



Sharing Experience with Integrated Water Resources Management (IWRM)

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Contents

Foreword	5
I) Introduction	6
II) IWRM concepts	8
III) The institutional set-up for IWRM	9
1) National governance	9
2) Basin management organisations.....	10
2.1) Types of basin management organisations.....	11
2.1.1) Basin councils, forums and associations	12
2.1.2) Basin directorates, agencies and authorities	13
2.1.3) Basin commissions and mixed forms.....	15
2.2) Collaboration and sharing information within the governance system	17
3) Local governance.....	17
3.1) Tasks of water user organisations	18
3.1.1) Water user participation.....	18
3.1.2) Local water management	18
3.2) Financing water user organisations.....	19
4) Success factors and challenges for institutional reform.....	20
IV) The IWRM implementation process	22
1) The legal framework.....	22
1.1) Developing the legal framework.....	23
1.2) Enforcing the legal framework	24
2) Planning water resources management	25
3) Financing water resources management.....	26
3.1) Financing sustainability	26
3.2) Licensing water abstraction.....	28
4) Monitoring and data management	28
4.1) Data processing and information use.....	28
5) Success factors and challenges for IWRM implementation.....	30
V) Lessons learned and the way forward	31
Annex 1: Overview of countries and GIZ programmes.....	32
Annex 2: Literature and further reading.....	38
List of Abbreviations	39

Examples and boxes

EXAMPLE 1:	The mandate of Kenya's Water Resources Management Authority.....	10
EXAMPLE 2:	Tasks of basin management committees in Namibia	12
EXAMPLE 3:	Tasks of Morocco's hydrographical basin agencies	13
EXAMPLE 4:	Tasks of Uganda's catchment councils	14
EXAMPLE 5:	Tasks of Tanzania's basin water boards.....	15
EXAMPLE 6:	Decision-making in Tanzania's water resources management.....	16
EXAMPLE 7:	Water resources user associations (WRUAs) in Kenya	17
EXAMPLE 8:	An example of a water user organisation in Yemen	18
EXAMPLE 9:	Tasks of water user associations in Egypt.....	19
EXAMPLE 10:	Tasks of water point user associations in Namibia	19
EXAMPLE 11:	Financing water user organisations in Morocco.....	20
EXAMPLE 12:	The legal framework for water resources management in Egypt.....	22
EXAMPLE 13:	The legislative process in Burundi	23
EXAMPLE 14:	The legislative and revision process in Egypt.....	24
EXAMPLE 15:	Regulation developed by the GIZ Water Programme in South Sudan	24
EXAMPLE 16:	Planning IWRM implementation in Egypt.....	25
EXAMPLE 17:	Financing water resources management in Yemen	27
EXAMPLE 18:	Financing water resources management in Namibia	27
EXAMPLE 19:	Financing water resources management in Zambia.....	28
EXAMPLE 20:	Egypt's surface water monitoring system	29
EXAMPLE 21:	GIZ's approach of supporting monitoring and data management in Uganda	29
BOX 1:	This paper's objective and requirements.....	5
BOX 2:	The Dublin Principles	6
BOX 3:	GIZ water programmes that contributed to this paper	6
BOX 4:	Coordination between technical and financial cooperation in the field of IWRM	7
BOX 5:	Functions of water resources management	8
BOX 6:	Basin management within a country and transboundary basin management.....	10
BOX 7:	Basin management organisations' tasks	11
BOX 8:	Characteristics of water user organisations.....	17
BOX 9:	Comparing different financing methods for WRM	27

Foreword

This document was developed by GIZ's working group on integrated water resources management (IWRM). The group consists of representatives from most GIZ water programmes that work on reforming IWRM in German development co-operation's partner countries (see Box 3). The working group was set up in 2010 and met regularly during GIZ sector network meetings. The idea behind the working group is to systemise experiences with implementing IWRM and provide a platform for programmes to share their experiences. This approach aims to identify sustainable components for designing IWRM reforms and enhance transnational learning processes.

Since its creation, the working group has developed several fact sheets on IWRM in Benin, Bolivia, Kenya, Namibia, Yemen and Zambia. In addition, the group commissioned a working paper on financing IWRM (Matz and Hübschen 2011). This report aims to develop a working document for practitioners that provides an overview of IWRM reforms in Germany's partner countries as a whole. Its focus is on GIZ's experiences.

All working group members made a valuable contribution to this paper by answering two questionnaires distributed to water programmes in 2012 or by making themselves available for interviews in person or over the phone. Some members agreed to provide feedback during the drafting of this paper; they deserve sincere thanks for this additional work: Wessam Thabet (GIZ Egypt), Nicola Martin (GIZ Burundi) and Roland Treitler (GIZ Afghanistan). Ariane Borgstedt (GIZ Egypt) and Jacob Doetsch (GIZ Zambia) also made significant contributions to the draft version.

Box 1: This paper's objective and requirements

IWRM is a major field of activity for GIZ's water programmes. Consequently, this paper aims to present and systematise GIZ's experiences in this field for the benefit of colleagues, partners, academics and the public. This document reflects opinions and discussions within the IWRM working group.

The paper's requirements:

It is a brief and easy-to-read compilation of experiences within a structured framework that reflects GIZ's IWRM activities.

It focuses on experiences and examples from partner countries, while using academic knowledge to structure these experiences.

Varying conditions mean that countries require a customised approach. IWRM, as understood by the group, is not a comprehensive reform agenda, but rather a toolbox of helpful approaches. Therefore, the different areas of intervention outlined in this report do not constitute perfect IWRM, but rather represent the sum of all GIZ activities in partner countries.

The paper is based on two surveys undertaken among the water programmes represented in the working group (see box 3).

1) Introduction

Over the last 20 years, integrated water resources management has evolved from an innovative idea to the dominant paradigm in international water management. It is based on the 1992 Dublin Principles, which signalled a paradigm shift in water resources management: a change from a purely technical notion aiming to yield ever larger quantities of water to a broader understanding of water and related resources as having environmental, social and economic facets.

Box 2: The Dublin Principles

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment
2. Water development and management should be based on a participatory approach, involving users, planners and policy-makers at every level
3. Women play a central part in the provision, management and safeguarding of water.
4. Water has an economic value in all its competing uses and should be recognised as an economic good.

These principles marked the political translation of growing awareness that natural resources are not finite and future challenges are immense. Growing demand for drinking water will put a strain on existing sources as urbanisation rates increase and land cover changes. Feeding a planet of 8 billion people by 2030 will require that more food is produced with less water by enhancing water efficiency in agriculture. Demand for energy will more than double in developing countries in the next 25 years, and hydropower will need to be a key contributor to clean energy production. Adding uncertainty, climate change will increase the complexity of managing these often competing demands.

IWRM is a management approach that views water resources and human activities relating to water in the context of the whole ecosystem. It aims to optimise natural water flows, including surface water and groundwater so that human needs can be satisfied without compromising the sustainability of ecosystems. Therefore, planning and management have to consider all sectors that might affect the ecosystem. Activities should focus on the sustainable use and protection of resources.

Pollution and usage conflicts do not stop at national borders. Therefore, management entities must follow hydrological rather than political boundaries. These problems call for all stakeholders and affected groups to participate so that they can share their economic and social interests.

Nowadays, IWRM is more than just a compilation of abstract principles; it is a worldwide agenda for reforming the water sector in many countries. However, IWRM implementation strategies vary depending on national circumstances. These reform processes are still in their infancy. Success stories are thus inevitably sporadic, while the change processes that they have triggered are much broader and their impacts will be visible only in the future. The main task of this paper is hence to summarise the pace of reform and analyse success factors and challenges based on GIZ's experiences.

GIZ's water programmes

GIZ is supporting more than 15 countries in reforming their water sector in accordance with IWRM principles. GIZ's role is focused on facilitating and coordinating dialogue between ministries and other stakeholders at different political levels. This role is especially important in countries with a more centralised governance system.

Box 3: GIZ water programmes that contributed to this paper

sub-Saharan Africa Benin, Burundi, Kenya, Namibia, Tanzania, Uganda and Zambia	Central Asia Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan
Middle East and North Africa Egypt, Morocco and Yemen	South America Bolivia

In many countries, GIZ's work in the field of IWRM is centred around governance and implementing IWRM within these governance structures. Programmes usually take a multilevel approach, combining capacity development at a national level with specific interventions at a regional/basin

level or at a local/sub-basin level. Programmes typically base their capacity development strategies on either developing the institutional framework, especially at a basin level, or on providing partner institutions with organisational development at different levels (e. g. human capacity or modes of financing).

The second main focus is on developing the legal framework in the broader sense, including laws, strategies and policies. GIZ is also supporting enforcement of these regulations. This work typically entails advising partner institutions as they draft laws and bylaws that clarify the roles of stakeholders and allow public administrations to consistently implement and enforce water laws.

Last but not least, GIZ's work focuses on improving the technical capacity to manage resources. Nearly half of the programmes support some kind of resource monitoring, mapping and investigation or data management.

German Development Cooperation distinguishes between technical and financial cooperation. Therefore, GIZ is undertaking infrastructural work on only a very minor level, with a focus on projects piloting innovative small-scale technologies. Some programmes are undertaking activities in areas where financial cooperation is building or enhancing infrastructure as a holistic package (e.g. Egypt).



Construction of a common intake (a central place where water is allocated and metered for 17 small scale projects). Meru, Kenya.

Box 4: Coordination between technical and financial cooperation in the field of IWRM

In the process of developing the new legal and institutional framework for water resources management in Zambia it became clear that one of the key tasks of the new institution to manage the country's waters (Water Resources Management Authority) is running a robust water resources information system. This information system is to be based on collection and analysis of hydrological (surface water), hydrogeological (ground water) and meteorological data (especially rainfall and others like temperature, wind, sunshine, air pressure) as well as restored historical data of all parameters.

German Development Cooperation through KfW and GIZ supports Zambia in a joint programme with financial (FC) and technical cooperation (TC) in improving hydrological and meteorological data management and utilization aiming at improving water resources planning and management considering the effect of climate change.

Technical cooperation focuses on:

- Capacity Development in WRMA, development of processes
- Water resources management, water allocation and planning considering Climate Change
- Utilization of data for management plans, identifying adaptation measures
- Pilot the information system and planning instruments in one catchment
- Operation of measuring network
- Data management
- Operation of data transfer and IT structure

While Financial Cooperation focuses on:

- Structural rehabilitation and instrumentation of up to 167 water level gauging stations and up to 11 groundwater gauging stations
- Extension of voluntary rainfall stations network
- Digitalization and quality control of historical meteorological and hydrological information

Development and operationalisation of IWRMIS including IT infrastructure

II) IWRM concepts

Before starting to outline how countries around the world are reforming their water sectors to achieve integrated water resources management, we would like to summarise which fields of activity are meant by water resources management. With the rise of IWRM, water resources management has become more important and now stands in its own right as a separate area to other major sub-sectors, such as water supply and irrigation.

Global water sector reforms establish specific institutional set-ups to perform these functions. These structures will inevitably depend on the specific conditions in the country in question. However, some overarching issues, which are also used to structure this report, can be identified in all countries.

Institutional reforms: participation and basin management

All of the countries in which GIZ works in IWRM are currently restructuring their institutional landscape in order to build structures that foster implementation of the second and third Dublin Principles. Therefore, establishing and strengthening decentralised structures at basin level and supporting local participatory processes is key in most countries (Chapter III).

Implementation processes: the enabling framework and modes of implementation

Additional processes must be launched to make these new institutional structures effective, specifically developing a legal framework, a comprehensive planning process, sustainable financing, as well as a reliable system of resource monitoring and data management. Chapter IV summarises and outlines these processes as implementation procedures.

Box 5: Functions of water resources management

Water resources management structures at different institutional levels work to:

- Assess water resources (groundwater and surface water availability)
- Assess demand from different sectors
- Plan the development of water resources
- Allocate water
- Set up communication and information systems
- Resolve conflicts over the allocation of water
- Establish policies and regulations
- Establish financing arrangements
- Establish self-regulation (voluntary actions)
- Conduct research and development
- Undertake development work
- Ensure accountability
- Develop organisational capacity
- Coordinate inter-agency and community actions
- Promote public participation and awareness

III) The institutional set-up for IWRM

Governance reforms are a major component of IWRM reforms around the world. GIZ is supporting these reforms in its partner countries at different levels. We focus on institutional set-ups because many countries' lack of water is only partly due to physical constraints and mostly due to economic shortcomings (IWMI 2006: 8). These countries have long had an inadequate institutional framework for water resources management. All of GIZ's partner countries are currently engaged in deep institutional restructuring processes. Given the general conditions facing developing countries, these processes inevitably come with transitional challenges and teething troubles described below.

Some broad analogies can be drawn regarding national reform strategies. First and foremost, nearly all countries provided the water resources management sub-sector with its own institutional basis at national level, thus setting it apart from other sub-sectors, such as water supply and irrigation (Egypt being the only exception as it combines water resources management and irrigation).

At a sub-national level, nearly all of GIZ's partner countries have adopted basin management as their main institutional strategy. Basin management means that water management functions are performed within hydrological or hydrogeological boundaries under the auspices of a specific basin management organisation. Basin management thus entails replacing administrative entities with new management bodies. Burundi and Egypt are the only countries covered by this report that have not made any institutional reforms towards basin management organisations. Burundi is not undertaking these reforms as it is too small to be meaningfully organised by hydrological units. Egypt's special geography and hydrology, with its huge dependence on the River Nile, led the country to take a management approach based on man-made irrigation channels.

At a local level, IWRM aims to allow water users to participate in the management of their resources. Therefore, institutional reforms addressing the creation of water user organisations are a key component of water sector reforms in all partner countries.

1) National governance

IWRM reforms generally involve decentralising competencies from the national to the sub-national level, especially the

basin level. However, a national approach to IWRM does not conflict with a basin-level approach to IWRM; in fact, they are complementary. A comprehensive national framework for IWRM is essential to both national and basin management. All of the countries surveyed for this report introduced IWRM reforms from the national level, starting with legal and institutional changes that will eventually provide the framework for participatory structures at lower levels. The main functions of national water resources management include:

- coordination within the water sector as well as between the water and other sectors
- providing the legal and regulatory framework for IWRM
- supporting the establishment of participatory structures at lower levels
- developing the legal framework for (international) transboundary basin cooperation

A fragmented institutional landscape is a common problem that should be resolved by taking the holistic perspective offered by IWRM. However, overcoming fragmentation is a long-term process that usually meets with resistance from organisations that fear losing influence. Egypt is a case in point, as more than ten of its ministries are involved in water affairs. Although the Ministry of Water Resources and Irrigation bears primary responsibility for the water sector, the Ministry of Agriculture and Land Reclamation has a huge say in the water sector given how relevant irrigated agriculture is to the country's water situation. Improving coordination within the water sector is challenging given that these structures take decades to grow.

Other countries have chosen to engage in deeper institutional reforms. Kenya created the Water Resources Management Authority (WRMA) during the water sector reform process. The WRMA is responsible for good-quality water being available to all users. Its main task is to manage, regulate and conserve all water resources, to ensure stakeholder participation, to enhance equitable allocation of water and to guarantee environmental sustainability. This is a relatively wide range of competencies compared with other countries.

Example 1: The mandate of Kenya's Water Resources Management Authority

- develop guidelines, principles and procedures for allocating water resources
- monitor and reassess the national water resources management strategy
- receive applications and allocate permits for water use
- regulate and protect water resources quality
- manage and protect water catchments
- determine charges to be imposed for the use of water
- gather and maintain information on water resources and publish forecasts, projections and information on water resources
- liaise with other bodies to improve the regulation and management of water resources
- advise the Minister concerning any issues connected with water resources

Issuing permits for water use gives the WRMA a strong tool with which to guide water abstraction and effluent discharge (see Box 1).

Zambia is another country where a complete restructuring of the central institutional level is currently envisaged. The future WRMA's main task is to plan for and safeguard the sustainable and rational use, management and development of water resources. Its approach is based on community, public and private sector needs and priorities within the framework of national economic developmental policies. The current organisations, the Water Board and the Department for Water Affairs – both part of the Ministry of Mines, Energy and Water Development – will cease to exist or have their mandate scaled back considerably. This deep restructuring will leave the Ministry mainly in charge of policy-making and international water affairs.

However, in most countries IWRM reforms aim to strike a balance between intersectoral coordination and complete institutional integration. Kyrgyzstan and Tajikistan are good examples of this: they have a national council structure whose mandate is to effectively guide the water sector without replacing existing sector institutions. Similar committee and council structures are found in Uzbekistan and Afghanistan, for instance, and are in the pipeline in other countries (e.g. Namibia).

The right organisational path for each country depends heavily on its institutional tradition. It appears that countries with a strong tradition of centralised water management, for instance former Soviet Republics, are a difficult place to create an integrated national institutional structure. Therefore, less radical solutions involving committees or councils might be preferable.

2) Basin management organisations

The management of water bodies (surface water and groundwater) in accordance with the natural resource's physical boundaries is one of the basic principles of IWRM. The rationale is twofold: in addition to strengthening stakeholder participation, basin management structures are supposed to reflect the natural characteristics of a water course and facilitate integrated resources management. In essence, basin organisations are umbrella organisations for basin management. Their mandate is to take a look at the big picture and be the leading voice on basin-wide water issues. This means keeping basin constituencies and decision-makers in all sectors, both public and private, and at all levels, fully informed and involved.

Box 6: Basin management within a country and transboundary basin management

IWRM dictates that water resources are managed according to hydrological boundaries. Consequently, national water management becomes an international affair in most parts of the world. Rivers, lakes and aquifers do not end at political borders. Therefore, GIZ strongly supports transboundary basin management in many shared river basins (<http://www.giz.de/Themen/en/28268.htm>).

However, this paper deals with the process of introducing or strengthening IWRM within countries. Basin management is hence limited to reforms within countries and to setting up basin management organisations at a sub-national level.

Box 7: Basin management organisations' tasks

Monitoring, investigating, coordinating and regulating

- **Collecting data:** collecting, managing and analysing data and communicating findings and results regarding water availability, water demand (including environmental requirements) and water quality to decision-making bodies and stakeholders to support different basin functions.
- **Prevention, monitoring and enforcement:** monitoring and controlling water pollution, salinity levels and ground water extraction; ensuring that they remain within accepted limits and enforcing laws and regulations to prevent degradation and overexploitation and restore ecosystems.
- **Coordination:** harmonising policies and actions undertaken in the basin by governmental and non-governmental land and water management entities.
- **Conflict resolution:** providing mechanisms for negotiation, arbitration and litigation.

Planning and financing

- **Allocating water:** defining mechanisms and criteria by which water should be allocated to user sectors, including the environment.
- **Planning:** formulating medium to long-term plans for developing and managing water resources in the basin.
- **Mobilising resources:** ensuring financing, for example by collecting water user fees or water taxes.

Developing and managing

- **Constructing facilities:** designing and constructing water infrastructure.
- **Maintaining facilities:** maintaining water infrastructure.
- **Operation and management:** ensuring that dams, navigation and water distribution infrastructure, and wastewater treatment plants are operated properly, that allocated water reaches its point of use and that surface water and ground water are managed conjunctively.
- **Preparing for water disasters:** protecting against floods and developing emergency work, flood or drought preparedness plans and coping mechanisms.
- **Protecting and conserving ecosystems:** defining priorities and taking actions to protect ecosystems, including awareness campaigns.

Source: based on IWMI 2006

Basin management organisations can take many forms: statutory decision-making and/or advisory bodies, management bodies, development entities and regulatory bodies. They often operate in conjunction with other government agencies and administrative bodies. Basin organisations are usually set up to deal with issues which are not, or not fully, addressed by other institutions or to foster harmonisation and exchange between the involved institutions in keeping with an integrated approach. Collecting and exchanging information and data have often been the starting points for developing initial basin structures.

Basin management organisations' tasks can vary significantly depending on their mandate; it is rare for any one organisation to be in charge of all of these areas. Yet organisations typically focus on the three fields outlined in Box 7.

2.1) Types of basin management organisations

The international debate distinguishes between three types of basin management organisations. Their main difference lies in the varying levels of formal power assigned by the government. This power ranges from pure consultation to exercising vital government functions. In reality, we will often find mixed forms of the three types in a single basin. In addition, these different types of basin management organisations might exist in parallel in one river basin.

The choice of a specific institutional arrangement depends very much on each basin's specific conditions, history and cultural context. It is, however, important to note that basin management is a dynamic process. As these organisations

Example 2: Tasks of basin management committees in Namibia

- to advise the Minister on matters concerning the protection, development, conservation, management and control of water resources and water resource quality in its water management area;
- to promote community participation in the protection, use, development, conservation, management and control of water resources in its water management area;
- to prepare or commission preparation of an integrated water resources management plan for its water management area to be submitted to the Minister for consideration when developing the Integrated Water Resources Management Plan under section 32;
- to make recommendations to the Minister in relation to applications for licences in respect of its water management area or the amendment, cancellation, or suspension of any such licence;
- to promote community self-reliance, including arrangements for the recovery of costs to operate and maintain any waterworks;
- to monitor and report on the effectiveness of policies and measures in achieving sustainable water resources management and resource quality in its water management area;
- to collect, manage and share data required for the proper management of its water management area in coordination with the Minister;
- to pursue, with the Minister's consent, a water research agenda appropriate to the needs of institutions and water users within its water management area;
- to help to resolve conflicts relating to water resources and resource quality in its management area;
- to report to the Minister the occurrence or threat of serious water or pollution problems within its management area;
- to compile and submit an annual report on its activities to the Minister and to assist the Minister in the coordination of such activities in Namibia; and
- to perform such functions as are delegated or assigned to it by the Minister.

usually start from scratch, their mandate, tasks and capacities develop over time. Examples of long-running basin management organisations reveal that transformation from a consultative commission to a more powerful political body is possible.

2.1.1) Basin councils, forums and associations

A basin council may be a formal or informal group of government officials, parliamentarians, NGO workers and other stakeholders who meet to discuss water management issues. Councils are usually set up to advise government bodies. Unlike a commission, which is also a body of experts and stakeholders, a council has no regulatory powers. Basin councils often exist alongside the formal administration and represent different categories of users, NGOs or local community groups.

Basin councils can have a variety of roles, for example providing advice, raising awareness, offering education and stimulating ownership of basin natural resources management and promoting the exchange of information. They can also serve as a watchdog. Basin councils are sometimes set up to solve a specific problem or for a specific basin.

Namibia's basin stakeholder forums and Yemen's water basin committees are examples of basin councils of organisation. In both countries, these organisations are the only formal water resources management bodies at a basin level and connect local water users with national entities. Their tasks focus on raising awareness among water users and advising the water Ministry at a national level. In addition, they constitute a platform where stakeholders and government officials at basin level can meet and exchange views. Namibian stakeholder forums elect a basin management committee to represent the forum. Basin management organisations in both countries have a government-supported institutional structure in form of a technical secretariat (Yemen) and a basin support office (Namibia).

Around the world we can find other examples of consultative bodies that exist in addition to governmental management structures. Kazakhstan's basin councils provide a platform to represent and protect the interests of water users. They coexist with water economy structures or inspectorates that are territorial subdivisions of the central government. A similar model is planned in Afghanistan in which voluntary basin councils complement government-run basin agencies. Basin committees will also play a role in Benin's water resources management in the future. The notion of having pro-



Washing in the Thiba River, Tana Catchment Area, Kenya.

fessional basin agencies or a sole national agency is still under discussion. Catchment water committees are also planned in Tanzania and will focus on harmonising planning processes in the basin as well as on conflict resolution.

These participatory structures are a new phenomenon or are just now in the process of being established in all of the countries where GIZ works.

2.1.2) Basin directorates, agencies and authorities

A basin directorate, agency or authority makes planning decisions and has statutory responsibilities as a decentralised or de-concentrated government body. These entities may set and enact regulations or have authority to give consent for them to be developed. They are usually founded on civil service principles to serve the public with some autonomy within a national legal framework. They may have an arbitration role and stakeholders may refer to them for decision-making on any conflict that arises. These bodies are usually in charge of carrying out tasks for medium-term planning purposes and for collecting water abstraction and discharge taxes to finance or support the investments needed to achieve objectives. In

some cases, they can also be responsible for water policy, studies, data collection or production, information sharing and public awareness.

Among the countries researched for this study, Morocco falls into this category. Its nine hydrographical basin agencies have far-reaching competencies in controlling and managing groundwater and surface water.

Example 3: Tasks of Morocco's hydrographical basin agencies

- water policing – permits (discharges and withdrawals)
- registering users, controlling groundwater use, billing water and groundwater
- strategic long-term planning (master plan) and basin action plans
- manage concessions to developers (raw water sales) and approving water points for irrigation
- water charges (pollution, abstraction)
- monitoring, data management, water modelling and production of GIS



Fetching water in Thiba River, Tana Catchment Area, Kenya.

Example 4: Tasks of Uganda's water management zones

- prepare zonal and catchment water development and management strategies and plans;
- develop, maintain and expand the zonal and catchment knowledge database and information system, prepare knowledge products, and disseminate data and information, including maps to support catchment management organisations (CMOs) and water management zones in performing their functions and facilitate catchment water management and development;
- promote awareness and understanding of integrated and sustainable water management and development among stakeholders in the zone and catchment, present government water policy, water conservation and protection values, the role and importance of CMOs in ensuring sustainable and equitable access to water;
- establish, support and facilitate an institutional framework for effective stakeholder participation in catchment management and development planning, and plan implementation, including training and capacity building for stakeholders;
- carry out holistic water resource assessments, estimate current water use and project future water demand, prepare water balances, and simulate and analyse integrated water use and infrastructure operations;
- design, install and operate a modern zonal and catchment water monitoring system for hydrological and meteorological data on groundwater and surface water, including data collection, storage and analysis and dissemination;
- design, install and operate a modern zonal and catchment water-quality monitoring system, and operate and maintain a regional water-quality laboratory;
- regulate water allocation, water use, and infrastructure operations in accordance with the agreed and adopted water management plan, administer the water permit system and monitor and enforce compliance with regulations, including the implementation of environmental management plans and project plans;
- review project proposals for water development and water use, water use permit applications, proposals for modifying regulations governing prior permits and environmental impact assessments (EIAs) in the zone and catchment;
- contribute to and support the formulation of new and revised regulations and laws, and national water development and management plans and strategies, and support Uganda's participation in transboundary water resource forums and implementation of agreements;
- coordinate, facilitate and support the activities of central sector departments and agencies, regional and district level officers, NGOs and donor partners within zone and catchment, including activities such as investing in water development at the zonal and catchment level, project planning and project preparation studies;
- guide and facilitate the continuing role and function of CMOs in the implementation of the catchment management and development plan.

Example 5: Tasks of Tanzania's basin water boards

- data collection, processing and analysis for WRM monitoring and resource assessment
- coordinate technical aspects of transboundary issues in the basin
- coordinate and approve basin WRM planning and budgets
- enforce water use permits and pollution control measures
- facilitation cooperation between sectors at the local level
- resolve conflicts between water users
- coordinate stakeholders
- integrate district plans into WRM plans

Uganda's water management zones are another example of this type of de-concentrated basin management organisation. These zones carry out core water management functions, such as regulating water allocation, administering the water permit system and enforcing compliance with government rules. Uganda takes a more top-down approach than other countries with structures that are part of the government system, although stakeholder participation is envisaged in the planning process.

2.1.3) Basin commissions and mixed forms

Commissions are another form of basin organisation found in GIZ partner countries. For many decades, bilateral or multilateral treaties or conventions between riparian countries have created these bodies for international transboundary basins and aquifers. Commissions may be solely advisory – providing guidance, educating and monitoring – but may also oversee activities and work to fulfil the goals of a government charter or international agreement.

Commissions are also important structures within countries when transferring water management from administrative to hydrological boundaries. These bodies are normally established by a formal government mandate or by national or regional rulings to coordinate policies and activities for a shared river or aquifer. Commissions bring together different governmental authorities with responsibilities in the respec-

tive basin. Their interaction ranges from sharing experiences to defining common rules on specific issues and, when necessary, deciding on allocating available resources between categories of use, regions and (in the case of transboundary basins) riparian countries.

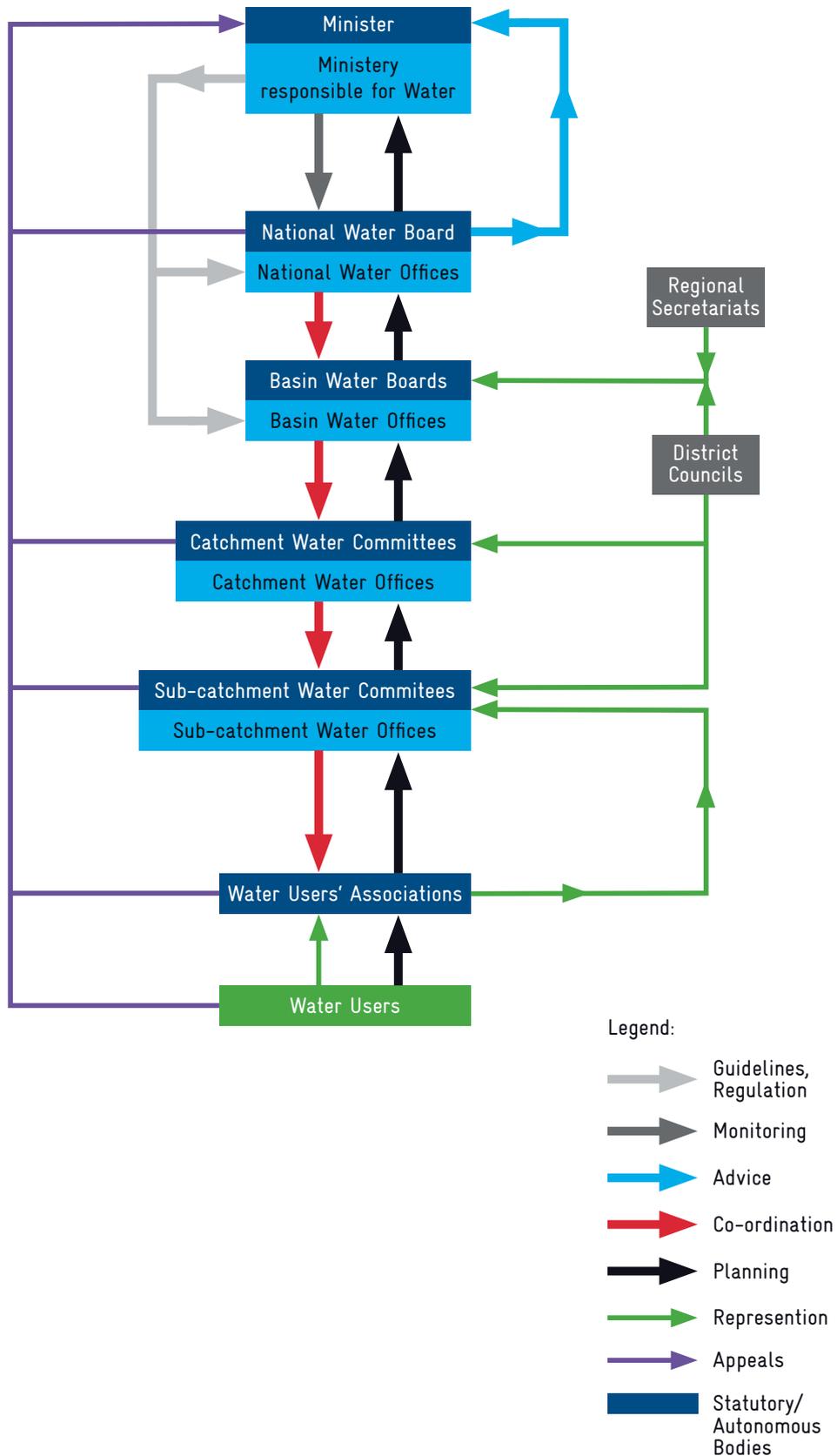
Basic commissions have varying degrees of institutionalisation. Some do not even have a permanent secretariat, while others were turned into government authorities after operating successfully over a certain period of time.

Tanzania's basin water boards are an example of these decentralised basin structures. They are to operate alongside future catchment water committees. While committees will provide a forum for stakeholders, water boards will be responsible for functions such as monitoring and water resources planning.

Another example of this model will be established in Zambia: catchment councils¹. The name 'councils', most of their tasks and their composition would suggest grouping them in the first category. These councils are still in the process of being set up, but the Water Law dictates that they be composed of government representatives and community nominees, e.g. from water user associations. An analysis of the councils' tasks reveals that they will be responsible for collecting revenue by charging for water use. As this is a sovereign function of the state, they form an intermediary form between an (advisory) council and a (governmental) authority.

1) The names of basin organisations often do not align with how they are categorised in this paper. Zambia's catchment councils fall under the category of a commission when it comes to their status and responsibilities.

Example 6: Decision-making in Tanzania's water resources management



2.2) Collaboration and sharing information within the governance system

Most of the governance structures analysed in this report are still in their infancy. Therefore, it is difficult to say how national entities and basin management will actually relate to one another. Obviously, basin management typically involves transferring competencies from national bodies to lower levels of governance. This process is always challenging as it entails changing the state's power structures. Sharing information among the new structures and central authorities is one area where these challenges become immediately visible. Information-sharing problems are more common in countries that have recently established systems of basin management than in countries following a more centralised model (e. g. Burundi).

However, balancing top-down steering by the national government with bottom-up participation is at the centre of all models. In Tanzania, planning and coordination shape this two-way relationship. The future needs to show how these terms will be brought to life.

Basin management committees still operate in isolation from authorities in Namibia, a country with a decade of experience of basin management. This illustrates an inherent danger of purely consultative bodies. While they are important information-sharing platforms in the beginning, they tend to become meaningless if their activities, competencies and assigned responsibilities do not grow.

Having learned this lesson, Uganda currently envisages a different model of balancing a top-down and bottom-up approach. While the national government initially dominates management decisions in order to launch the process, the government aims to increase the active participation of local stakeholders by creating and strengthening community-based organisations. Under the rules, stakeholders are supposed to participate in elaborating catchment management plans and developing new water infrastructure as well as take responsibility for the management and protection of their water resources.

3) Local governance

Participation is the key concept behind reforming IWRM at a local level in partner countries. Most governments are establishing or are planning to establish a kind of water user organisation to manage resources at a local level in order to bring about local participation. In all of the cases examined, water user organisations were designed as voluntary non-governmental bodies open to all individual or corporate water users in the area in question.

Example 7: Water resources user associations (WRUAs) in Kenya

Water resources user associations are community-based groups focused on managing and conserving the specific water resources in an area, a river or aquifer. A WRUA is formed by water users, water dischargers, riparian landowners and stakeholders who join voluntarily. WRMAs, NGOs or CBOs may catalyse the formation of a WRUA. It is preferred that they register with the Attorney General, who provides the group with the legal status to operate, open bank accounts, hold assets and enter into legal contracts. The WRUA may then apply to the WRMA for formal registration as a WRUA. The WRMA and WRUA then sign a memorandum of understanding setting out both parties' roles and responsibilities.

Scientific research conducted in recent decades substantiates participatory local water management as a third form of organising water resources management beyond the classical dichotomy of state control and the market. Elinor Ostrom identified seven characteristics of user organisations that enable them to effectively manage common-pool resources. This theoretical snapshot provides helpful insights into the framework conditions for local water management.

Box 8: Characteristics of water user organisations

- clearly defined boundaries for the resources' geographical scope
- proportional balance between the costs and benefits of participation for users
- collective choice arrangements: members of the group affected by the rules can also modify them
- effective monitoring that is accountable to the users
- graduated sanctioning mechanisms in the case of fraud
- access to conflict resolution tools
- acknowledgement of common-pool resources by formal authorities (e. g. the government)
- adequate nestedness at different levels from the local to the high political level in the case of larger common-pool resources

Source: Ostrom 2005: 259

3.1) Tasks of water user organisations

The actual design, tasks and geographical scope of water user organisations depends heavily on circumstances on the ground. In general, a certain orientation towards hydrological or infrastructural conditions is visible when defining water user organisations' territory. User organisations made up of farmers often take care of tertiary or quaternary canals in countries with extensive canal networks used for irrigation, such as Egypt, Kyrgyzstan, Tajikistan, Uzbekistan and Kazakhstan. Water user organisations are usually responsible for managing water points in countries where groundwater is very important to rural (drinking) water supply, such as African nations (Namibia, Tanzania and Kenya). In Namibia, water user organisations were set up to oversee water points, even in rural areas with pipeline water supply.

The tasks of all of these different models of user organisations can be summarised under two headings:

- enabling water user participation and
- allocating and managing local water resources.

These organisations must have sustainable financing to perform these tasks. Therefore, this report will take a closer look at water user organisations' finances after explaining these two main fields of activity.

3.1.1) Water user participation

Water user organisations are usually structures created by the national government and/or by international donors to enable local water users to participate and bear responsibility for their resources. Up until now, there have been only a few examples of water user organisations being created at the request of water users, for instance in Kenya. Having governments or NGOs take a strong role is one way to connect the water user organisation with international norms, for instance related to gender. Examples include Kenya's stipulation (supported by the 2010 Constitution) that the association be made up of 30% women or Namibia's requirement for a gender-balanced management board. Such progressive provisions are positive from development partners' perspective, as they help to change societal norms that might have disfavoured women and girls. However, in the short run these provisions might also make certain groups or individuals less willing to participate. Therefore, water user organisations are not currently able to represent all stakeholders in their territory. It needs to be emphasised that certain groups or individuals might often

Example 8: An example of a water user organisation in Yemen

Awareness raising and training as part of Yemen's water sector programme:

The Community Awareness and Women Empowerment Programme (CAWEP) (upscaling awareness activities) within Yemen's Water Sector Programme largely focuses on strengthening civil society and women, in particular, to develop the local capacities needed to (a) improve water supply and sanitation in a sustainable manner, (b) educate and empower women and (c) strengthen governance and reduce fragility in the project area. All activities were closely coordinated and implemented with the respective village water committees and local authorities. CAWEP offers literacy classes for women, health and hygiene education for women, men and children, village cleaning campaigns and generational dialogue.

be excluded voluntarily, as users just do not see any benefit from spending time and effort on participating in water management work.

Therefore, awareness raising and increasing users' knowledge of resources is a central issue for water user organisations. While users are affected by resource degradation on a daily basis, certain cause-effect relationships, such as the connection between water use and the depletion of water resources, are often not fully understood. The knowledge-attitude-practice approach taken by IWRM (Matz and Hübschen 2011: 11) thus comes to fruition at the local level. Raising awareness and changing mindsets and mental models about water management are hence the main goals of participatory local governance structures, which may have impacts on all areas of rural life well beyond the water sector.

3.1.2) Local water management

Beyond providing a framework for participation, water user organisation's actual tasks are very much dependent on conditions in the respective area. In Tanzania, the tasks of local water user associations are broadly defined as:

- managing the allocation of water resources at local level
- managing equitable allocation of water resources during droughts
- mediating local disputes

Bearing responsibility for water allocation gives these bodies huge political relevance. The competency to mediate local disputes also assigns a very important governance function to a rural participatory institution, a step that is reported to be very successful.

Additional tasks relating to maintaining infrastructure and financial management are part of water user organisations' activities in countries with more sophisticated infrastructure (Example 9).

Water point user associations in Namibia have been assigned similar far-reaching tasks, as they are responsible for rural water supply through boreholes or pipeline-fed water points (Example 10).

Kenyan regulations governing local water user organisations also highlight environmental aspects such as:

- campaigns raising awareness of catchment protection;
- rehabilitating degraded catchment areas;
- wetland protection to enhance the availability of water resources;
- resolving conflicts over water sharing;
- protecting riparian areas;
- building micro catchments, such as water pans and sand dams;
- permits required for dischargers (pollution control).

The compilation of these tasks leaves some crucial questions unanswered. One is the issue of enforcement. The strength of water user organisations is that they are rooted within local communities. Therefore, they should be able to enforce water protection rules, for instance, without inherent governmental authority. Another crucial issue concerns the sustainability of financing for water user organisations.

3.2) Financing water user organisations

One basis tenet of IWRM is that local water user organisations should be self-financing as part of the process of transferring responsibility for local water management to the user. This is one of the main implementation challenges so far and also a frequent point of criticism: either poor people struggle to bear these costs or organisations suffer from a lack of finances, which limits their effectiveness. Experience clearly shows that donors and national governments play a pivotal role in launching water user organisations. However, it seems possible that water users may self-finance organisations in countries with a longer history of such organisations (e.g. Morocco).

Generally speaking, sustainable financing should be considered from the very beginning when starting to implement a decentralised institutional framework for water management. External support is crucial during the initial phase, but cannot replace sustainable internal financing over the long run. Therefore it is important not to overburden organisations in the beginning (Example 11).

Example 9: Tasks of water user associations in Egypt

At tertiary level, water user associations shall be responsible for:

- administrative and financial management of water allocation
- operation and maintenance of water infrastructure
- water quality management
- conflict resolution
- participation in project implementation
- communication with relevant stakeholders
- monitoring and evaluation

At quaternary level, farmers' organisations are currently being set up, but are not yet operational.

Example 10: Tasks of water point user associations in Namibia

- planning for the water point and checking the progress on these plans
- organising and mobilising the community to carry out various tasks
- motivating and guiding WPUA members to fulfil their tasks
- managing the water installation: the engine, pipelines, connections, taps, reservoirs and cattle troughs etc.
- site management: fencing the water point, cleaning the area around the water point and draining waste water etc.
- financial management: budgeting for the water point, collecting money, keeping financial records and financial reporting.

Example 11: Financing water user organisations in Morocco

The Moroccan water law from 1995 transformed the regional water directorates into 'Agences de Bassins Hydrauliques – ABH's'. The main task of the ABH's is water resources management. The ABH's are governed by a supervisory board that consists of regional representatives of other public authorities, municipalities and water users. The ABH's are financed partly through government aid and partly through charges for groundwater, wastewater and the production of hydroelectric energy.

The current situation shows that water user organisations around the world are caught between the expectations of being bottom-up structures managing their water resources and the reality of having been created from the top down. Wherever possible, it is recommended that water user organisations be based on existing local structures. In Afghanistan, for instance, water users in irrigated agriculture are used to paying a mirab (the water master) who is in charge of releasing the amounts of water agreed on by the community. This tradition of paying for certain water services is likely to provide a basis on which water user organisations can be built.

4) Success factors and challenges for institutional reform

National level

At a national level, the most important factor for success seems to be a **clear conceptualisation and shared understanding** of the reform path among all important stakeholders. This shared understanding is the only way to ensure political support for the deep institutional changes associated with IWRM reform. Therefore, (potential) water problems need to be communicated to stakeholders. IWRM should also be present in the public discourse as a reform strategy that helps to ease these problems. In Namibia, the existence of active research institutes has proven to be a major advantage, as they performed awareness raising and educational work.

Institutional strategies at all levels need to be **highly adapted to the country's conditions**. Therefore, special solutions need to be found to overcome the specific challenges facing each country. Afghanistan has a weak government, and competencies for water are split among no less than nine different ministries. The establishment of the Supreme Council on Water uniting all of these ministries took a major step towards coordination in the water sector.

Another example of a successfully adapted strategy is Uganda's decision to choose de-concentration rather than full decentralisation. This step enables some crucial IWRM principles, such as participation, to be implemented without moving all crucial competencies to the basin level.

An important factor in successfully strengthening basin management can be identified in Namibia: A designated budget for IWRM and the Basin Support Division offers a remarkable national set-up that provides sustainable support at the basin level.

A major challenge for IWRM found in many developing countries – albeit with huge differences in gradient – is a certain degree of **weakness on the part of state institutions** in general. There is a danger of overburdening the government with reforms that cannot be put into action. The result would be a promising institutional structure that exists solely on paper. Therefore, the importance of designing realistic institutional reform paths cannot be underemphasised.

Basin level

Namibia illustrates well that a **target-oriented bottom-up approach** is a viable factor in successful basin management. In this case, pressing issues exist that a significant number of stakeholders want to see resolved. Such issues make stakeholders much more willing to participate than an abstract vision of participatory water management. In the same sense, a lack of real issues on the ground can turn basin management organisations into paper tigers in no time.

An **inclusive approach during establishment** has also proven to be a success factor for basin management. In Yemen, regional governors adopted a different stance towards basin management. The significant degree of political commitment and support from these authorities made a big difference to the structures' work and when it came to Water Basin Committees financial sustainability a local budget was allocated.

Another vital factor for the viability of basin management organisations seems to be a certain degree of pressure from below. Establishing basin management is more promising if **active NGOs or water user associations** are in place. In this regard, the role of volunteers in setting up user associations was highlighted. Donors can support such bottom-up pressure through community-based dialogue and objective-oriented awareness raising.

Horizontal coordination at basin level can be a challenge when many government authorities have competencies in water resources management. In Uganda, simply moving the basin management organisation's office into one complex with key government offices eased the coordination process. However, effective coordination also depends on the capaci-

ties of regional government branches, as experience from Yemen shows.

Challenges for establishing viable basin management can be identified at different levels. Generally speaking, setting up **water resources management by hydrological boundaries** involves very deep institutional reform that will inevitably result in friction, especially when basin management organisations have to coordinate with government authorities. At the same time, basin management organisations outside the government system have not yet developed sustainable financing methods. Instead, they rely either on external funding or support from the government budget.

However, water resources management below national level is something rather new for many developing countries. It enables basin management organisations to operate in a new field and build up WRM from scratch. However, most countries analysed for this report were seen to have basin management organisations that did not yet have the capacities to live up to expectations. The character of water resources management and, in particular, the new goal of integration makes **human resources a major bottleneck** for basin management organisations around the world. This challenge is even greater in countries with unfavourable conditions, such as Afghanistan. Therefore, the process of designing mandates needs to be constructed carefully and should leave room for responsibilities to be enlarged in the future.

Local level

Up until now, water user organisations in most countries have been created at the initiative of the national government or international donors. The **existence of active stakeholders** has proven to be a success factor when taking a bottom-up approach to these organisations. Local NGOs or community-based organisations can be important drivers of local-level participation. In this regard, volunteers play an important role in setting up user associations. Donors can support this bottom-up pressure through community-based dialogue, target-oriented awareness raising and lobbying for these organisations to have far-reaching competencies.

At the same time, **support from upper levels** is vital during the start-up phase. The provision of incentives – not necessarily money – can help to increase participation during the organisation's start-up phase.

In addition, the **benefits of IWRM should be visible** to local stakeholders from the outset. Therefore, direct activities, such as tree planting, dam maintenance and spring protection, at the beginning of implementing IWRM at local level and guided by WUAs have proven to be a factor for success. This improves understanding of good water management and increases people's willingness to participate.



Meeting of a Water User Association in Egypt

It is also crucial that local **water user organisations are not overburdened** with tasks they cannot handle or realistically finance. While user organisations can rely on social power to enforce rules, the areas in which this power can really be used need to be carefully analysed. Therefore user organisations' tasks need to be adapted to local circumstances. Iterative models with tasks that increase over time can also be a way to strengthen water user organisations.

One of the major challenges for water user organisations is a **lack of stakeholder capacity**. Few are water management experts, which stops them from making a real contribution to planning processes. Therefore, capacity development is badly needed by higher institutional levels.

One structural challenge at local level is the possibility of government officials or other influential individuals **taking over the new structures**. Kazakhstan and Kyrgyzstan, in particular, have experienced situations in which local user groups are not only formed by the government, but also constantly driven by local government officials. Such a situation is likely to leave only limited scope for participants to truly influence decision-making and develop innovative solutions that might call the government's strategies into question. This challenge might also influence the willingness to participate. Yet local water organisations will facilitate inclusive water management only when enough stakeholders feel that they have adequate capacity to actively participate in policy-making processes.

IV) The IWRM implementation process

IWRM is far from being merely an administrative agenda. It is a process of changing the government's approach towards water resources management. Therefore, IWRM can only be implemented incrementally. The next chapter will outline and compare four major processes in the implementation of IWRM in GIZ's partner countries. These processes are:

- developing a comprehensive legal framework that builds upon IWRM principles,
- planning processes for water resources management,
- setting up sustainable modes of financing, and
- data management and processing.

1) The legal framework

As a holistic approach to the water sector, IWRM requires a comprehensive legal framework defining all stakeholders' competencies and responsibilities. Elaborating water laws is thus an important step in the process of implementing IWRM. Developing a legal framework is more advanced than other implementation aspects in most of the countries

analysed in this report. Most of these countries have a water law based on IWRM principles or are currently in the process of developing a piece of legislation. Egypt is one exception

In addition, most governments use policy documents to define broader goals, often with a long-term perspective. They are an integral part of IWRM reforms in most countries, as they send strong messages to different audiences. On the one hand, governments can inform national stakeholders and citizens about the political direction in the sector and hence prepare the ground for political shifts, e.g. when changing from a centralised to a more decentralised system. Policies are also an appropriate way of introducing new topics into the national discourse or of raising awareness of certain subjects, e.g. reusing waste water. On the other hand, governments can signal to the international community that they take IWRM seriously and that they are willing to adapt to international standards, which is often tied to receiving international assistance.

Uzbekistan was identified as having no national water policies because water policies are part of the agricultural policies. Most other countries have very recent documents (since 2008) that either deal with the water sector as a whole or with particular sub-sectors. Some countries (e. g. Kazakhstan and Kenya) have water-sector policies that cover fixed periods of time and will be updated regularly. These periods can either

Example 12: The legal framework for water resources management in Egypt

Instead of having a single integrated water law, Egypt's water management is founded on laws governing irrigation and drainage on the one hand and environmental protection on the other hand. Most of Egypt's legal texts are rather old and it is doubtful to what extent they can support IWRM processes. This might be one explanation for the rather slow pace of reform in the Egyptian water sector.

Laws with relevance for the water sector in Egypt:

Irrigation and drainage

- Law 12 of 1984 on irrigation and drainage and
- Law 213 of 1994 on farmer participation and cost-sharing.

Laws and decrees governing environmental protection

- Law 93 of 1962 on discharge to open streams, revised in 1962, 1982 and 1989,
- Law 27 of 1978 on the regulation of water resources and wastewater treatment,
- Law 48 of 1982 regarding the protection of the River Nile and waterways from pollution,
- Law 4 of 1994 on environmental protection.



Water level monitoring at River Agu, a tributary to Lake Kyoga in the Kyoga Water Management Zone in Uganda

be short (Kenya: 2012-2016), allowing for more detailed planning, or very long (Kazakhstan: 2008-2025), providing for a rather visionary time frame.

1.1) Developing the legal framework

Developing a water law can be a very lengthy process. In Namibia, a new water law to replace the old one dating back to 1957 was drafted in 2004. The law was reviewed in 2011 and has still not been enacted by the president. A new draft water law was also shelved in Benin for about 10 years before it came into force rather quickly in 2010.

GIZ and international donors typically play a major role in the legislative process, as they are a bridge to connect national decision-makers with international state of the art on IWRM. In addition, they can provide valuable services in facilitating the legislative process. It has been proven that the participation of relevant stakeholders is crucial to increasing national ownership of future legal texts. However, such a process needs to be carefully steered by the national government. Ownership is also crucial, as international experts often come on board during the drafting process. While they ensure

that the law is up to international standards, permanent dialogue with national authorities is required. This step avoids overburdening the government with a legal text that does not correspond to the local conditions.

Example 13: The legislative process in Burundi

Burundi inaugurated its water law, which is based on IWRM principles, in April 2012. The first draft was developed by national consultants who submitted it to a technical group made up of national stakeholders and international donors. The process of elaborating a harmonised technical draft took about one year. The Water Minister used this document when addressing the Council of Ministers and then the Parliament. The parliament established a parliamentary committee that actively commented on the draft. This process ensured that all relevant technical and political stakeholders were included and that the water law was inaugurated in a rather short time frame.

Commitment on the part of the national government is the most important factor in the legislative process. However, diverging opinions will exist within the government in many cases. The example of Egypt underlines the time frame and the procedural steps that may be required when developing legislation in a country with a highly fragmented institutional structure (Example 14).

1.2) Enforcing the legal framework

Bylaws and regulations are indispensable tools when clarifying and specifying laws. Most countries with water laws based on IWRM principles are still in the process of developing the related bylaws (e. g. Afghanistan, Egypt and Zambia). A lack of specifying legal texts is a major reason why enforcing legislation is one of the major hurdles when implementing IWRM.

All of the countries analysed for this report struggle with enforcement. The lack of bylaws and regulations results in unclear roles and competencies for institutions.

Example 15: Regulation developed by the GIZ Water Programme in South Sudan

In South Sudan the Ministry of Water Resources and Irrigation is responsible for the development of a water law. It started in 2012 with the drafting of a comprehensive water act, comprising both water services, regulation and water resources management. The Ministry oriented itself on other regional water laws and institutional set-ups, for example the water laws of Kenya and Zambia. The water act of South Sudan is still in the development process.

IWRM reforms usually involve establishing new institutions, e. g. for basin management, which often suffer from insufficient capacities. The risk of an ineffective institutional framework is high if these organisations' roles and competencies are not clear enough.

Example 14: The legislative and revision process in Egypt

Year	Step
2000	The Ministry of Water Resources and Irrigation (MWRI) task forces
2001	WPAU/EPIQ Working Groups
2002	Legal Amendment Committee
2003	Consultation with MWRI departments, directorates and districts
2003	First Draft of modified law
2003	Consultation with relevant ministries (Agriculture, Housing, Environment, Industry)
2003	Feedback from political parties and parliamentary committee
2003	Legal Amendment Committee with relevant projects and units
2004	Final draft of the Water Resources Law
2004	Approval by His Excellency, the Minister of Water Resources and Irrigation
2005-2009	Review and approval by the State Council and the Cabinet
2009-2010	Division of the law into 5 laws
2011-2012	Regroup law with modifications
2012	Final draft of the Water Resources Law
2012	Approval by His Excellency, the Minister of Water Resources and Irrigation
2013 (planned)	Seeking review and approval by the State Council and the Cabinet
2013 (planned)	Referral by the President for review and approval by the Parliament
2013 (planned)	Promulgation by a presidential decree Bylaws formulated and issued

Example 16: Planning IWRM implementation in Egypt

At a national level, the **National Water Resources Plan (NWRP)** describes the country's water resources, the objectives, problems and issues, and proposed measures and activities. It covers the period until 2017. The NWRP includes a large number of policy decisions and measures that will be implemented in the upcoming years.

An implementation framework has been developed that assigns clear responsibilities for carrying out the plan's activities. It also includes the budgetary requirements for implementation, including investments and recurrent costs. The framework specifies:

- what: the concrete actions that have to be taken,
- who: the stakeholder with primary responsibility and who will take the lead in implementing the action,
- how: the steps to be taken and the consultative process,
- when: the timing.

Implementation of the National Water Resources Plan will follow Egypt's five-year and annual planning system. It is an element of the water sector's overall planning and coordination structure. The implementation framework covers the bottom-up element in the planning process.

The main elements of this framework are:

The **National Implementation Plan**, which provides an overview of the actions to be taken. It includes a list of actions, budgetary requirements and indicates which stakeholder will be primarily responsible for taking action. Moreover, the National Implementation Plan describes how the actions of the individual stakeholders will be coordinated, monitored and evaluated.

Individual stakeholders' **operational plans**, which translate the National Implementation Plan into concrete actions by stakeholders and designate responsible organisational units. Some of these operational plans are national in nature; others are more local. Stakeholders are fully responsible for their own plans. Therefore, these operational plans have not been included in the NWRP.

Monitoring, progress reporting and evaluation: Stakeholders will also be responsible for monitoring, reporting progress and evaluating implementation. The NWRP describes this procedure. Monitoring will track the progress of implementation and provide feedback on the impacts of implementation on the water resources system. As such, it will contribute to the next round of planning. The National Water Council will oversee monitoring, progress reporting and evaluation.

Therefore GIZ is strongly supporting the process of developing bylaws and regulations in most partner countries. GIZ is identifying regulatory gaps and providing advice on how to address legal challenges.

2) Planning water resources management

IWRM's holistic perspective requires a comprehensive overview of a country's water resources and a long-term vision for how they should be managed. All partner countries are hence in the process of developing planning frameworks at different levels.

For most countries, the first step in the planning process is a national framework guiding IWRM implementation in political and institutional terms. These documents include the National Water Strategy (Burundi and Yemen), the National

IWRM Plan (Namibia), the National IWRM Action Plan – PANGIRE (Benin), the National Water Policy (Tanzania) or the National Water Resources Plan (Egypt).

The elements addressed in national and regional water planning inevitably depend on the specific situation in the country or river basin in question. However, the paradigm shift in water resources management spurred by IWRM leads to a number of similar issues being included in partner countries' planning documents.

The environment, water resources protection and efficient water use are prominent features of national planning documents in a number of countries (e. g. Kazakhstan, Burundi, Morocco and Egypt). This illustrates the change from predominantly supply-driven water resources management to demand management, based on the knowledge that sustaining water quality and the environment are key to ensuring water security.

3) Financing water resources management

One major element of the IWRM implementation process is developing sound financing for the aforementioned institutional structures. The water sector is known to be highly cost-intensive, as it involves large-scale infrastructure. This section, however, will discuss issues of financing water resources management and will thus exclude infrastructure financing. In many regards, this simplification is false because dams and canals, etc. are usually multi-purpose infrastructure serving water resources management and water supply. The costs of water resources management, as understood in this paper, mainly include administrative costs and the costs of specific physical actions that are not defined as infrastructural investments, such as afforestation or water banking.

Four main financial instruments are used to finance water resources management:

→ **General taxes**² refer to funds that the treasury allocates to central and/or decentral water management organisations, e. g. in form of the water Ministry's annual budget.

→ **Water charges** can also be broken down into earmarked and non-earmarked charges. Earmarked charges translate the user-pays principle into financial terms, as certain behavioural patterns are directly related to charges. Germany's groundwater abstraction fee for private wells is an example of earmarked charges.

→ **Fines and penalties** can be considered a third source of funding as they can yield substantial income for WRM authorities. However, the amount is difficult to predict, and the authority is actually interested in reducing fines and penalties as far as possible. Yet income from fines and penalties can be used to finance one-off measures in the next year.

→ **Stakeholder contributions** might be another source of funding, e. g. voluntary contributions for a particular project. Very few examples exist of WRM authorities really being able to collect considerable funding from stakeholders to date, especially in developing countries. Box 9 summarises the advantages and disadvantages of different sources of funding, including water fees that users pay for water supply or sanitation services.

In quantitative terms, general taxes and water charges are by far the largest source of funding for water resources management at the moment. Earmarked charges are considered the most useful financial instrument for IWRM. Their main advantage is that water users can immediately understand what they are being charged for. These charges should trigger behavioural change by creating this understanding. However, general taxes typically finance the administrative aspects of WRM, as this provides a certain degree of funding security and cross-subsidises poorer regions within a country.

3.1) Financing sustainability

An empirical analysis shows that some countries in the spotlight of this report have made further progress on the path towards sustainable financing for water resources management. This progress includes making basin management organisations more independent from the central government. International donors have been seen to play a major role during the start-up phase of basin management and water user organisations. However, donor financing cannot be considered sustainable. Government funding can be a sustainable source of funding. However, enduring financial dependence on the central government contradicts the idea of autonomous basin management. Therefore, most countries with basin commissions, committees or authorities are in the process of creating financing methods that allow basin management organisations to collect their own funds while the government finances administrative costs (e. g. Benin, Egypt, Tanzania, Yemen and Zambia) (Example 17).

Purely consultative basin councils or committees have neither the competency, nor the enforcement authority to collect their own funds. Therefore, they are fully dependent on government or donor funds (e. g. Afghanistan, Kazakhstan and Namibia). These organisations are part of governments' budgeting procedures and thus compete with other government agencies. De-concentrated government bodies (e.g. in Uganda) are in the same situation, as they are an integral part of governmental authorities. Like any other government agency, they apply to the central government for their yearly budget. Unlike consultative basin councils or committees, they exercise certain state functions which increases their security of funding (Example 18).

2) Other state revenues, e. g. from selling state assets or from inter might of course also contribute to this type of funding.

Box 9: Comparing different financing methods for WRM

	Area of application	Advantages	Disadvantages
Service fees	All water-use services (water supply, wastewater treatment, irrigation, etc.)	Direct payment for services raises awareness of personal consumption patterns	Poor people may not be able to pay cost-covering tariffs, requiring special compensatory measures
General taxes	Financing water administration and associated tasks	National payments allow cross-subsidisation of poorer regions. Externalisation allows regulatory measures to be financed.	Tax payments are not earmarked so incentive measures do not work.
Add-on charges	For water use (abstraction) or pollution	Earmarked charges are a powerful incentive to guide personal behaviour.	Not advisable for financing law-enforcement measures due to probable resistance on the part of contributors
Fines and penalties	Violations of current laws and regulations	A powerful tool to prevent individuals from violating rules.	Usually has little impact on raising awareness.
Stakeholder contributions	Financing stakeholder mobilisation costs for meetings, etc., but as well for certain local measures	A high level of internalisation. Guarantees a high degree of direct control over funds.	Does not allow cross subsidies, solely permitting investments that direct stakeholders can finance.

Source: Matz and Hübschen 2011: 20

Example 17: Financing water resources in Yemen

Abyan, a governorate in southern Yemen, has proven to be a good example of how important political commitment and support from local authorities are to truly implementing IWRM. The WBC received all support required during the last two years under the patronage of the Governor of Abyan, who also serves as the committee's chairman. This support enabled the committee to act in accordance with its mandate and hold regular meetings, even in times of crisis. Financial sustainability is guaranteed since the WBC receives an annual allocation from the local budget.

Example 18: Financing water resources management in Namibia

Namibia's river basin committees are consultative bodies that presently receive half of their financing from the government and half from GIZ. The amount of money available is not really the limiting factor in Namibia. Instead, basin management committees are suffering from structural weakness caused by unclear competencies. This weakness is preventing sustainable financing from being established, as the relationship between government authorities – which are funded by general taxes – and basin management committees is not sufficiently defined. The high percentage of donor funding also raises question marks about long-term financial sustainability.

3.2) Licensing water abstraction

Licensing groundwater and surface water abstraction is an important step in the process of implementing IWRM. Firstly, it is an instrument to ensure sustainable financing for the necessary institutional structures. Secondly, it is a very effective instrument to steer water abstraction and implement demand management. However, the introduction of this instrument is currently in the development phase in most partner countries (e. g. Benin, Burundi and Zambia).

Arid countries generally have more advanced licensing systems (e. g. Egypt, Morocco and Yemen). One of the main advantages of licensing is that it stops uncontrolled abstraction of water resources that threaten ecological sustainability. However, even the above mentioned countries and also Central Asian states still experience problems enforcing abstraction limits. Enforcing legislation largely depends on the level of interest and the availability of resources to do so. Structural weakness on the part of new basin management organisations when dealing with water users can therefore be a major challenge when enforcing abstraction rules. Another hurdle to enforcement is the lack of monitoring stations (see below).

4) Monitoring and data management

Comprehensive planning processes involving all relevant stakeholders, as foreseen by the IWRM approach, rely heavily on the availability of information and data. These processes lack a foundation and planning processes inevitably remain

meaningless without detailed information on water availability, water quantity, hydrogeology, precipitation, water use, social and economic aspects of water use, the state of aquatic ecosystems, ecological services provided by the water, etc.

The quality of monitoring activities in GIZ's partner countries varies considerably. It is, however, not a mere reflection of the government's general capacity. Burundi was able to maintain a relatively high-quality monitoring even during phases of civil unrest. Therefore, the political will and resources assigned to this crucial field of activity are the key factor in the quality of the monitoring system.

Given the conditions facing developing countries, irregular funding for competent organisations is a frequent problem resulting in data gaps over time. Such problems can be exacerbated by inadequate bureaucratic procedures, which make it hard for officials to take needed business trips. Many countries are also now delegating water resources management to new institutions, such as basin management organisations. These institutions will need additional capacity development to be able to perform these tasks.

4.1) Data processing and information use

A comparison of GIZ's partner countries reveals that the main challenge for high-level monitoring lies not in technical implementation but in administrative procedures and institutional limitations. For most countries, data management and processing (in other words, turning raw data into usable information) thus pose greater problems than gathering data.

Example 19: Financing water resources management in Zambia

Zambia's system of financing looks convincing on paper, but it is worth taking a closer look. While the main government authority, the Department of Water Affairs, is funded by general taxes, the Water Board is supposed to collect its money by issuing water-right permits. The money from these permits should be split between the Treasury and the Water Board. However, this system is not fully operational yet, and very little money is collected from water-right permits at the moment. This factor, combined with insufficient financing for the Department of Water Affairs, is creating a severe financial shortfall for water resources management in Zambia.

Zambia's system of financing is in the process to be changed with the new water law in place. In the current system the Department of Water Affairs as the main governmental authority responsible for water resources management is funded by general taxes, whereas the national Water Board administering the water rights is partly funded by general taxes and revenues from water permits. The money earned from these permits are distributed between the national Treasury and the Water Board through a yearly agreed key (usually 50/50). However, the money collected through water right permits is very little at the moment. Together with the insufficient amounts dedicated to the Department of Water Affairs this leads to a severe financial shortfall of water resources management in Zambia.

In future the WRMA will mainly be financed by water right fees. Water users will be paying the fees directly to the WRMA and not to the national treasury anymore. At the same time the tariff system is in the process to be improved.

Example 20: Egypt's surface water monitoring system

Egypt's current water monitoring network comprises 232 sample monitoring stations on Lake Nasser, the Nile River, along irrigation canals and drainage canals. The Ministry of Water Resources and Irrigation (MWRI) and its research wing – the National Water Research Center (NWRC) currently monitor most sites along the Nile River for water quality and water quantity at pre-defined intervals. Four of these sites on the El Salam Canal are under semi-continuous water quality monitoring.

Water quality monitoring locations along the Nile are defined by water body or stretch. The main branch of the Nile is divided into four stretches. The first stretch is from HAD to Esna Barrage, the second stretch from Esna Barrage to Naga Hammadi Barrage, the third stretch from Naga Hammadi Barrage to Assiut Barrage and the fourth stretch from Assiut Barrage to Delta Barrage.

This monitoring system works properly on a large scale. However, monitoring is not taking place on a smaller scale, for instance at tertiary and quaternary level. This regime, while important for studying the River Nile, cannot detect a threat to water quality from any event of environmental pollution in real time. This sampling system is also not conducive to any early-warning system and cannot be used for competent authorities to set into motion any corrective measures.

Responsibility for data management is highly fragmented in many countries. Centralising data management is perceived as one possible solution, as the public sector often has a weak data-sharing culture. Just two of the countries analysed for this report, Benin and Uganda, have a centralised data management system in place. Benin's integrated database contains data from the water sector and is also linked to an agricultural database. However, the quality of this data is reportedly not reliable enough and not complete, which results in very limited use by stakeholders. Accessibility to the database is reported to be a problem in Uganda; the public has access to only some data.

None of the other countries currently have a centralised database of this type. Kazakhstan has a national GIS based water information system. Zambia is planning to integrate its fragmented databases dealing with groundwater, surface water, water quality, meteorology and social and economic statistics. This new database will have an online interface and therefore be accessible to everyone with user rights. This

database is planned to primarily support decision-making about water abstraction and infrastructure planning. Once fully developed, the database can provide run-off models. The database should become the core instrument for the WRMA to manage Zambia's water, also with regard to the impact of climate change. Namibia and Uzbekistan, where a water information centre is planned, reportedly intend to centralise data management in a single government authority as well.

By contrast, Burundi's Government decided against centralising data management in 2009, instead opting for a distributed database approach. The Geographic Institute of Burundi now manages data on water resources availability, while the multi-state urban water supplier oversees data on urban water use.

As processing monitoring data is a huge challenge, most countries' use of data for managing water resources is also rather limited as the required information is not available. However, the establishment of basin management organisa-

Example 21: GIZ's approach of supporting monitoring and data management in Uganda

GIZ's Water Programme in Uganda is supporting national structures in the fields of water resources monitoring and data management at different levels. The programme is currently financing the installation of 14 hydrological stations in the Kyoga Water Management Zone in order to establish an early-warning system after a flood risk assessment. This network is complemented by 23 automatic weather stations for forecasting and early warning.

In addition to providing this technical support, the programme is supporting the Ministry of Water and Environment and de-concentrated structures as they improve their analytical capacities in the field of water quality assessment, especially with regard to drinking water protection.

tions and these organisations' development of basin management plans are the first steps towards continually using monitoring data for planning purposes. This approach usually takes place in pilot basins and will be implemented nationwide in the future.

5) Success factors and challenges for IWRM implementation

Success factors and challenges

An analysis of implementation processes in partner countries reveals that a lot of challenges still lie ahead in some fields that are still in their infancy in most countries, such as participatory planning processes. The development of the legal framework is a major precondition for IWRM and is rather advanced in most countries. The **participation of all important stakeholders** has proven to be a major success factor in order to increase ownership of the new water law.

The most important success factor for all implementation processes reviewed by this report seems to be the **decision-makers' political will** at the high and working level. Government officials need to actively take leadership of these processes. Therefore, it is crucial to have a shared understanding of the desired results of IWRM implementation.

It is also important that **regional government structures are part of the implementation process** and not merely confronted with the results. Otherwise, implementing IWRM has proven very difficult without regional and local authorities being on board.

In many countries, IWRM is not the only new concept; **water resources management itself is a rather new field**. Understanding water resources management as a task for government needs to be established first, before the focus can turn to integration. In this regard, it is crucial to identify real

problems and define ways of resolving them before designing institutional structures. Viewing the creation of structures as a separate objective might easily lead to an over-ambitious and not adapted approach.

The **actual use of gathered data** is a key success factor when it comes to monitoring and data management. Therefore, the ways in which this information is used for planning will determine the sustainability of improvements in monitoring.

The **principles of IWRM may contradict traditional notions of water management**, for instance with regard to the role of women. In such cases, focusing on visible results from IWRM, especially at local level, might be a rewarding strategy to demonstrate the advantages of this concept.

One major challenge with regard to the legal framework is **enforcing rules**. While most countries have high-level documents pertaining to IWRM, enforcing new rules is a major hurdle, for instance with regard to water abstraction. GIZ is significantly strengthening enforcement by supporting the development of regulations and bylaws and by advising competent organisations.

Another big challenge for many countries is the **financial sustainability** of water resources management. With abstraction fees existing only on paper in many countries, most water management organisations depend on general taxes or donor support. This is a particular problem for new basin management organisations, which often do not yet have a sustainable mode of financing.

Another difficult area when implementing IWRM is **monitoring and data management**. While the technical side of monitoring water resources traditionally receives external support, data management is often where this support stops. A culture of non-sharing makes it difficult for water resources management authorities to make informed decisions. Ineffective public sector rules and a lack of data management capacity also pose considerable challenges.



V) Lessons learned and the way forward

Though IWRM has been the dominant paradigm in the water sector for the last 20 years, its implementation is still a very recent process in most of GIZ's partner countries. A comprehensive legal framework, one of the main success factors for implementation, is often the result of years of advisory services and stakeholder dialogue. The number of very recent water laws in partner countries illustrates that IWRM reforms are actually just in their infancy. However, the goals are ambitious and involve processes of very deep institutional restructuring within partner countries.

One crucial lesson learned from this study is the huge differences in the IWRM approaches taken by different countries. Adapting the fundamental principles and designing institutional solutions tailor-made to fit the circumstances is one of the major success factors when implementing a concept that is demanding at a political and management level. In this regard, it is very important not to overburden new institutions, even if that means disregarding some IWRM principles for the time being. Developing practical IWRM implementation should be at the centre of any reform strategy. Competencies need to be designed realistically and sustainable funding needs to be provided.

The study also shows that IWRM cannot be implemented against the resistance of decision-makers. However, change processes will always trigger opposition. An important lesson learned when dealing with these conflicting statements – which are both true – is to develop a shared understanding of the direction and goals of change. Only a common vision for IWRM will ensure that politicians at different levels support

change processes and might convince authorities that they are not going to get lost in restructuring.

Most lessons learned from this study are at the basin or national level. However, IWRM is a process that puts personal participation in the centre. Therefore, supporting local structures' participation in water management can be very promising. From GIZ's experience, we know that visible results are key for water users to become involved in participatory processes. Local activities need to take this factor into consideration and find tangible benefits that water user organisations can provide to their members.

As the implementation of IWRM is still at the beginning, major challenges still need resolving. While monitoring water resources mainly depends on (financial and human) capacity – something that governments and development partners can work on – data processing and information management suffers from deeper problems. IWRM requires a high degree of coordination and data sharing, which is not in place in most countries. This is also a question of the institutional culture in many places, as data sharing between organisations or departments had never been a high priority.

Another challenge will be putting in place sustainable modes of financing for new management bodies at basin or local level. Support from governments and development partners remains vital as these organisations are still in their start-up phase. However, self-sustaining modes of financing water resources management will need to be identified in the future, as competencies are only half as effective without the necessary financial resources.

Stakeholder discussing water management in Yemen



Annex 1: Overview of countries and GIZ programm

	Benin	Burundi
Water management at national level	The water sector is in the process of being restructured. Discussions are under way about creating new institutions (Agence National de l'Eau and a Fonds National de l'Eau).	An IWRM directorate, which is responsible for protecting and conserving water resources, was set up in December 2011. The directorate, supported by an interministerial IWRM group nominated by the Minister in February 2012, is developing IWRM in a pilot zone (200 km ²) with a focus on drinking water protection.
Basin management	Basin WRM structures are not yet in place, but planned: - River basin committees - Agences de bassin	No basin management
Water management at local level	Some voluntary sub-basin groups have been formed, always with external incentives (NGOs).	Local authority administration and water user groups are likely to play an important role in WRM in the future.
Legal framework	2010 Water Law based on IWRM principles Politique National de l'Eau of 2009	The Water Law (Code de l'Eau) passed the senate in April 2012. A technical committee has recently elaborated supplementary regulations (for example on protection zones).
Planning process	The National IWRM Action Plan (PANGIRE) defines the implementation of IWRM	The national water strategy's action plan provides a basic orientation for IWRM implementation. A sub-catchment IWRM action plan has been designed for the IWRM pilot zone in a participatory process involving local stakeholders.
Financing WRM	General budget and donors	State budget and donors
Monitoring and data management	Considerable investments in groundwater monitoring in recent years; however, data processing is a challenge	A high technical level of monitoring; data processing is a challenge
Focus of GIZ programmes with regard to IWRM	<p>Institutional and organisational advice at national level Capacity development:</p> <ul style="list-style-type: none"> → organisational development at a central level (Ministry/DG-Eau) → advising participatory structures at a central level (National Water Council), assisting decentralisation (IWRM planning with local authorities) <p>Thematic areas of activity:</p> <ul style="list-style-type: none"> → advise on strategic water sector planning based on IWRM (programme-based approach) → defining key IWRM work processes for public administration → advice on the legal and institutional framework (also aspects of licensing and control) → advice on local IWRM approaches → prospective study on urban drinking water supply → update the hydrogeological map of Benin → foster transboundary WRM (in cooperation with ABN) 	<p>The programme advises on integrating IWRM elements at a policy level for the national water strategy and national poverty reduction strategy (the advice being to scale down their ambitions).</p> <p>The programme is accompanying the development of an IWRM approach applied to precarious drinking water protection in a pilot zone.</p>

Kenya

The Water Resources Management Authority (WRMA) is responsible for monitoring surface water and groundwater resources, the protection (water quality), development and conservation of water resources, but also for transparent water allocation in order to avoid conflicts.

Six regions based on drainage basins from major rivers in Kenya. Each region is sub-divided into sub-regions based on the density of the hydrological network and geography (25 nationwide).

Water resources user associations (WRUA) are implementing catchment management plans at their level; sub-catchments areas vary from approximately 150 to 200 km².

The Water Act of 2002 (presently under revision due to the new constitution) defines the WRMA's existence, roles and responsibilities. The 2007 Water Rules define the obligations of the water users and dischargers.

National water resources management strategy (an updated version for 2012-2016 will probably available in the coming months).

National water quality strategy

Catchment management strategies for all basins

Sub-catchment management plans, developed by the WRUA in a participatory process, provide a local implementation plan (included activities and budget).

General budget and donors, especially for WRUAs

The project intervenes at national level, supports three of the six basins and supports the realisation and implementation of SCMPs in 16 sub-catchments.

Capacity development:

Reforming the WRMA to adapt it to new constitution, make basins more autonomous, create multisectoral coordination structures, avoid overlaps in its mandate with other institutions, improve stakeholder participation, create a performance report (a good tool to communicate to the public and stimulate transparency and "competition" and good governance within the institution) and create an IWRM regulator, for instance, support national policies and strategies and continuous advice at basin level (e.g. data management)

Namibia

The Ministry of Agriculture, Water and Forestry has all necessary responsibilities.

The water law provides for participatory forums at a national level, but they have not been implemented yet.

Purely advisory basin committees.

Stakeholders are exchanging information, but no real decision-making has taken place yet.

Water user associations exist countrywide.

Suffers from a lack of human capacities and sometimes a lack of willingness to participate.

A water law in accordance to IWRM has been drafted, but not inaugurated

IWRM National Plan of 2011

<http://www.az.com.na/fileadmin/pdf/2012/az/Integrated-11-23-12.pdf>

Through national budget; basin management is supported by GIZ

A high technical level of monitoring; data processing is a challenge and data fragmented between institutions

Institution building and capacity development

National level:

support coordination of IWRM and basin management

→ dividing Namibia into basins and sub basins: study, workshop, agreement, application of the agreement

→ basin water information system (BWIS):

→ study, introduction of the system, training

→ website: establishment, hardware installation, selection of content, training

→ use of the government financing system: training

→ climate change: study, workshops

→ HIV/AIDS: integration into work plans

Basin level:

→ establishment and capacity development for voluntary basin management committees and government-organised basin support offices, supported by work plans and local subsidy contracts and studies.

→ establishment of water resources management plans at basin level

	Tanzania	Uganda
Water management at national level	National Water Board is advising the Ministry of Water	The Water Policy Committee (WPC) provides an avenue for promoting IWRM at national level, guides the strategic management and development of water resources and advises the Ministry of Water and Environment. The Directorate of Water Resources Management (DWRM) supports deconcentration of management functions, integration of entities and public participation.
Basin management	Water basin boards are decentralised government structures that allow for grassroots participation; they are responsible for coordination, planning, allocation and rule enforcement	Water management zones (WMZ): De-concentrated water management authorities have been established and integrated at the regional level, forming four water catchment zones covering the territory of Uganda.
Water management at local level	Catchment and sub-catchment committees and water user associations	Catchment management organisations (CMOs), such as catchment management committees (CMC) and catchment technical committees (CTC), sub-catchment and micro catchment committees, water user groups, stakeholder forums.
Legal framework	A water law based on IWRM principles exists	Water Act Cap. 152 National Water Policy 1999 WRM Reform Strategy
Planning process	Water resources management features as one of four key areas in the Water Sector Development Programme (WSDP), which is the key implementation plan for the National Water Sector Development Strategy.	A report on making catchment-based WRM operational was drawn up to support the Directorate of Water Resource Management (DWRM) in making the concept of catchment-based water resource management operational in four water management zones (WMZ).
Financing WRM	Basin management is mainly financed by the Ministry.	WRM is part of the Ministry's structure and therefore financed through the general budget. At local level, organisations are financed through member contributions, by support from local governments and development partners.
Monitoring and data management	Many monitoring stations are in bad shape and do not work properly. Basin water boards are in the process of rehabilitating them. New equipment has been bought and will be installed soon with funds from the WSDP. The accuracy of existing data is not known.	Since establishment, WMZs have had responsibility for monitoring in the different areas, while overall responsibility has remained with the DWRM at national level. Data collected in the field will continue to be processed at the headquarters for now.

Zambia

WRM is under the Ministry of Mines, Energy and Water Development. So far two institutions within the Ministry are responsible for WRM. The Water Board issues water rights for surface water abstraction, while the Department of Water Affairs is the Ministry's technical wing with divisions covering WRM, surface water and groundwater.

Under the new water act the WRMA will be responsible for water resources management while a department in the Ministry will keep the tasks of policy development and international waters.

Introduction in process. The entry into force of the Water Act on 1 October 2012 provided the institutional framework to create basin management structures. Only the first pilot user associations have been formed to date.

Two WUAs exist at local level to date. As this is a new approach for Zambia, the first activities were driven by government, for example identifying areas where WUAs would make sense. Two areas were identified mainly based on the existence of issues, such as conflicts over water and resource degradation

A water law based on IWRM principles enacted in October 2012

There are currently no updated WRM plans. An Integrated Water Resources Management and Efficiency Plan for 2008-2030 was formulated in 2008 based on an initiative by the Global

Water Partnership through the Zambian Water Partnership. This document offers a broad implementation plan. Unfortunately, this plan has not resulted in more detailed plans guiding implementation.

Financing through the general budget and water right fees

Very poor at a technical level. More and more gauging stations do not deliver data any more. Rating curves are often outdated and incoming data is processed very slowly

Egypt

WRM is still centralised. The Ministry of Water Resources and Irrigation is mainly responsible for WRM with other ministries having a say in the sector:

The Ministry of Water Resources and Irrigation (MWRI)

The Ministry of Drinking Water Sanitation Facilities

The Ministry of Agriculture and Land Reclamation (MALR)

The Ministry of State for Environmental Affairs (MoSEA) / Egyptian Environmental Affairs Agency (EEAA)

No basin management

The number of WUOs is now approaching nearly 10100, as planned. The term 'water management' means participation in decision-making processes. WUOs are mostly active in the field of irrigated agriculture at present.

There is no single overarching law governing water resources in Egypt. The main laws relevant to water resources management include irrigation and drainage laws on the one hand, and environmental protection laws on the other hand.

National water planning dates back to the 1970s. In June 2005, the Ministry presented an Integrated Water Resources Management Plan, which was prepared with technical assistance

from the World Bank, as a "transitional strategy including further reform in interventions" building on the NWRP. The plan includes 39 actions in the fields of institutional reform and strengthening, policies and legislation, physical interventions, capacity building, technological and information systems, water quality, economic and financial framework, research, raising awareness, monitoring and evaluation and transboundary cooperation. The physical interventions include improving irrigation and rural sanitation, not to mention the government's major projects that are at the heart of Egypt's present water policy.

	Morocco	Yemen
Water management at national level	The Department of Water (under the Ministry of Energy, Mining, Water and Environment)	The National Water Resources Authority (NWRA) is responsible for assessing, monitoring and planning water resources. The NWRA's main tasks are to carry out WRM including developing regulations, executing studies, planning and monitoring either by itself or in coordination with relevant stakeholders e.g. the WBC.
Basin management	Nine water basin agencies are responsible for supervising and managing all water issues in water basin areas; several watersheds are sometimes united in a single zone, aquifers are sometimes divided into several zones.	Advisory and participatory water basin committees (WBCs) represent all stakeholders in the basin.
Water management at local level	Voluntary user groups only reported in the agricultural sector or rural sanitation in douars.	Village water committees are responsible for drawing up local development plans, implementing activities and projects accordingly and monitoring water use and resources at local level. They are represented and provide WBCs with relevant information at regional level.
Legal framework	Water law since 1995	The Water Law (since 2002) and the National Water Sector Strategy and Investment Programme (NWSSIP) (since 2004) provide the legal framework including IWRM, decentralization and participation concepts.
Planning process	Strategie Nationale de l'eau (SNE) Groundwater Management Concept Water Reuse Concept	A water management plan does not exist at national level. The NWRA and WBC are elaborating water management plans for some water basins; one governorate also has local water management plans tied to regional plans. These plans are not updated and followed up on regularly due to the ongoing crisis and difficult political situation.
Financing WRM	Local user groups are self funded.	Allocations from the local budget or direct donor support.
Monitoring and data management	Basin agencies are responsible.	The NWRA is responsible for the national monitoring network. Monitoring surface water flow and water abstraction is over a small area and does not take place regularly. Groundwater levels and quality are regularly monitored in main basins, depending on funding and the security situation.
Focus of GIZ-programme	Intervention levels: National: Direction de l'EAU within MEMEE (Ministry of Energy, Mining, Water and Environment) Regional/basin: Water Basin Agencies of Tensift, Souss Massa Drâa, Oum Er R'biaocal/sub-basin) Topics: Reforming water-sector structures; enforcing groundwater protection, reusing wastewater and rainwater harvesting.	Nationwide: support for the legal framework conditions Governorate level: support for the creation of WBCs and support for existing committees as well as local coordinating networks connected with the WBC Management: Support for the elaboration of water management plans Local level: Support for the creation of village water committees, village water management plans and strengthening local actors so that they can assume responsibility.

Afghanistan

The Ministry for Energy and Water (MEW) is responsible for WRM

The Supreme Council on Water is the coordinating body between different ministries

River basin agencies and councils are currently being established and are to take over day-to-day WRM.

Traditional forms of local water management exist.

Water user organisations have been created in some areas. More organisations will be formed in the future.

A water law based on IWRM principles has been existence since 2009.

No plans have been developed yet. However master planning is currently under way at all levels (river basin and national).

General budget

These systems are currently being established. Official, governmental monitoring activities are under way alongside NGO activities. The Government is currently establishing a hydrological data centre.

Topics:

The legal framework (bylaws and regulations), data management, the National Water Master Plan, transboundary water and water protection.

Annex 2: Literature and further reading

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List of Abbreviations

ABH	Agence de Bassin Hydraulique (Morocco)	MWRI	Ministry of Water Resources and Irrigation (Egypt)
ABN	Agence du Bassin du Niger	NGO	Non Governmental Organisation
BWIS	Basin Water Information System (Namibia)	NWRA	National Water Resources Authority (Yemen)
CAWEP	Community Awareness and Woman Empowerment Programme (Yemen)	NWRC	National Water Research Center (Egypt)
CMC	Catchment Management Committee (Uganda)	NWRP	National Water Resources Plan (Egypt)
CMO	Catchment Management Organisation (Uganda)	NWSSIP	National Water Sector Strategy and Investment Programme (Yemen)
CTC	Catchment Technical Committee (Uganda)	ONEE	Office National de l'Electricite et de l'Eau Potable (Morocco)
DG-Eau	Direction Generale de l'Eau (Benin)	PANGIRE	National IWRM Action Plan (Benin)
DWRM	Directorate of Water Resources Management (Uganda)	SCMP	Sub Catchment Management Plan (Kenya)
EEAA	Egyptian Environmental Affairs Agency	SNE	Strategie Nationale de l'Eau (Morocco)
EPIC	Environmental Policy Indefinite Quantity (Egypt)	TC	Technical Cooperation
FC	Financial Cooperation	WBC	Water Basin Committee (Yemen)
GIS	Geographical Information System	WMZ	Water Management Zones (Uganda)
GIZ	Deutsche Gesellschaft für International Zusammenarbeit (GIZ) GmbH	WPAU	Water Policy Indefinite Quantity (Egypt)
IT	Information Technology	WPC	Water Policy Committee (Uganda)
IWMI	International Water Management Institute	WPUA	Water Point User Association (Namibia)
IWRM	Integrated Water Resources Management	WRM	Water Resources Management
IWRMIS	Integrated Water Resources Management Information System (Zambia)	WRMA	Water Resources Management Authority (Kenya, Zambia)
JICA	Japanese International Cooperation Agency	WRUA	Water Resources User Association (Kenya)
KfW	Kreditanstalt für Wiederaufbau	WSDP	Water Sector Development Programme (Tanzania)
MALR	Ministry of Agriculture and Land Reclamation (Egypt)	WUA	Water User Association (Zambia)
MEMEE	Ministry of Energy, Mining, Water and Environment (Morocco)	WUO	Water User Organisation (Egypt)
MEW	Ministry for Energy and Water (Afghanistan)		
MoSEA	Ministry of State for Environmental Affairs (Egypt)		
MWE	Ministry of Water and Environment (Uganda)		



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