How to finance water resources management?

Overview on ways of financing Water Resource Management structures and procedures oriented by IWRM-principles









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Abbreviations

Abbr.	Heading	Description
ABH	Agences de Bassin Hydrographique	Moroccan basin organisations
ADE	Agences de l'Eau	French basin organisations
BSO	Basin Support Officer	Civil servant on basin level (Namibia)
C SD	Commission for sustainable development	International UN-Body for development affairs
EFQM	European Foundation for Quality Management	Assessment framework for organisations
ERWR	External Renewable Water Resources	Resources from outside a given region or country
EU	European Union	
GIZ	Gesellschaft für Internationale Zusammenarbeit	German Development Cooperation (merger of GTZ, DED and InWEnt in January 2011)
IRWR	Internal Renewable Water Resources	Resources from inside a given region or country
IWRM	Integrated Water Resources Management	
JMP	Joint Monitoring Programme	WHO/UNICEF managed programme to follow up on the MDG achievements in the water sector/
MDG	Millennium Development Goals	
MEDDTL	Ministère de l'Écologie, du Développement durable, des Transports et du Logement	French Environment Ministry
MOWAGO	Model of Water Governance	Impact oriented model for Water Management
SDAGE	Schéma Directeur d'Aménagement et de Gestion des Eaux	French term for the watershed management plans
TRWR	Total Renewable Water Resources	Sum of internal and external renewable water resources in a given region or country
WFD	Water Framework Directive	European Water Management Directive
WR	Water Resources	
WRM	Water Resources Management	
WSS	Water Supply and Sanitation	

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1. Preface

This document is about *Integrated Water Resources Management* (IWRM) and about how to finance those structures dealing with water resources management. It is not about financing investments and operations of water services such as water supply or irrigation. The motivation for this report lies in the fact that as an interpretation of the second Dublin principle (see Box 1 for reference) several countries proceeded to establish decentralised and participatory organisational structures for water management. In many cases these structures are financed through external means, mainly from development partners[1]. Under development criteria this is seen as contradictory to organisational sustainability because such structures run the risk of disappearance with the end of external financing. The purpose of this report is to clarify aspects of water resource management structures and to present proposals of financing structures for water resource management in specific selected country contexts.

Box 1: The Dublin Principles

1. Water is a limited and vulnerable resource, necessary for life, development and the environment
2. The development and the management of water should be based on a participatory approach, including users, planners and politicians at every level
3. Women are at the centre of the process of water supply, water management and water conservation.
4. For all these - mostly competing - usages, water has an economic dimension. Therefore water has to be considered as well as an economic resource.

GIZ is very much engaged in the water sector. Water policy advisory services are in the focus of several GIZ projects. Since IWRM started influencing the water policy sector, IWRM constitutes the overall framework for GIZ's capacity development programmes in the water sector.

Having made numerous experiences in this context, there are still a lot of open questions. This report targets the needs of water sector advisory projects by describing experiences

[1] The 4th Dublin principle referring to the 'economic dimension' of water is being interpreted to the fact that water is and costs money, causing a widespread discussion about privatising water services. This article however is not referring to this aspect.

about water resources management structures and their financing mechanisms from developing and developed countries alike. The report wants to contribute to a fruitful and target oriented discussion on what works and what doesn't in water resources management and its' financing.

2. Introduction

2.1. IWRM or WRM, this is the question!

To start with, we need to define something that is well known to everybody in the water sector: IWRM. IWRM as defined in the Dublin principles of 1992 has dominated the discussion around water policies since then. It's nowadays the uncontested answer for the management of the water sector as a whole. But this raises questions: To the water sector as a whole? So what was the original problem that was to be solved with the help of the Dublin principles which are the underlying principles of IWRM? There are people who argue that IWRM gives answers but has forgotten about what the problem was. Is it about improving water resources or water services or both?

In order not to leave the reader in the dark about what this paper is about, the following definitions are presented as they are going to be used in this paper, before we discuss some of the critiques surrounding IWRM in chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Figure 1 shows how water uses and water resources management are organised by **water legislation and regulation** of a country, The nowadays widely used term of **Water Governance** defines the framework of institutionalised mechanisms and procedures (e.g. laws, norms, standards, administrative processes etc.) which set the for management activities and decisions in the water sector. The whole water sector as it is defined in this paper is composed of the two elements: **water resources management** and **water use/services.** Water Services Management covers those management functions that aim to ensure technically and financially the delivery of water in the right quantity and quality, at the right location and time for different purposes such as drinking water and irrigation services. In this paper, water uses are thus understood as a function that 'is 'subordinate' to water resources management. However, water use efficiency – and thus also demand management – is part of policy decisions of the respective administration within water resources management. To avoid confusion this is not presented as such in the figure but should be kept in mind.

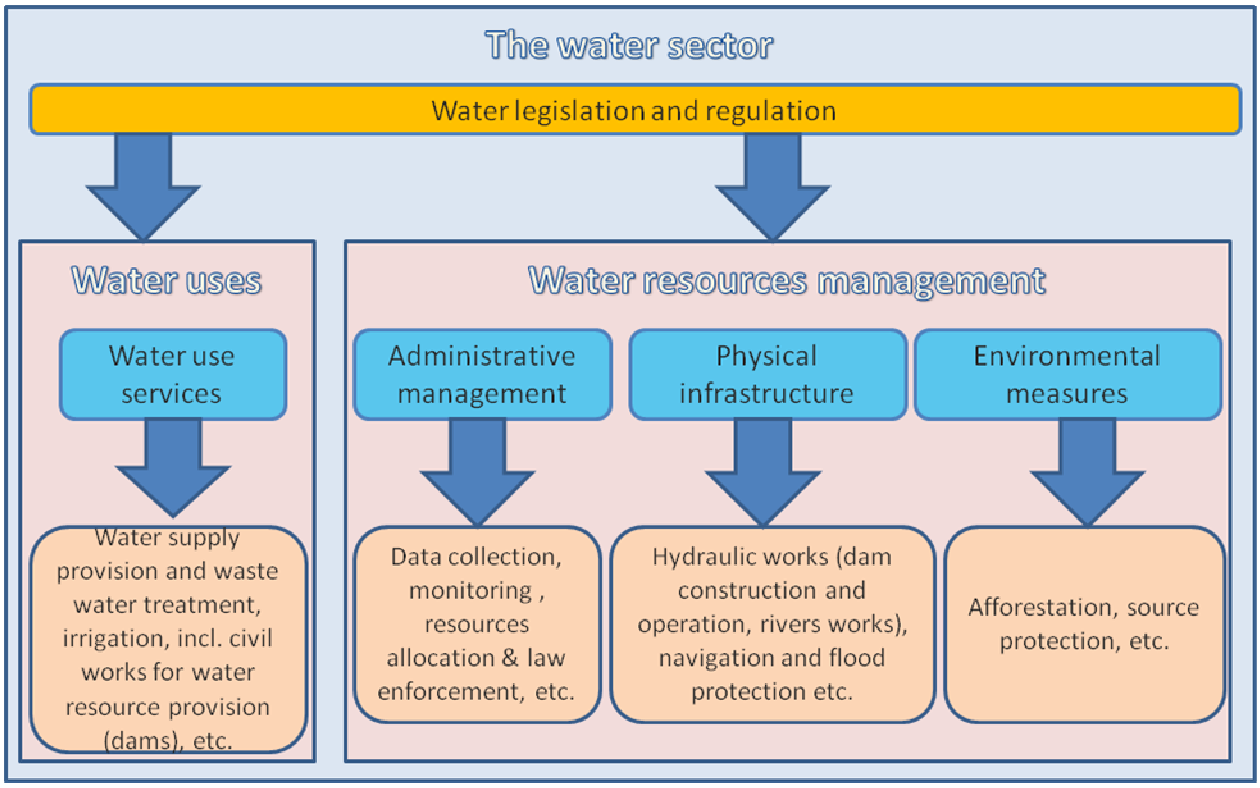

Figure 1: The water sector chart. (Own depiction from the author)

This document defines **Water Resources Management** as a series of activities envisaging to protect water resources, to guarantee equitable access of today's and future generations' needs and ecosystems thereto as well as to grant access for different water uses.

The importance of dealing carefully with the available resources in a country differs widely and depends to a high extent on the availability of renewable resources as well as the population density. Table 1 shows the m^3/per capita availability of renewable fresh water resources of all the countries mentioned in this report, split up into internal and external sources.

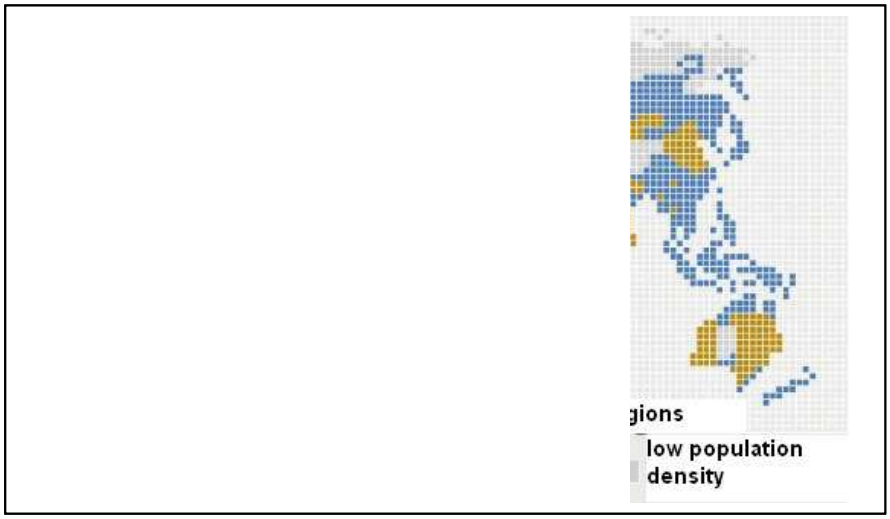

Figure 2: World water shortages and population densities

The dependency ratio gives a hint on the importance of external as compared to total resources.

	Population (2008)	Renewable water fresh availability			Dependency ratio	Specific renewable total fresh water availability
		Internal	External	Total		
Unit	(Mio)	(km^3)	(km^3)	(km^3)	%	(m^3/cap/year)
Benin	8,6	10,3	16,1	26,4	61, 0%	3.069
France	62,0	200,0	11,0	211,0	5,2%	3.401
Germany	82,3	107,0	47,0	154,0	30,5%	1.872
Kenya	38,8	20,7	10,0	30,7	32,6%	792
Morocco	31,6	29,0	0,0	29,0	0,0%	918
Namibia[2]	2,1	6,2	11,6	17,7	65,2%	8.319
Yemen	22,9	2,1	0,0	2,1	0,0%	92
Zambia	12,6	80,2	25,0	105,2	23,8%	8.336

Table 1: Specific water availability in selected countries (Source FAO Aquastat 2008)

Inte*grated Water Resources Management* *(IWRM)* is definitely the best known response to water challenges during the past decade focusing on a common management of the different water uses, including for the environment. There is a variety of IWRM definitions but many of them include similar features, such as being a response to the much-criticized, sector-approach to water management (irrigation, energy, etc.), highlighting instead the benefits that an integrated, overall approach to water management, preferably on water basin level, can deliver. The definition that is most often quoted at present is the one that was formulated by the Global Water Partnership (2000), which defined IWRM as "a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."

In many contexts IWRM approaches and activities do not differentiate between water resources and water services management. Talking to IWRM activists, this even seems to be one of the advantages of IWRM not to differentiate between these two but instead integrating them into one concept, which finally justifies the name 'integrated'. This paper suggests that the two sectors of water services and water resources management, understood in the light of the aforementioned definition as the 'use' and the 'protection' of water are actually having opposing interests that are difficult to harmonise. The focus of this paper clearly lies on water resources management, regarding water services management as a task which is subordinate to the former.

[2] Due to unequal distribution of the population and water resources respectively there are water scarce and water abundant regions in Namibia.

2.2. Financing IWRM: a forgotten aspect?

Since the creation of the Dublin principles IWRM has been discussed about a lot. Those discussions are mainly about how to define IWRM[3]. Van Concerning the financing of IWRM approaches or structures, analysing several practical experiences of applying the principles of IWRM provides little information about how to finance related structures and processes. As participatory aspects are very much in the centre of IWRM approaches, it could be understood that relevant processes and structures should be financed by the users directly or as part of their in kind contribution. Since IWRM processes and related structures are becoming more and more real in many countries, it appears to be high time to talk about their financing.

For the purpose of this report we define IWRM as a process that finally aims at sustainable water management. Water uses management is of course linked to the management of water resources, but we concentrate on what is necessary to guarantee that these water uses are occurring in a sound administrative environment of long-term management of water resources. The central question that is tackled in this report is how this link can be established and which mechanisms of financing water resources management exist and what is potentially feasible in specific cultural or political contexts.

3. Existing financing mechanisms of water resources management

3.1. What is to be financed?

The costs that are linked to **Water Resources Management** are to a large extend of administrative nature such as personnel costs, running offices, financing campaigns, collection and acquisition of hydrological data etc. They are targeting the development of policies and regulations, monitoring and enforcement of such regulations, named here ‘administrative management (Figures 1 and 5, 6, 7). This relates very much to official administration. In literature and common understanding there is no clear-cut distinction between financing water resources management and financing water uses management. Making water resources available for uses through dams or other civil works is part of water uses / services, but such infrastructure might also serve the purpose of resource management for flood protection of ecologic purposes. The costs of such water resources management may therefore as well be for physical measures, externalised to general monetary contributions in water resource management such as afforestation, reestablishment of ecosystems such as rivers or wetlands, or any other measure to improve water resources quality or quantity. Especially in dry areas measures to stabilise the water table, for instance through enhanced infiltration, play a very prominent role here.

[3] See Allan 2003), Van der Zaag 2005 and Merrey 2005 for IWRM definition and discussion.

3.2. Sources for financing water management

To finance these tasks there are different sources. It can – as in most cases, where water resources are managed by official administrative bodies- be done through **general taxes** paid by any citizen. The money goes directly to the treasury and is spent according to existing administrative procedures in a country. Another form of financing this is collecting **water charges** that are mostly linked to water related activities such as abstraction, pollution or non-consumptive use. These water charges can be raised by adding a specific sum or percentage to water service bills such as drinking water consumption, waste water treatment, water for irrigation but as well non-consumptive production activities (e.g. power generation). Pollution caused by industries or farmers can be a source of such water charges as well. If these charges go to separate accounts and are solely used for aiming at water resource protection they are called **earmarked charges** to differentiate them from **general taxes**. Earmarked water charges are in practical terms one form of the 'user-pays' or 'polluter-pays' principle. As a form to keep costs for such measures bearable to single users who want to undertake water protection measures, funds created by such charges can be used to subsidise them.

Just for the sake of completeness: The payment for water services (using water for drinking or irrigation purposes) are defined in this study as **fees** that are collected to pay for the costs of these services. They are unlike **water charges** mentioned above directly linked to the costs for enabling this service provision for example by paying for raw water, electricity, investments and their financing costs, personnel etc. In the common understanding the user pays principle applies as well here. The user shall pay for the service he/she gets. Since in many countries tariffs are not high enough to cover the long-term production costs of a service, costs are in this case 'externalised' to the general public (if the service is subsidised by governments or donors) or to future users that have to pay for repairing or replacing run down installations if the necessary maintenance and repairs were not met, neither through sufficiently high tariffs nor subsidies from anywhere. Even in the case that tariffs for services allow for full-cost recovery, supplementary 'ecological charges' added to the water services bill (see above) are rare. They are envisaged to compensate for or to avoid the possible ecological damage caused by the water service through e.g. withdrawal or pollution. At the same time they cater for possible administrative costs that are incurred by organisations that administer such funds. The French *Agences de l'eau* (ADE) are a very prominent example of such an ecological bank-type organisation.

3.3. Policy options to trigger behaviour

Beside the different ways of financing water management through charges or taxes another aspect of governing water is important. It is the way behaviour change of water users is triggered. The author has identified three main types that will be used in this study in the way described below. These three ones are schematically displayed in Figure 4, with the

extremes, 'regulation-based', '(dis)incentive based' and 'knowledge-attitude-practice based' approaches[4], that and their implication for financing water resources are described as follows:

The **regulation based approach**. It means that access to water resources is in the first place based on regulations and enforcement. This water management is considered a government task who is their custodian and the access to it consequently subject to laws, by-laws and so on. Users have to adhere, otherwise they will be fined. This regulatory approach is a strict one and does not allow water users much say. Typically the use of a certain quantity of water in a specific location is requested from the relevant authorities. In accordance with the quantitatively and qualitatively available resources a permission of using the water is granted or not. A precondition to make this system work is a water law spelling out clear principles, a regulatory framework down to the single user and a functional water administration acting as water police, which has to be independent from water users in order to avoid conflicts of interest. A typical example for this approach is found in Germany. Since this is purely a government based approach, countries that follow – possibly in combination with the other approaches mentioned-this approach are financing their water management mainly through general taxes.

The **(dis)incentive approach** is the second one. Incentives, mainly monetary ones can trigger behaviour very strictly by making unwanted behaviour more expensive. This approach tries to manage water resources by making abstraction and pollution expensive while rewarding water saving or less polluting water uses monetarily. Application of more cost efficient water uses and cleaner water based production therefore gains monetary attractiveness which in turn effectively influences individual, industrial and political water related decision-making. It reflects the polluter-pays or users pays-principle presented in the fourth Dublin Principle.

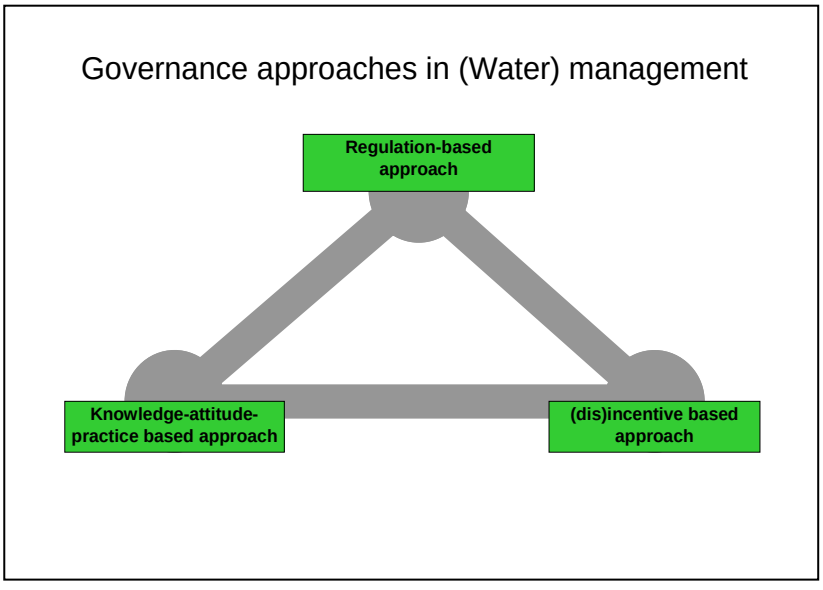

Figure 3: The governance approaches triangle (own depiction from the author)

[4] In praxis, a mix of all approaches is always applied. Differences between countries are characterized by tendencies to one extreme of the triangle or another.

The incentive based approach plays an important role in the French system and those that are influenced by it. Abstraction and pollution charges on service fees are a usual form of this incentive approach. The funds accumulated can be earmarked for the improvement of water quantity and quality or as a subsidy for water services and constitute herewith an important source of financing water resources management.

The knowledge–attitude-practice based approach is number three: This approach targets a comprehensive and well informed stakeholder society that takes water related decision on water bodies they are using. The synonym for this is the participatory approach that is reflected in the second Dublin Principle. Participation leading to well informed decision taking is widely believed to be a key to good water resources management and therefore appears as a cornerstone in most IWRM approaches. To achieve positive results with this approach, funds must be secured e.g. for campaigns. They may come from general taxes or from earmarked ecological charges.

But first let's go to some examples of WRM and how it is financed in selected countries other than those for the case study. All of them have been influenced by the IWRM discussion in some way, but how this was put in place differs widely.

In order to compare the flow of funds for financing the water sector in the three countries described below the following general structure in Figure 5 works as a basis.

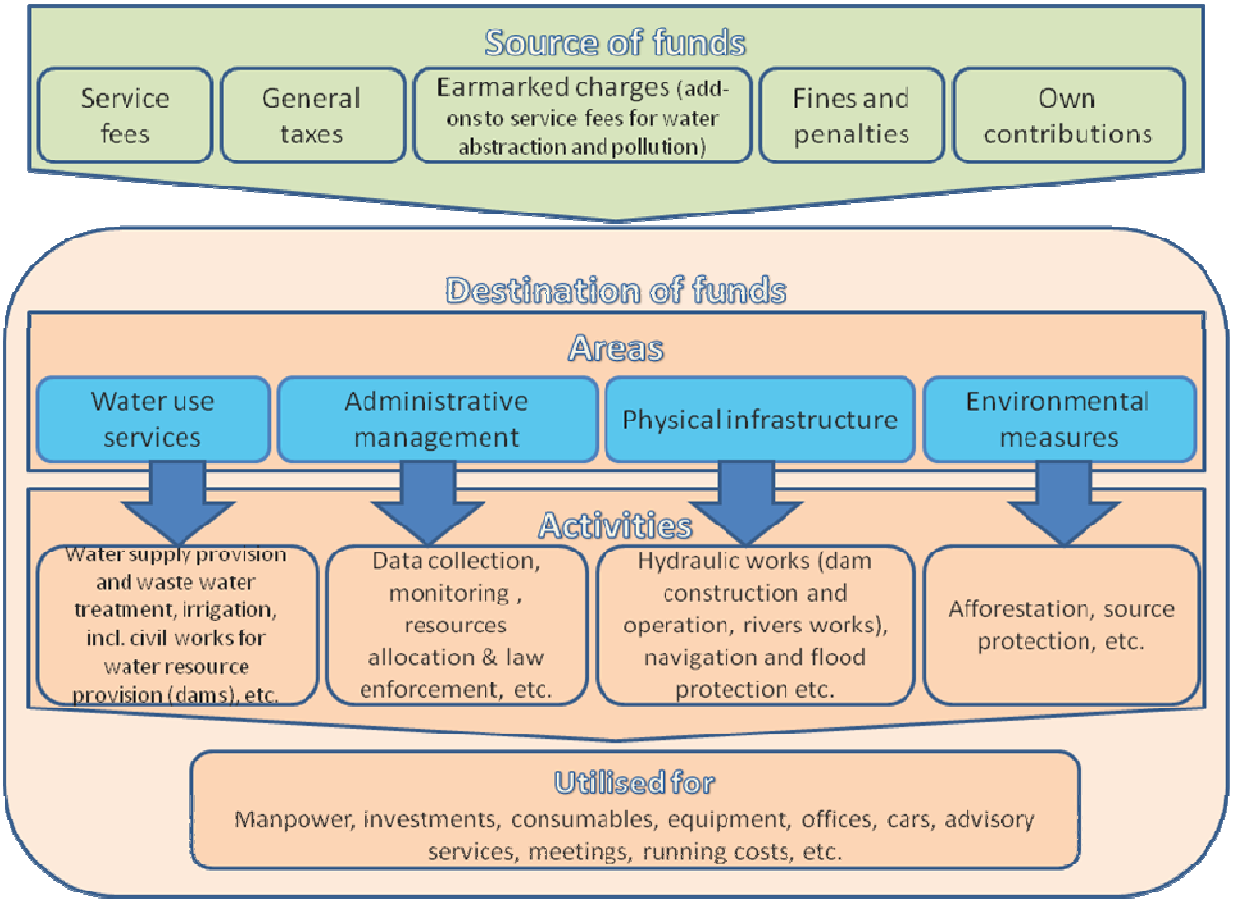

Figure 4: Overview on all possible finance flows (sources and destinations) in the water sector (own depiction from the author)

It covers all areas of water management, water services and water management alike. Figures 6, 7 and 8 in the next chapter depict the specific flow of funds in the countries presented.

3.4. Selected facts of current main models of financing water resources management

Morocco has embarked with a very ambitious restructuring of its water sector through a la law passed in 1995. River basin organisations were set up in the main 7 river basin districts, which are basically financed like any other administrative body. They replaced an administrative structure which was decentralized on every administrative level. These *Agences des bassins hydrographiques* (ABH) have two functions which have a good chance to contradict one another. To ensure access to water resources for all Moroccans, regulatory functions have to be executed by the ABH, such as issuing permits for the water users. At the same time the ABHs uses participatory approaches to convince mainly farmers of using water more efficiently. This means that the same organisation has regulatory and conscience-building functions. Under a professional point of view, it must appear difficult to combine these two functions in the same institution. Moreover the following fact shows the conflict between the approaches: In the ABH Souss-Massa in the south of Morocco, a 'framework convention' has been developed since 2005, which was signed by several stakeholders, including main farmers and public administration. The framework was a combination of water demand-oriented and water supply-oriented measures laid down in six specific conventions. Parts of the activities envisaged in these specific conventions derived from the framework, should be financed through water user fees. The activities are water demand-oriented such as subsidizing conversion to drip irrigation but at the same time are envisaged to finance law enforcement costs, such as cars for the water police and personnel. While the first was easily welcomed by the farmers for the latter this wasn't the case. The farmers argued understandably that it is not in their interest to contribute directly to finance enforcement functions which are targeting themselves. One of the big problems in the basin are illegal groundwater abstractions, illegal bore holes and unknown volumes abstracted from the ground for irrigation purpose and the ABH did not have enough resources to undertake control measures. The ABH are herewith collecting funds for financing tasks that practically are part of their administrative duties. Another problem is the lack of power of the ABH to enforce regulations on powerful and political well connected Farmers.

This called another player on the plan. The finance ministry started being reluctant to financing the administrative costs of the ABHs, since they are collecting charges on their own.

Both the old and the new water resources management system in Morocco is to a large extent financed by public means or general taxes. Fees for licences and charges for abstraction are minimal because the laws specified very low rates in order not to upset users,

mainly large irrigation farmers. Not all of the ABHs apply them, only if a comprehensive plan exists. As example for such a plan details are given for the ABH Souss Massa framework convention, agreed upon between big water users, the regional government and the ABH Souss-Massa. The charges collected are foreseen to finance subsidies for higher efficient water use-options in irrigation, to contribute to research and studies and public water saving campaigns but as well to finance law enforcement actions such as the equipment of the water police of the ABH, causing the above mentioned widespread rejection among the farmers. Figure 6 presents the flow of financing in the Moroccan water sector. It shows that the water administration and the ABH are financed through general taxes and parts of the ABHs' activities through earmarked charges from water abstraction for irrigation and water supply. The central water administration is mainly responsible for physical infrastructure for water management but as well for water services. Meanwhile environmental measures are mainly a task of the ABH, which also manage the access to water resources (administrative management).

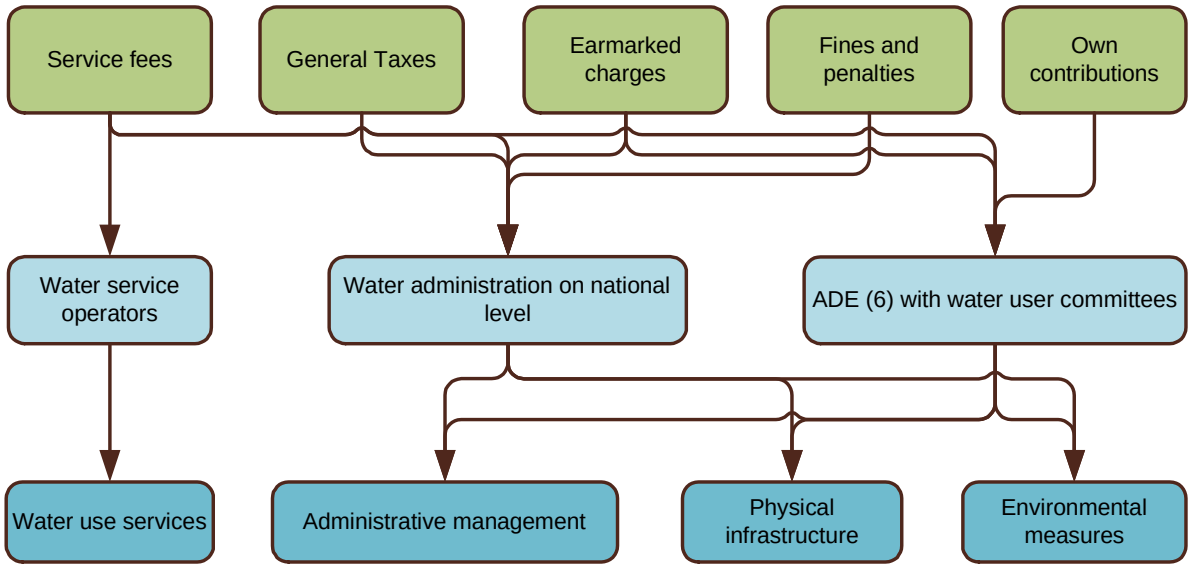

Figure 5: Financing water management in Morocco

With its administrative water sector reform, Morocco has embarked on a very ambitious way of water resource management. The ABH have a clear role of being the mandatory custodian of the water resources in the country. But by mixing enforcement tasks and participatory financing instruments, the system is running into trouble of being less effective than theoretically possible. The ABH are in the middle of state administration tasks and non-government-organisations like activities which seem to be difficult to harmonise. The result is not surprising: The ABHs are in addition torn apart between water demand and water supply oriented management of water resources. And since big water users – mainly farmers and tourism - industries have a strong lobby, improving water use efficiency works mainly on incentive based measures through earmarked charges. However, these are insignificantly

low up to now and the ABH Souss Massa struggled hard in recent years to raise them. The big water users remain sceptical about their intention and are deeply critical towards them. Under these conditions, law enforcement by the ABH seems almost unfeasible. The ABH do not have the necessary strength to push decisions through against farmers that are well linked to politics.

France is considered the motherland of watershed orientation, the monetary incentive approach and user participation, which are key elements of the IWRM-approach. The *Agences de l'eau* (ADE) play a key role in this administrative set-up and many non-French observers believe, that they are solely responsible for water management in France, while in reality the *ADE* do not have any regulatory functions but play an advisory role in preparing watershed management plans (=SAGE at water body level, and SDAGE at hydrographical district level), that have to be approved by the water administration. The ADEs are the executive of the 'water parliaments', the basin committees that adopt the SDAGEs but the ADE support their implementation after agreement from the administration. The funds for that and the administrative costs come from the users through levies applied to their water and waste water bills (earmarked charges). Industrial premises not connected to public WSS also pay according to their water consumption and the amount and quality of water discharged into the hydraulic cycle. The critical aspect of this 'participatory' approach, where the users prepare the hydraulic plans according to their needs and the availability of funds, is that they are mainly oriented by their individual interests but only in second place by environmental needs, which play the role of a 'side-effect' of the planned measures. The criticism by environmental economists was therefore that the French system is too much funds- and too little results-oriented and that it focuses too much on end-of-pipe technology solutions, and not enough on sustainability visions. This was the centre of an argument between the Ministry of Environment and the ADE in the late 90's.

The ADEs do not grant water abstraction permissions or fine pollutions. This is a duty of the state represented in the relevant institutions of the Ministry of Environment or other delegated Ministries on national, regional and county (*département*) level. The so called 'water and aquatic environment police' is an expression of a function jointly performed by different administrative bodies on several levels to control the respect of norms and laws.

1964, when the 6 ADE were created, was a very early moment for environmental conscience in Europe. The green movement only started in the developed countries in the 80's and until now remained quite weak in France. It appears that the creation of the *ADE* was also motivated by the conviction, that a strict regulatory approach as developed at the same time in neighbouring Germany would have little chance to be effective. Actually the founders of the ADE were probably right in this respect and it is no question that the *Agences* were and are quite successful, although only many years after their creation in the 80's, when industries and WSS services started understanding the positive monetary aspects of water

abstraction and pollution charges for their own interest: getting subsidies and zero-interest loans for their investments. Measures financed are to improve on quantity and quality of water but were for the reason given above mainly funds-oriented. The fact that over the years the *ADE* collected increasingly more funds created some kind of jealousy of the French *Ministère de l'Écologie, du Développement durable, des Transports et du Logement* (MEDDTL) suffering from a reduced role in water police and management. The conflict escalated when the French state had to align to the result oriented Water Framework Directive (WFD) brought on the way by the EU in the late 90's. In the light of the success of the *Agences,* the French government was not able to develop stronger regulatory structures, although since the water law of 1992, the state is the custodian for water resources. The conflict between funds oriented and result oriented approach in the French water set-up is not really solved up to now. This deficit is one of the driving forces of reforms, which the MEDDTL in France was pushing through in the system of *ADE*. The main points of the ministry are unsurprisingly a too strong monetary orientation with too weak result orientation of the *Agences*. In the light of the European Water Framework Directive (WFD) it was difficult for the French government to enforce specific activities leading to results the government adhered to vis-à-vis the EU through their incentive oriented water management system of the ADE which were not obviously leading to defined results. However, the ADE are in fact easy scapegoats for the MEDDTL and the prefects who are in charge of policy implementation and enforcement. For instance, France was condemned by the EU court of justice for delays in implementing the *Urban Waste Water Directive*. The ADE have no power to force mayors to build or modernize sewage works, so they had unspent money in particular at the eve of municipal elections, since mayors did not want to invest and increase water prices. Yet it is the ADE which were blamed by media and interested politicians.

A case in Brittany around 1997 (city of Guingamp) gave an excellent example of the linkages between user interests and government obligations: Local members of a consumer NGO had complained to the mayor of a mid-size town about the high content of Nitrate in their drinking water. This was due to high liquid manure application on the agriculture land by local farmers, and above all to inappropriate manure treatment which led to river pollution. The mayor passed the claim on to the private water supply company, which was condemned to pay compensation for the cost of buying bottled water in the supermarket. The company then sued the state for not doing enough to keep water resources clean by enforcing existing regulations. In the following trial the state was charged to pay a compensation to the company of about 400.000 € because the judges found the state guilty of not enforcing its own regulation (on pollution from industrial poultry farms). This case was presented in a newsletter from the MEDDTL under the title: '*The Ministry was charged for not being listened to'*. From a regulatory point of view it seems difficult to understand, that the state does not have means of "*being listened to*". One could argue that the successful development of the ADE in France might have weakened the 'official' water administration from within the

Ministry of Environment. Issuing permits and other regulatory functions are still duties of French administration but are poorly carried out due to weak staff or delegation of such tasks to other than environmental departments. In fact, the *Agences de l'eau* were not initially set up to deal with non point source pollution, and still today they levy very little money on farmers, even on pig factories which are in the same category as heavy polluting industry. It is then difficult for the *Agences* to spend a lot of their budgets on non-contributors, and they might even be blamed by government for doing it. In the end, farmers associations are very powerful and well protected by the ministry of Agriculture; it is the difficult for the environmental administration to obtain significant changes. In particular, *Agences de l'eau* even have difficulties to find rural partners to spend the small budgets they want to devote to diffuse groundwater pollution control.

As explained above, the financing of water resources management in France is split in two. On the one hand is the official water administration financed through the general treasury, on the other hand are investments and operations, while the administrative costs of the ADE are financed through user charges on water abstraction and pollution. This is a distinction as compared to the two other models of Morocco and Germany presented in this report and laid down in Figure 7. It shows that the water administration is responsible for water allocation and afore defined physical structures of water resources management and the ADEs for undertaking environmental measures including through the provision of subsidies for water use services. Own contributions come from water users for their participation in water basin committees. Earmarked charges play a very prominent role in the water sector of France since they amount to up to 20 % of the water and waste water bills of users. These funds also finance the administration of the ADEs.

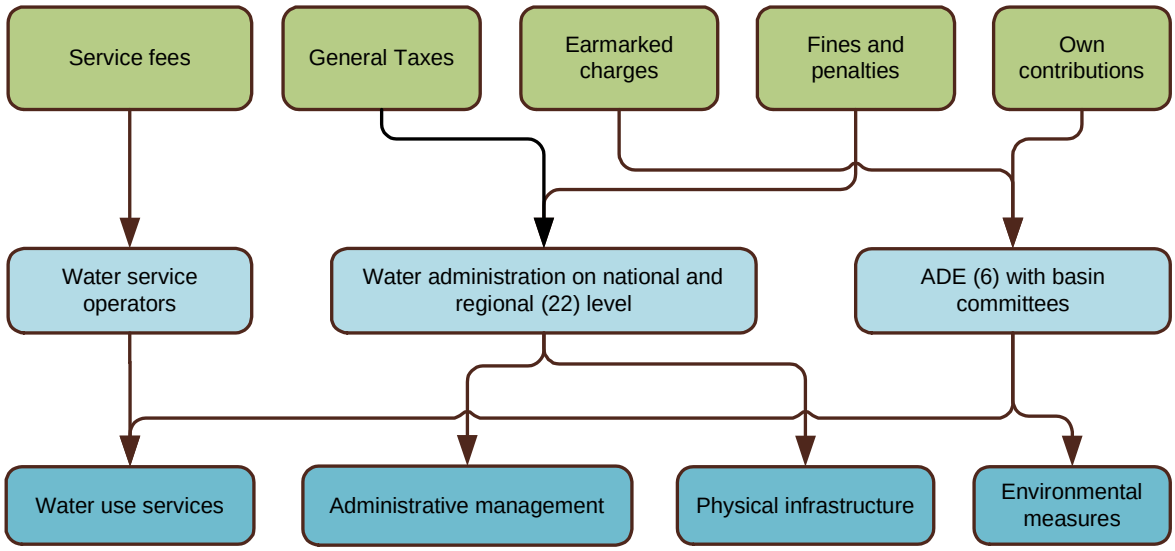

Figure 6: Financing water management in France

In **Germany** up to now water resource management is mainly based on a regulatory approach. The WFD has provoked some changes mainly with regard to consumer participation in water management. The demand of the WFD to manage water by basins did not alter he administrative set-up significantly. In the opinion of the international water community Germany is thus not following IWRM and holding on to an obsolete water resources management system. To go into detail here some specificities:

The policy framework is the German Water Law (= 'Wasserhaushaltsgesetz'), which summarises water management under a "precautionary principle" (= 'Daseinsvorsorge'"). This national law is due to federal structure of Germany transferred into State (='Länder') laws and executed through regional and local government departments. Due to the administrative boundaries there is only a workgroup based watershed orientation in German water management ensuring an inter-administrative management within waterbasins in order to satisfy the WFD requirements. Nevertheless, there are in parallel several forms of watershed organisations in form of river basin associations dealing mainly with water production, irrigation but as well water supply and waste water treatment. Some of these organisations date from the beginning of the last century. Meanwhile some of these associations undertake activities which are considered to be sovereign ('hoheitlich') as for example waste water treatment (contrary to drinking water supply!), the regulatory function of granting permits for water abstraction, collecting fees for groundwater abstraction or pollution, is a task of the state organisations.

Since water resources management is done through official administration it is financed to 100% through taxes. With this approach, water resources management and ecological costs are completely 'externalised', say financed from outside the water sector. Typical costs are those mentioned in Chapter 3.1 but as well all the costs related to participatory planning activities that follow German regulations (= 'Planfeststellungsverfahren') or newer ones introduced through the WFD, which are believed to increase the bills of the administration for participatory measures.

In order to keep costs equitable, a cross subsidy mechanism ('Länderfinanzausgleich') applies between the richer and poorer states.

Beside the 'externalised' financing mechanism for water resources management, a waste water charge was introduced on federal level but managed through the governments of the states, which is paid through the waste water fees of the users, and has to be sufficient to cover the service costs. These funds are used for any improvements of water quality, threatened by waste water discharge, such as improvement of waste water treatment plants. One way of reducing Nitrate brought into the soil by agricultural activities is to offer farmers compensation for the loss of production by using fewer fertilizers. The thereto necessary funds can be paid for from waste water charges. It is obvious that this mechanism is beneficiary for the water quality in rivers, but puts the *polluter-pays* principle actually upside

down, because the polluter is paid to reduce pollution and not paying because of the pollution he causes. The same mechanism exists in the drinking water sector but is paid for directly through the fees of the users.

Some states – not all since this is not based on a federal law unlike waste water charges - have introduced earmarked groundwater abstraction charges which differ widely from state to state in quantity and use. The mains uses are to finance measures to protect groundwater and enhance infiltration of rain water, other ecological measures, awareness campaigns, subsidies of water saving devices and removal of toxic waste and soil stemming from former industries.

German regulation does not allow using these funds from waste or groundwater abstraction charges for any 'official' water resource management activity, which sometimes causes intense discussion on the level of administration on what is seen as an official task and what is additional.

Another form of earmarked charge in Germany is the ‚ecological charge' (='Naturschutzabgabe'), that has to be paid by anyone using soil for measures that are withdrawing it from nature. These are mainly building activities. The funds are used to compensate the loss of nature by investing in natural protection in the wider sense such as measures to restore nature.

The German and French systems are actually quite similar on paper, with similar mechanisms and similar ecological visions. The state is the custodian of water resources and has to manage its allocation. The difference is only that this administrative task is done in both countries with complete different resoluteness. The biggest difference however is that the 'earmarked charges' are drastically lower than the budget of the official administration in Germany. Many *Länder* actually abolished raw water abstraction fees completely, while charges on waste water are compulsory by federal law. These are used to subsidise investments in waste water treatment. Figure 8 depicts the situation in Germany: Water allocation (administrative management) is strictly done by the administration, meanwhile private service operators or water associations undertake several services in water uses and water resources management. Special cases are the water associations in the state of North-Rhinewestphalia which are set up quite similar to the French ADEs. They manage water resources under quantity and quality aspects for their members who are mainly the communes who use the water to provide drinking water services and manage waste water services for the population.

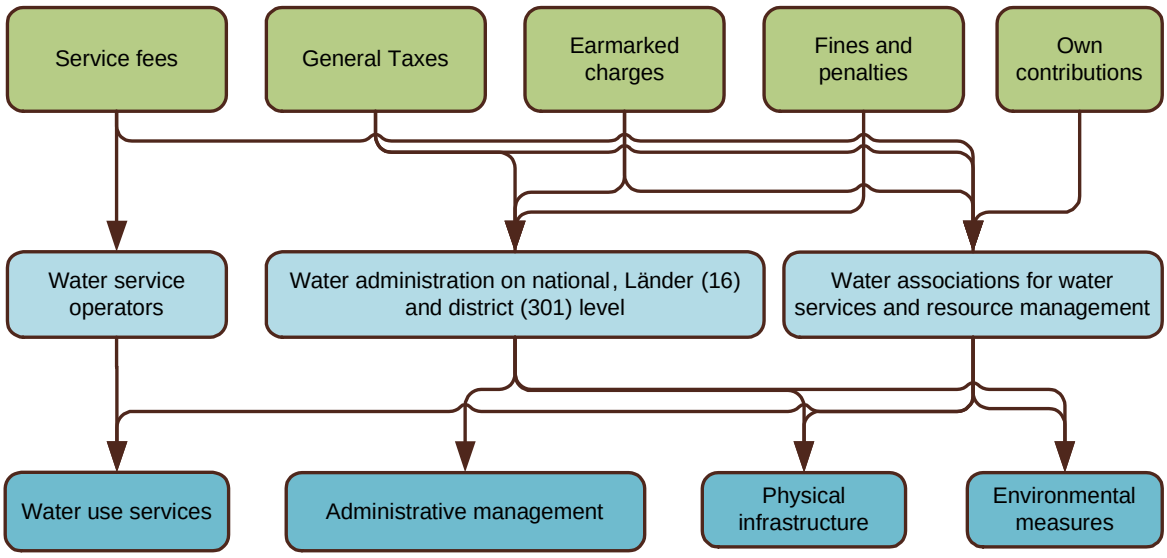

Figure 7: Financing water management in Germany

The WFD actually puts a target to water resources management by defining that all water resources in European countries have to be of good quality. In the light of the systems of France and German explained before, it is evident that it is more difficult for France to satisfy this requirement. Another new development with regard to the WFD for all European states is the consideration of ecological and resource costs in charges or fees. This constitutes a real challenge since the value of nature or the loss of it is not known in many countries. Beside the fact that is currently in discussion how to value trees, wetlands, lakes or forests it is not clear, how these charges will be collected and whether they are part of the fees or must be considered as ecological charges.

3.5. Critical assessment of main financing features (charges and taxes)

We have seen in the chapters before that there are substantial differences between what has to be paid for service delivery (water fees) and for managing water resources (charges or taxes).

To remain within the main topic of this paper, we concentrate in this assessment on charges and taxes for water resources management.

Taxes are mainly used for financing administration. This implies that the amount of taxes collected must be sufficient to cover the tasks attributed to the relevant administration. As the example of France showed, the official administration has been weakened by the success of the ADE. It appears difficult to strengthen the existing official water administration whilst the ADEs exist. Allocation of taxes to the water sector remain limited, meanwhile the ADEs benefit from a comfortable budget. It appears that some conflicting events in the past between the ADE system and the French administration have been overcome and that in order to achieve the targets of the WFD, the ADE have aligned to a more ‘result-oriented’ bouquet of measures than in the past, where they mainly acted as an ecological bank. Since

the ADE and their activities are financed through earmarked charges, we can therefore conclude that in France those 'earmarked charges' are used to achieve targets that administration – by its commitment to the WFD – has adhered to. The aforementioned examples of Morocco and now France show the problem / difficulty of harmonising user interest with precautionary functions of a state as, for example, the custodian of the natural resource water.

In the case of water charges being a cross-subsidizing instrument, the problem is that, for instance, a polluter can profit from these funds demanding loans or subsidies for necessary investments which result in lower pollution fees for him. This questions the polluter pays principle, as it appears profitable to pollute because it is rewarded with offers for loans or subsidies. The problem with the incentive approach is that it is difficult to establish objectives or targets, because, the only "motivation" for undertaking activities in order to improve water quality or quantity is the fee one pays for not behaving ecologically correct. If an industrial plant finds it more profitable to pollute and pay the respective fees, and if regulations do not exist, are not enforced or not obeyed, improvements on water quality and quantity become arbitrary.

Table 2 summarises the different sources of funds, their general application and the advantages and disadvantages they bear.

	Application area	**Advantages**	**Disadvantages**
Service fees	All water use services (water supply, waste water treatment, irrigation etc.)	Direct payment for services raises conscience on own consumption patterns	Poor may not be able to pay cost covering tariffs demanding special measures to compensate this
General taxes	Financing water administration with their respective tasks	Payments on national scale allow cross-subsidies of poorer regions. Externalisation allows financing regulatory measures.	Payment of taxes are not 'earmarked' so incentive measures are not working.
Add-on charges	On water uses (abstraction) or pollution	Earmarked charges are a powerful incentive instrument to guide personal behaviour.	Not advisable for financing law enforcement measures due to probable resistance of contributors
Fines and penalties	Infractions committed against current laws and regulations	Powerful to avoid infraction of individuals	Has usually little conscience building aspect.
Own contributions	Financing own mobilisation costs for meetings etc. but as well for certain local measures	High level of internalisation. Guarantees high degree of direct control of funds.	Does not allow cross subsidies allowing only Investments that are financeable by the direct stakeholders.

Table 2: Generic comparison of the different financing mechanisms of water

3.6. Potential financing mechanisms for water resources management in the MENA and Sub-Sahara African Region

There is no uniform understanding of the aforementioned definitions across the world. One aspect of determining the use of the described financing mechanisms is certainly the quality of governance in a country. If criteria as defined in the Country Governance Analysis (CGA) (DFID, 2008), such as responsiveness, state capability and accountability, are fulfilled to a great extent, financing water resources management through taxes seems feasible.

But poor governance is actually a quite common situation in many of the countries of the developing world. The second Dublin principle seemed to be a response to this by demanding to manage water on the lowest possible level, just in line with newest insights of governance researchers such as Brozus (Brozus, 2010). Two questions arise here: if lowest possible level assumes that it is up to users to manage water, who then plays the part of the custodian of water resources, guaranteeing their sustainable use (i) and who finances related structures(ii)?

To respond to (i): it appears feasible, that water users manage their water uses, but it is questionable that they do it considering sustainability, as suggested by Matz (Matz M. , Rethinking IWRM under cultural considerations, 2008). Most cases of water management as demonstrated in the case studies show that water user management is limited to the distribution of the available water volume without considering ecological needs. The distribution of all sustainably available water resources must be considered as an overarching task which takes precedence to water use management. The distribution of complete water resources sustainably available must be considered a task that is ‘above user management. It is hard to think that any other than state administration can play the role of allocating the available water resources for the benefit of today’s and future generations.

To respond to (ii) The financing mechanisms derived from IWRM principles, such as user-pays-oriented earmarked charges are usually proposed to finance basin organisations (in case of France), but through taxes where they replace former administrative bodies (in case of Morocco). In the latter case it must still be ensured that the mandate and the position of such a body is strong enough to play the role of the custodian of water resources, free from the influences of water uses. A water protection department inside a water and irrigation ministry will have a weak stand.

So definitely in financial terms we are in a dilemma in countries with poor governance: state institutions are not able to effectively play the role of the custodian of water resources and participatory structures are unlike to look beyond their own group interests with regard to their own water needs.

Concerning financing : Typically IWRM-approaches tend to assume that water groups dealing with IWRM on lower levels either work on voluntary basis or entirely neglect the question of administrative costs. User based groups can possibly bear their own

administrative costs, while organisations with staff and administrative structures as for example basin or river basin organisations need financing.

4. Case countries situation analysis

4.1. Criteria set of assessing WRM

The criteria set in the following chapter will give a definition of how the water management[5] structure of the case countries is being assessed. The set might be surprising for some because it is actually not based on the traditional principles of IWRM, but on principles that have been developed by the author throughout the years of working with water management and their institutions. The system is inspired by the development of the Model of Water Governance (MOWAGO), based on EFQM by the author (Matz M. , Water Governance / Overview of existing approaches and a methodology to assess and promote water governance, 2010).

4.1.1. Legal framework

Although a legal framework does not say much about quality and result of water management, without it, it would be difficult to achieve any result in water management. The key questions are:

- Is there a water act, bill or policy which was passed by parliament?
- Is it realistically applicable in the whole country?
- Does it have defined targets or at least indicates who should define them?
- Does water resources management have a separate stand or is it ‘part of water uses?
- Are modern criteria of sustainability, such as demand-oriented water resources management reflected in the legal framework?
- Is access to water resources clearly defined (responsibilities, implications, priorities)?
- Are the enforceable penalties in case of non-compliance?

4.1.2. Administrative set-up

Respecting the prerogative of ‘form follows function’, here some key aspects that are assessed with regard to bodies active in water resources management:

- Does the administration have a mandate which is independent of the interests of water users in the country?
- Does it manage access to water resources (through permits e.g.)?
- Is it the advocate for sustainability?

[5] Since in most countries there is no distinction between water uses and water resources allocation, that overarching term of water management is applied where this is the case.

- Is it solely responsible for water resources management or are there other institutions with similar or overlapping tasks (water basin organisations or participatory water user organisations)?
- If participatory structures like water user organisations exist, do they deal with water 'protection' or do they manage (their) water 'uses'?
- Is it empowered to enforce existing legislation?

4.1.3. Monitoring and planning

Managing water resources requires knowledge about their condition and about the impact of specific measures. A sound monitoring system is therefore crucial for assessing the quality of water resources management and respective plans. Often extensive plans exist, but their application is not being monitored because there is no political will or simply no monitoring system in place. This is because it is often claimed that there are no indicators for water resources. However, this is not true: A selection of internationally approved and collected water resource indicators can be found in Annex 2 of the report on the 'Status of Implementation of CSD-13 Policy Actions on Water and Sanitation' (Matz & Rey, 2008). Specific questions included therein, which shall also be considered in this paper are:

- Is there a monitoring system that allows to follow up impacts on water resources (ground water level, environmental base flow, water efficiency in water uses etc)?
- Do water management plans for water resources (not only water services) exist?:
- If yes, are they based on realistic figures and do they have realistic targets based on objectives to meet?
- Are water management indicators showing progress with regard to water resources (quantity and quality)?

4.1.4. Financing mechanisms

The French say: *L'argent est le nerf de la guerre* (=*Money is the nerve of war*). This is true and therefore it is a centre piece of assessment of the case countries. We will be looking at the following aspects:

- Are there secure and sustainable financing mechanisms of the official administration?
- Does the water administration have enough funds to perform its tasks?
- Considering the source of funds for WRM: are they earmarked **solely** for water management or as well for water uses?
- Is there a clear distinction between sources and utilisation of taxes, water charges and water fees in the country?

4.2. Description and assessment of case country situation of water resources management and their financing mechanisms

The description of the case countries Benin, Kenya, Namibia, Zambia and Yemen on the following pages is separated into the legal and institutional aspects on the one hand and financial aspects on the other. These countries have been selected due to presence of water

policy advisory projects of GIZ, which support local structures in the IWRM-process. The description is based on information provided by advisory personnel in these countries through a thematic questionnaire prepared by the technical department of GIZ / Eschborn. The assessment at the end of each country description is aligned with the criteria questions presented in the last chapter. For a quick overview, answers to these questions are summarized in *Annex 1, Criteria analysis chart for sustainable WRM in 5 case countries.*

4.2.1. Legal and institutional framework

Benin: There is no separate and independent official administration responsible for water resources management. The *Direction Général de l'Eau* (DG-EAU in the Ministry of Water and Energy), has the double task of ensuring regulatory function in water supply and WRM and to offer advisory service to the local authorities with regard to water supply and resources management (in rural areas only). Local authorities are responsible for water supply provision in the constituencies. The cooperation with other water users as for example the urban water supply company SONEB is fixed in a so called '*contrat-plan'*.

There are no official basin organizations so far but water basin management committees, which are composed of the regional and local branches of relevant ministries. As participatory water organizations there are fisher, agriculture and drinking water organizations which are dealing with their specific water use problems.

Since the new national water law was passed in October 2010, water management is influenced by the IWRM principles and the sustainability of water resources. The new water law defines as new structures a "*Agence Nationale de l'eau*" and a "*Conseil de l'Eau*" at national level and basin committees at water basin level. Benin is in the stage of reflection about how institutional structures should exactly look like. Some details will be specified in implementation decrees. The elaboration of 18 such decrees is ongoing out of which 8 are already submitted to the council of ministers for approval. The adoption of a National Water Management Plan is ongoing. A draft has been formulated by the international consulting Company IHD.

Normally, the Ministry of energy and water/DG-Eau is supposed to publish a hydrological yearbook. Measurements are collected on major rivers and in some aquifers by the department of information of the DG-EAU sometimes in cooperation with international universities and projects (IMPETUS, AMMA). Monitoring of surface water quality is still rare. There is no decentralized structure of the hydrological service. A serous limitation is funds to perform these monitoring tasks.

Assessment: The water resources management structure in Benin is being developed at the moment and therefore not much can be said so far. The fact that the DG-Eau is at the moment responsible for advisory service in rural water supply to the local authorities and at the same time responsible for water resource management is considered to be an overlap of

functions and carries the risk of water resources not being managed with the necessary resoluteness. A clear mandate of one institution responsible for managing the allocation of water resources did however not exist. The new decrees are as well mostly silent about clear responsibilities for the allocation of water resources. Some interview partners suggest that it is the '*Agence National de l'eau'* who will be in charge of that. The ANE has only one representative on basin level according to the plans so it is questionable whether this function can be performed from within the national level. A certain danger of overlapping function between the DG-EAU and the ANE might rise as well, leaving as well the future of DG-EAU personnel in the dark, reason for already noticeable unrest among their personnel. Beside that the creation of such a body might cause other problem as mentioned before, especially when the distinction between mandatory and participatory functions on the one hand and charges and taxes on the other hand are not clearly separated. The development of the water sector looks very much influenced by typical IWRM oriented approaches without really considering the existing situation in the country. For example the DG-EAU has as at now the mandate of administering the access to water resources but performed this task only fairly. It is little known about what the role of the DG-Eau in future will be after the creation of the ANE and the fate of the staff of this department. It seems that the reform process was done very hasty focussing more on forms than on functions. A good reform process should be designed by the prerogative of 'form follows function'.

Kenya: Kenya has a *Water Policy*, which dates from 1999 and a *Water Act* from 2002. The latter one will be aligned to the new constitution. The objectives of the Water Act are to

- Separate water resources management from service provision;
- Establish effective and autonomous institutions with defined roles and responsibilities;
- Encourage stakeholder participation in the water sector;
- Enhance service delivery.

The water resources allocation is done by the *Water Resources Management Authority* (WRMA) operating on national and catchment level. WRMA has the task to 'effectively address critical water related issues and challenges such as water scarcity ……, degradation of water resources (pollution and over-exploitation), catchment degradation (deforestation, siltation) and climate variability and change (floodings and droughts)'. Overlaps in functions exist only with the *National Environmental Management Authority* (NEMA) with regard to effluent discharge permits. A total of 458 personnel are working in the WRMA financed by the Government of Kenya through the *Ministry of Water and Irrigation* (MWI).

On lower levels there are *Catchment Area Advisory Committees* for stakeholder participation at catchment area level and *Water Resources User Associations* (WRUAs) for stakeholder participation in WRM at sub-catchment level. The objective of the Kenyan water resources management is to '1*. Ensure available safe water and promote equitable water sharing 2.*

Ensure effective capacity for better WRMA performance 3. Improve compliance and investments, and ensure effective catchment protection (for details cf. strategic plan attached). Following that definition, the above described structure is strictly separated from water services organization existing as well on the different administrative levels.

Water (allocation) plans are not well developed but abstraction surveys are being conducted which are the basis for developing future water allocation plans. The process is slow and will take time before the development of water allocation plans pick up. This is expected to happen in the near future.

Sub-catchment management plans (SCMP) are foreseen as the main implementation tool and they are developed through participatory approaches with the involvement of WRUAs.

Assessment: Kenya has embarked on a new water resources management system which is being built up in some regions. The apparent strict distinction of water services from water resources management is considered positive. The challenge is however to keep this separation working on WRUA level after the abstraction surveys are being completed and water allocation plans are being developed. It is regarded as positive that WRMA has a strong and clear mandate so that the necessary resoluteness in protecting water resources management independent from use interest can be expected, provided the necessary enforcement mechanisms exist and are implemented.

Namibia: Namibia has as well embarked on a new water resources management system with its water resource management bill presented in 2010, replacing a water act from 1956. Its objective is

- to ensure that the water resources of Namibia are managed, developed, used, conserved and protected in a manner consistent with, or conducive to, the fundamental principles - among others - of:
- Equitable access for all people to safe drinking water in a reasonable distance,
- Harmonisation of human water needs with the water requirements of environmental ecosystems and the species that depend on them (and)
- The promotion of the sustainable development of water resources based on an integrated water resources management plan which incorporates social, technical, economic, and environmental issues
- The recognition of the economic value of water in the allocation of water.

The *Ministry of Agriculture, Water and Forestry* (MAWF) plays the leading role in water management. Its' role is to:

- Develop a cohesive national policy for managing water
- Manage, coordinate, monitor and control water resources, and to
- Ensure that all Namibians have access to potable and adequate water, especially the rural population.

The State of Namibia is the owner of the water resources and has the responsibility to ensure that water resources are managed and used to the benefit of all people in furtherance of the objectives of the Water Act.

This function of water resources management is presently undertaken by the *Directorate of Resource Management* (DRM) with Divisions of Geo-hydrology, Hydrology, Water Environment, Planning and Law enforcement (licensing of water allocation and pollution). The first three of these Divisions are considered “collectors and providers” of technical information and advice, whilst the two last ones use this information to undertake planning and enforce regulations. The *Resource Management Directorate* has responsibility for water environment management functions including environmental impact assessments and some research activities. This includes such activities as developing and administering environmental releases from dams. Specifically, the directorate also has the responsibility for water quality and pollution control through the assessment, approval and administering of pollution permits for effluent discharges to water bodies.

On water basin level there are so called *Basin Management Committees* (BMC), which regroup representatives of administrative bodies and user representatives. BMC – who’s members works on voluntary basis -mainly play an advisory role to the responsible ministry and in turn this ministry provides technical and financial support to the BMCs’ management initiatives. As government representative there are two Basin Support Officer (BSO) paid by government (civil servant) working on BMC level. All other BSOs are paid by GIZ. There is a loose link between beneficiaries and BMC members. The few activities on beneficiary level are broadly linked to water, for example through the building of dry latrines as a mean to reduce water use.

A *National Integrated Water Resources Management Plan* has just been finalized (2010). Only few BMC, (e.g. the *Kuiseb* basin, which was the first to have a BMC in place) have basin water resources management plans. None of the plans are believed to be implementable because the focus is much too high and not adapted to the working reality of low staff in the relevant departments of WRM.

The responsible department for information of water resources is very weak and does not have comprehensive information on the water resources. Decisions on new water abstraction permits take a long time which is probably linked to these two aspects. At the moment, it appears that most of the water resources in Namibia are not actively managed, but water resources are not overused due to the high specific renewable water availability of 8,319 m^3/cap (Source: FAO Aquastat. This makes Namibia the most blessed country with regard to water resources among all those mentioned in this report (cf. Table **1**: Specific water availability in selected countries).

This situation will probably change in the future, especially under the conditions of possible droughts, increasing water demand and the impacts of climate change.

Assessment: Considering the low pressure on water resources in Namibia, it seems less likely that users see the necessity of engaging in water resources management. Information gathered from Namibia shows that after a resource problem was solved in one basin (Kuiseb basin) the users lost interest in continuously looking into that issue. In other basins there is less initiative on catchment level. At the same time the mandatory function of issuing water permits by the DRM is not done with the necessary resoluteness. Permitting processes take long and relevant decisions are not easily taken. The fact that this department is under the MAWF and does not have a superior position to water user departments might have a negative influence on these permitting procedures.

Zambia: The Water Policy of 1994 defined several principles for the Water Sector (WRM & WSS). One of them was the clear separation of WRM and WSS. Up to 2000, the sector reform focused on WSS which included transfer of water supply schemes from the *Ministry of Energy and Water Development* (MEWD) to local authorities (in the form of Commercial Utilities). In 2001 the *Water Resources Action Program* (WRAP) was formed. This unit was established to facilitate the WRM reform. WRAP has since then developed a proposal for a new institutional and legal framework for the management of water resources, based on the principles of IWRM. The WRAP has also developed an institutional framework that refers to river catchments as its management unit. To give effect to the catchment approach, it was necessary to repeal and replace the Water Act of 1949. The *Water Resources Management Bill*, which was finalized in 2010, is now subject to decision of Parliament and the first of three readings were held on 26/11/2010. The revised Water Policy 2010 does not spell out objectives, but mentions - among others - the following principles:

- The State shall be the trustee of the nation's water resources and shall ensure that water is allocated equitably, protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, in the public interest while promoting environmental and social values and protecting Zambia's territorial sovereignty;
- Water resources shall be managed in an integrated and sustainable manner;
- Water is a basic human need and as such domestic and non-commercial purposes shall enjoy priority of use;
- The environment is a water user and shall enjoy second priority of use to the human need;
- Water has a social value and all domestic and non-commercial use of water will not be required to obtain a water permit;
- Water has an economic value and the cost of facilitating its use has a significant administrative cost element and this shall be reflected in the charges for water permits for the right to use water for economic purposes;
- There shall be no private ownership of water and no authorisation for its use shall be in perpetuity.

By passing the *Water Resources Management Bill*, which is expected for February 2011, the *Water Resources Management Authority* (WRMA) and its sub-structures such as the *Catchment* and *Sub-catchment Councils* as well as *Water Users Associations* will be put in place. Other issues that are tackled within the Water Policy are the:

- Introduction of an improved allocation system;
- Introduction of new tariff structure for water rights (water permits) and also verification of existing, pending and expired water rights;
- Design and setup of new information systems for surface and groundwater
- Support of WRM activities at local level (WUAs).

The MEWD is the lead agency concerning water in Zambia. Currently its Water Board is responsible for issuing water rights whereas the *Department of Water Affairs* (DWA) is the operational/technical wing in the day to day management of water resources, which also deals with international waters. Policy development is done in Department of Planning and Information under the same Ministry in collaboration with DWA. The Water Board does not have a decentralized structure. The *Department of Water Affairs* has three sections: Surface Water, Ground Water and Water Resources Management. DWA has an office in each province and district water officers in several districts. With the new law the Water Board will stop to exist and its tasks will be taken over by the *Water Resources Management Authority* (WRMA), which has as the central function to: '…*plan for and ensure the sustainable and rational utilization, management and development of water resources based on community and public needs and priorities, within the framework of national economic developmental policies…'.* Also most of the technical functions of DWA will be transferred to the WRMA. DWA will stop to exist and a new department called *Department of Water Resources* (DWR) will be created being responsible for issues of policy and international water.

Two other Zambian Ministries are involved in water management. The *Ministry of Agriculture and Cooperative* (MACO) as a typical water user is mainly concerned with the construction and management of irrigation infrastructure whereas the *Ministry of Environment and Tourism* through the Environmental Council of Zambia has some stake in WRM with regard to general environmental management.

The Japanese cooperation JICA prepared a comprehensive *Water Master Plan* for the whole of Zambia, which was released in 1995 and contains mostly technical information but was since then not updated. In 2008 an *Integrated Water Resources Management and Efficiency Plan* was formulated based on an initiative by the GWP through the Zambian Water Partnership. Many stakeholders were involved in the formulation of the plan. Unfortunately the lead Ministry MEWD never showed much ownership and only occasionally references to this document are made. With the new WRM Bill the *IWRM and efficiency plan* may become a central piece of guidance.

Assessment: As far as planned, Zambia has a quite advanced water resources management framework with regard to structures and procedures. The set-up is similar to Kenya. However, how it develops remains to be seen since there is a possible overlap in interests of water uses and water protection with MEWD as the overarching ministry, especially since Energy also falls under this ministry and hydropower provides 99% of electricity in Zambia. It will depend very much on the mandatory standing of the WRMA. It is seen positive that the denomination is 'authority' so that the necessary resoluteness in water resources management can be expected, if the necessary enforcement mechanisms exist and are implemented. One of the problems of putting the new system in place could be inadequate human resources resulting in insufficient staffing. Capacity and quantity of personnel would then not be sufficient to undertake the work foreseen in water management according to the new set-up. Therefore it has to be seen if a comprehensive application of the system as planned is feasible. This point was specifically mentioned for the Zambia case but might apply as well in other case countries.

Yemen: Yemen's policy framework is a water law issued in 2002 (but without by-laws which are not yet passed) and the *National Water Sector Strategy and Investment Plan* (NWSSIP) with its update covering a period from 2009 to 2015. The WRM structures are based on the water law. They are composed as follows: *The Ministry of Water and Environment* (MWE) after proposal of *National Water Resource Authority* (NWRA) is the legally responsible body on water allocation in coordination with the relevant bodies. The qualitative and quantitative aspects are managed through norms and standards that have been approved by the Cabinet in accordance with the water law guidelines. Besides this there are basin organizations in several hydrographical basins of the country. The different basin committees are formed through a ministerial decree which is followed by a cabinet decree to give these structures a legal base.

A number of basin management plans have been formulated by NWRA. Some of them (e.g. the Taiz) WRMP are under implementation. The others are still not approved by the Cabinet. Their objectives are mainly to guide and coordinate the planning and monitoring processes of sub-sectors such as distribution of water for irrigation, but the plans do not have water allocation characteristics.

Although the MWE is the overarching ministry for water resources with tasks as the overall policy making, indicative planning and technical monitoring of water resources, the MWE is a weak Ministry in comparison to the *Ministry of Agriculture and Irrigation* (MAI), which is the spokes-ministry of rich farmers with a lot of political influence. The role of NWRA is rather communication and coordination, and not law enforcement. However, communication and coordination between ministries is difficult, but is slowly improving. The basin user group organizations are overly working in their interest of distribution the available water and not

towards sustainable water resource protection. An advocacy for water protection-oriented management is almost nonexistent on any level. Especially in the North, tribal influences determine the political reality and make any law enforcement of the central government administration practically impossible.

Assessment: Water resources management in Yemen is definitely a challenge due to high interests of lobby groups (irrigation farmers) and a traditionally weak administration. Information gathered from Yemen shows that the NWRA is both suffering from a weak standing vis-à-vis the water user department inside the same or other ministries and a small budget. Regulatory enforcement by the NWRA is extremely difficult as well due to the generally weak influence of public administration especially in the north of the country.

4.2.2. Current financing mechanisms

Benin: The DG-Eau as part of the official administration is financed by the general budget supported by several donors for staff, administrative costs and investments. In the past investments in water supply were done by the DG-EAU but are now increasingly programmed and managed by the local authorities with advisory support of the DG-EAU. The same applies to investments in water resources. Other forms of financing WRM do not exist as at now. The 2010 law foresees abstraction charges except for household consumption. Whether this also applies to the national (urban) water corporation SONEB is not yet clear. As of now these charges are subject to the approval of a one of the decrees submitted to the council of ministers. According to that decree a 'Fonds National de l'Eau' (FNE) will be created that will at least partially finance the new *'Agence Nationale de l'Eau'* (ANE) among other more indistinct tasks such as 'promoting practices of sustainable water management and strengthening the skills of water actors.". Whether this covers as well the supposed administration costs of the 'basin committees' is unclear. General taxes are only mentioned as 'other sources' of financing of the ANE.

Assessment: Budget funds of the administration appear to be limited and not sufficient to perform their tasks. The planned abstraction charge to be paid for by the urban water supply sector is a good mean to finance the basin structure foreseen but it is uncertain if these charges will be implemented in near future. Not only this remains in the dark in the decrees to the new water law, but as well details of the origin of finances of the FNE such as water charges (percentages, who and how) as well as their destinations. The indistinct formulation of the decrees shows a quite high uncertainty of the decision makers in the change process of the water sector in Benin.

Kenya: The costs of the official administration explained above are as well mainly born by the government. In addition there is an important share taken up by development partners such as GIZ, SIDA, JICA and DANIDA. Other sources are revenues from water allocation and own resources mobilized by WRUAs.

The WRUAs develop Sub-Catchment Management Plans with implementable activities such as:

- Awareness campaigns on catchment protection;
- Rehabilitation of degraded catchment areas;
- Wetland protection to enhance availability of water resources;
- Resolving conflicts of water sharing;
- Protection of riparian areas; and
- Construction of micro catchments such as water pans and sand dams.

The funds for those activities are coming from the *Water Services Trust Fund* (WSTF), managed by the *Ministry of Water and Irrigation* and others like the locally based *Constituency Development Funds* (CDF). This is a fund from the Kenyan government devolved to the local constituencies for funding projects developed by community-based organisations such as WRUAs. Other sources are the *Local Authority Transfer Fund* and funds from NGOs and the private sector.

Assessment: The exact shares taken by the Government of Kenya and donors are not known but -provided that donors financing is gradually replaced by government funds as planned- Kenya is embarking on a sustainable way of financing water resources management activities. The WSTF bears the term of 'services' which suggests an orientation towards water uses. This might create a conflict of interest resulting in lesser attention for activities in the area of protecting water resources. However, the fact that WRMA is financed through general taxes promises a stronger advocacy function for managing water resources in a sustainable manner.

Namibia: The Ministry and its departments are financed by general taxes to pay for water resources management activities as well as their personnel. On BMC level there are only two Basin Support Officer paid by government. All members of the BMC are working on voluntary basis.

The BMCs' annual working plans (that have to be in line with the guiding Water Act) are financed half by GIZ and half by the Ministry. The governmental funds are difficult to access because the financial procedures of the Namibian administration are quite cumbersome.

Assessment: The limitation of sustainable water resources management in Namibia does not seem to be linked to budget restrictions but to structural weaknesses (see above). This refers

to the regulatory function of issuing water permits. The fact that activities on BMC level are strongly subsidised by GIZ constitutes a problem for institutional sustainability, but is expected to be quite common in all case countries.

Zambia: The Ministry of *Energy and Water Development* (MEWD) and it's DWA, provincial and district structures are financed by general government revenues through the National Budget. About 50% of the allocated funds are used for personal emoluments and the remaining for general administration, recurrent costs and investments. The Water Board under MEWD instead is partly financed by government revenue but also from collecting Water Right fees. These fees are shared between the National Treasury and the Water Board on an annual agreement. The revenue from Water Right charges is potentially high with major users being hydropower, commercial farms, water companies and mines. This potential has not been used as yet. Currently there are only 416 valid water rights registered, compared to 1120 pending and 1650 expired this emphasizes the need for a new institutional structure.

The budget granted to DWA was always quite little compared to other sectors and often releases by the Ministry of Finance are very slow. Between 2002 and 2007, the budget was between 1.5 and 7 Mio USD. More than half of the money was used for salaries.

Assessment: The financing of the Zambian water resource sector seems to be sound and sustainable according to the 'papers' but reality shows a different picture. Government subsidies are as at now too little and the potential of financing through water rights is not sufficiently utilized (see above).

Yemen: The official water management institutions are government financed through general taxes and co-financed by developing partner. The funds are used for staff and activities such as monitoring, studies etc. NWRA as a centre body for water resources management has about 250 staff. Concerning government funds, the *Ministry of Finance* decides on the financial allocation based on the plans approved by the *Ministry of Planning and International Cooperation* after submission of the competent bodies.

Concerning donor funds, the *Water Sector Support Program* (WSSP) is to mention as a pooled funding with contributions from the government of Yemen, Netherlands and World Bank. Germany is giving in kind contributions which are coordinated with the pool.

The activities of the *Water Basin Committees* are financed through the governorate (running costs), through NWRA budget and partly through the WSSP (annual activity plan of the basin committees).

Assessment: The NWRA's other huge problem – besides the structural one explained above – are budget restrictions and high dependency from donors. Financially the situation of the water resource management sector in Yemen is far from being sustainable.

4.3. Recommendations for the Case countries

4.3.1. Legal and institutional framework

The situation in the case countries differ widely not only with regard to the pressure on renewable water resources. One aspect, however, seems to apply to all of them and is therefore presented before the specific country situations. Monitoring of the situation of water resources availability (ground and surface water) is either not existing or sufficiently done in order to show the progress of water resources management policies and measures. As suggested above has the focus on process aspects in applying IWRM principles to some extent provoked to disregard whether it has finally improved for the sustainability of water resources. Therefore it is recommended to reconsider the importance of hydrological services for supplying relevant information and link it to water resources management measures.

Some specific cases country recommendations are as follows:

Benin: Looking from the general concept of WRM as presented in this paper, it is recommended to ensure that one independent body should be responsible for water resources allocation and that overlapping tasks should be avoided. A strong mandatory position is necessary to ensure the regulated allocation of available water resources. The necessary body should have clear defined functions for the different administrative levels. If this task will be attributed to the ANE it will be necessary to create regional or preferably basin representations. Since there are so many open questions remaining it is recommended to support the Government of Benin with advisory service in the formulation of the decrees that are foreseen to detail the new water law. Especially the mandate of the ANE, it's regional and/or basin structure should be clarified as well as the future role of the DG-Eau.

Kenya: The structure as planned looks very promising. The mandatory function of the WRMA should contain clear enforcement mechanisms in order to allow the implementation of its mandate. After a testing period is completed in the selected basins, the system should be extended to the whole country.

Namibia: It is recommended to engage with the relevant ministries on how to improve the mandatory function of water allocation by the DRM. Probably a stronger mandate independent from water use bodies should be considered. The links between real water users and the BMC should be reviewed and clarified.

Zambia: The structure as planned looks very promising. Water uses and water resources management are well separated and financing seems to be sufficient and ensured. If not yet considered, necessary enforcement mechanisms should be developed and implemented. The process should be monitored and probably the experiences published for other countries to learn from.

Yemen: Strengthening the mandate of NWRA seems to be highly necessary on the one hand, but as experience has shown, a central body for water resource management will have difficulties to enforce regulation given the political situation in the country. However, regulatory functions on local level for water management could be considered and are traditionally not completely absent in Yemen. Given the current political situation in the country, basin wide solutions could perhaps be more promising. These are already applied in several parts of the country. It should be tried to enhance the precautionary water management on regional or basin level by defining 'advocate' structures for water resources. Such structures, which can be located at local and/or regional administration level, should merely have the mandate to represent the interests of the sustainability of water resources. Such a body or the assigned persons will have a hard stand given the extremely high discrepancies between available needs and available water resources. A monitoring function of water resources (ground water levels and run of quantities) should be established and linked to such a body. The generated information should be used for increasing consciousness of water users in the use of water.

Expectations should not be too high since donors have already been active in this respect for a long time. There are as well numerous initiatives for promoting more efficient irrigation systems and new water supply schemes. However, all initiatives combined were up to now not successful to reduce the overuse of water resources in the country. Measures in water management are, however, more prominently to be located in the agriculture sector. Attempting to reduce the high needs of water for irrigation, *Khat* is the biggest challenge. Solutions as to import *Khat* from Ethiopia might be technically feasible but will perhaps only be accepted when there is virtually no more water available.

4.3.2. Financing mechanisms

A common recommendation applying to all of the case countries is to check whether administrative bodies are sufficiently funded to be able to carry out their obligations. Attributions and funds should be in a balance. Although this appears to be evident, it is not the case in most countries. Water uses enjoy much more attention and thus funding. Also donors often find it difficult to understand the importance of a functioning regulating and/or monitoring body, such as hydrological service or authority. Besides this, there is a need to clearly earmark ecological water charge for water resource management purposes and not mix it up with purposes of water use such as subsidies for water supply or irrigation.

The following country specific recommendations are given:

Benin: The second most important point to discuss and define is the exact source of funds of the FNE (who pays how much?) and the exact destination of funds (who receives which share what for?). Since the flow of funds from water abstraction will only slowly increase it is recommended that a 'transitional finance plan' should be elaborated that ensure the operation of the newly to created ANE. A business plan shall be established that shows in which way donor contributions should gradually be replaced by own funds. At least in the beginning of the existence of the ANE subsidies from the state towards their operation will be necessary. To which extent these subsidies become permanent depends as well from the details laid down in the decree and must be reflected in the 'business plan' proposed.

Kenya: The financial set-up of Kenyan water resource management looks promising as well. The strict separation of funds for water services and water resources management should be ensured in the building up of financial mechanisms.

Namibia: The performance of the DRM in Namibia does not seem to be linked to budget restrictions meanwhile the BMC encounter this problem. If decentralised water management is expected to be performing administrative functions at BMC level, it must receive more funding.

Zambia: The Zambian way of financing water resource management appears to look quite well-thought and financially sustainable, provided the potential of financing the system are used, which is not the case as at now. It is recommended to prepare a business plan for the transition phase in order to have clear targets and a timeframe for achieving the establishment of the system as planned. This business plan shall define inputs and outputs precisely in order of the tasks to be fulfilled. If national additional staffing is foreseen it should be introduced in such a plan.

Yemen: Yemen's water resource management strongly depends on donor contributions, making it highly volatile besides the other problems mentioned before. Since a stronger focus on regional and basin level was recommended in the last chapter, ways of financing such structures should be developed. Although it appears challenging that ecological earmarked charges will find the acceptance of the water users, it is recommended that the regional administrations try to establish something like a 'sustainable water management' fund from which solely water protection measures are financed including the responsible body . The current WSSP does not distinguish clearly between water uses and water protection measures. A strict separation shall be established probably with a separate fund as suggested.

5. General recommendations for the German TC with regard to advisory services in water resources management

5.1. Rethinking IWRM

It probably looks strange to some reader that in this paper none of the typical IWRM criteria, such as women's participation, polluter-pays-principle, and management on the lowest appropriate level or basin orientation are reflected in the list of criteria for assessing the situation in the case countries. The ones used are mostly linked to the aspect of sustainability which is actually part of the first Dublin principle. This does not mean that we do not consider the other ones important. They are significant under considerations of political development such as democratization important, but we believe these are mainly process oriented aspects. Without a clear impact orientation as laid out in the study on existing water governance practices (Matz M. , Water Governance / Overview of existing approaches and a methodology to assess and promote water governance, 2010) a sustainable management of water resources cannot be achieved

The understanding and application of IWRM should perhaps undergo profound adaptation in order to effectively contribute in a proven way to the result of good water management as defined by sustainability and equitable access to WR. Currently we believe that this objective might have gotten a bit lost in the 'prayer wheel' proliferation of IWRM approaches all over the world.

GIZ can play a prominent role in bringing the objective back on the agenda by following the recommendations below:

- Develop a pragmatic system analysis model for water resources management. This will make use of IWRM as a useful set of good practices, but more strongly target an impact-oriented concept of water resources management.
- In this spirit, the process of water resources management should obey the following logic: first allocation of water resources, second water use management. This refers to structures and procedures of water management and very particularly concerns the financing of water resources management. That means: water resources allocation should be an administrative task and paid for by taxes, as it is actually the case in most countries presented in this paper. However, funds are often not sufficient.
- Strengthening of the role of central water administration / regulation is critical. Decentralised structures are important to create but the administration for water resource allocation should not give up their mandatory function to participatory bodies. This applies to countries with relatively sound administrative systems. In cases of weak administration or 'failing states' a different approach has to be found focusing on empowering lower administrative levels or user management structures. In this case there is a strong need to strengthen or establish the advocacy of water resources protection. Without this water resources management remains subject to water users only. This role could be 'played' by one person or structure a participatory structure.

- Conflicting structures of water protection and water use should be avoided in order not to compromise the sustainable use of water resources. It is still often the case that water resources organisations are just a department on the same level as those for water uses or even hierarchically subordinate to such departments or ministries.
- Engage more actively in hydrological monitoring activities since these are the knowledge base to measure the impact on water resources. Together with metrological services this has been strongly neglected in recent years. Without a functional hydrological survey, the monitoring of water resource management remains arbitrary.

6. Background and reference material

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Annex 1: Criteria analysis chart for sustainable WRM in 5 case countries

	Benin	Kenya	Namibia	Zambia	Yemen
The legal framework					
Is there a water act, bill or policy which was passed by parliament?	++	++	+	-	-
Is it realistically applicable in the whole country?	o	++	-	++	--
Does it have defined targets or at least indicates who should define them?	+	++	-	+	-
Does Water Resources management have a separate stand or is it part water uses?	o	++	-	++	+
Are modern criteria of sustainability, such as demand oriented water management reflected in the legal framework?	-	++	++	++	+
Is access to water resources clearly defined (responsibilities, implications, priorities)?	+	++	+	++	o
Are there enforceable penalties in case of non-compliance?	o	+	?	+	?
The administrative set-up					
Does the administration have a mandate which is independent from interests of 'water-users' in the country?	-	++	++	++	-
Does it manage access to water resources (through permits e.g.)?	-	++	++	++	+
Is it the advocate for sustainability?	-	++	+	++	+
Is it solely responsible for water resources management or are there other institutions with similar or overlapping tasks (water basin organisations or participatory water user organisations)??	+	++	+	++	o
If participatory structures like 'water user organisations' exist, do they deal with water 'protection' or do they manage (their) water 'uses'?	--	+	-	+	--
Is it empowered to enforce existing legislation?	++	+	+	0	--
Monitoring and planning					
Is there a monitoring system that allows to follow up impacts on water resources (ground water level, environmental base flow, water efficiency in water uses. etc.)?	O	O	--	-	--
Do water management plans for water resources (not only water services) exist?:	--	++	-	-	--
If yes: are they based on realistic figures and do they have realistic targets based on objectives to meet?	O	+	-	-	--
Are water management indicators showing progress with regard to water	--	+	?	?	--

	Benin	Kenya	Namibia	Zambia	Yemen
resources (quantity and quality)?					
Financing mechanisms.					
Are there secure financing mechanisms of the official administration?	**+**	**+**	**+**	**++**	**-**
Does the water administration they have enough funds to perform its tasks?	**--**	**O**	**-**	**-**	**--**
Considering the source of funds for WRM: are they earmarked solely for water management or as well for water uses?	**o**	**++**	**+**	**O**	**-**
Is there a clear distinction between sources and utilisation of taxes, water charges and water fees in the country?	**-**	**++**	**+**	**++**	**O**