



# Towards Integrated Water Resources Management

International experience in development of river basin organisations



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Cover photo by Brendan Bromwich: A new flood in a wadi in the Hajar mountains in the Sultanate of Oman is recorded at a gauging station.

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# CONTENTS

ACKNOWLEDGEMENTS.....	6
ABSTRACT.....	7
1. BACKGROUND.....	8
2. JUSTIFICATION FOR RIVER BASIN MANAGEMENT THROUGH RIVER BASIN ORGANISATIONS.....	9
2.1. Why river basin management?.....	9
2.2. Why do we need river basin organisations?.....	10
3. TYPES OF RIVER BASIN ORGANISATIONS.....	11
4. DECENTRALISATION AND SUBSIDIARITY.....	13
5. DEVELOPMENT OF RIVER BASIN ORGANISATIONS.....	15
5.1. Data/baseline survey.....	16
5.2. Demarcation and subdivision.....	17
5.3. Transparent and effective decision making/Stakeholder participation.....	20
5.4. In what ways should stakeholders participate?.....	21
5.5. Platform establishment and development.....	22
5.6. Legal framework and organisational set-up.....	24
5.7. Tasks and competencies of platforms: progressive delegation.....	26
5.8. Adaptable management structure.....	27
5.9. Integrated planning system.....	27
5.10. Financial sustainability: cost recovery and water pricing.....	28
5.11. Capacity building.....	28
REFERENCES.....	30

## BOXES

BOX 1	CONSOLIDATION OF RIVER BASIN ORGANISATIONS IN THE NETHERLANDS, OR BALANCING BOTTOM-UP WITH TOP-DOWN.....	16
BOX 2	DEVELOPMENT OF RIVER BASIN COUNCILS IN MONGOLIA.....	18
BOX 3	CATCHMENT AND SUB-CATCHMENT COUNCILS IN ZIMBABWE .....	22
BOX 4	PROGRESSIVE DELEGATION IN SOUTH AFRICA.....	25
BOX 5	SAMPLE FUNCTIONS FOR RIVER BASIN LEVEL.....	27
BOX 6	SAMPLE FUNCTIONS FOR SUB-BASIN LEVEL .....	27

## ABBREVIATIONS

IWRM – Integrated Water Resources Management

PPP – Public-Private Partnership

RBO – River Basin Organisation

UNEP – United Nations Environment Programme

WRC – Water Research Commission (South Africa)

WASH – Water, Sanitation and Hygiene

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## ABSTRACT

Integrated Water Resources Management (IWRM) is widely used to combat floods and droughts, to preserve aquatic ecosystems, or to streamline other upstream-downstream relations. Where this is done at the catchment scale, the prevailing institutional arrangement is with a specific, single-purpose river basin organisation (EU 2001). River basin organisations appear all over the world as existing institutions or as upcoming arrangements in a water sector reform. The term 'river basin organisation' (RBO) covers a wide range of organisations that may have very different tasks and responsibilities. There are also many ways of characterising river basin organisations. For the purposes of this paper, 'RBOs' will refer to commissions, authorities, agencies and partnerships; this is both a functional as well as a legal characterisation of the term.

The design and development of river basin organisations can be seen as a product of decentralisation of administrative functions. Within this process different ways of decentralisation can be identified in ascending order of transferring autonomy: deconcentration, co-administration, delegation and devolution or divestiture (Ostrom 1990). The level of autonomy plays a crucial role in the functioning of river basin organisations. Delegation is probably the

most practised institutional instrument for transferring tasks and competencies. Delegation can be prompt and definitive (as in Zimbabwe) or gradual and progressive (as in South Africa). Progressive delegation is applied over time as the need for delegation arises and on request by the stakeholders. A crucial issue is the process of stakeholder participation. It has become very clear that water resources planning without the participation of stakeholders in decision-making is highly ineffective. How river basin organisations develop depends to a large extent on the circumstances under which development takes place. There are also many characteristics that are relevant for the functioning of river basin organisations. The most important ones are availability of data, logical demarcation, adequate organisational design, clear mandates, stakeholder participation and transparent decision-making, autonomous and adaptable management structure, integrated planning system, financial sustainability, capacity building, and history (as in the Netherlands).

**Key-words** Integrated River Basin Management, River Basin Organisations, Stakeholder Participation, Functional Decentralisation, Progressive Delegation, Capacity Building.

## I. BACKGROUND

Integrated Water Resources Management (IWRM) is gaining increased attention in Sudan. This has a number of potential benefits. As agriculture grows in significance to the national economy, sustainable management of water supplies will have economic benefits, particularly in the face of increasing climate variability. As urban populations continue to grow there are competing demands for urban and agricultural uses of water.<sup>1</sup> In some areas, such as Darfur, the pressing concern is finding a form of environmental governance that enables equitable access to natural resources so as to escape patterns of chronic local violence. UNEP's Sudan programme supports the development of IWRM in non-Nile<sup>2</sup> contexts, noting the significance of these resources as Nile water use becomes increasingly utilised.

In Darfur, the conflict has weakened both traditional and formal governance of natural resources. Social changes have created new stresses in the balance of water demand and resource availability. In response, decision makers and technical experts in the Darfur water sector have begun to review options for restoring sustainable and equitable management of water resources. Critical to this review were two study tours to South Africa in 2010, the first for technocrats and the second for senior government figures (including two undersecretaries of federal ministries and a number of state level ministers). Delegates on both tours observed how reforms in South Africa's post-apartheid democratisation process had created a more equitable society with respect to water management. The Hex Valley, which features in this report, was an important part of both tours. Two vision statements were produced on these tours identifying priorities for the take-up of IWRM in Darfur. By the time of the Darfur International Water Conference in 2011, consensus had been developed to reflect

both resource management and WASH objectives in the appeal document. 2013 was a landmark year with the start of a major catchment management programme in Wadi El Ku. 2014 sees the start of a new eco-hydrology training programme. The project was designed to support sustainable livelihoods, to address upstream/downstream water management, and to manage competing demands from El Fasher's urban area and the rural surroundings.

The IWRM agenda also gained traction at the national level in 2011 and 2012 due to an emerging policy debate that contextualised IWRM principles in Sudan; these discussions comprised awareness-raising and cross-government consultation. An IWRM unit in the Groundwater and Wadis Department was established in 2011. In 2013 the renamed Groundwater and Wadis Unit developed a new national database for groundwater and surface water management, organised along hydrological boundaries, reflecting an IWRM based approach to water management.

Against this backdrop of increasing attention to IWRM at the catchment level in Sudan, this report aims to support the development of policy and strategy that can take this work forward. It reviews different national strategies for the development of river basin organisations in order to inform dialogue over models that will emerge in the particular context of Sudan.

This report builds on a wider programme and series of publications by UNEP. Of particular significance is the 2013 report: "Governance for Peace Over Natural Resources: A review of transitions in environmental governance across Africa as a resource for peacebuilding and environmental management in Sudan" to which this report adds its focus on water resources.

<sup>1</sup> For example in Kassala, El Obeid, El Fasher and Nyala.

<sup>2</sup> For example, on rivers that have inland deltas, or are outside the Nile basin.



## 2. JUSTIFICATION FOR RIVER BASIN MANAGEMENT THROUGH RIVER BASIN ORGANISATIONS



The heavily silted Golo Reservoir in El Fasher. To control silting in the reservoirs like Golo, erosion control is needed in the upper reaches of the wadi. This requires a holistic approach to catchment management.

Photo: UNEP

### 2.1. Why river basin management?

Why is there a need for an institutional mechanism as complex as integrated river basin management, and consequently for river basin organisations as the implementing institutions? Should river basin management be initiated by the government or by the relevant stakeholders themselves? Can it be introduced or imposed from the outside or does it have to originate by itself? In other words, can the establishment of river basin organisations be conducted from the top or should the process of establishment be an agglomeration of existing water arrangements from the bottom? Why not accept the regular management by multi-purpose sector ministries and their decentralised institutions operating on politically accepted administrative boundaries (regions, provinces, districts) rather than river basin boundaries? Why opt for water management on hydrological boundaries and specific organisations? These are relevant questions that policy makers must consider when assessing the justification for integrated river basin management.

Water resources management on hydrological boundaries is not a new phenomenon. It has been in existence since ancient times whenever serious water

competition arose. Under other physical circumstances, the necessity for communal flood control has created a fertile breeding ground for institutional “upstream-downstream” arrangements. These may transcend political boundaries, needing careful coordination. More recently, new challenges relating to managing water quality, preserving environmental integrity, and sustaining environmental flows have added a new dimension to water resources management. A crucial issue is the process of stakeholder participation. It has become very clear that water resources planning without participation of stakeholders in decision making is highly ineffective. The application of serious measures without the involvement of stakeholders nearly always seems to be lacking ‘fine tuning’. Subsequently, a domino problem of enforcement arises. The issue of stakeholder participation is strongly related to the need for decentralisation or water management at the lowest appropriate level. Of late, calls for governments of developing countries for at least partial cost recovery of water resources management has provided a new incentive for innovative policies. Institutions for integrated river basin management provide substantial comparative advantages in the implementation of these systems of cost

recovery. But how feasible are they?

## 2.2. Why do we need river basin organisations?

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This question is, of course, connected with the previous one. If Integrated River Basin Management is ‘the most appropriate tool’ to deliver IWRM at a basin scale, then river basin organisations are increasingly being promoted as the vehicle by which this tool should be implemented. In recent decades, river basin organisations have become “a central component of ... the framework that defines how water is managed at the river basin or strategic level” (Makin et al.

2004; see also Radosevich and Olson 1999).

The need for the establishment or restructuring of river basin organisations is part of nearly every contemporary water sector reform and is incorporated in nearly all new water legislation that has been produced over the past ten years (for example, in South Africa, Brazil, the European Union, Nigeria, Indonesia, and the Netherlands, among other countries). One may say that river basin organisations are an accepted reality – a globally applied concept that has both advantages and disadvantages. This report discusses these with respect to the different types of organisations that are used.

### 3. TYPES OF RIVER BASIN ORGANISATIONS

Although the term ‘river basin organisation’ may give the impression that an RBO is a clearly defined entity, the reality is that the term is a blanket, or better a ‘patchwork quilt’ that covers many different types of organisations, with very different tasks and responsibilities. Various criteria can help to distinguish among the types of organisations that exist.

Millington et al. (2005) distinguished RBOs according to the function they performed, rather than the

basis on which they were operating. As a result, the researchers came up with three categories of RBOs: the river basin coordinating committee/council, the river basin commission, and the river basin authority. Hooper (2006) follows a similar path of distinguishing the tasks of the RBOs, but expands on the number of categories identified. Hooper arrives at nine different types of RBOs, presented in the following table.

River basin organisations can also be characterised in

Table I: Types of RBOs according to Hooper (2006)

No	Type	Description
1	Advisory Committee	Formalised or quasi-formal organisation, in which individuals take responsibility for undertaking action planning and provide advice, usually does not have legal jurisdiction.
2	Authority	Makes planning decisions at a central or regional government level. It may set and enact regulations, or have development consent authority.
3	Association	A private organisation of like-minded individuals and groups with a common interest. In a river basin they have varying roles: providing advice, stimulating basin awareness, education and ownership of basin natural resources management issues; educational functions and information exchange.
4	Commission	It is delegated to consider natural resources management matters and/or take action on those matters. A basin commission's powers vary, and include advisory/education roles, monitoring roles, undertaking works, fulfilling goals of a specific government's charter or an international agreement. Commissions normally are instituted by a formal statement of a command or injunction by government to manage land and water resources. Sometimes, commissions may have regulatory powers.
5	Council	Formal group of experts, government ministers, politicians, non-governmental organisations and citizens brought together on a regular basis to debate matters within their sphere of basin management expertise, and with advisory powers to government, it does not have regulatory powers in addition to a role as advisor to the government.
6	Corporation	A legal entity, created by legislation, which permits a group of people, as shareholders (for profit companies) or members (non-profit companies), to create an organisation, which can then focus on pursuing set objectives.
7	Tribunal	A basin entity, which has formalised procedures and quasi-judicial powers; a heavy emphasis on bureaucratic decision-making. Stakeholders may formally participate through hearings. Major decisions are taken by independent bodies, like a water pricing tribunal. A Tribunal acts as a special court outside the civil and criminal judicial system that examines special problems and makes judgments.
8	Trust	A legal device used to set aside money or property of one person for the benefit of one or more persons or organisations. It is an organisation which undertakes river basin works, develops and implements a strategic plan. Its mandate is to be the river basin 'advocate'. Through some sort of agreements local programs are coordinated.
9	Federation	A collaboration of organisations or departments within one government or between state and national governments to establish and undertake actions for river basin management.

Source: Hooper 2006

legal terms. In this way Hooper's comprehensive subdivision can be refined. Associations and Trusts work under **private** law. Advisory Committees, Councils, Federations and Commissions are voluntary organisations with either no **formal** mandate or more often with a mandate **indirectly** derived from the government or from the mandate the members bring from the organisation to which they are (professionally) attached (as in Mongolia). A Corporation is a legal entity under special law. A Tribunal is a regulated organisation with quasi-judicial powers. The choice of appropriate organisation is dependent on the specific circumstances. At times, various river basin organisations with different jurisdictions exist alongside one another. In Indonesia, for example, nearly every major project brings a new type of organisation.

It should be noted that no characterisation will cover the full spectrum of RBOs. The character of an RBO will depend on a number of factors:

- physical characteristics of the basin or hydro-graphic entity
- social and cultural circumstances
- history, level of maturity
- character and extent of the main problems to be tackled: floods, droughts, water
- quality, navigation, etc.
- economic circumstances
- legal and political tradition and administrative realities

For the purposes of this report, we would like to opt for the characterisation of Huitema, Mijerink e.a.(2012), who make a distinction that suits legal as well as functional purposes. The following distinction is used:

- 1) Commissions, councils, committees with a co-ordinating mandate. Jurisdiction, if at all, comes straight from the government.
- 2) Authorities, with all the mandates of an independent, single-purpose organisation. Jurisdiction is attributed by law.
- 3) Agencies, corporations, specially created bodies at arms-length of the government and under direct supervision of the government. Special laws are often used to equip these agencies.
- 4) Partnerships, voluntary organisations under private law, often with little or delegated jurisdiction.

## 4. DECENTRALISATION AND SUBSIDIARITY



At Ar Keweit, Red Sea State, sand dams, like this one, are used to reduce soil erosion and improve agricultural production in the area. It is part of a larger community based catchment management approach.

Photo: UNEP

Within the context of integrated water resources management, we are dealing with government functions, tasks and competencies that all fall under the umbrella of public administration. So, term **decentralisation** refers to the process of explicitly transferring tasks and competencies – either indefinitely or for an indicated period of time – from the centre of authority to other departments, agencies or administrative levels in order to organise or implement a government function. The purpose of decentralisation can be manifold. A driving force for decentralisation is to increase the efficiency and effectiveness of government. However, another driving force for decentralisation is to create transparency and to stimulate public accountability through participation and appeal procedures. One motive for the decentralisation of government functions is to put decision-making in the hands of people who are well informed, accessible to interested people, and capable of making fundamental decisions in a timely manner. Further, for reasons of accessibility, decision making is supposed to take place at a level as close as possible to the end-users.

There are various ways to arrange decentralisation – both within the public administration and from public administration to semi-public or private

organisations. In the case of integrated river basin management, **functional decentralisation** is often applied. This refers to situations in which decentralisation is not general, but aimed at specific administrative functions, in this case tasks and competencies of water resources management. We can speak of functional decentralisation when a specific organisation is created for a single government function, in this case water resources management.

If we concentrate on the public sector first, we can identify three main methods of implementing decentralisation efforts: de-concentration, delegation and devolution (cf. Ostrom 1990).

In the case of **de-concentration**, executive tasks and competencies are assigned to other (regional) offices of the central authority or to lower levels within the same administrative structure. Authority and responsibility remains within the central institution. This agency can re-take control over the task and competency at any time. It can also impose rules or regulations at any time or randomly.

With **delegation**, executive tasks and competencies are assigned to another public or private body; there is a transfer of responsibility without an irreversible

transfer of authority. Responsibility is shifted to the surrogate unit or private organisation and the central authority will create a regulatory framework in advance. The central agency is not allowed to take up the task or competency itself, at least not within the indicated period of delegation or only unless specific allowances for such a transfer have been made.

Under **devolution**, executive tasks and competencies are assigned to other administrative levels on a continuous basis with a complete shift of authority and responsibility. The lower administrative level is responsible for decision-making and resource mobilisation. ‘Devolved’ tasks and competencies are further managed in autonomy by the lower level of administration. As such, devolved competencies can hardly be distinguished from competencies that are originally attributed to a body or organisation in autonomy.

It goes beyond the scope of this document to fully characterise and describe autonomy accurately. However, an organisation can be considered to have a higher level of autonomy, when some of the following requirements are met:

- Independent decision-making process
- Financial independence
- Freedom of budget application
- Ownership of assets
- Election of key personnel

Cases of devolution are rare. To shift authority completely is the same as giving away a caretaker function. No government likes to do that, especially not when it concerns a public function as sensitive as managing a basic need like water. De-concentration occurs frequently. However, since there is no shift in responsibilities for decision-making, this figure is not offering

extra opportunities to empower stakeholders. Delegation is also very common; it is probably the most practised institutional instrument for the transfer of tasks and competencies. Delegation can be prompt and definitive (as in Zimbabwe) or gradual and progressive (as in South Africa).

**Progressive delegation** is applied over time *as the need for delegation arises and as stakeholders request it*. Actual delegation takes place when stakeholders are to a basic extent capacitated and when effective institutional arrangements have been established. In South Africa and Tanzania, there is a progressive delegation of responsibilities to river basin organisations. In Zimbabwe, delegation has been necessarily prompt (Jaspers 2001).

In the Netherlands, the Water Boards developed rapidly as autonomous structures. Their power was gradually restricted. Conversely, in France the ‘Agences de l’Eau’ rose in importance after 1964 in order to provide a balance to central government control (Alaerts 1995). In Turkey, Mongolia and some African countries the process of delegation is still restricted or experimental.

Decentralised competencies should be clearly distinguished from tasks and responsibilities that are carried out in **co-administration**. In this modality, lower or other levels of government administration co-operate in the implementation of activities or arrangements of other competent bodies. The newly empowered parts of government are given the necessary instructions and means to carry out these duties (cf. Indonesia: “tugas perbantuan”). Basically, these activities are not carried out under the responsibility of the decentralised agencies.

## 5. DEVELOPMENT OF RIVER BASIN ORGANISATIONS



Work on the Shamalan Canal is coordinated under the Helmand and Arghanadab Valley Authority. The canal is being rehabilitated as part of the broader post conflict reconstruction effort in Afghanistan.

Photo: Mott MacDonald

How river basin organisations develop depends to a large extent on the circumstances under which that development takes place. It matters whether water is scarce or abundant; whether the main problems are water competition or flooding or water pollution; whether the basin is big or small, densely or sparsely populated, etc. Social and economic factors such as culture, legal tradition etc., also play a considerable role. When the need for effective river basin organisations has prevailed for some time, it is often the case that organisations already exist and may have a mature structure. If the need is less high or if it has emerged only recently, then local water arrangements may exist simultaneously with some ad-hoc arrangements for co-ordination but without a clear organisational structure. A number of factors can serve as stimuli for the development of the river basin organisation:

- triggers and problems: water competition, floods, environmental disasters
- complexity of the physical and social environment
- social and political developments
- donor policies
- economic development level
- the need to share benefits from the water resources
- the need to widen the playing field beyond the limits of water management (van der Zaag 2004) etc.

On the one hand, a river basin organisation may have a very mature character and a long history of autonomous development (as in the Netherlands). On the other hand, river basin organisations may simply originate as a result of some political negotiation process, sometimes with the donor community as the main drivers (as in Namibia and Mongolia), with resulting constraints for practical implementation (c.f. Shah and van Koppen, 2006). Of course, experiences of river basin management may fall anywhere between those two extremes. In this article we will try to look from both ends and analyse prompt, politically induced top-down decentralisation processes versus autonomous development of local water arrangements into mature river basin organisations.

All over the world, efforts are being made to create new river basin organisations. Especially in developing countries, functional decentralisation processes, some of which are being pushed by donors or development banks or agencies, are inspiring water sector reforms. But which aspects have to be covered in order for RBOs to function properly? Which questions have to be answered? What are the needs of a properly functioning river basin organisation? Results of these sector reforms have not always met expectations. Comparative assessment of a considerable number of major river basin organisations (Jaspers

## BOX I

## Consolidation of river basin organisations in the Netherlands, or balancing bottom-up with top-down



Bovelandse sluice, the Netherlands. The importance of water management in the Netherlands means that the water boards are some of the oldest institutions in the country. These organisations are adapting to new challenges driven by population growth, climate change, and a greater emphasis on working with rather than against ecological processes.

Photo: Siebe Swart

### Origin

When reflecting on the origin and the transition of the Dutch Water Boards, one should realise that they originated in the west of what we call at present the Netherlands, an area predominantly near or below mean sea level.

From the ninth century onwards, large peat areas had been drained for agriculture. As drainage in peat areas causes land subsidence, flooding and the discharge of excess water became important issues. The local governments, the so-called ambachten, singly or together, had to build dykes and construct drainage canals. Sometimes they dammed rivers, which minimised the total length of dykes that needed to be constructed and freed the downstream area from water from upstream, thus facilitating drainage of their areas. In

the upstream areas, however, this construction of dams caused very serious flooding problems (Mostert 1998).

### Scale

Gradually, the scale of the water management problems became so large that the local communities could no longer solve their management problems on their own or with some neighbouring communities. Thus, from around the 12th century regional water boards were established; these boards took the form of regional government bodies with specific water management tasks. The tasks were related to relatively minor infrastructure works with regional benefits.

In addition to regional water boards and the ambachten,

2001, 2003; Blomqvist, Dinar, Kemper 2005; van der Zaag, Jaspers, Komakech 2005; Schwartz, Douven, Jaspers 2008; Hooper 2006) has demonstrated that the following characteristics can be considered to be crucial:

- Relevant data of the river basin
- Demarcation according to effective hydrological and logic administrative boundaries
- Transparent and equitable decision making process: platform establishment
- Stakeholder participation in decision-making
- Adequate legal framework and organisational design
- Clear mandates and functions
- Adaptable management systems
- Arrangements for integrated planning
- Financial sustainability
- Arrangements for capacity building

These aspects and objectives may be considered as benchmarks for well-functioning river basin organisations.

### 5.1. Data/baseline survey

Before embarking on any river basin development process it is good to have relevant data of the river basin. The more that is known – about the basin's natural features, hydrology, water quality, economy, social structure, population, pressures and impacts, land use, trends in water policies etc. – the better. This is a moving target: monitoring never stops. Ideally, a comprehensive hydrological measuring network for the monitoring of all types of water resources is needed. Ranges of data should be made available. The network should facilitate water resources planning as well as operational management. Water bodies will have to be characterised, and typology is needed to



in the west of the Netherlands, local water boards were also established; these were called 'polders'. Their task was to improve local drainage, first by constructing local drainage canals discharging as far downstream as possible, and – from the early 15th century onwards – by building and operating windmills. Their size could differ greatly, and many transgressed the borders of the ambachten. As their activities could influence the regional drainage systems, the regional water boards gradually began to supervise the local water boards.

### General versus functional (specific) government

In the Middle Ages, the functional water boards and general government had a close relationship. Local water management was the responsibility of the local landowners, supervised by the local government. The construction and maintenance of the regional infrastructure was the joint responsibility of the benefiting local communities, supervised by the regional water board. Things changed in the 16th century. The regional water boards started to do more work themselves, the costs of which they recovered from the beneficiaries.

After 1798, the functional water management and the general government separated further. Due to old charters the independence of the water boards remained secure. Provincial supervision over the water boards' functioning, however, became more intense as the provinces gained more influence as general government institutions for land and water issues.

### Concentration of water boards

In 1953, 2544 water boards existed in the Netherlands (Mostert 1998). Then, on 1 February of that year, a combination of spring tide and a strong storm raised the water level in the southwest of the Netherlands to a level 0.57 meter higher than the highest level previously recorded. An area of 200,000 hectares was flooded and 1,835 people

drowned. The maintenance of the dykes in the affected area had been the responsibility of mostly very small water boards that were low on both funding and technical expertise. Consequently, the dykes had been in a bad state of repair. To solve the problem, many water boards in the southwest of the Netherlands merged after 1953.

Concentration was also necessary because the scale and complexity of water management increased. Water quality became a new object for water management. Water quality management required expertise that could not be efficiently developed by small water boards. The solution chosen was to give the responsibility for water quality management to the provinces, which could delegate the task to existing (bigger) water boards or to newly formed water quality water boards (Mostert 1998).

The last stimulus for concentration came from 1985 onwards, from the introduction of the concept of 'Integrated Water Resources Management (IWRM)'. Under this approach, water systems (surface and groundwater quality and quantity, banks, river bed and technical infrastructure) have to be managed as a whole, and nature gets more attention. This shift increased even further the demands on the water boards in terms of required expertise. Moreover, the idea became popular that management of both water quantity and water quality should be undertaken by the same organisation (Ministry of Transport and Water Management, 1985, 1989, 1990). This promoted further mergers between small water quantity water boards and between water quantity and water quality water boards, resulting in about 27 water boards in 2003.

Within the framework of the implementation of the new EU Water Framework Directive it appears to be necessary that even more water boards will merge as a reaction to the need for water management on tangible hydrological boundaries (EU Framework Directive, article 3: river basin districts). The process of amalgamation is ongoing.

*Source: Jaspers 2001.*

make comparative assessment possible (EU 2000). From an organisational point of view, especially, the existing legal and organisational framework is of importance; this includes the trends in water policies, the social pressures and impacts, and analysis of stakeholders (groups and individuals) and their specific stakes. At this moment in time, we should learn everything about the existing organisations and partnerships that are already involved in water management. Often something valuable is in existence before, which is shaped in the way it is for good reasons. Sometimes the best choice is to enforce something that already exists or to modify it slightly. A good partnership based on accepted social norms can work better than a bureaucratic, over-sized agency.

## 5.2. Demarcation and subdivision

It is advisable to identify river basins in their total sphere of influence and to consider all types of water resources that are feeding into the basin: surface water, underground water, waste water, intruding seawater, seepage, ice melt, etc. Some management functions can only be carried out at the scale of the entire river basin.

More often than not, a river basin is too large a unit to manage. Scale aspects are very important. Institutional arrangements for a river basin such as the Nile or the Amazon are substantially more complex than they would be for small local river basins, although in essence they are not different. Various levels of subdivisions are sometimes needed to either subdivide or support the management functions of the entire river basin or to enable operational management per

## BOX 2

**Development of River Basin Councils in Mongolia****The issues in Mongolia**

Between 2007 and 2010, the Ministry of Nature, Environment and Tourism of Mongolia has embarked on a process of establishment of River Basin Councils through the National Water Authority (Mongolian Water Law, Article 9). The initiative is supported by two pilot capacity-building projects. In total, about 20 River Basin Councils are envisaged. Mongolia has a cold climate with average temperatures zero degrees for much of the year. The growing season lasts for only four months and the subsoil is permanently frozen. Hydrology is strongly influenced by ice melt from glaciers and permafrost conditions. Due to global warming, this pattern is subject to steep changes and becomes more erratic. Mongolia is a huge country with considerable natural resources and diversity, and with semi-nomadic human occupation. Mongolians depend primarily on livestock, but a significant minority of sedentarised farmers, often with origins as immigrants of Kazakhstan, irrigate to grow crops. The country is rich in all kinds of minerals, which are being exploited by big international companies predominantly from China, Canada and Australia. The big water issues are environmental protection, water quality management, water allocation and distribution, and adaptation to climate change. The administration is organised to facilitate the mobility of people and management of resources.

**Functions**

A crucial arrangement is the establishment of River Basin Councils or Water Basin Councils as they are mentioned in the Water Law of Mongolia. According to the Law (Article 19), the River Basin Council shall exercise certain legal powers. The function of the Councils is mainly advisory, monitoring and planning. They advise on the establishment and the withdrawal of water rights and mining concessions and licenses for other big works. They formulate and monitor water use plans and assist in the monitoring of Environmental Impact Assessments. Further, an important task of the Councils is to promote awareness about conservation and water use and to assist in catchment restoration. For the time being, they have no executive powers. Implementation, control and enforcement is generated through the authority of regular member organisations or individual members.

**Establishment and demarcation**

The law does not clearly spell out which organisation is responsible for the establishment of River Basin Organisations. A certain freedom was created to learn by doing and establish the resulting procedure afterwards. If a river crosses the boundary of the Province (Aimag), then the members of River Basin Councils are to be appointed by the national government (Minister of Environment, Nature and Tourism). If the river flows within the Aimag the members are appointed by the Aimag and within the Soum or District by the Soum or District. Most of the rivers cross administrative boundaries, so the minister is entitled to

nominate councillors. In practice, the minister asks advice from the Aimag and nominates from a list provided by the Aimag (signed by the Aimag Heads or "Governors"). As of 2010, three River Basin Councils had been established.

The National Water Authority – a functionally corporatized organisation in charge of water issues under the responsibility of the Minister of Environment, Nature and Tourism – is responsible for supplying the River Basin Councils with professional management (Mongolian Water Law Article 12.2.6). Thus, one may assume that the Water Authority is fully authorised to prepare and guide the development of the River Basin Organisations.

A working group of experts operating under the auspices of the National Water Authority is responsible for demarcating the boundaries of the river basins.

**Ministerial regulation of on rules for River Basin Councils**

Ministerial Regulation No. 187 of the Mongolian Ministry of Environment, Nature and Tourism orders the approval of the rules governing River Basin Councils. The idea of a ministerial regulation is to clarify and arrange the operational functioning of an agency.

In many developing countries, the production of regulations is a bottleneck. In many cases, regulations are not present, unavailable or not clear. It is crucial for the establishment of river basin organisations to be underpinned by clear and relevant regulations that give sufficient support and authority to the councils to meet their ambitions.

**Legal status**

In line with Art 19.1 of the Law of Mongolia on Water, the objective of the RBC is to engage citizens in the local management of water resources, for the protection, effective use, and restoration of water resources.

A River Basin Council should be considered as a public-private partnership (PPP) in which government officials, citizens' representatives, citizens, NGOs and other private organisations and enterprises are represented in their normal daily professional authority for the purpose of coordinating water management issues. The PPP derives its mandate from the Law on Water and from its establishing authority (so by delegation from the Minister, Aimag or Soum). Thus, the RBC should be seen as an implementing arm of the ministry, Aimag or Soum, composed on a voluntary basis. For the time being it is not a body corporate in itself, not a private foundation or association; to that extent, it cannot sue or be sued. No new authority is created. If in the longer term this situation is not acceptable anymore, the Water Law should be adapted or a new



A herder tends to his camels in Khovd Province, Mongolia. Pastoralism is a significant component of Mongolia's economy and is therefore an important consideration in the arrangement of water resource management.  
Photo: UN/Eskinder Debebe

law should be created and an RBC should be created with autonomous authorities.

## Representation

Representation is described by the Water Law (19.4), which offers a list of possible members (others could emerge): the authorised government, citizens' representation and administration, environmental and professional inspection agencies, agriculture, industry, citizens, researchers, rangers, and NGO delegates. In general, in developing countries, there is a tendency to underestimate the involvement of the direct water users (cf. Indonesia, Tanzania). Members of the council have an active role in facilitating and strengthening the active participation of direct users. One should not forget that in the case of Mongolia the purpose of establishing RBCs was to engage citizens in water management and conservation. From the first experiments with the establishment of RBCs (which were conducted by WWF through the IWRM project, which was funded by the Dutch government), it can already be concluded that representation will be different in nearly every river basin. Social and administrative diversity is huge in Mongolia.

## Financing

A very important issue is the financial sustainability of the RBC. The regulations indicate various ways in which the Councils might be financed:

(i) A percentage of the income collected from water use fees could be used to cover operational costs. The complication is that the fees are collected by regular decentralised taxation offices in the Aimag and Soum and there is no direct link to disbursement to the RBC. Further, it is not clear whether this revenue could be used for the operational costs of the RBC. The fee structure is given by the Law on Fees for the Use of Water and Mineral Water.

1) According to the approved RBC Regulation, it is possible to establish a fund to operate the RBC. The

objectives and regulations for such a fund would have to be described. The fund could collect money from donors, enterprises, other funds, etc. It could function as a sort of trust, but the legal applications would have to be assessed.

- 2) The operation of service delivery could also be an option, notably of operation and maintenance services for irrigation activities, but also monitoring and issuing discharge permits; it goes without saying that any charge should be based on an accepted service delivery.
- 3) Of course, there is always the option of direct funding through donors, private sponsors, or direct income from delivering services, campaigns, etc., but this would not have a formal status unless it were deposited formally in the new trust.

## Sub-basins

It is to be expected that sub-basin councils will be needed. In fact, the Tuul Basin Council in the pilot area in the IWRM project can already be considered as a sub-basin. According to Regulation 87, the basin authorities, in this case the chairperson of the council, are authorised to approve the members of the Sub-basin Council. The establishment of a sub-basin could follow a similar track as the establishment of a Basin Council. The establishing authority is responsible for deciding how the mandate for exercising certain tasks and responsibilities would be distributed over Councils and Sub-Councils. For the time being, however, the Tuul Council is considered a Basin Council. A consolidation with the rest of the basin could come in the future. There is a possibility that the remaining Orkhon part could be incorporated into the basin structure later on.

WWF has begun to establish River Basin Councils along the Khovd and Buyant Rivers. The process is similar to that which was organised by the IWRM project for the Tuul River. There are two Councils under one chairperson and one secretary. As with Tuul and Orkhon Rivers, the idea is to perhaps merge the councils in the future. An important consideration for the WWF programme is that

BOX 2  
continued

representation of stakeholders varies substantially from place to place with different patterns.

It should be mentioned that the establishment of RBCs and Sub-RBCs is normally a 'learning by doing' process. There are no distinct best practices except allowing for sufficient flexibility and engaging relevant stakeholders. The same approach was followed in Zimbabwe and South Africa (Jaspers 2001).

### Monitoring and water use plan

The idea is that the RBC will develop a plan on water use and conservation for its area. If possible, this plan should be approved by the authorising agency (Ministry, Aimag or Soum). It is important to decide on the status of the plan. Obviously, the plan will have functions of co-ordination, informing the public, comprehensive and effective management, etc. The level of binding will have to be decided upon. The binding character of a plan can extend as far as determining water allocation or making decisions on investment (cf. the French model, Cheret). The preparation of a plan is generally a good exercise to generate confidence in a new organisation, to clarify roles and responsibilities, and

to build the new team. Councillors should be taken serious and, more importantly, councillors should also have the feeling that they are taken seriously.

### Enforcement

Not surprisingly, agencies are struggling with enforcement in Mongolia. Distances are huge, certain areas are difficult to reach, people lead sometimes nomadic or semi-nomadic lives, and conditions are hard. To equip RBCs with enforcement powers will not be easy and may not be necessary. If the relevant agencies are represented in the Council, then the authority to enforce can be derived from their normal authorities and capacities (cf. France, where the Ministry of Environment carries out the Master Plan and Management Plans of the Water Board).

### Capacities

In order to create sufficient human and organisational resources, a comprehensive approach on capacity building is needed. Councillors need capacities. The organisation needs good bylaws and other legal and institutional arrangements to lean on.

se. The scale of the subdivision will highly depend on the physical characteristics, on the density of occupation, the type of land use, etc. At this stage it is wise to consider administrative boundaries as well. With a few minor adaptations, hydrologic subdivisions may effectively coincide with administrative boundaries or vice versa. This may add considerably to the co-ordination potential.

In Zimbabwe, the whole water sector was decentralised and commercialised during the process of revising the water legislation (Jaspers 2001). The country was subdivided into seven river basins (in fact, river sub-basins) of approximately 80,000 km<sup>2</sup>. Each of these basins was subdivided into five to six logical sub-basins, which in essence had been the lowest management unit until that time.

A similar process is going on in Tanzania. Twelve river basins have been identified that will be subdivided into various sub-basins. (The scale is essentially the same.) There is a likelihood that these Catchment Water Organisations will be composed of lower-level, multi-sectoral Water User Associations. In South Africa, the number of water management areas (based on catchments) has recently been rationalised from 19 to nine. In France, the country is hydrologically subdivided into five River Basin Authorities ('Agences de l'eau': Alaerts 1995). Water management in the Netherlands is overseen by about 25 Water Boards (2009), which administer small sub-basins. There

is an intention to consolidate those small and independent organisations into approximately 15 units. In Turkey, the idea is to subdivide the country into seven large river basins, to which smaller sub-basins will be added. As of 2008, the Water Department, DSI, operated in 26 River Basin Districts, which are based on practical considerations and hydrological boundaries.

### 5.3. Transparent and effective decision making/Stakeholder participation

One of the main characteristics of effective decision-making is that it enables both vertical and horizontal co-ordination. Vertical co-ordination implies that a tiered structure of river basin and sub-basin organisations is in place. Horizontal co-ordination occurs when natural resources management organisations co-operate across different sectors or ministries. Many scholars and practitioners are of the opinion that transparent decision-making with active stakeholder participation is a cornerstone of an effective decentralisation (Dublin principle no ii).

For this type of decision-making, the production of an integrated river basin management plan is very useful, if not indispensable (See also EU Water Framework Directive, EEB 2001). A modern institutional development approach will stress that decision-making should be done at the lowest appropriate level. This does not mean that all water users should do all of

Source: [http://www.grida.no/photoalbum/detail/landscape-with-little-forests-left-south-west-madagascar\\_572](http://www.grida.no/photoalbum/detail/landscape-with-little-forests-left-south-west-madagascar_572)



The upper part of this catchment in Madagascar is suffering from significant deforestation. A consequence of the tree loss in upper catchments is that erosion increases causing higher amounts of sediment in the river which may be deposited in reservoirs downstream.

Photo: Peter Prokosch

the decision-making; certain decisions or decision-making processes are beyond the scope of the water user. This approach generally means that whatever decision-making can be left to a lower relevant level should be left to that level. It is important to characterise the extent of the stakeholder participation. Stakeholder participation in decision-making may take different forms and have different appearances. Levels of influence may differ substantially in the different appearances.

However, a direct or indirect representation of stakeholders at all relevant levels of planning or decision-making is indispensable.

#### 5.4. In what ways should stakeholders participate?

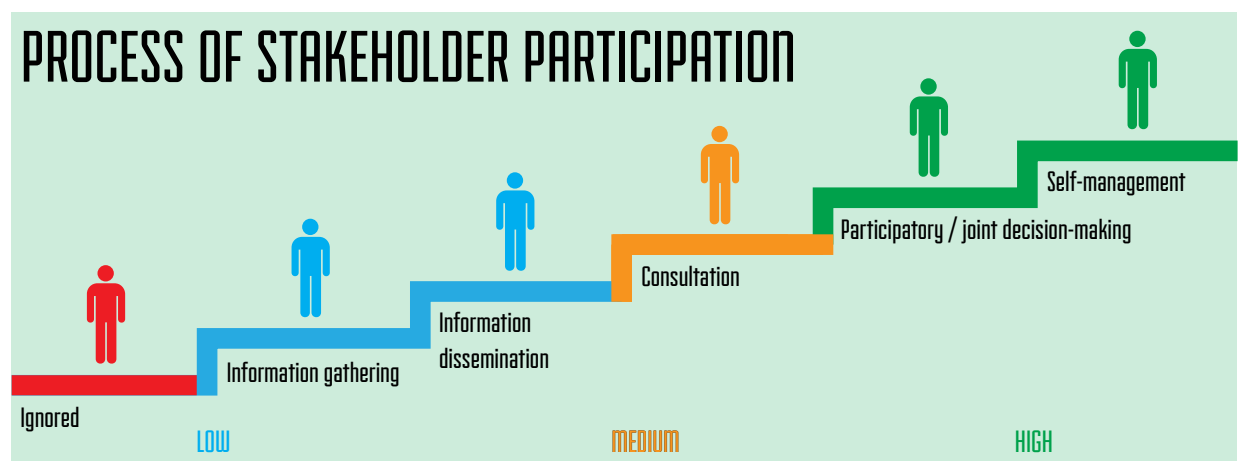
Stakeholder participation in decision-making is the optimum. Decisions can then be made after all interests have been considered, or at least after stakeholders have been offered the opportunity to bring their interests forward. Depending on the level of decision-making and the specific management function envisaged, stakeholder participation can also be instrumental in planning, monitoring, and even

enforcement. In Zimbabwe, as an example, water users monitored water meters in a neighbouring area that was in the same part of the river basin (Jaspers 2001). Because of the interdependency of the users, this appeared to be a very effective instrument of monitoring. Through the mechanism of social control, enforcement took care of itself.

Several problems may arise in the establishment of a process of stakeholder participation:

- 1) The characterisation of stakeholders is difficult to do. Sometimes, it is difficult to identify the users. In the Netherlands, for example, it may not be immediately clear how city dwellers may be represented alongside rural water users who are easier to categorise and define. Still, identifying and characterising users is an important function of the Water Boards, for which citizens have to pay.
- 2) Sometimes there is no competition for water users and there are no NGOs or groups that deal with environmental protection, a function that will always be of interest. (This is the case in some basins in Tanzania.) In essence no direct users can be identified.
- 3) Water users are spread or otherwise not organised. In Mongolia, the main water users are nomadic

Figure 1: Ladder of characterisation of stakeholder participation (Based on Arnstein, 1969)



## BOX 3

**Catchment and Sub-catchment Councils in Zimbabwe**

The Insiza Dam lies on the Insiza River in the upper portion of the Mzingwane catchment, in the Limpopo River Basin.<sup>3</sup>  
Photo: Simon Walker

**Background**

During the severe droughts that struck Zimbabwe in the early 1990s, it became apparent that the administration lacked the capacity to supply and allocate water, even to cover bare necessities. The following factors played a major role:

- 1) The water rights system on date priority appeared to be very difficult to administer under circumstances of severe drought. The insistence of downstream users to have their flow (abstraction without storage) rights satisfied resulted in the substantial loss of desperately needed water.
- 2) Too many water rights had been issued in already-oversubscribed catchments (river basins). The legal tools of the government to tackle droughts and structural shortages of water proved to be too bureaucratic and impractical.
- 3) The government was organised along administrative boundaries, which resulted in all kinds of co-ordination problems between the national level and the provinces and districts, especially in the planning of the use of water resources.

(iv) The river boards – which until then consisted only of private users and had been bestowed with some public authority since the (minor) changes of the Water Act in 1986 – were in practice managing the catchments. Their (privately financed) monitoring ability, social control and management flexibility proved to be very valuable. There was just one major problem with river boards: only commercial farmers were represented and they were predominantly white.

**Catchment Councils**

The Rhodesian Water Act (1956) gave the Permanent Secretary, as head of the Water Department, the power to

constitute Advisory Councils and to produce outline plans. However, this power was never utilised. The Department of Water Development and the Administrative Court jointly took a 'sky is the limit' approach and carried out the planning and decision-making on water allocation in a haphazard way. There was no organised participation of stakeholders other than powerful individuals who applied for an unrestricted amount of water rights, thus accumulating unrestricted volumes. Obviously, large groups of people and many interests remained outside the 'deal' and this triggered large social unrest, especially when the public became aware of the fact that huge private dams were constructed without a valid water right and that the law was not enforced in practice.

In the Water Act of 1999 (GOZ 1999), the principle of managing water along hydrological boundaries was introduced. According to the Water Act, the Minister of Rural Resources and Water Development has the authority (and obligation) to establish catchment councils in consultation with a newly established National Water Authority (clause 20). Authority was bestowed on seven catchment councils to set up the management of the use of water in the catchment areas under their jurisdiction. This includes the power to issue water use permits for a given duration. In principle, the council has full autonomy in the allocation of water. This implies that the original function of granting water rights has now become a function of issuing water permits; this function is taken away from the Administrative Court and instead decentralised to catchment councils. The Administrative Court will operate as a Court of Appeal.

**Tasks**

Catchment councils have a number of tasks: assisting in the preparation of outline plans; determining applications and

granting permits for the use of water; regulating and supervising the use of water by permit holders; and ensuring compliance with the Water Act. The Act stipulates that in the composition of the catchment councils, there has to be equal representation of all water users in the area concerned. The new legislation is designed specifically to ensure that people in the communal and resettlement areas are involved in water management.

### Sub-catchment Councils

Before the promulgation of the new legislation, there was an extensive trial period in which the government used pilot projects to experiment with various systems of representation. The system that was selected encompasses a subdivision of the catchment in workable sub-catchments. (In principle, these were selected along hydrological boundaries but with an eye to administrative realities.) The councils have an equitable distribution of all water uses and potential uses. Existing water user organisations, private and public, have been merged into the sub-catchment council. The catchment council consists of the chairpersons of the various sub-catchment councils in its area. In addition, some representatives of major urban areas have a

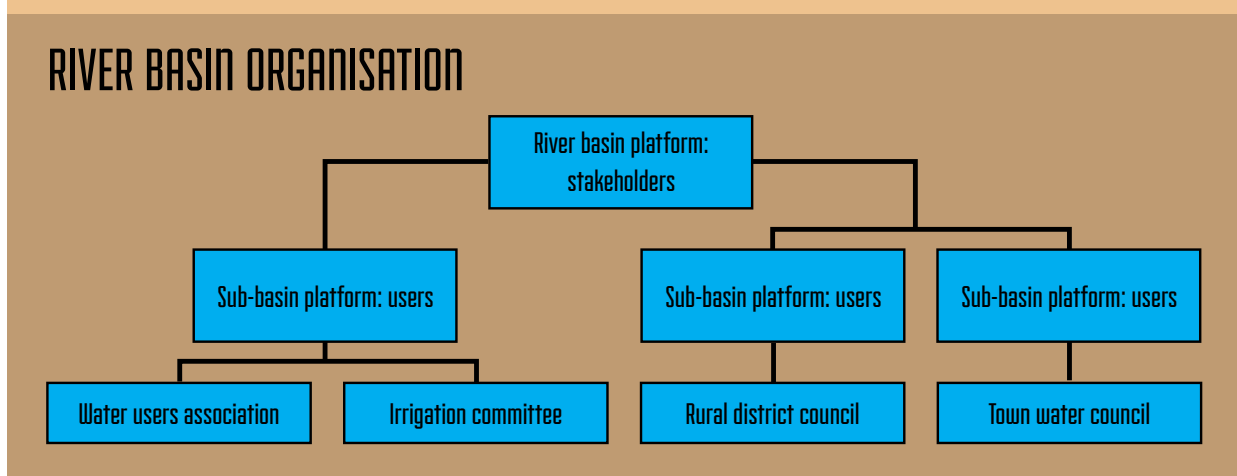
fixed seat in the catchment councils.

Sub-catchment councils are corporate bodies that have the power to levy rates upon permit holders in the areas for which they are responsible; this enables them to cover their expenses. The sub-catchment councils are in charge of the monitoring and the day-to-day management of the water use. In some instances the boundaries of the sub-catchment councils coincide to a certain extent with the former boundaries of the river boards, thus giving a sort of administrative continuity.

3 Operated within these different tiers of basin management it provides water for Zimbabwe's second largest city, Bulawayo, and for irrigation. Insiza River also supports communities downstream in Zimbabwe before reaching its confluence with the Limpopo River on the South African border. The Limpopo River Basin is managed with 27 sub-catchments across four different countries. This dam is the 8th largest dam in the basin with a height of 44 meters and a storage capacity of 173 Mm<sup>3</sup>.

Source: Jaspers 2001

Figure 2: River basin organisation in Zimbabwe



farmers who have little official structure or representation.

- 4) There may be variable levels of awareness of scientific, legal or financial awareness amongst resource user groups.
- 5) Social beliefs or culture may cause differences in perception or expectations on participation, cost recovery or other issues.

However, although many hurdles have to be overcome, one can observe that many water sector reforms have embraced stakeholder participation as a condition *sine qua non* and that the results are often significant (as in Brazil and Indonesia).

### 5.5. Platform establishment and development

In order to enable transparent and equitable decision-making, it is crucial to establish a platform for decision-making that enables stakeholder participation in the development of a river basin organisation. For the sake of simplicity, one can distinguish three situations:

- 1) Platforms or similar bodies are already in place and only need reinforcement, revitalisation, extension, capacity building (bottom up), etc. Examples can be found in the Netherlands, France, and Australia.
- 2) In other situations, the ambition is to set up these platforms from scratch, often as an integrated part of the new establishment of a river basin management organisation. The organisation is designed in line with state-of-the-art experiences and best



Artwork to publicise the stakeholder dialogue relating to the Lukaya River basin near Kinshasa.

Photo: UNEP

practices that have been adapted to local circumstances. Examples of this scenario can be found in South Africa, Zimbabwe, and Mongolia (see respective water laws).

- 3) An existing river basin organisation is extended to include a stakeholder platform. In such a scenario, the need to involve stakeholders became so strong that the professional organisation was expanded to include a stakeholder platform. Examples include Indonesia and Brazil (see their respective water laws).

In this final scenario, it is important to make clear the envisaged role of the platform and its position in the organisational set-up of the river basin organisation, as well as the level at which this platform should be functioning.

However, some common aspects can be distinguished. The process of establishing platforms with relevant tasks, competencies, and responsibilities and strengthening them in their roles is connected to the process of **decentralisation**.

One will always observe tension when **autonomy** has to be surrendered from the top of an organisation to the local levels. This is also the case when autonomy is retrieved, as we saw in the case of the Dutch Water Boards.

transferring authority and preparing and strengthening the stakeholder platform to exert this authority. The central agency will sometimes argue that stakeholders are not capable of public management. It may even create conditions that prevent the platform from taking up serious responsibilities. Often stakeholders are offered the choice between little autonomy or strong interference in serious matters and large autonomy in issues with little impact or issues with a high chance of failure. Many examples are known in the field of water supply and sanitation of central governments offer communities the chance to manage village drinking water facilities without providing resources or creating local organisational arrangements and management capacities at the community level. The contrast it between delegating in order to empower communities or to pass on responsibility as a result of a lack of capacity.

A crucial element of decentralised autonomy is the competency and ability to recover costs and the freedom to spend the available budget in an autonomous way. A big bone of contention is to attribute the right of charging fees from the centre of authority to the local agency and to transfer the responsibility of financial management to the stakeholders. Often, this competency is laid down in the constitution of a country and changes are only possible by formal law (in line with the constitution).

The transfer of autonomy is a delicate balance between



## BOX 4

**Progressive delegation in South Africa**

The Hex Valley Water User Association in 2010. This group represents the diversity of water users in the sub-catchment and overseeing water use of around 33 million m<sup>3</sup> per year.  
Photo: Hex Valley Water User Association

**Background**

In South Africa, two factors helped to trigger the development of a special Water Services Act (DWAF 1996) and the subsequent National Water Act (1998): The choice of the former apartheid regimes to concentrate black and coloured people in areas with a precarious water situation, and the difficulty of creating institutional capacity in those rural areas. Both laws deal with the provision of safe drinking water to all levels of society and enhance the already extensive decentralisation of the water supply function to local government.

Further, the Department of Water Affairs and Forestry was organised along administrative boundaries, causing a main bottleneck in effective watershed management. Similar to the establishment of river boards in Zimbabwe, useful (non-governmental) experiments were undertaken in the field of watershed management. The positive outcome of these experiments supported the concept that water management unavoidably had to be carried out along hydrological boundaries. It goes without saying that full stakeholder participation was gravely undervalued under the apartheid regime. A comprehensive description of this problem goes beyond the reach of this review.

Water management in South Africa will be carried out along hydrological boundaries. For all 12 catchments in the country, catchment agencies will be progressively established in an attempt to decentralise decision-making to the lowest appropriate level. This progressive delegation will take place at the request of groups of stakeholders as and when sufficient management capacity has been established and can be demonstrated. Where catchment management agencies are not yet viable, the Director-General will take care of their function, whether or not assisted by an advisory committee, as a first step towards establishing an agency.

Catchment management agencies may be established for specific geographical areas, after public consultation, on the initiative of the community and stakeholders concerned. In the absence of such a proposal, the minister may establish a catchment management agency on his own initiative.

**South African Water Act**

Part 3 of Chapter 8 of the South African Water Act (DWAF 1998) deals with the functions and operation of catchment management agencies. Original functions include investigating and offering advice on water resources, developing a catchment management strategy, and co-ordinating the related activities of other water management institutions within the water management area. Additional powers and

duties as described in Schedule 3 may be assigned or delegated to agencies. These include establishing water use rules and management systems; directing users to terminate illegal uses of water; and temporarily limiting the use of water during periods of shortage. A catchment management agency may be financed by the state from water charges made in its water management area or from any other source.

Part 2 of Chapter 8 describes the appointment of members of the governing board of a catchment management agency. The board of a catchment management agency will be constituted in such a way that the interests of the various stakeholders are represented or reflected in a balanced manner, and that the necessary expertise to operate effectively is provided for. Members of the governing board can be elected or nominated by the different water user groups for appointment by the minister, and the minister may of his or her own accord appoint further members. (The minister may also remove board members for good reason.)

**Water Users Associations**

The Act goes even further in its endeavours to guarantee stakeholder participation by introducing the principle of water users associations. Although water users associations are water management institutions, their primary purpose, unlike catchment management agencies, is not water management. They operate at a restricted localised level and are in effect co operative associations of individual water users who wish to undertake water-related activities for their mutual benefit. A water users association may carry out management powers and duties only if, and to the extent that, these have been assigned or delegated to it. The minister establishes and disestablishes water user associations according to a standardised procedure.

Existing irrigation boards, subterranean water control boards, and water boards established for stock watering purposes will continue to operate until they are restructured as water users associations.

Part 4 of the Act enables the minister to disestablish a catchment management agency or make changes to its water management area for reasons that include the need to re-organise water management institutions for more effective water resource management. An agency may also be disestablished if it does not operate effectively.

Source: Jaspers 2001.



Work to maintain this foot bridge in Cambridge in the UK requires the County Council to liaise with numerous local bodies. It is part of a larger structure essential to ensure flood control, navigation, and the amenity value of the river in the town. The Cam Conservancy is a collective body that has been responsible for river navigation in the historic city of Cambridge since 1702, but more recently work has begun on a larger catchment management strategy coordinated by the Cam Catchment Partnership.<sup>4</sup>

Photo: UNEP

## 5.6. Legal framework and organisational set-up

There are examples of river basin organisations that have been developed in a learning-by-doing process basically as strong partnerships without legal back-up (as in Zimbabwe and Brazil). But it goes without saying that, at a certain stage, an adequate legal framework is needed. Such a framework can help to establish formal decision-making; clarify mandates; enable stakeholder representation and participation; validate a process of water pricing or a system of charges; and formalise equitable water allocation and water rights. It is important to clarify the level of jurisdiction and types of regulatory functions that RBOs can have. In Mongolia, RBOs still do not have formal jurisdiction; instead, they should be considered public-private partnerships. The members of the platforms, who are formally appointed, bring their mandates they may have as government officials (e.g., the rangers, the governor, the mining authorities). In Mongolia, there is still much to arrange in the regulations.

However, as RBOs gain increasing levels of responsibility, there will be an increasing need for them to have sufficient autonomy in decision-making, especially for the category of independent water authorities. The institutional set-up in the assessed examples varies from country to country, especially because the package of required tasks and competencies is highly variable.

In Zimbabwe, the Catchment (River Basin) Authority is composed of the Catchment Council, which consists of direct water users and an executive that is appointed and employed by the National Water Authority (the water sector in Zimbabwe is decentralised and commercialised). A variation on this set-up could be that the executive is appointed and employed by the Catchment Council. The Catchment Council is composed of two representatives of each Sub-Catchment (Sub-basin) Council. Further, depending on the working rules expressed in the bylaws of the specific council, some positions may be reserved for representatives from particular sectors or organisations (Town Water Supply Authority, Governor etc.) that have a crucial stake. The members of the Sub-Catchment Councils are elected by the stakeholders in the sub-catchment.

In Tanzania, the situation is comparable. The Basin Water Organisation is subdivided into an Executive and a Basin Water Board, which is composed of stakeholders (mainly government officials in this case). The Catchment (Sub-basin) Water Organisation is still in an experimental stage. A representation per sector is likely until associations of water users have been established and capacitated. In South Africa the system of Catchment Management Agencies hinges on the development of Water Users Associations. At present this an on-going process. In the Netherlands, members of the Water Boards are now directly elected.

## 5.7. Tasks and competencies of platforms: progressive delegation

One way of establishing platforms is by progressive delegation. In such a scenario, the aim is to set up these platforms from scratch as an integrated part of the new establishment of a river basin management organisation. The organisation is designed in line with state-of-the-art experiences and best practices

<sup>4</sup> IWRM in the UK is being promoted by the Environment Agency under the EU Water Framework Directive. This is enabling local stakeholders to work towards a catchment management strategy for the Cam. For more information see:

The Cam Conservators: <http://www.camconservators.co.uk/>

The Cam Catchment Partnership: <http://cambridgeppf.org/river/>

The EU Water Framework Directive

[http://ec.europa.eu/environment/water/water-framework/index\\_en.html](http://ec.europa.eu/environment/water/water-framework/index_en.html)

that have been adapted to local circumstances. The best case is South Africa, where – in the post-apartheid regime – there is a strong need for stakeholder participation, especially in formerly marginalised black communities, but implementation capacities are insufficient. Arrangements have to be developed for informed decision-making, administration, monitoring and control by councillors, who sometimes have a lot of wisdom but little schooling.

**Progressive delegation** is applied over time, *as the need for delegation arises and stakeholders request it*. Actual delegation takes place when stakeholders are to a basic extent capacitated and when effective institutional arrangements have been established. In South Africa and Tanzania, the delegation of responsibilities to river basin organisations is progressive. Box 4 describes the situation as it had progressed to 2001. After this implementation was less rapid than expected leading to rationalisation of the number of catchment areas from 19 to nine 2012. Some of these management areas contain more than one physical catchment.

Tasks and competencies of the river basin organisations may differ substantially from country to country. Especially in many parts of Africa, there is still intensive experimentation. A list of universal tasks of RBOs is difficult to give because it highly depends on scale, physical, social and other characteristics. One could say that the river basin authority concentrates on *collective choice* functions and the sub-basin authorities/water users associations focus more on *operational* functions (cf. Ostrom 1990). Let us imagine a sample country with a two-layer river basin organisation (as in Zimbabwe, Tanzania, and South Africa) and specify a common (non-exhaustive) denominating task distribution:

It is crucial to arrange aspects of representation and task distribution in a clear set of regulations or standard by-laws that can be modified by the users if local circumstances demand. Apart from rules

for representation and function, by-laws should also cover aspects of water resources planning; allocation and registration of water rights; tariff structures and fee collection; fund development and application; monitoring arrangements; penalties and sanctioning; and conflict resolution and appeal procedures.

## 5.8. Adaptable management structure

Generally speaking, the better-performing river basin organisations (Schwartz, Douven, Jaspers 2008) are capable of reacting promptly to changing circumstances. They are more flexible and capable of embracing innovation at an early stage. Social, economic, and physical characteristics are nowadays subject to significant change. For instance, an issue such as climate change will alter the agenda of many river basin organisations.

## 5.9. Integrated planning system

An integrated planning process can support a system of integrated river basin management in various ways:

- Planning helps to assess the present and the desired situation in the basin and to develop a comprehensive set of measures to reach the desired situation (van Hofwegen and Jaspers 1999).
- Planning delivers an opportunity to streamline the participation process; it should also increase the transparency of the decision-making.
- The production of plans forces the makers of decisions into a process of horizontal and vertical co-ordination (cf. Mostert 1999).

One of the key targeted outputs of a system of integrated river basin management is the production of river basin plans in which water quantity, water quality and environmental integrity are maximally integrated (horizontal co-ordination). Besides, this planning should incorporate a full consideration of the interests involved. It should also be established according to procedures that enable full stakeholder participation in terms of decision-making. If the river

### BOX 5

#### Sample functions for river basin level

- Development of strategic river basin plan
- Development of operational river basin plan
- Contributing to river basin protection plan/measures
- Water right or water permit allocation
- Effluent discharge permit allocation
- Allocation of drainage permits or drainage responsibilities
- Co-ordination between sub-basins
- Collection of water charges
- Fund administration and development
- Appeal function (first layer)
- Awareness creation and capacity building

### BOX 6

#### Sample functions for sub-basin level

- Co-development of strategic sub-basin plan
- Co-development of operational sub-basin plan
- Contributing to sub-basin protection plan/measures
- Advising on water/discharge permits
- Monitoring and enforcement of drainage responsibilities
- Monitoring of water abstractions, water pollution
- Monitoring of drainage processes
- Enforcement of water rights, discharge permits
- Enforcement of drainage responsibilities
- Legal action against defaulters
- First layer of conflict resolution
- Collection of charges and levies

basin is large, the river basin plan should include lower level sub-basin, catchment or watershed plans (vertical co-ordination).

This is easier to be said than done. First of all, planning is not a uniform, single-level process; plans can have a strategic or operational character. Sometimes a plan's only objective is to increase communication; other times, wide-ranging decision-making is involved. Plans may address government institutions or citizens or both. Plans may focus on very different time horizons. And then, of course, they may differ substantially in subject.

The management of water quantity, water quality and environmental integrity must be linked up as far as strategic (policy) planning is concerned; this is crucial. For the sake of uniformity and administrative simplicity, the number of plans should be kept to a minimum. However, it is not necessarily the case that all of these aspects should – or could – be covered by any one plan. The system of (national) environmental planning in the Netherlands is linked up with the system of water resources planning. The separate plans allocate guidelines or tasks to one another and every plan indicates how the issues earmarked by the other plan are dealt with. Every four years one plan is revised in alternating sequence ('leapfrog planning', Mostert 1999).

It will not always be possible to link up operational plans in time and in subject, but a legal instruction to the planners to harmonise the implementation of the plans could be very viable. In the so-called 'open planning approach' adopted in the Netherlands, the responsible authority is in contact with partner governmental institutions, interest groups and NGOs at all crucial stages of the development of the plan (Mostert 1999). The open planning approach is extensively studied at present, including in the business world.

### 5.10. Financial sustainability: cost recovery and water pricing

One of the Dublin principles is that water should be considered an economic good in all of its competing uses. Consequently, water should be priced (ICWE 1992). The phrase 'in all its competing uses' is a very important one, because it implies that when there is no competition water per se should not necessarily be priced. Especially in developing countries and emerging economies there might be various reasons why water should not be priced up to its real value, reflecting the opportunity costs of the water commodity (Rogers 1998). There might be social or even political reasons for not being too eager to price water; these could include aspects of willingness or capacity to pay. The absence of water might paralyse certain economic activities. Water availability is often a precondition for social and economic reform and for poverty alleviation in the widest sense. Water pricing sometimes also encounters cultural or religious constraints. In Islamic culture, water pricing

has a different sound than in a commercialised segment of the United States.

Notwithstanding the various concepts of water pricing, the recovery of costs for providing water services is widely accepted. The justification for cost recovery can be manifold and is not necessarily restricted to economic aspects. The following reasons prevail:

- It allows the provision of water services or an increase in coverage;
- It stimulates water-saving behaviour and water conservation;
- It enables the allocation of water as per best economic advantage.

More often than not a water pricing approach hinges on a combination of each of the above factors.

It is not always easy to recover the total cost of water management directly from water users under all circumstances, especially when large investments in infrastructure are needed (cf. for flood control). The principle, however, is that the price – of gaining access to raw water, being protected against flooding, or having discharged pollution treated – *is paid by the user/beneficiary/polluter*. One step further is to recover the full economic costs of the water per se (including externalities and opportunity costs, Rogers 1998). In the final stage, water rights are traded or water is even auctioned (Holden and Thobani 1995; Lee and Jouravlev 1998); as such, water is used as an instrument to maximise the economic output per unit of volume. Such scenarios require a high level of organisation and specific institutional arrangements.

Many people support – but some others disagree with – the statement that 'water is an economic good'. For sure, water is also a social good with an ethical dimension. The new EU Water Framework Directive states the following: "Water is not an ordinary economic good, but a (social) inheritance that has to be protected, defended and handled as such (EU 2001)."

However, there is consensus about the need for cost recovery and hence water pricing. On top of that, water pricing and charging for pollution is also a very important instrument of demand management.

A comprehensive system of rights and licences is needed to apply effective water pricing and to charge for pollution. Clear water allocation criteria, pollution discharge standards, and quality standards for the recipient water are also necessary. The registration, administration, monitoring, enforcement and policing of water rights and pollution discharge permits as well as the monitoring and enforcement of water quality protection measures can only be carried out effectively with the river basin as the logical unit for management (Jaspers 2003) and with an effective administration, preferably run by a river basin organisation.

## 5.II. Capacity building

Capacities can be seen as the knowledge, skills and other faculties, in individuals or embedded in procedures and rules, inside and around sector organisations and institutions. The capacity-building process should be seen as a continuous exercise – whether carried out by individuals or organisations – in structured autonomous and social learning in order to adapt abilities to continuously shifting opportunities, challenges and constraints (cf. Mostert 1999).

Capacity building assists in the diagnosis of sector performance and institutional strengths and weaknesses; it articulates and prioritises the required capacities that need to be imparted to the individuals and institutions; and it offers support through a variety of tools and instruments (Alaerts 1996).

The main components of capacity building for the water sector can be summarised as follows:

- The creation of an enabling environment with appropriate policy and legal frameworks;
- Institutional development, including community participation (and of women in particular);
- Human resources development and the strengthening of managerial systems.

Under what circumstances is capacity building most needed? Such circumstances include the following:

- Presently weak institutional frameworks;
- Large problematic changes in the natural environment in the medium to long term (water pollution, climate change, water erosion, desertification etc.);
- Large fundamental shifts in the social economic environment, economic decline, structural adjustments, etc.;
- Under-performance in efficient and sustainable water resources management (Alaerts 1996).

Instruments that play a crucial role in the application of capacity building can be of very variable nature; the field of institutional development is wide and the nature of the challenge is diverse. It matters a lot whether you are anticipating capacity building for a target audience of senior decision makers at the national level in a state with a strong and mature institutional environment or for a process of transferring



A catchment model being used to enable learning about water resources in the Lukaya River basin near Kinshasa in the Democratic Republic of Congo.

Photo: UNEP

irrigation management to local farmers in developing countries. Although capacity building should be considered a continuous and flexible open-ended process, a few major composing parts can still be identified:

- A general assessment and analysis (field of work, constraints, stakeholders actors);
- Description of both the present situation and the desired situation (done with or by the stakeholders)
- A gap analysis of needed capacities
- Interventions
- Monitoring procedures and evaluation
- Feedback mechanism.

The whole process should be considered as cyclic (van Hofwegen, Jaspers 1999).

The third category of human resources development is a very important one. This one is especially felt in developing countries, where river basin organisations sometimes have to manage complicated, extensive river basins with just 10% of the necessary staff. Apart from sufficient staff in quality and quantity, tailor-made formal education and training programmes can be instrumental; the same is true for on-the-job training. A modern river basin organisation should have a comprehensive programme that enables its staff to continuously upgrade their skills.

## REFERENCES

- Alaerts G.J.F.R. (1995), *Institutional Arrangements in the Water and Sanitation Sector, European Country Studies*, IHE Working Paper, Delft.
- Arnstein, S.R.,(1969) *A Ladder Of Citizen Participation*, Journal of the American Planning Association, 35: 4, 216 — 224
- Caponera Dante A. (1992), *Principles of Water Law and Administration: National and International*, Balkema, Rotterdam, p.11.
- Chéret I. (1993), *Managing Water: The French Model*, in Valuing the Environment (I. Serageldin and A. Steer eds), The World Bank, Washington DC. European Union (2000), *Water Framework Directive*, Directive 2000/60/EU, EU Publications, Brussels.
- EEB (2001). *Making the EU Water Framework Directive Work: Ten Actions for Implementing a Better European Water Policy*, EEB, Brussels.
- Farai A. Mchibwa, Frank G.W. Jaspers, Pieter van der Zaag, *From reforms to implementation: the paradox of financial sustainability in river basin organizations in developing countries*, *Science and Chemistry of the Earth*, Delft, 2008.
- Global Water Partnership (2000), *Integrated Water Resources Management*, Technical Advisory Committee Background Paper No 4, Stockholm.
- Hooper, B.P. (2006), *Key Performance Indicators of River Basin Organizations*, <http://www.iwr.usace.army.mil/inside/products/pub/iwrreports/2006-VSP-01.pdf>.
- Hofwegen van Paul J.M., Jaspers Frank G.W. (1999), *Analytical Framework for Integrated Water Resources Management*, IHE Monograph 2, Inter-American Development Bank, Balkema, Rotterdam.
- Holden, Paul and Thobani, Mateen (1995), *Tradable Water Rights: a Property Rights Approach to Improving Water Use and Promoting Investment*, Cuadernos de Economía, December, No 97, Pontificia Universidad Católica de Chile, Santiago, Chile.
- International Conference on Water and the Environment (ICWE 1992), *The Dublin Statement and Report of the Conference*, 26-31 January 1992, Dublin.
- International Law Association (1966), *Helsinki Rules on the Uses of the Waters of International Rivers*, adopted by the International Law Association at the 52nd conference, Helsinki, 20th August 1966, International Law Association, London.
- Jaspers Frank G.W. (2000), *Institutions for River Basin Management*, Paper presented at the conference “Alternatives to Water Wars in the Middle East”, RUSI/MENARG Conference, London.
- Jaspers Frank G.W. (2001), *The New Water Legislation of Zimbabwe and South Africa, Comparison of Legal and Institutional Reform*, International Environmental Agreements: Politics, Law and Economics 1, p. 305-325, Kluwer, Dordrecht, the Netherlands.
- Jaspers Frank G.W. (2003), *Principles for Water Allocation, Transition of Traditional Customary Water Allocation to Modern Systems of Sustainable and Economic Water Allocation*, UNESCO Background Paper for Reader, Educational Track, UNESCO Programme “From Potential Conflict to Co-operation Potential”, UNESCO 2003, Paris.
- Jaspers Frank G.W., January 2003, *Institutional Arrangements for Integrated River Basin Management*, Water Policy Volume 5 number 1, p. 77-90, World Water Council, IWA Publishing Journals, London, UK.
- Lee, Terence and Jouravlev Andrei (1998), *Prices, Property and Markets in Water Allocation*, Serie Medio Ambiente y Desarrollo 6, Economic Commission for Latin America and the Caribbean, United Nations, Santiago de Chile.
- Malano H.M. and van Hofwegen P.J.M. (1999), *Management of Irrigation and Drainage Systems*, Balkema, Rotterdam.
- Makin, I. W., Parks, Y.P. and Arriens, W.L., (2004), *Supporting the Development and Efficient River Basin Organizations in Asia. A Discussion of the Application of Organizational Benchmarking approaches*. Prepared for a NARBO Consultation Workshop Batu-Malang, Indonesia, International Water Management Institute.
- Mchibwa,F, Jaspers F, van der Zaag P. (2008), *From*

*Reforms to Implementation: The Paradox of Financial Sustainability in River Basin Organizations in Developing Countries*, Paper presented at Stockholm Water Week (2007), Stockholm.

Millington, P., Olson, D. and McMillan, S. (2005), *Integrated River Basin Management from Concept to Good Practice*, Briefing Note, Bank-Netherlands Water Partnership Program (BNWPP), Netherlands.

Molle, F. (2003), *Development Trajectories of River Basins: A Conceptual Framework*, Research Report 72, Colombo: International Water Management Institute.

Mostert Erik (1998), *The Allocation of Tasks and Competencies in Dutch Water Management: Discussions, Developments and Present State*, RBA Series on River Basin Administration, Research Report No 7, RBA Centre, Delft.

Mostert Erik (ed.) (1999), *River Basin Management*, Proceedings of the International

Workshop on River Basin Management, International Hydrological Programme, 27-29 October 1999, The Hague.

Mostert Erik (1999), *River Basin Management and Planning: Institutional Approaches and Results in five European Countries and six International Basins*, RBA Series on River Basin Administration, Research Report No 10, RBA Centre, Delft.

Nile Basin Initiative (1999), *Shared Vision Programme Overview*, Nile Secretariat, Programme Description, Entebbe.

Ostrom E. (1990), *Governing the Commons; the Evolution of Institutions for Collective Action*, Cambridge University Press, Cambridge.

Radosevich, G.E. and Olson, D. (1999), *Existing and Emerging Basin Arrangements in Asia: Mekong River Commission Case Study*, Third Workshop on River Basin Institution Development June 24, 1999, Washington D.C.: World Bank.

Rogers P., Bhatia R. and Huber A. (1998), *Water as a Social and Economic Good: How to Put the Principle into Practice*, TAC Background Paper No 2, Global Water Partnership, SIDA, Sweden.

Shah Tushaar and van Koppen Barbara (2006), *Is India Ripe for Integrated Water Resources Management?*, Economic and Political Weekly, Special Articles p. 3413 – 3421.

Theclaff L.A. (1985), *Water Law in Historic Perspective*, William S. Hein Company: Buffalo, New York.

Savenije, H.H.G. (2000), *Water Resources Management, Concepts and Tools*, Lecture Notes, IHE Delft.

Savenije, H.H.G., van der Zaag P. (eds) (1998), *The Management of Shared River Basins*, Focus on Development 8, Ministry of Foreign Affairs, The Hague.

Senter International (2001), *Implementation of EU Water Framework Directive in Turkey*, Terms of Reference, The Hague.

UNCED (United Nations Conference on Environment and Development) (1992), *The Rio Declaration on Environment and Development, Agenda 21*, 3-14 June 1992, Rio de Janeiro.

Van der Zaag, Pieter (2004), *Policies, Laws and Institutions*, Course Module No 0.5, Masters Course IWRM, WaterNet, Harare, Zimbabwe

### Government publications

Department of Rural Resources and Water Development of the Republic of Zimbabwe, *Water Resources Management Strategy Secretariat (1999)*, *Towards Integrated Water Resources Management*, Final Report, Harare.

Government of the Republic of Zimbabwe (1996), *Water Act of the Republic of Rhodesia*, 1976, Revised Edition 1996, Chapter 20:22, Government Printer, Harare.

Government of the Republic of South Africa (1998), *National Water Act No 36*, Government Gazette No 19182, Cape Town.

Government of the Republic of South Africa (1997), *Water Services Act*, Government Gazette, Cape Town.

Government of the Republic of Zimbabwe (1998), *Zimbabwe Water Act No 31, Chapter 20:24*, Government Printer, Harare.

Government of the Republic of Zimbabwe (1998), *Zimbabwe National Water Authority Act*, Government Printer, Harare.

*Law of Mongolia on Water 2004*, 22 April 2004, Compendium of Laws, A Citizens Reference Book, Ulaan Bator, Mongolia.

Ministry of Nature, Environment and Tourism of Mongolia, *Water Law of Mongolia*, Mongolian Citizens Reference Book, Compendium of Mongolian Laws, Mongolian Law on Water (2004), Ulaan Bator.

Ministry of Nature, Environment and Tourism of Mongolia, *Ministerial Regulation No 187 on Regulations for Water Resources Councils*, Mongolian Citizens Reference Book, Compendium of Mongolian Laws, Ulaan Bator.

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