitoring the use of water for fishing, fish farming and livestock watering;
 - the Ministry of Local Government and Housing (MLGH) is the lead ministry in Water Supply and Sanitation, and is also responsible for policy development in this field, for the physical planning of water supply, and for sanitation services and resource mobilization;
 - the Ministry of Tourism, Environment and Natural Resources (MTENR) is mandated with the protection of water resources;
 - the Ministry of Health (MOH) is in charge of setting standards and monitoring the quality of drinking water;
 - the Office of the Vice-President coordinates disaster management;
 - the Ministry of Transport and Communication provides meteorological services and is responsible for inland waterways;
 - the Ministry of Mines is responsible for dewatering in mines.
- Local authorities (e.g. city, municipal and district councils) are mandated to provide, in an environmentally sustainable way, water supply and sanitation services to the areas under their jurisdiction. This mandate is carried out through nine commercial water utility companies.
 - Parastatal companies, such as the Zambian Electricity Company (ZESCO) with the functions of generation, transmission and distribution of electricity, and commercial water utilities that supply water and sanitation services under the general regulation of NWASCO.
 - Regulatory authorities that are statutory bodies established by Act of Parliament. The main authorities, besides the Water Board, are the National Water Supply and Sanitation Council (NWASCO), regulating and setting standards for the urban and peri-urban water supply and sanitation services providers, and the Environmental Council of Zambia (ECZ), which establishes water quality and pollution control standards, and determines conditions for the discharge of effluents. Another important body is the National Heritage and Conservation Commission which provides for the conservation of ‘natural heritage’, such as waterfalls. Further, the Zambia Wildlife Authority (ZAWA) controls, manages, conserves, protects and administers the National Parks.
 - Private sector companies that operate in the manufacturing, mining, food processing, agriculture and power generation fields (e.g. mining companies, Zambia Sugar Company, industries).
 - Bilateral and multi-lateral cooperating partners (e.g. European Commission, World Bank, African Development Bank, Germany, Denmark, Japan, UNICEF, etc.) that have been the main financiers of water-related projects and programmes in Zambia.
 - Non-governmental organizations (NGOs) and Community Based Organizations (CBOs) (e.g. World Wildlife Fund, Care International, WaterAid, Residents/Ward Development Committees) that operate in a variety of fields related to water management, such as the promotion of community-based management of water supply schemes, gender related activities, sanitation and health education.

Sector Advisory Groups (SAGs) were introduced in 2003 by the Government of the Republic of Zambia through the Ministry of Finance and National Planning as a vehicle for contributing to the process of planning, implementation, monitoring and evaluation in the sectors. The SAGs comprise representatives from key institutions and stakeholders, which currently include the line ministries, statutory bodies, cooperating partners, academic and research institutions, NGOs and other stakeholder associations actively involved in the sectors. The Water Sector Advisory Group has four Sub-SAGs.

These are the Water Resources Management Sub-SAG, Water Resources Infrastructure Development Sub-SAG, Water Supply and Sanitation Sub-SAG, and the Capacity Building, Monitoring and Evaluation Sub-SAG. The main Water SAG advises the government on sector policy issues, performance of the various sub-sectors, efficient and effective water use, transparent management and sub-sectorial coordination. Furthermore, it provides a forum for sector-wide approaches concerning planning, budgeting, delivery and implementation.

4.2. *The water sector reform process*

The overall goal for the management of the Zambian water resources as explicitly stated in the IWRM and Water Efficiency Implementation Plan is ‘to achieve equitable and sustainable use, development and management of water resources for wealth creation, socio-economic development and environmental sustainability by 2030’ (GoZ, 2008).

To realize this ambitious objective, institutional reforms have been started in various sectors. In February 2010, a revised water policy for Zambia was approved by Cabinet. The revised National Water Policy 2010 aims at the improvement of water resources management by setting institutional coordination and defining roles as well as responsibilities for the various ministries. Thus, the new policy is regarded as a document that covers all sectors and strives to address cross-sectorial interests, with particular focus on water resources planning, development, management and utilisation. It encompasses the various sector policy objectives to be incorporated in one document and it is explicitly inspired by the principle of Integrated Water Resources Management, with stakeholder participation and decentralization being two main thrusts. The policy underlines the following as major components of change with respect to the previous water policy of 1994:

- decentralization in decision-making to the lowest possible level. This approach is buoyed up by the Decentralisation Policy (GoZ, 2003) and by the long-term government vision of a fully decentralized system of governance, and implies a marked shift from a heavily centralized system (as of today) to one based on hydrological boundaries that transcend provincial and district boundaries. Water management is thus the responsibility of a Water Resources Management Authority (WRMA) that delegates most of the activities to catchment and sub-catchment Councils and Water User Associations (WUAs);
- promotion of active community and stakeholder participation in the design, implementation and management of water resources related programs and projects. It is, in fact, recognized that the views of stakeholders are valuable for influencing decisions that affect communities in water resources management and development;
- promotion of regional cooperation in water resources management as well as in areas of research, data collection and information exchange;
- assurance of resource efficiency and equity amongst all users, consistently with the social, economic and environmental needs of present and future generations.

Although the Revised Water Policy refers to the normative aspect of water management, question still remain on how these objectives will be fulfilled.

Nonetheless, first steps have been taken at local level. WRAP together with DWA has supported two WUAs since 2008, namely those in Kamfinsa and Lunsemfwa. The Kamfinsa WUA lies within the Upper Kafue catchment while the Lunsemfwa catchment is situated in the Upper Lunsemfwa sub-

catchment of the Luangwa catchment. The need to form such structures at the local level to manage water resources arose in the areas because of competing uses and disputes. Lessons learned from the two pilot WUAs were fed back into the formulation process of the Revised Water Policy and Water Resources Management Bill.

In the new Water Resource Management Bill, the WUAs will play a crucial role in managing Zambia's water resources. While the pilot WUAs are financed through WRAP (EU and GIZ¹), within the new structure and the Water Resource Management Authority, catchment Councils, and sub-catchment Councils, the WUAs will finance themselves mainly through water permit charges and by grants only when necessary. However, since the WUAs will consist of voluntary members, training and capacity building efforts should be conducted at catchment and sub-catchment Council level to support the proper functioning of the WUAs; but, at the same time, some capacity development must happen within the WUAs in order to ensure the sustainable operation of such institutions. A detailed summary of the functions of the Water Resource Management Authority, catchment Councils, sub-catchment Councils and WUAs is provided in Table 4.

Despite the on-going reform process, the institutional set up is not yet completely aligned to sector policies, leaving 'grey zones' of responsibility and complex *de facto* arrangements. An analysis of the empirical material revealed selected non-compliance in the current structure, as listed below (and further elaborated in Section 4):

- a lack of an integrated approach to water resource management;
- inadequate institutional and legal framework (i.e. for monitoring, regulation and sanctioning);
- lack of commitment by key stakeholders and staff in key institutions;
- lack of decentralized structure to provide for stakeholder participation;
- inadequate human and financial capacity for water resources management.

5. Challenges to water governance in Zambia

The complex network of economic activities that draw their lifeblood from the Kafue's waters has given rise to an increasing competition for the resource basis and motivated the necessity to adopt a more integrated approach to water management. In fact, recognizing the sectorial and centralized basis of water management, the Zambian government formulated (through the WRAP) an integrated approach towards the management of water resources in the country. The WRAP noticed weak linkages between institutions, and a lack of legislation and policy in managing water resources (GoZ, 2008). Moreover, local communities are not adequately organized nor sensitized to water management and planning, while their participation is equally lacking (Sievers, 2006).

Amongst all water uses, hydropower generation has always been awarded the highest priority due to power requirements for copper mining activities and other local industries. The construction of the Itezhi-Tezhi reservoir has had many negative impacts, primarily felt by the communities downstream of Itezhi-Tezhi who depend on the Kafue Flats for their livelihoods. Observed impacts include the reduction of the available surface area of grazing land and available land for crop production, a reduction in fisheries, and a decline of rare endemic species due to habitat loss (WWF, 2005).

¹ Commissioned by the Federal Ministry for Economic Cooperation and Development (BMZ).

Table 4. Functions of the main institutions as outlined in the draft Water Resources Management Bill (2010).

	Water Resources Management Authority (WRMA)	Catchment Council (CC)	Sub-Catchment Council (SCC)	Water User Association (WUA)
Water allocation	<ul style="list-style-type: none"> • Approve allocation plans and determine the quantity of water to be allocated for the various uses, as well as the purpose for which the water shall be used. • Identify potential sources of freshwater. • Plan the development of water resources. • Secure the provision of adequate safe water for various purposes. • Decide on the water allocation for various purposes. • Issue water permits and licenses for the use of water. • Carry out tasks of CCs, SCCs or WUAs if none exists in specific catchment or sub-catchment. 	<ul style="list-style-type: none"> • Regulate and supervise the use of water at a catchment level. • Include sub-catchment allocation plans in catchment management plan and submits plan to Authority. • Carry out tasks of SCC if none exists in specific sub-catchment. 	<ul style="list-style-type: none"> • Regulate the use of water in sub-catchment. • Undertake investigations and make recommendations on the applications for a water permit or license in sub-catchment. • Prepare an allocation plan for inclusion in a sub-catchment management plan and submits the plan to the CC. • Monitor permits, licenses, water works, water quantity and quality in sub-catchment. 	<ul style="list-style-type: none"> • Facilitate and support inspections.
Water charges	<ul style="list-style-type: none"> • Develop and revise water charges. • Carry out revenue collection in catchments where no CC exists. 	<ul style="list-style-type: none"> • Collect revenues through charges for the use of water in the catchment and sub-catchments and transmit these to the WRMA. 		
Quality	<ul style="list-style-type: none"> • Protect potential sources of freshwater. • Resource quality monitoring and evaluation. • Conserve, preserve and protect the environment. 	<ul style="list-style-type: none"> • Resource quality monitoring and evaluation. • Undertake catchment protection. 	<ul style="list-style-type: none"> • Monitor water quality and implement regulations and guidelines on catchment protection. 	<ul style="list-style-type: none"> • Monitor water quality and ensure water conservation. • Undertake projects that ensure catchment protection.

Policy function	<ul style="list-style-type: none"> Provides advice and recommends policies to the Minister for the management of water resources. 			
Disputes solving	<ul style="list-style-type: none"> Investigate and deal with any dispute related to the use of water when the dispute does not fall in an area with a CC, SCC, or WUAs. Encourage and facilitate the resolution of disputes over water by using alternative dispute resolution methods such as arbitration, mediation or conciliation. 	<ul style="list-style-type: none"> Investigate and deal with any dispute related to the use of water. Play an important role in alternative dispute resolution. 	<ul style="list-style-type: none"> Investigate and deal with any dispute related to the use of water. Play an important role in alternative dispute resolution. 	<ul style="list-style-type: none"> Investigate and deal with any dispute related to the use of water. Play an important role in alternative dispute resolution.
Information management	<ul style="list-style-type: none"> Establish and maintain a water resources information system. Carry out functions of CC, SCC or WUA in areas where they do not exist. 	<ul style="list-style-type: none"> Carry out hydrological and hydrogeological services. Consolidate data forwarded by a SCC or other entities. Carry out functions of SCCs and WUAs in areas where they do not exist. 	<ul style="list-style-type: none"> Collect hydrological, metrological, water quality and quantity, socio-economic and environmental data for submission to the CC. Maintain equipment for data capturing. 	<ul style="list-style-type: none"> Collect hydrological, metrological, water quality and quantity, socio-economic and environmental data for submission to the SCC. Maintain equipment for data capturing.
Participation	<ul style="list-style-type: none"> Carry out advocacy programs. 	<ul style="list-style-type: none"> Carry out public awareness campaigns in collaboration with SCCs. 	<ul style="list-style-type: none"> Carry out public awareness campaigns. Promote the participation of the community in water management. 	<ul style="list-style-type: none"> Promote the participation of the community in water management.

(Continued.)

Table 4. (Continued.)

	Water Resources Management Authority (WRMA)	Catchment Council (CC)	Sub-Catchment Council (SCC)	Water User Association (WUA)
Plans and reporting	<ul style="list-style-type: none"> • Formulate and submit to the Minister a national water resources strategy and plan for the management, use, development, conservation, preservation, protection, control and regulation of water resources. • Recommend to the Minister what catchment management plans should contain. • Recommend to the Minister the constitution of a CC. • Provide technical support and coordinate the activities of CCs, SCCs and WUAs. • Approve catchment and sub-catchment management plans. 	<ul style="list-style-type: none"> • Prepare and update catchment management plans, in collaboration with the WRMA. • Harmonize sub-catchment management plans with catchment plans and facilitate their implementation. • Prepare catchment reports and report back to WRMA. • Provide technical support to SCCs and WUAs. 	<ul style="list-style-type: none"> • Develop sub-catchment management plans and facilitate their implementation. • Prepare an allocation plan for the sub-catchment. • Harmonize local management plans with sub-catchment management plans. • Provide technical support to WUAs. • Compile reports on activities in the sub-catchment and submit them to the CC. 	<ul style="list-style-type: none"> • Propose local water management plans to the SCC and implement them.

CC: Catchment Council; SCC: Sub-Catchment Council; WRMA: Water Resources Management Authority; WUA: Water Users Association.

Despite the negative environmental impacts, ZESCO Limited has been approved to increase the height of the dam by 10 m. An Environmental Impact Assessment (EIA) has been conducted by ZESCO Limited which shows no major impact to the Kafue Flats and its population, but an independent assessment to prove the same has not yet been carried out. Other hydropower projects like the Kafue Gorge Lower Hydropower Dam, which will be constructed at the confluence with the Zambezi, will have limited effects on the Kafue basin but will have marked impacts on the Zambezi River.

The downstream part of the Kafue basin witnesses stiff competition for water resources between agricultural water use and use for hydropower generation. The expansion of agriculture over the last decade has enforced the competition in this part of the basin. Agricultural production, especially sugar cane for export and regional markets, is now seen as a boosting sector and is getting a lot of attention in terms of future expansion (COWI, 2009). A developing economy and population growth, coupled with the acute water demand to sustain all activities in the basin, are expected to worsen water resources utilisation. In addition, existing conflicts could become critical without appropriate governance mechanisms. These mechanisms are essential to introduce equitable and transparent allocation, and to account for illegal and unlawful activities in the use of water resources amongst all stakeholders within the basin (Burke, 1994; Scott Wilson Piésold, 2003; Nyambe & Fielberg, 2009).

All the above-mentioned economic activities are important to sustain Zambia's growth potential and having an efficient and equitable water allocation thus becomes crucial. In Zambia, the allocation of water has faced a number of challenges as well as conflicting interests for the available water resource. This is aggravated by the fact that there is a lack of reliable information systems to provide accurate hydrological data for optimum allocation of water amongst all users.

The priority of the government focuses on specific economic sectors which earn valuable foreign exchange through export, such as hydropower production and irrigated agriculture. This undermines the potential of other sectors related to development within the basin, especially small-scale farmers who represent the larger population within the basin, and provide two-thirds of the annual staple food harvest. They should, therefore, be the prime beneficiaries of water according to the poverty alleviation and food security strategies in Zambia, but these strategies have not been effectively adopted yet and often small-scale farmers still do not get the share of water they need.

As a result of overlapping competences, the inter-ministerial competition for control of important water resources affects the coordinated planning and implementation of policies that are paramount for the overall development of the water sector. The SAGs were formed as a platform where inter-ministerial coordination could occur, but the Water SAG is not utilized in the manner it was proposed to be. There is a lack of commitment and ownership amongst the representatives of the coordination platform, making this mechanism ineffective. Coordination and integration of various sector policies are still an unresolved issue. This has also created barriers in implementing policies supporting individual sectors using water resources.

Given the size of Zambia, decentralization in the water sector was advocated to induce greater reach and efficiency in its operation, but this has not yet been successfully achieved. Some constraints that have been identified are the lack of adequate human resources to support such decentralized structures. There is also a resistance to change the current centralized institutions as some ministries fear to lose their power and authority. This creates an uncertain future for the respective ministries who, at the moment, hold more power within the water sector.

Currently, the fragmented institutions in the water sector are unable to provide the emerging farmers with essential access to water. There is a clash between the land tenure under customary law, which follows traditional water management, versus the system based on water rights linked to the ownership of land by title deeds. Those emerging farmers without adequate resources and title deeds have no access to water for mechanized irrigation. Such an arrangement systematically undermines the development of a majority of the population living in the basin. Without further options, the farmers have to abstract water, which is deemed illegal by the authorities. This underlines the vulnerability of small- and medium-scale farmers due to the discrepancies in the current water sector.

Hence, the government supports stakeholder participation in the water sector. But participation is only limited to consultation and decisions are still formalized behind closed doors, creating mistrust in the system amongst stakeholders. Moreover, the interests of the commercial farmers, organized into lobby groups and associations, often overshadow the claims and interests of the peasant farmers.

Missing human and financial capacity in the Zambian water sector is paramount and institutions are unable to provide the necessary support and infrastructure for further development in the Kafue basin.

These identified gaps clearly indicate the lack of appropriate governance mechanisms causing impediments to successful implementation of IWRM in the Zambian water sector. This indirectly affects the strategies to fight against poverty and the vulnerability of the majority of the population who rely on subsistence farming.

6. Conclusion

Zambia is now confronted with the challenge of implementing good water governance. The water governance system is highly sectorial, and the institutional and legal frameworks are not yet sufficient to support the change towards IWRM. Moreover, the governance structure is highly centralized and leaves little room for effective stakeholder participation, and stakeholders' influence in the decision-making process is still limited. If these features are added to the low resource base, in terms of human and financial resources, and to the weak commitment and resistance to change of key stakeholders and staff in the water institutions, it is easy to understand why a transition to IWRM-based governance practices will be difficult.

The revised water policy approved by the cabinet in February 2010 is a big chance to support the change to good water governance in Zambia and first steps at a local level (in the form of WUAs) have already been taken. However, it is questionable how these WUAs will function without adequate human and financial support. In fact, a massive number of well-trained professionals will be needed to manage such decentralised institutions at national, catchment and sub-catchment level, as well as to assist the work of the WUAs. Without fulfilling this void of human and related financial capacity, the success of the new water policy is at stake.

Though the Kafue River is the backbone of the Zambian economy, the country has abundant water resources from other river basins like the Zambezi Basin, Luangwa Basin and Luapula Basin. A possible solution to the problem could be the promoting of further economic development and required infrastructure in these basins to support the economic growth of other Zambian regions, and to enforce the decentralisation process. This would considerably reduce conflicts in the Kafue Basin. But such allocation of infrastructure in more remote parts of the country would also require large investments and long time frameworks, which would pose a great challenge to such projects.

Some conflicts cannot be solved by replacing water users and need to rely on good water governance where all stakeholders participate to solve conflicts and find better solutions to secure the livelihoods of the rural population, mainly engaged in the production of their staple foods. Good water governance will be a key issue for the sustainable development of Zambia.

Declaration

This paper expresses the personal views of the authors.

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