

Framework for Assessment of Institutional Frameworks for Integrated Water Resources Management

Paul van Hofwegen

*International Institute for Infrastructure, Hydraulic and Environmental Engineering,
Delft, the Netherlands*

Abstract

Integrated water resources management (IWRM) is the management of surface and subsurface water in qualitative, quantitative and ecological senses from a multi-disciplinary perspective, and focussed on the needs and requirements of society at large regarding water. IWRM requires a platform for weighing of all relevant interests and decision-making on use of water and water systems in the river basin. Ideally, all interests are represented in this platform and it requires decision, control and sanctioning powers under governance of government to protect the interest of society at large. A minimum set of institutional conditions should be met to allow such IWRM platforms to operate successfully. A framework with guidelines for application has been developed to assess the required capacity-building interventions to arrive at these conditions and to establish such platforms. This framework is based on a development process with and by the stakeholders to come from an identified present water resources management situation to some desired integrated water resources management situation. It is a compromise between the present and an "ideal" IWRM situation, as a result of a negotiation process in which policymakers, water resources and water utility managers and stakeholders are involved.

During development, the guidelines for assessment of the institutional framework were tested in three pilot cases: in Guatemala, Jamaica, and Colombia. After their acceptance the Inter-American Development Bank (IDB) applied these guidelines in, among others, Honduras, Dominican Republic and Costa Rica. This paper describes briefly the methodology and its theoretical framework underlying these guidelines and elaborates on the experience with and outcome of their application.

1. Introduction

International awareness about the importance of water resources management is growing. Originally the approach was very sub-sectoral, mostly in relation to water supply, sanitation and irrigation. There is however, a growing consensus that Integrated Water Resources Management (IWRM) is necessary for sustainable resource use for all the sub-sectors and to protect the environment.

The aim of IWRM is to discard the one-sided management perspective of single interests of one sub-sector by one government agency and to strive for a participatory multi-sided management perspective of all interests in management of water resources. IWRM therefore takes account of all natural aspects of the water resources, all sectoral interests and stakeholders, the spatial and temporal variation of resources and demands, relevant policy frameworks and all institutional levels.

The Inter-American Development Bank (IDB) developed a strategy for IWRM which aims to help borrowing member countries to shift from a sectoral, development-based focus to an integrated, management-based approach. One key principle of this strategy is an increased emphasis on institutional issues and capacity building. This requires an analytical framework for the assessment of the institutional setting for integrated water resources management that the bank could use for the incorporation of capacity-building considerations in future IDB water-related projects.

This paper describes an overview of the framework and the guidelines as developed for project teams, bank officers and government agencies to facilitate the process of project formulation and monitoring (van Hofwegen and Jaspers, 1999, 2000).

2. Framework for assessment of institutional frameworks

2.1 Need for integrated water resources management

Actions to use or control water for specific purposes are aimed at security, social well-being, economic gain and the preservation of ecosystems. These activities of use and control can create problems that may be classified as externality, open access, public interest and scarcity problems (Lord and Israel, 1996).

Externality problems exist when actions of one party affect the well-being of a second party, and the first party cannot itself gain by considering this effect and modifying its behaviour accordingly. Open access problems exist when the use of the resource is open to all, and when the rate of use of that resource affects the amount that can be used. Public interest problems relate to the necessity to provide a particular good to all in equal amounts. No one can be excluded from consuming it, and the cost of providing it to one is as great as the cost of providing it to all. The problem is that these goods are likely to be under-provided because no one will undertake to produce them, since they cannot be withheld from others, thus cannot be sold to make profit. Government thus must provide these goods. Scarcity problems exist when the users want more of a good than the quantity available at a given price. Economic markets handle scarcity by allowing competition, in which those with the most purchasing power, and to whom the resource is most valuable, will bid it away from others. To safeguard the low-income strata of society and the environmental needs, the negative effect of scarcity is commonly dealt with by non-market institutions such as river basin councils or the government.

Solving these problems requires establishment or changes of water use rules that must occur at water resource level. Creating an effective set of water resource management rules requires action at the water policy and law level. These higher level actions are important because ineffective rules and ineffective accountability and policing mechanisms assure that water use and control problems cannot be solved.

2.2 Interests

There are many interests in water. Interests in water means the benefit obtained or preserved by individuals, groups or nations with the presence, use and control of water.

Interests can be classified as those of the first and second order. Interests of the first order are essential conditions for life (human, animal and plant) in that water system. Interests of the second order are those that can be prioritised after being weighed on their economic, ecological and social values.

Government has the "care function" as for management of water resources. First-order interests are interests of society and therefore require to be represented by government. Second-order interests are interests of individuals, groups, or parts of society, and can best be represented by their stakeholders.

First and second order interests are different in place because of different physical, hydrological, cultural and socio-economic conditions. As development goes on, especially second-order interests will change. This means that interests are site-specific and time-specific, and site-specific approaches are therefore warranted.

In water resources allocation there is general agreement that the supply of water for basic human needs has priority. In this respect the equity principle plays a major role. Another priority is the requirement to maintain essential life support ecosystems. These can be considered first-order priorities. All other needs for industry, agriculture or other societal needs should be prioritised according to socio-economic criteria, by which water is considered an economic good. Although cost-recovery and economic pricing are overriding principles, pricing and tariff regulations within sub-sectors are considered necessary where equity or social well-being are at risk and environment is endangered.

2.3 Generally accepted principles

Another clear consensus is the need for adequate participatory approaches to planning and management, and mechanisms for accountability and democratic control. This is closely related to the principle of decision-making at the lowest appropriate level (subsidiarity), which also implies that some decisions (for instance, on the sharing of international waters) should be taken at the highest level. In that case, mechanisms of democratic control and stakeholder participation clearly operate at the highest level of government.

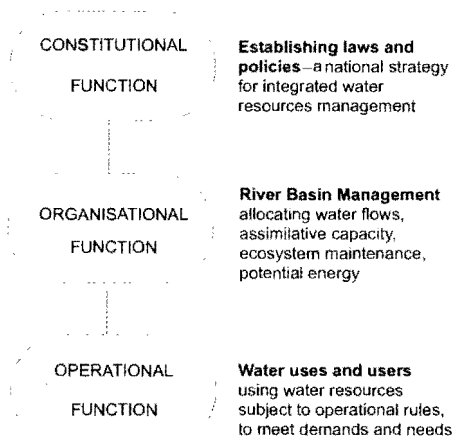
The river basin is the logical unit for water resources management. In many cases this has led to the decentralisation of management to river basin level. But one should not forget the role of central government. River basin management is largely an operational matter, whereby water allocation, water quality management, cost recovery and stakeholder involvement are essential components. However, the river basin authority is not a legislator and not responsible for policymaking and the setting of objectives and constraints to operational management.

Central government has an important role in IWRM in policymaking, legislation, strategic planning, establishment of the appropriate legal and institutional framework, capacity building, and supervision of decentralised and privatised institutions in water resources management. In addition, government should provide the protocols for information exchange (on water resources, water use and infrastructure), should provide adequate databases required for strategic planning and should prepare integrated river basins plans in response to its policy guidelines and constraints.

2.4 Functions and functional levels in IWRM

IWRM means decision-making concerning development and management of water resources for various uses. In this decision making process it takes into account the needs and desires of all the different uses, users and stakeholders. To pursue IWRM three functions are considered (figure 1): the operational or water use function, the organisational or water resource management function, and the constitutional or water policy and law function (Lord and Israel, 1996). The operational function is focussed at use or control of water for specific purposes to fulfil specific needs and demands. These include water supply and sanitation, irrigation and drainage, flood protection, hydropower, industrial supplies, tourism and recreation, fisheries, navigation and the preservation or rehabilitation of ecosystems.

Figure 1: Functions in integrated water resources management



To minimise the problems and conflicts of these different uses and users, co-ordination of water use and water allocation is required. Solving these problems also requires establishment or changes of water use rules. This is the organisational function. It involves co-ordination, planning, decision-making and policing of water use and users in water systems (river basins, aquifers).

To make the organisational function possible an enabling environment has to be created. This requires water policies, institutional development policies, including human resources development and normative and executive legislation. This is the constitutional function. These higher level actions are important because ineffective rules, accountability and policing mechanisms assure that water use and control problems cannot be solved (IDB 1997).

IWRM requires a good performance at all these functional levels. Development towards IWRM, therefore, needs to address these levels in a holistic way. These

development efforts are called capacity building. To make a proper assessment of required capacity building interventions the following framework is proposed.

2.5 The framework

The analytical framework is based on a cyclic development process to come from an identified present water resources management situation to some desired integrated water resources management situation. The desired IWRM situation is a compromise between the present and the ideal IWRM situation as an instantaneous complete introduction of IWRM is unrealistic and maybe undesirable to expect. This compromise will be the result of a negotiation process in which policymakers, water resources and water utility managers and stakeholders are involved. The outcome will be determined by technical, financial and political attainability under prevailing socio-economic conditions. With changing conditions the desired IWRM situation will change. This process contains the following major steps (figure 2):

- Assessment of the present situation and trends,
- Formulation of a desired IWRM situation based on an “ideal” or eventual IWRM situation,
- Formulation of interventions to arrive at the desired IWRM situation,
- Establishment of a monitoring system to see whether the interventions are being carried out properly and whether they really contribute to the achievement of the IWRM goals.

The framework and the guidelines are developed for the three functional levels: constitutional, organisational and operational.

2.6 The “Ideal” IWRM situation

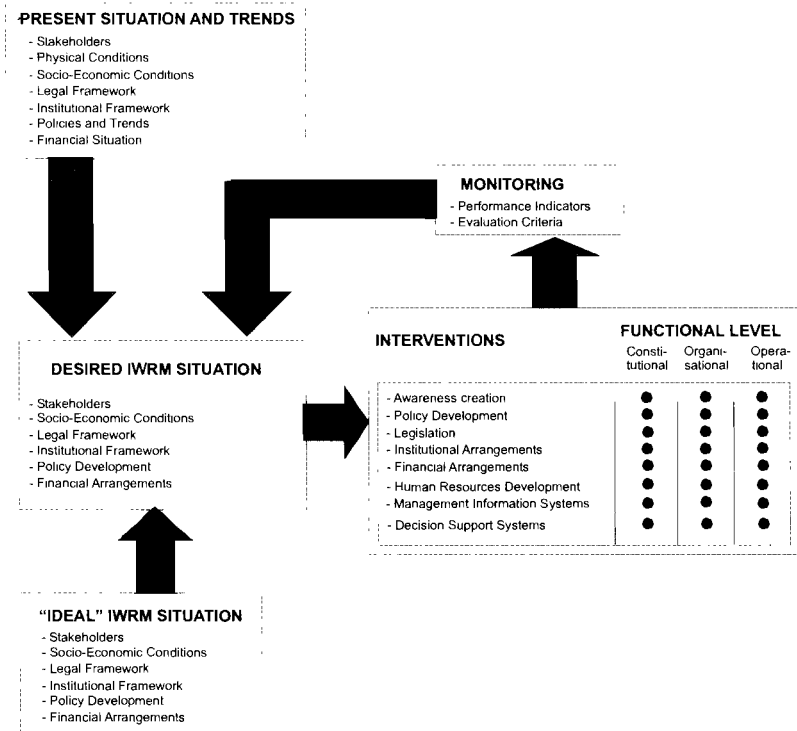
In the framework an “ideal” IWRM situation is formulated that should give direction to the process of integration of the management of water resources. In an ideal IWRM situation the water resource is managed on (sub-) basin level in a sustainable way. The water related interests of all stakeholders are considered in decision making on water use. All stakeholders are aware of the potential of the water source and the impact of their use on the other stakeholders. Decisions on water use and associated cost of service provision are made in a participatory manner according criteria agreed and accepted by all stakeholders. Implementation of IWRM is done at the least cost in a transparent way with effective accountability mechanisms in place.

The “ideal” IWRM situation is derived from the theory on IWRM and the internationally accepted and applied principles on water policies. Use has been made of regional and local water policy documents aiming at IWRM. (IDB 1997, Worldbank 1993, ADB 1996, South Africa 1997, the Netherlands 1997). The “ideal” IWRM situation does not exist. Local and regional conditions will determine what the most appropriate situation will or should be. The ideal situation is only presented to provide

an orientation in formulation of the desired IWRM situation. Conscious choices must be made to deviate from the ideal situation. This not only helps to increase understanding of the implications of IWRM, but it also generates (in the end product) a better sense of participation and belonging. It allows for active contributions to the formulation process, as the desirable IWRM situation will be used to define gaps in different arrangements, which in turn could be used for formulation of interventions.

Before IWRM can be successfully carried out, a set of institutional conditions must be met. These requirements are at the three functional levels and will be discussed in the following chapter.

Figure 2: Analytical framework for the assessment of the institutional setting and capacity building requirements for integrated water resources management



3. IWRM requirements for the functional levels

IWRM is a process of assignment of functions to water systems, the setting of norms, enforcement (policing) and management. It includes gathering information, analysis of physical and socio-economic processes, weighing of interests and decision making related to availability, development and use of water resources. This means that IWRM requires:

- a platform for weighing of all relevant interests and decision making on use of water and water systems in the river basin;
- this platform should represent all interests and be under governance of government to protect the interest of society at large;
- this platform should have decision, control and sanctioning powers;

A minimum set of conditions should be met to allow such IWRM platforms to operate successfully. These conditions are related to constitutional, organisational and operational functions. For all these functions it is required that the respective authorities have the mandate and the resources (financial and human) to carry out their tasks in development and implementing IWRM.

3.1 The Constitutional Function: Water Policy And Law

The main purpose of the constitutional function is to create an enabling environment for the IWRM platform with appropriate policy and legal frameworks, which gives the boundary conditions for effective implementation of the organisational and operational functions. Constitutional functions include policy development based on clear principles, development of normative and executive legislation and development of human resources development strategies. An important aspect to be arranged at this functional level is the degree level of participation of the private sector in all three functional levels.

IWRM requires from the constitutional function a system that:

- enables effective development and implementation of laws and regulations,
- enables effective constitution and development of relevant institutions,
- regulates decision making based on interests of all stakeholders,
- enables all stakeholders to participate in decision making,
- provides quantitative and qualitative standards for use,
- provides quantitative and qualitative standards for effluents,
- enables and regulates effective control and sanctioning of violations,

- enables implementing agencies to take the necessary steps to secure and conserve the resource,
- provides effective and transparent accountability mechanisms,
- provides sufficient capable people to meet the IWRM demands of policymaking, adapting legislation and all other activities,
- enables and regulates private sector participation.

3.2 The Organisational Function: Integrated Water Resources Management

The organisational function is integrated water resources management. The ultimate goal of the management process is to allocate water in quantity and quality terms for different purposes. The process involves resource assessments, planning, decision making, implementation and policing on allocations and use of water resources with and based on the interest of stakeholders. These processes are time and location specific. The activities are highly multidisciplinary, involving engineers in hydrology, hydraulics, construction, water supply, sanitation, hydropower, irrigation, and non-engineers such as: environmentalists, ecologists, lawyers, economists, sociologists, agriculturists, politicians and representatives of interested parties, pressure groups, and water users.

The development of an integrated water resources management capacity and capability is both a top-down and bottom-up process. The top-down process is a result of the execution of the care function of government. Government has to impose measures and regulations to protect the interest of society through protection of resources, ecosystems and socio-economic well-being of the people. Government executes this task through policy development and creation of legal and institutional frameworks for use and management of water resources.

The bottom up approach originates from the operational level where different and sometimes conflicting use and control interests need to be protected. This bottom up process is to be carried out in the enabling environment as created by government. As this is a process of learning, correcting and adjusting, the frameworks as imposed by the constitutional level should leave enough room for refining and adjusting. This means that only main policies and major concepts are regulated in law and the interest groups are given the opportunity to formulate their own way of co-ordination and operation. This, of course, should be done under tutelage of government.

3.3 Platform for co-ordination and decision making

The development efforts should be focussed at the creation of a platform for weighing interests and decision making on water use and control. To be successful this platform should have the support of the stakeholders. A consultation process before establishment of such platform is warranted.

The platform should have a decision-making capacity on river basin level that reflects the interests of different uses and users. The great lines for decision-making procedures should be part of the regulatory framework prepared by government. This should include a clear regulatory framework with norms and standards for decision making.

An effective and transparent accountability mechanism is essential for effective management. This includes accountability to the operational level to see whether the service agreements are being carried out, and to the constitutional level to ensure that societies' interests (wise use of resources) are not violated. Such accountability mechanisms require the platform to have power to control and sanction violations. These accountability mechanisms and policing powers have to be regulated in legislation from government.

3.4 Data availability

An effective IWRM system requires reliable information on the availability, use and quality of surface and groundwater in the basin. Databases, observation networks and inspection systems are to be made accessible, improved or developed. Good access to these data allows analysis of various options or scenarios for interventions in development and use of water. Sufficient capable and motivated people with the appropriate tools are required to meet these IWRM demands for planning, management, control and development. Identification and development of people and tools for management are part of the development process of the platform that also requires consent and support from the different stakeholders as important cost can be involved.

The legal and institutional framework in which the platform is to be developed and will operate is to be created at constitutional level. At constitutional level also the policies are set for development of capable and motivated staff.

3.5 IWRM requirements at organisational functional level

The basic function at organisational level is to co-ordinate between the different interests and to decide on the different uses of water. An effective organisational function requires:

- a decision making capacity on (sub-) river basin level which reflects the interests of different uses and users,
- a clear regulatory framework with norms and standards for decision making,
- a system that provides reliable information on the availability, use and quality of surface water and groundwater in the (sub-) basin,
- a system that allows analysis of several scenarios for interventions in use of water at basin level,

- an effective and transparent accountability mechanism,
- power to control and sanction violations,
- sufficient capable people to meet the IWRM demands on planning and management, control and development.

4. The operational function: water services

In IWRM a distinction is to be made between the management of the water resource and the delivery of water services, both of which are necessary in each country. Usually the planning, development and management of the water resource must be a government responsibility to ensure that public interests are served. In contrast, specific water services are generally best delivered by autonomous and accountable public, private or co-operative agencies with scope for increased private sector participation.

Manipulation of flows and (ground) water levels, to provide these services, requires an hydraulic infrastructure, whose development and management costs need to be recovered from the beneficiaries or from the community at large, if the system is to be sustainable.

Sustainability requires among others, adequate funding for operation, maintenance and management of the system. The costs for services are in principle to be recovered from those who benefit from the provision of those services. This requires an identification of beneficiaries and clients for the services provided. Clients are only willing to pay for services if these are reliable and considered not too expensive. Often government subsidies are provided to reduce the cost for the clients or to stimulate certain developments. However, this usually reduces the incentive for the managing agency for optimal performance of service delivery and effective and efficient use of resources. Financial autonomy of the managing agency that is fully accountable to the clients is a prerequisite for system sustainability.

4.1 Service orientation

The provision of the services requires an infrastructure that needs to be planned, designed, constructed, operated, maintained and after some time replaced or modernised. At the onset of development, the infrastructure is designed to provide a certain level of service. The cost of service provision is directly related to the level of service provided. The higher the level of service, the more management efforts and infrastructural requirements are needed, the higher the cost. In a situation where clients fully pay for the cost, the level of service must then be balanced against the associated cost in a consultative process with the clients and other stakeholders. They will agree on the level of service and its associated cost. The results are included in a service agreement between the service provider and the client. These agreements can only be successfully carried out if transparent and effective accountability mechanisms and accountancy systems are in place (van Hofwegen and Schultz, 1997). These also constitute part of the service agreement.

4.2 Water management services

Water management is the manipulation of surface or subsurface flows, levels and quality of water to serve either one or a combination of the following purposes:

- water supply for agriculture, domestic, municipal and industrial use, recreation and environmental protection;
- drainage of urban and rural areas;
- flood protection for urban and rural areas;
- control or maintenance of water quality.

These manipulations are carried out by individuals or organisations in a provision of public or private services on a local, regional and international scale and are mutually interactive.

The nature of water as a resource and its multiple use requires co-ordinated efforts to manage the different and often conflicting manipulations needed to fulfil the demands for the different purposes. These management efforts are offered as services and can be carried out by one or more institutions that can be either government, semi-government, private or users' organisations.

It happens that different organisations are involved in the provision of one service. Typical for such situations is the provision of irrigation water for agriculture not directly to the individual clients but through a water user's association.

4.3 The clients

In water management different services are provided for different client groups. The nature of the service determines whether the clients are clearly identifiable individuals who can voluntarily use or reject the services without doing harm to others. In water supply the transaction of a certain volume of water can be demanded or rejected without harming another water user (provided water is not a constraining factor).

However, flood protection, drainage and water treatment are water management activities that are of public nature and cannot be accepted or rejected by individuals. It is clear that water services are not always provided to identifiable individuals. Clear definition of the clients is necessary to decide with whom to enter into a service agreement, who is to be charged, and where to send the bill.

4.4 Development of the service relationships

As described above, the service relations and the services provided need to be clearly defined and transparent administration and effective accountability mechanisms need to be introduced. These are the main ingredients of the service agreements (van Hofwegen and Malano, 1997).

4.5 IWRM requirements at operational functional level

Effective operational functioning within an IWRM context requires a management system that responds to societal needs. This means that for water services the system should enable, provide or regulate:

- effective control of the service providers by users/clients and the IWRM Platform
- representation of clients' interests at and by the managing agency
- cost recovery by the service provider
- negotiations between the managing agency/service provider and its clients on the level of service it provides and recovery of its associated cost
- assessment of the demands, actual use and availability of water (quantitative and qualitative)
- power at the service provider to control and sanction violations
- sufficient capable people to meet the IWRM demands, planning, development and management of services provided
- a system that allows market incentives to make most economic use of water through participation of the private sector

5. Assessment of the institutional framework—process and tools

Assessment of the institutional framework requires a process, to come from an identified present water resources management situation to a desired integrated water resources management situation. The steps in this process are: identification of the present situation, formulation of a desired IWRM situation, formulation of interventions to arrive at the desired IWRM situation and establishment of a monitoring system to see whether the interventions are being carried out properly and whether they really contribute to the achievement of the IWRM goals.

The assessment process is using 10 steps that have been based on the experience gained from the test cases in Guatemala, Colombia, and Jamaica. In this chapter these steps are elaborated and tools which have been used successfully in these case studies are presented.

5.1 Step 1: existing water management situation

The present situation on water resources use and management should be well known before any intervention directing to IWRM can be made. Understanding the water situation is a prerequisite for assessment and analysis of the institutional framework and the (potential) water use conflicts between stakeholders. It appeared essential to have a basic document on the present water management situation to

start the institutional assessment process. Such a document will represent an experts opinion and will not necessarily be complete, accurate and representing the opinions, desires and aspirations of all stakeholders.

Important aspects to be dealt with are: water availability and water use, stakeholders, physical conditions, socio-economic conditions, legal framework, institutional framework, policies and trends and the financial situation. Experts are assigned to prepare such a (desk study) report describing the existing water management situation combined with registered problems (quantity, quality and environment). The report serves as a general background document for the following steps and has to be disseminated accordingly.

Physical conditions

The assessment of the physical conditions concentrates on the temporal and spatial availability and use of water (quantitative and qualitative). It requires information on the climate and meteorology, hydrology and hydro-geology, aquatic ecosystems, abstractions and influents and the availability and capacity of storage facilities.

As in IWRM water is managed on basin or sub-basin level, use of water resources, water distribution per sector and the resulting water balance have to be identified per basin or sub-basin. This is essential information for IWRM so the existence of observation networks and data bases, the levels of processing and the accessibility to these datasets and should be included in the inventory.

For the inventory a clear distinction has to be made between the different levels: national, basin and sub-basin level. At national level the inventory should limit itself to the water balance in the different basins. Such water balance provides insight into whether and when the basin is in a surplus or deficit condition. Temporal surplus conditions provide the opportunity to overcome temporal deficit conditions by creation of storage facilities. During deficit conditions the occurrence of major conflicts in interest will be most prominent both in quantitative and qualitative sense.

At basin or sub-basin levels a more detailed inventory can be required. For such an inventory a water use flow diagram can be most helpful. Such a diagram provides not only the uses and users but also their inter-dependencies with regard to water quantitative and qualitative aspects.

Stakeholders and interest groups

Stakeholders are people or groups of people with a legitimate interest. Legitimate interests are formulated in the by-laws of the interest group where the stakeholder is regarded as a private entity/body. Stakeholders are not the same as interest groups. Interest groups represent all kind of interests: public, private, environmental, social etc. If they are organised and have statutes or by-laws they represent legitimate interests (GO's, NGO's, professional organisations, commercial organisations, users associations) and as such become stakeholders.

In IWRM the stakeholders can be classified as follows:

- water users — consumptive and non-consumptive uses
- water polluters — agriculture, industry, domestic etc.
- water managers — organisational and operational level
- water policy and law makers — constitutional level
- society — general interests represented by government and specific interests represented by NGOs

It depends on the socio-economic and the political situation whether all the interests are represented. So it is important to assess which stakeholders' interests are considered and which are not considered, but are important for sustainability.

A water use (flow) diagram can be most helpful in identifying the stakeholders. Water use will be different for each basin. Therefore, stakeholders have to be identified on basin level.

Inventory of water problems

In this stage the inventory of water problems limits itself to those generally known and registered at the main stakeholders. The basin water balances and the water use flow diagram can again be most useful to put the registered problems into the basin perspective. The type of problems that not only concern water quantity, quality and environmental issues (erosion, siltation salinity etc.) but also relate to navigation, recreation and other uses. This inventory will be used in the second step as a starting point for an analysis of the problems and identification of other interest groups and stakeholders.

Water rights and water allocation

In most of the countries water is considered a public good, but individuals can obtain private rights over water by tradition. Existing water rights are often a main constraint and a source of many problems in the optimisation and introduction of IWRM. The system of water rights (surface water and groundwater) their acquisition and conditionalities, their transferability and the system of water right administration should be clearly presented. Especially in water market systems a sound administration and a system of approval of transfers is required. If not available, planning of water will become very difficult.

Water allocation between different uses and users is an organisational function. The introduction and development of IWRM could learn much from the present water allocation system, the conditions and procedures and actors in the decision-making process. A good description will, therefore, be very valuable especially for the analysis of water quantity related conflicts or problems. These aspects can be verified in the stakeholder interviews in the next step.

Description of socio-economic and financial environment:

Many of the problems identified above will be said to be due to the actual financial and social situation. Lack of infrastructure and maintenance, lack of good management, and the difficulty of having effective cost recovery are usually blamed on lack of financial resources. Therefore, it is important to have insight into the budget allocation mechanisms, budget constraints, cost recovery mechanisms, subsidies, price and tariff structures, collection mechanisms, collection efficiencies, capability and willingness to pay for the various uses. These mechanisms should be identified in general terms per sub-sector or use.

Existing water policies and strategies

In many countries the water sector is under debate due to problems experienced and the commitment of governments to the outcome of the international conferences. Though often not yet formulated, many countries are in the process of policy development. These policies deal with principles like: equitable and socially acceptable water distribution (priorities, redistribution to marginal groups: poor, women etc.), water as a scarce, finite and economic good (efficient water use, cost recovery, pricing mechanisms and tariff structures, transferability of water rights, rate of commercialisation), water management at the lowest appropriate level and on hydrological boundaries (delegation and decentralisation, water users participation, involvement, water management by and for water users), integrated planning arrangements and other co-ordination efforts, private sector participation, and environmental protection. An inventory of these policies indicates the level of awareness and commitment at constitutional functional level.

Lack of these means either that there are no problems, lack of awareness or lack of political will.

Legal framework

An inventory with an explanation of principles is required of existing water laws (and other relevant environmental legislation), water regulations and relevant environmental regulations and decrees and by-laws of water authorities and river catchment agencies. It is important to indicate, whether and how the above mentioned focal policy aspects are incorporated in the legislation such as equitable water distribution, pricing, delegation and decentralisation, participation, integrated planning, and environmental protection.

Especially in countries where water policies are changing, legislation will be under reconsideration or in the process of change. Therefore, it is necessary not only to present the existing legislation but also the adjustments envisaged. When legislation is in a process of change this indicates that on constitutional level they are aware that present legislation does not satisfy the needs. It is of great value to describe the background of these changes and the direction of the change.

Special attention is to be paid to "trial" legislation where government has given mandate to certain management entities to work with legislation under design in pilot areas, for example, IWRM or basin level management.

Relevant water institutions

Relevant water institutions are those institutions that with regard to water and water management either formulate policies and laws, do or are involved in water planning, co-ordinate water uses and users, provide water services or make use of water services. These can be government, semi-government or private institutions on national, basin or use level. A water use flow diagram can give an indication of water users, service providers and co-ordinators.

Past and present experience in IWRM

It is important to know what has been tried in the past to overcome certain problems encountered and to what extent these interventions have been successful or not. A description is desired of lessons learned from local experiences of earlier and/or present interventions in the field of integrated water resources management and reasons for success or failure.

5.2 Step 2: stakeholder selection

A first inventory of stakeholders will be made in step one. These stakeholders will be the obvious operators of water services, co-ordination bodies and policy and lawmakers. For the further process a selection of stakeholders has to be made to avoid duplication. Also some stakeholders might have been overlooked in the first study. Therefore, an independent team is formed to identify and select relevant stakeholders from the categories: water policymakers, water managers, water service providers, water using agencies, water using groups, water users and other potential interest holders at constitutional, organisational and operational levels. These stakeholders will be approached for in depth interviews.

5.3 Step 3: stakeholder interviews

Experts carry out an elaborate procedure of interviewing the selected stakeholders applying the guidelines for interviews. These guidelines are in the format of a questionnaire which contain questions relating to the stakeholders interviewed and their perception of the existing situation and what they consider to be the desired IWRM situation. During this interview previously overlooked stakeholders can be identified through the identification of parties that negatively influence the implementation of the stakeholder's duties.

A different set of questions under the issues in the matrix is used for all three functional levels. They are organised under the headings: stakeholders, awareness, policy, legal framework, institutional framework, financial arrangements, human resources development, management information systems and decision support systems.

The selected stakeholders will be invited to answer the questions during the interview. Guidelines for interviews have been prepared (Van Hofwegen and Jaspers 1999). The interviews should provide information on the situation of water management and indicate the conflicts and the level of agreement and disagreement between

the stakeholders. It is, therefore, important that the interviews are made by specialists who understand the meaning, purpose and operationalisation of IWRM and the potential problems and conflicts that might be encountered.

A second part of the interview aims to obtain a description of the stakeholder's concept for improvement of the existing water resources situation, towards more integrated water resources management. The following aspects and principles should be included:

- Equitable and socially acceptable water distribution
- Efficient and economically sustainable water use
- Delegation, decentralisation and other devolution of authority
- Participation of stakeholders
- Integrated planning
- Private sector participation
- Environmental protection

It is obvious that no guidelines can be prepared on how the IWRM situation should be as this is location and time specific. However, to give direction to the process on formulation of a desired IWRM situation, an "ideal" IWRM situation is formulated where in relation to all the points raised during the interview, a clarification is given on how the situation would look like under ideal conditions.

The formulation of the desired situation by the individual stakeholders provides information on what they consider the main constraints and what should be changed and what they see as being realistic and attainable in their present situation.

The "ideal" IWRM situation is derived from the theory on IWRM and the internationally accepted and applied principles on water policies. It does not exist but is only presented to provide an orientation in formulation of the desired IWRM situation. Conscious choices must be made to deviate from the ideal situation. This allows for active contribution to the formulation process, as the desirable IWRM situation will be used to define gaps in existing arrangements, which in turn could be used for formulation of interventions (steps 4–6).

5.4 Step 4: analysis of stakeholder opinions

The guidelines are presented in the format of a matrix where through sets of questions for different stakeholders the present and desired situation for each of these stakeholders on the various levels are identified. The outcome of all the interviews will be collected and an inventory will be made of agreements and disagreements between the different stakeholders on the present situation, the problems and constraints and the steps to be taken to come to a better water management. The results of the interviews are described in a report and

disseminated with the background document to the interviewed stakeholders. These stakeholders should also be invited to the workshops that follow in the process.

5.5 Step 5: workshop 1—problem identification

The first workshop to which all the relevant stakeholders are invited deals with the assessment of the existing water resources management situation and problem identification according to the perception of the stakeholders. The steps 1-4 were focussing on individual stakeholders and their interests. Their agreements and disagreements as formulated in the analysis report in step 4 are an interpretation of the “expert”. Therefore, it is important that all the relevant stakeholders recognise their problems and those of others.

The purpose of the first workshop is to confront the different stakeholders with the perception of other stakeholders and to obtain consensus between all different stakeholders of what the real problems are and which should be addressed. The analysis report will be used as a reference and will be improved in accordance with the outcome of the workshop. The agreed set of problems will then be used as an input for the further stages on formulation of a desired IWRM situation and necessary interventions. During the test cases it proved to be a very fruitful method to arrive at a set of most important problems.

Important is that the workshop will be organised under the auspices of acknowledged and accepted authorities as participants will only take such an activity serious if the result will contribute to the process of change. This means that the outcome should be included in the policy development process, implementation process or operationalisation of water resource management.

5.6 Step 6: workshop 2—formulation of desired IWRM situation and interventions

The second workshop (one to three months after the first workshop) will elaborate extensively on the principles of integrated water resources management and will further result in the formulation of a desired water resources management situation in that specific country or river (sub-) basin and the set of interventions that will be needed to achieve that.

This workshop is indicative and the outcome provides directions for constitutional, organisational and operational interventions. The outcome should be seen as an input for national policy and decision makers on the one hand, and as a framework for defining interventions at the three levels. It is, therefore, important that the status of the outcome is valued in this light.

In case these guidelines are applied for specific project work, an additional step in this workshop is required to analyse which, if any, of the above formulated interventions should be promoted in the context of this specific project and which interventions better to leave for other projects or sets of activities.

5.7 Step 7: preliminary country/basin/sub-basin report

Based on the foregoing steps the experts will draft a preliminary country document comprising:

- assessment of existing water management situation
- complete problem inventory
- desired water resources management situation
- proposed set of general and specific interventions needed to reach the desired situation

5.8 Step 8: dissemination and comments

The draft country/basin/sub-basin report is disseminated and a thorough procedure for collecting comments from the different stakeholders at the different levels is followed.

5.9 Step 9: final country/basin/sub-basin report

Experts draft a final country/basin/sub-basin report which is offered to the government and financing agencies for endorsement and inclusion into the strategy and/or into specific water related projects for the specific country.

5.10 Step 10: Monitoring procedure

A monitoring procedure is developed to see whether the interventions are taking place and whether the envisaged results are achieved.

6. Application of guidelines and lessons learned

These guidelines have been developed in an interactive process, which included field tests in three countries (Colombia, Guatemala and Jamaica). The use of the guidelines initiates a process towards balancing the interests of different stakeholders in water. The guidelines can be applied in different stages of the project cycle: sector policymaking, sector planning, institutional design and management arrangements for the sector and for specific projects. Its use should result in an agreement on what the problems and conflicts are and how these can be resolved. The process in itself is cyclic and by monitoring the effectiveness of the interventions new problems and constraints can be identified and corrective actions or new solutions have to be sought. The following points require attention in the application of the guidelines:

1. The use of the guidelines has to be regarded as the initiation of the process towards IWRM attached to projects envisaged. The first cycle of the process results in a set of interventions necessary to achieve the desired IWRM situation. These interventions can be included in the

project design. These projects can be sectoral on regional or (sub-) basin scale or sub-sectoral and on local scale.

2. The application of the framework is most effective in programmes aiming at sector wide institutional change and development because the aim of the programme coincides with the purpose of the guidelines. Moreover, the programme is most likely to be supported by the main stakeholders, making the possibilities for interventions wider and necessary adjustments in legal and institutional frameworks less complicated.

The guidelines can also be applied in relation to local projects in physical infrastructure. The project should be of such scale that different stakeholders can and will be influenced and conflicts of interest on local and (sub-) basin scale are foreseen. However, in this case the focus of the project is on the physical works and institutional change is a derivative of such a project. The possibilities for interventions will also be limited by the room provided in legislation as it can hardly be expected that for only one such project legislation will be amended.

3. It is important to notice that, on the local scale, the situation is not always perceived as problematic. However, it is the duty of government to foresee possible negative effects for, and conflicts with, the interest of society. In such cases government should take appropriate action through awareness creation and, in a later stage, should participate as a stakeholder in the formulation of interventions using the proposed framework.
4. The guidelines can be applied at different levels of scale: sub-basin, basin and national level. For whatever level of scale these guidelines are applied, it is crucial to identify and engage all relevant stakeholders at the three functional levels. Leaving out some stakeholders might lead to non-acceptance of the outcome of the process and obstruction of the further development of IWRM. Therefore, these exercises cannot be done through desk studies.
5. It is advisable to engage independent local experts and preferably not from within the government. Independence should take away bias towards selection of stakeholders in the process. Government officials are likely to focus on official government policies and government agencies limiting the margins of problem identification and solving.
6. During the tests it became clear that the interview procedure required more emphasis. The purpose of the interviews is to obtain the opinion of the individual stakeholders or their representatives. The guidelines for the interviews are meant to be a tool for the interviewer to structure the interview and to interact with the stakeholder on the different issues raised. The guidelines should not be handled as questionnaires to be handed over to the stakeholder to be filled as then the sensitive issues

will not surface. This means that besides a good understanding of IWRM, good communication skills are required for the interviewer. It also emphasises the necessity for good, clear and field tested guidelines.

7. The workshops proved to be an effective tool to obtain consensus on what the problems and conflicts are and what steps should be taken to resolve them. On several occasions it seemed to be the first time that different stakeholders were sitting in one room discussing their problems! However, to deal with problem identification and resolution in one workshop was too much asked for. Several workshops with different focus are needed e.g. one workshop on problem identification and one on solutions and interventions.
8. Clear prospects for the stakeholders are a necessary condition for the stakeholders to participate actively. The idea that problems are being inventoried and ways are sought to solve them leads to expectations that follow up will be given. Therefore the framework of this process must be made clear from the onset. Active participation also depends on the authority of the initiator of the process. For example, the role of the Inter-American Development Bank as initiator and organiser of the workshops appeared to be crucial in all the test cases.
9. Some understanding of IWRM and private sector participation (PSP) among the participants in the process is a condition for a good outcome. The first inventory should identify the level of awareness and knowledge on IWRM and PSP. If necessary awareness and knowledge can be raised through information and education and training programmes.
10. A basic requirement for IWRM is the preparedness to reflect on principles of active democracy, because IWRM is about weighing private and public interests and therefore a matter of compromises. Outcomes of democratic processes should be respected and solutions should not be forced.
11. In most cases the scale of the process will not be sufficiently known. In such case step one of the process (inventory) can be separated from the remainder. The outcome of step one should then include a cost estimate for one cycle of the process.

Bibliography

- ADB. 1996. *Towards Effective Water Policy in the Asian and Pacific Region*, Asian Development Bank 1996.
- Ait Kadi, M. 1997. *High Water Stress - Low Coping Capability, Morocco's Example*, in *Mar Del Plata 20 Year Anniversary Seminar*, Stockholm International Water Institute pp. 113–126.
- Hofwegen, P.J.M. van; and H.M. Malano. 1997. *Hydraulic Infrastructure under Decentralised and Privatised Irrigation System Management*. In *Deregulation, decentralisation and privatisation in irrigation: state functions move to the free market*; DVWK Bulletin no 20; pp 188–216; Bonn 1997.
- Hofwegen, P.J.M. van; and E. Schultz (eds.) 1997. *Financial Aspects of Water Management*, Proceedings of the 3rd Netherlands National ICID Day, Balkema Rotterdam.
- Hofwegen, P.J.M. van; and Frank G.W. Jaspers. 1999. *Analytical Framework for Integrated Water Resources Management – Guidelines for Assessment of Institutional Frameworks*, IHE Monograph 2, Balkema Publishers Rotterdam/Brookfield.
- IDB. 1997. *Integrated Water Resources Management: Strategy Background Paper*, Draft October 24, 1997. IDB Washington.
- Lord, W.B.; and M. Israel. 1996. *A proposed strategy to encourage and facilitate improved water resources management in Latin America and the Caribbean*. IDB Washington.
- Ostrom, E. 1992. *Crafting institutions for self-governing irrigation systems*, Centre for Self-Governance, Institute for Contemporary Studies, San Fransisco.
- Savenije, H. 1997. *Concepts and Tools for Integrated Water Resources management*, IHE Delft.
- Small, L.; and M. Svendsen. 1990. *A framework for assessing irrigation performance*; *Irrigation and Drainage Systems*; Vol. 4/4, November 1990; Kluwer Academic Publishers, Dordrecht, the Netherlands.
- Verhallen et.al. 1997. (in Dutch) *Integraal Waterbeheer*; Delft University of Technology.
- World Bank. 1993. *Water Resources Management*, a World Bank Policy Paper, Washington D.C.