

Making water rights administration work

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This paper distills guidelines from experiences in Argentina (Mendoza Province), Chile, Mexico, South Africa, Sri Lanka, Uganda and Uruguay in designing and implementing their respective formal water rights administration systems, grouped in guidelines for setting up an enabling environment for implementation, for drafting “implementable” water legislation; for the implementation itself, and for making a water rights administration system a true water resources management tool. The last set refers to the most important challenge, namely “doing the right thing, not just the thing right”. It also proposes a dynamic approach to water resources policy, law and regulations drafting, namely the “parallel track approach”. Informal/customary systems of water rights are not specifically addressed in the seven case studies summarized herein; assuming – perhaps naively – that in most cases customary practices may be taken into account through stakeholder participation within the fold of formal water resource legislation. Therefore, a fifth set, namely guidelines for addressing plural legislative frameworks through stakeholder participation is also offered.

Keywords: water rights system design and implementation, water rights guidelines, water legislation drafting

Introduction

A system of water rights (permits to abstract and use water resources – Garduño 2003), based on formal water legislation (Caponera 1992 and Nanni *et al* 2003) is often first introduced as a means to reduce interference, avoid counterproductive conflicts and resolve emerging disputes between neighboring users. However, the development of a stable system of water rights has far wider benefits, since it provides a sound foundation for the development and protection of water resources and for the conservation of aquatic ecosystems. Also, certain other steps towards more integrated water resources management can only be effectively tackled when water rights have been adequately defined:

- fostering the participation of water users in water resource management
- implementing demand management programs
- ensuring water availability for new water resources development to address the needs of the poor
- systematic collection of water use charges to promote water use efficiency and to raise revenues for resource management
- possible subsequent trading of water rights to promote more efficient water allocation
- developing conjunctive use of surface water and groundwater resources

Regulation of freshwater abstraction from, and of wastewater disposal into, surface and underground water systems, and of water rights accruing as a result, is a recurrent feature of much modern legislation for the management, development, conservation and use of water resources. Regulating water rights, however, will not *per se* ensure that the relevant abstraction licensing and wastewater disposal permitting materializes. Enacting legislation is one thing, implementing it quite another. It is safe to say that, in fact, implementation tends to be the Achilles’ heel of the process of reforming and modernizing water resources legislation.

Timely and effective administration is critical to establishing the credibility of such legislation and to ensuring public support for and compliance with it. Administration of the legislation is equally important to establishing the security of rights to water resources and hence to promoting private-sector investment. This should, however, take place in a context where meaningful protection is provided for basic human and environmental requirements while available water resources get allocated to users in an increasingly competitive environment.

Because of the dynamic complexities of the quality and quantity aspects of the water cycle, the human interventions in it and the many historical, social, ecological, economic and political circumstances that influence the use of water resources, water laws are very complex and success in implementing and enforcing them, not only in developing countries, is extremely difficult to achieve. Probably the most complex challenge water laws pose is the administration of water rights, i.e., the granting of licenses, concessions, permits and other comparable legal titles for the abstraction of water from watercourses, lakes and other expanses of surface waters, and for the extraction of groundwater; and the granting of licenses, permits and other comparable legal instruments for the discharge of waste and wastewater directly or indirectly into a water body or onto the soil. A perhaps more formidable challenge still is monitoring and enforcing the compliance of water users with the law in general and with the terms and conditions of such licenses and permits in particular. The difficulties stem from the complexities mentioned above, but also from the fact that in many cases legislation is drafted with limited regard for the institutional capacity to "absorb" it.

This paper, which mainly summarizes two FAO publications (Garduño, 2001 and Garduño *et al*, 2003) is equally directed at policymakers, lawmakers and government administrators. It has been written in the belief that laws and regulations will stand a serious chance of being implemented and effectively administered if the demanding complexities of the implementation and administration of systems of water rights, and of the associated licensing and permitting legislation are factored into the drafting of the legislation. But sound implementation may not be enough unless water rights administration serves the purpose for which it was established. To this end conclusions are offered as preliminary guidelines for the use of lawmakers and government administrators. The reports cited above include references to other sources.

Seven case studies illustrate this paper. The Mexican case is based on the author's experience as responsible for designing and implementing the water rights administration system as established by the water resources legislation in his own country, updated recently (2003) with one of his successors. The studies on the Republic of South Africa, Sri Lanka and Uganda draw from his experience as FAO consultant (during 1997-1999) on the implementation of water resources licensing legislation in those countries. The studies on Chile, Mendoza Province in Argentina and Uruguay, were prepared in 2003 by key role players in the administration of water rights system in each country.

The complexities mentioned above are further aggravated when plural legislative frameworks (formal and customary) coexist. This is the case in most countries in Africa. Nevertheless, the guidelines offered deal basically with the processes involved in the design and implementation of water rights systems, and in this respect they could be also useful in making the best of existing informal systems. Informal/customary systems of water rights are not specifically addressed in the seven case studies summarized herein; assuming – perhaps naively – that in most cases in the case study countries and perhaps in some African countries customary practices may be taken into account through stakeholder participation within the fold of formal water resource legislation. To this effect, some guidelines dealing with stakeholder participation are also included.

Conceptual framework

This paper deals mainly with the right to abstract and use water, but it must be recognized that the administration of such rights should go hand-in-hand with the administration of wastewater disposal permits and of water-resource fees or levies. Therefore, these three components are first dealt with, followed by a general description of the water rights administration process and of the implementation tools usually required for such administration to be operational.

Components

Water abstraction and use rights

A 'water right' usually constitutes the right to use (but not ownership of) the water itself. Lawyers call this a 'usufructuary right'. A water rights system (Garduño *et al* 2002) should have the following attributes:

- *requirement for effective and beneficial use of water*, such that water resources cannot be obtained for speculation or let run to waste

- *reasonable security of water use tenure*, including entitlement to compensation under some (but not all) circumstances when reduced, notwithstanding the requirement for efficient and beneficial use
- *flexibility* to reallocate water, to more beneficial social, economic and ecological uses, through periodic review or other mechanisms, rather than allocation in perpetuity.

Water rights are thus normally subject to a series of terms and conditions (Box 1).

Box 1. Terms and conditions usually specified in water abstraction and use rights	
Term or condition	Comments
duration of right	allocation flexibility requires some time limitation (say 5-50 years)
point of abstraction and use	these should be specified and may be different
purpose of use	important to distinguish consumptive and non-consumptive use rights
rate of abstraction	specify annual maximum together with any short-term limits
specification of works	details of diversion, storage dam or well
environmental requirements	linked specifications of location/quality of return flow
cost of right (water resource levy)	fee usually paid for holding and/or using right
record of transaction	obligation to declare transfer of right (when permitted)
loss or reduction of right	forfeiture without compensation for non-use or non-compliance
suspension of right	as a penalty or in emergency without compensation
review of right	periodic adjustment with compensation according to supply/demand
renewal of right	facility to apply for continuation before expiration

Source; adapted from Garduño et al 2002

Wastewater disposal permits

These permits usually specify the amount of water a user is allowed to dispose of in a certain surface or groundwater body or onto the soil, subject to complying with a certain wastewater standard or to using a specified wastewater treatment technology. Since water abstraction from a water body may affect its natural pollutant assimilation capacity and discharging wastewater into it may affect its quality, it is important that both abstraction and disposal permits are considered simultaneously and preferably managed by the same agency or at least with close coordination between the water resources and environmental agencies.

Water resource levies

Notwithstanding the fact that most poor users in developing countries cannot afford the full economic cost of the water they use, and that social equity considerations may very well override cost recovery policies, thus making it necessary to introduce targeted subsidies, it is important for water resource managers and users to be aware of the components of such cost. Figure 1 illustrates the case of groundwater (Kemper *et al*, 2004), which is often undervalued. The exploiter of the resource (in effect) receives all the benefits of groundwater use but (at most) pays only part of the costs – usually the recurrent cost of pumping (providing the energy use of water is not subsidized) and the capital cost of well construction, but rarely the external and opportunity costs. This undervaluation often leads to economically inefficient resource use and groundwater excessive exploitation. Conceptually water resource fees or levies should include the resource administration cost as well as the opportunity and external costs.

In some countries also wastewater disposal levies are charged to control pollution; to be effective these charges should make the polluter pay more than is required to treat and dispose of the effluent according to specified standards.

The water rights administration process

"Implementable" legislation is one that the Government is able to administer and enforce, and water users have the ability to comply with. Figure 2 shows how the different actors may interact in the administration of a water rights system. In the particular case of a water use, the most important actor is the water user/ applicant/license holder. But other users in the same river basin or groundwater aquifer who may be affected by that use also play an important role. Stakeholders -even if they are not users of water- may also want to express their opinion

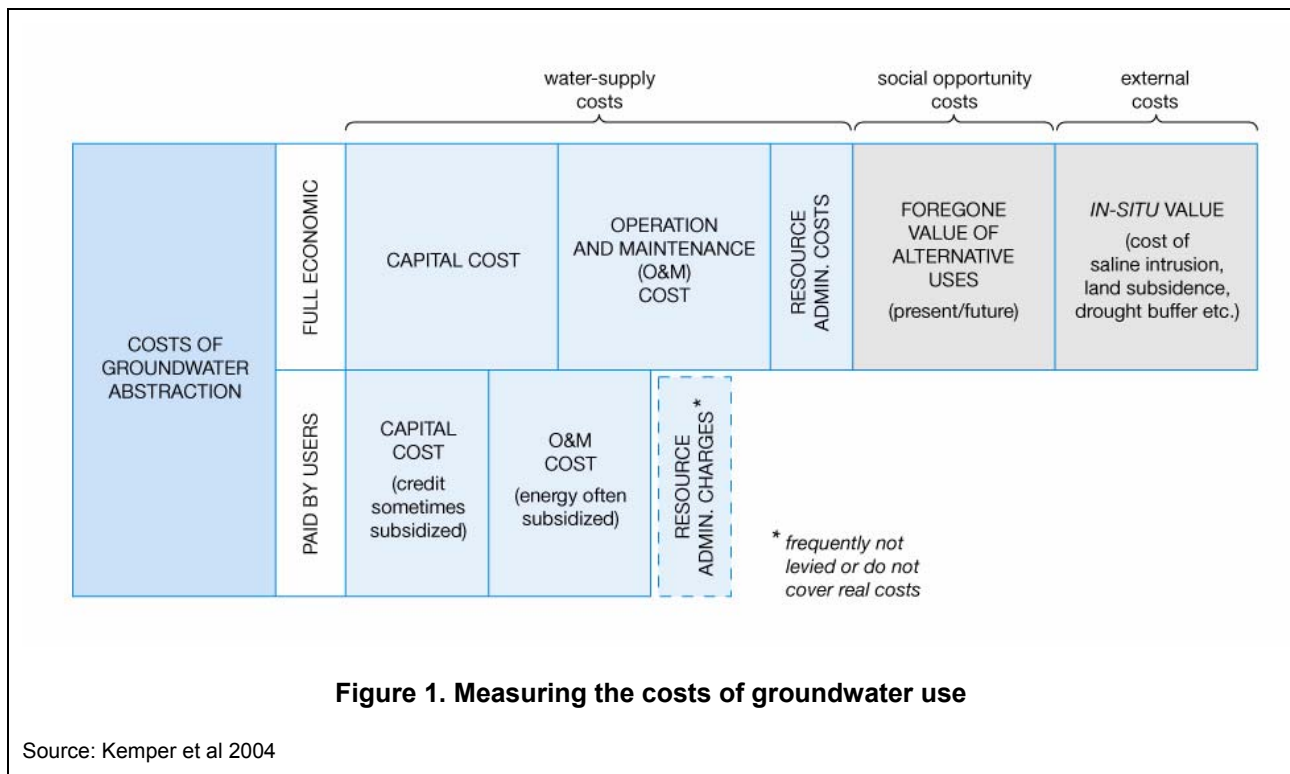


Figure 1. Measuring the costs of groundwater use

Source: Kemper et al 2004

regarding an application for a new water use license or permit, or file a complaint or lawsuit against an existing user, or appeal against the decision of the water authority. The water authority may deny the applicant a license or permit, or it may grant it and register it. Once the applicant is granted a license or permit, he or she becomes a legitimate and lawful user and must abstract water, discharge waste into a receiving water body and pay fees and charges according to the water legislation and the terms and conditions attached to the license or permit. The water authority keeps records and monitors the water users'/license holders' compliance through field inspections and other appropriate means of verification. On a finding of wrongdoing, the water authority will impose a fine on the user/license holder or seek prosecution by the judiciary if a criminal offence has been committed. In addition, the water authority and/or the judiciary may hear appeals from the user/license holder or from affected third parties, lodged against a decision of the water authority.

Implementation tools

When designing a water rights administration system and setting up a time frame for implementation, it is wise to be aware of the tools that may be required to implement it; otherwise an unrealistic system may result. Box 2 shows the usual kinds of implementation tools in a water rights administration system. It is needless to say that these tools should be designed as simple as possible and taking into account the existing capacity and information. For instance, only when enough hydrological data, trained personnel and hardware is available should sophisticated computer models be used for water resource allocation; otherwise simple spreadsheets and international water use indices based on socioeconomic information may be used (see the second guideline for an implementation strategy below). In effect, all these tools can be tailored to the specific situation of a country or region within it, and made as simple as required.

Case studies

Following is a brief summary of the seven case studies which are dealt with extensively in Garduño 2001 and 2003.

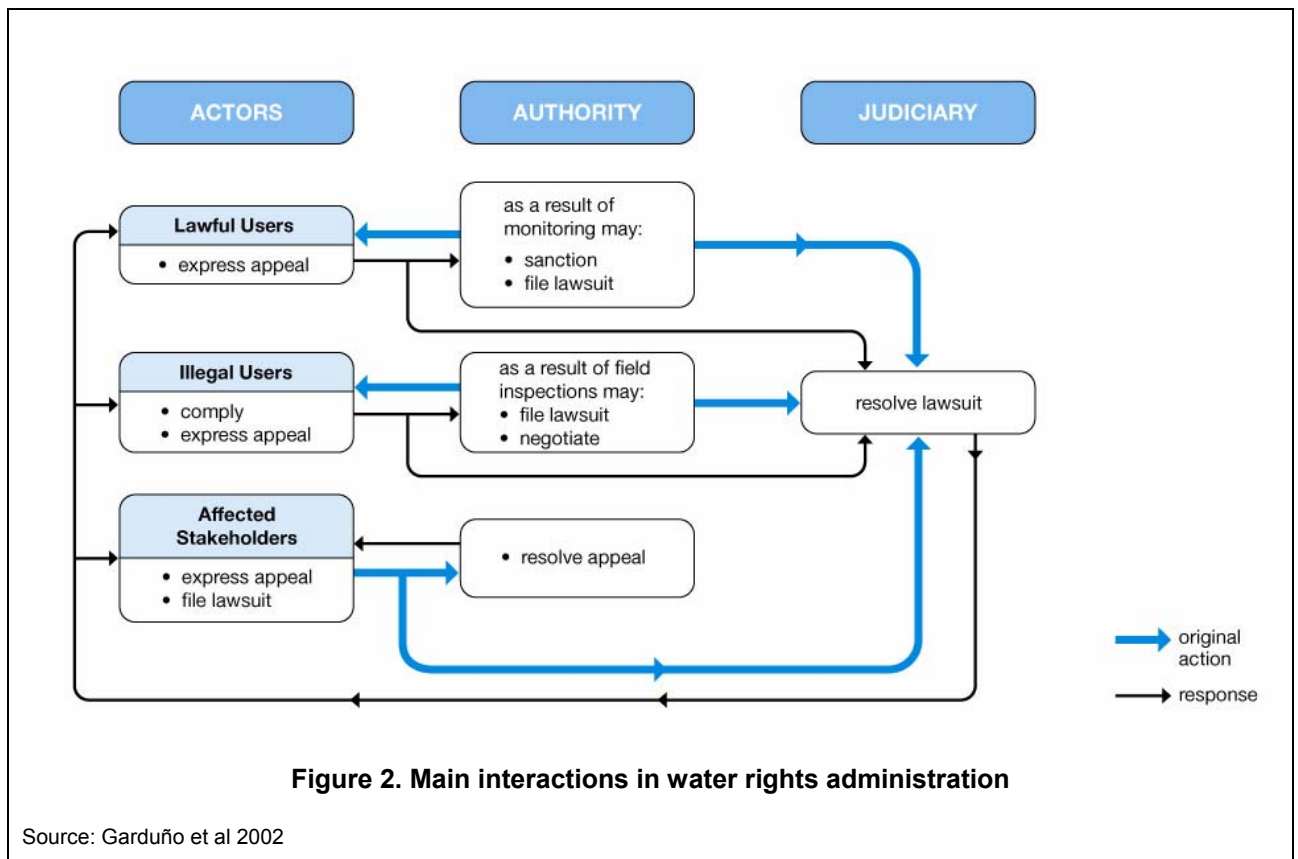


Figure 2. Main interactions in water rights administration

Source: Garduño et al 2002

Box 2. Usual implementation tools for water rights administration

Planning Models

- users and polluters model
- preliminary water quantity and quality balances for defining priority control river basins and aquifers

Guidelines and procedures for the filing, processing, granting and control of water abstraction and wastewater disposal permits

technical

- determination of ecological water requirements
- simple manual procedures and computer models for reviewing permit applications

managerial

- filing and processing applications, approval or refusal
- permit registration and public consultation of the water rights register
- applicant and user manuals
- monitoring of user and polluter compliance after permits have been granted (in this case, besides managerial some technical and legal aspects must also be included)

Information system

- library management software to systematically safeguard, retrieve and release all documents involved in each application
- databases and follow-up systems to keep track of applications and permits
- databases and follow-up systems to keep track of users' and polluters' compliance with conditions in their permits and with 'user-pays' and 'polluter-pays' principles

Argentina (Mendoza Province)

The Province of Mendoza has the longest water resources management tradition in Argentina, because limited water availability has faced a continuously growing demand and pollution. The most pressing water quality issues are groundwater salinization, low coverage of industrial effluent treatment albeit 80% of municipal effluents are treated. Recently, wastewater reuse for irrigation of restricted crops has contributed to pollution control and proved to be an additional source of water whose allocation calls for new water rights to be issued.

A number of public and private entities are involved in water resources management, thus creating a complex institutional framework. Separate management for each water use sector has caused duplication of functions, slow decision making and regulation credibility loss leading to non-compliance. Nevertheless, albeit incipient, transfer of some management functions to strong water users associations is bringing users into the fold of the law but these organizations still need to be streamlined, inter-institutional coordination reinforced and river basin management established.

Mendoza has adopted several water resource management principles stemming from the Provincial Constitution that constitute the axis of the legal system. The main ordinance is the 1884 Water Law, which needs to be updated to face new water uses and increasing demand. Wastewater control has been uneven, but it is financially self-sufficient; the system relies on a polluting premises registry which facilitates regular effluent monitoring. The water users and uses registry is being updated through a geographical information system aimed at assessing existing water rights and simulating alternative scenarios in order to develop a long term plan. To sustain the water resource administration users pay a water levy, according to the kind of water use and whether the source is surface water or groundwater. In spite of water levies being low collection is difficult mainly because of the registry being incomplete.

The main improvements envisaged by some local water resource managers are: declaring all waters to be under public dominion, permitting water rights markets, updating the water rights registry, modernizing the administrative structure of the water authority, improving institutional coordination, streamlining application procedures for abstraction and wastewater disposal permit applications, establishing a water demand management program and a volumetric delivery and charging system, and strengthening users participation.

Chile

In this country the various user sectors increasingly demand larger volumes of water, in a context of scarcity, where particularly surface water resources are almost fully allocated to meet current demand. Thus, at the present time, new demands will have to be met with surface water resources from the southern part of the country and with groundwater.

The main institutional feature is that the Water Agency (independently from all water user sectors) is the sole governmental body in charge of water resources monitoring, research and administration (including issuing of water rights). Another important feature is that once Government grants a water permit, water user organizations distribute and manage the resource with no state intervention.

The Chilean water legislation, effective since 1981, with full constitutional support, establishes solid water rights, which are neither tied to land ownership nor to a specific beneficial and effective water use. Moreover, they may be freely transferred; consequently a water rights market has been established. This legal security on the use rights, water markets and the fact that no water resource charge is levied, have been essential for the development of productive projects; nevertheless, it has increased water waste and made speculation with water rights possible. Since the early 90s significant progress on wastewater discharge identification and control through adequate standards has been achieved, but the "polluter-pays principle" has not been implemented. In 1993 the National Congress started discussing draft amendments to overcome the legal impediments to the water rights system.

Mexico

Water resource management is perhaps Mexico's most urgent environmental problem today, and one that impacts heavily on the economy. The country is slightly less than 2 million km² in size and the population has quadrupled from 25 million in 1950, to 100 million today. Population growth has occurred nationwide, but has been greater in the semi-arid and arid north, northwest, and central regions, which are precisely the regions with greater economic activity and where the major water shortage problems occur. Half the volume of abstracted groundwater is pumped from overexploited aquifers. In 1975, 32 of a total of 653 aquifers were considered overdrawn; there were 80 by 1985 and 100 by 2002, accounting for over 50 percent of the country's groundwater supply. In contrast, the southeast has abundant water resources but only 23 percent of the population.

A new water law and regulations came into effect in December 1992 and January 1994, respectively (the day after their publication in the Official Gazette) and provided for only a three-year period to register the estimated 300,000 existing users. This period was insufficient, so in 1995, 1996, 2001 and 2002 the President of the Republic issued decrees to extend it and pardon the arrears of water charges owed by those who applied for water abstraction and wastewater discharge permits. Water legislation provided for 5 to 50-year permit duration. However, according to the 1996 decrees, all applicants were issued 10-year permits. This was deemed to be a short enough duration for the Government to be able to rectify a grant when users ask for permit renewal, but long enough to improve information on water availability (taking into account both quantity and quality) and on water uses, in order to make a decision based on adequate studies.

Thanks to the presidential decrees, mass media campaigns and hundreds of meetings with water users, by mid 2003, most users (330,000) had been granted abstraction permits, which were recorded in the Water Rights Public Register. The fact that all applicants were granted permits without carrying out water balance studies was accepted in 1995 as an “ecological price” for obtaining much needed information that had to be paid because in some of the river basins and aquifers where permits were granted, water is scarce. This “ecological price” would make it possible to register all existing users in order to be able to set the stage for sustainable water resources development and management.

Although that consideration continues being valid and to count on a complete Register constitutes an important asset, it is necessary to recognize that many river basins and aquifers were over-allocated, numerous users declared to be using greater volumes to the real ones (and consequently they obtained their legal permits for such amounts) and due to the high speed of the process during the first years, the Register is not as trustworthy as desirable.

Once concluded the formalization process the National Water Commission has put a greater emphasis in streamlining implementation tools; reinforcing order and control mechanisms; as well as granting new fiscal incentives and adjusting water charges aimed at enforcing users’ compliance and increasing revenue. The Commission has also launched some measures to ensure that the water rights administration system effectively becomes a water resource management tool.

Water resource levies, both for abstraction and wastewater disposal were introduced in 1989 with a dual purpose: (a) improving water use efficiency, promoting gradual reallocation to more economically efficient uses and preventing pollution, and (b) providing economic resources for water resource development and management. The tariff structure for water abstraction provides for cross subsidies: industry is charged the highest tariff, municipal water utilities an intermediate tariff and irrigation, which was exempted until 2003, now is charged a very low tariff and only for the abstracted volume exceeding the user’s entitlement. This charging scheme, along with incentives such as not charging irrigation when users comply with their entitlement, reinvesting in system improvement the levies paid (plus an equivalent amount provided by Federal Government) by municipalities, and exempting industries from their wastewater disposal levy during the time they build their treatment plant, has resulted generally in positive experiences such as promoting water savings in industry as well as a more water resource – conscious geographic industrial location, and construction of numerous wastewater treatment plants. Additionally, the levy revenue has been quite substantial, remaining above 50% of the Commission’s total expenditure (for water resources development and management) since 1989, with a peak 92% in 1993

In April 2004, the water law was substantially amended: the author is of the opinion that implementation will be even more difficult than it already was with the previous version, due to some un-realistic new provisions, such as the mandate to set up river basin agencies all over the country in only 18 months.

South Africa

South Africa depends mainly on surface water resources for most of its urban, industrial and irrigation requirements. In general, surface water resources are highly developed over most of the country. Groundwater, while also extensively utilized, particularly in the rural and more arid areas, is limited due to the geology of the country, much of which is hard rock. Large porous aquifers occur only in a few areas. In the northern parts of

the country both the surface and groundwater resources are nearly fully developed and utilized. Over-exploitation occurs in some localized areas. The reverse applies to the well-watered south-eastern region of the country where there are still significant undeveloped and little-used resources. (DWAF 2004)

South Africa's water sector reform should be seen as part of the dramatic political change that has taken place in the country since 1994. The main objectives of these reforms are the equitable allocation of water resources. In 1995, the Ministry of Water Affairs and Forestry embarked on a process of reviewing South Africa's existing water law, with the objective of developing a new law that reflects the values of the new Constitution and the limits to the country's water resources.

During the preparation of the fourth draft of the National Water Bill, the experience of other countries in preparing a new law was sought, with the assistance of the FAO. One of the main recommendations was to establish an implementation team with the task of anticipating what implementing the Bill, once it became an Act, would require. The close interaction of the drafting and implementation teams led to the detection of possible implementation problems in early drafts and the preparation of a capacity building program well before enactment.

There are at least two important features of the National Water Act that may facilitate implementation. One is that water use permits will be required only in water stressed areas, thus providing for a realistic and gradual approach to the regulation of water resources abstraction. The other is that the Act empowers the Minister to bring different sections into effect at different times. The latter feature has allowed spending more than one year after enactment to carry out the groundwork required for implementation.

The congruence of implementation with the spirit of the Water Act is remarkable. In effect, the 2003 draft National Water Resource Strategy calls for a realistic phased program to establish Catchment Management and compulsory water use licensing, along with an intensive capacity building program to support both actions. One of the issues that remain open to question is whether the water rights administration system has in fact evolved into a strong water resource management tool able to address the political changes advocated 10 years ago.

Sri Lanka

Economic development, population pressure and growing demands for food production, electric power, and adequate water for domestic, industrial and commercial use and sanitation services are placing increasing pressure on water resources. In addition, current uses of water also include maintenance of carrying capacities for mitigation of impacts from effluent discharges from domestic and industrial pollutants. It also serves as a medium for maintenance of an environment for aquatic biota and reproduction of aquatic species associated with wetlands. Projections for the year 2000 show that expected demand far outstrips supply, particularly in the country's dry zone where most of the irrigation schemes are located. The available water resources have been subjected to competing uses without concern to its equitable distribution among users. There is no incentive for conserving water although many are deprived of basic requirements of water in terms of volume and acceptable quality for different purposes. There have been frequent water shortages arising from climatic changes and inefficient systems adopted in water use, in the light of rising economic, social and environmental demands.

The Water Resources Secretariat was leading the modernization of water resources management in Sri Lanka. The following parallel activities were undertaken: (i) drafting and discussing the National Water Resources Policy and the Water Resources Act; (ii) drafting the Water Resources Regulations; and (iii) drafting a user and applicant manual to analyze the legislation drafts from their viewpoint. This approach has been very useful, because the two-way feedback which has resulted has improved the draft legislation. It has also helped in making a timely assessment of the water authority's capacity building requirements.

The Policy has been approved in early 2000. The Water Resources Secretariat has approved an implementation workplan, which includes "pre-enactment" and "post-enactment" activities. The first group of activities includes preparing a first version of "implementation tools" such as guidelines, procedures, information

systems, user manuals and organizational arrangements. These would be tested and improved by simulating implementation on paper. The process would assist in preparing a realistic capacity building program.

The draft Water Act provides for a gradual approach to implementation. This is an asset, which makes inclusion in the post-enactment activities of pilot testing on a few selected catchments and aquifers possible, thus providing the opportunity for further improving the implementation tools before nation-wide and fully-fledged implementation begins.

Uganda

Unlike its neighboring countries, Uganda is fortunate to possess, in general, an abundance of water resources at the national level. However, very large differences are found in its spatial distribution. Surface water is the main source for a broad range of activities and may be divided into the Upper Nile System; and the remaining river basins of Uganda. The Upper Nile system represents a huge water resource and is the basis for a broad range of development activities. Most competition for water occurs in the drier regions of the north-east and south-west. Groundwater resources are presently used for rural water supplies. Aquifers are comparatively low yielding with a limited areal extent and poor hydraulic characteristics. Pumped irrigation is only limited in very restricted areas. Also groundwater is used on a small scale in industrial activities due to the high costs and low yields of wells and boreholes.

The Water Statute was enacted in 1995, that is, the same year the new Constitution was adopted. Such enactment followed the simple and gradual approach to water resources management advocated by the Ugandan Water Action Plan, which was adopted also in 1995. However, the Water Rights Administration Unit was grossly understaffed and this fact made it impossible for the Unit to establish a fruitful dialogue with the draftspersons in charge of preparing the Water Resources Regulations (WRR) and Wastewater Discharge Regulations (WDR), which were issued in 1998. As a result, some contradictions and loopholes, which make implementation difficult, were found in these regulations. For instance, while the WRR provided for one year for existing users to register, the WDR did not provide for a transition period. Also, the draft effluent standard was unrealistic because it did not take into account the laboratory capacity in the country.

Some legislative provisions were drafted to overcome the problems in the regulations mentioned above, as well as a User and Applicant Manual to make legislation easier to understand. It was also recommended to follow the "blue and red area approach" described in the guidelines below. The Government resorted to some provisions to improve the Water Rights Administration Unit staffing. However, it was deemed necessary to complement this unit by external support. Therefore, the capacity building program, including a twinning approach in order to simultaneously train civil servants and national consulting firms, was proposed.

Uruguay

Generally, water users' needs are presently satisfied. Although so far the use of water has not generated great number of conflicts, demand is rapidly increasing and problems regarding the use of water and wastewater disposal could be faced in the future. The National Hydrological Agency is invested with the sufficient authority to manage the water resources independently of all user sectors, but the fact that each water user sector is handled by a different entity, makes water resources management integration difficult and paperwork cumbersome. Water quality aspects, including the issuing of wastewater discharge permits, are handled by a number of other agencies and water pollution status is not well known.

Water users have complied with the Water Code approved in 1978, mainly because they are aware that Government will protect rights in the Public Water Registry. Nevertheless, the registry still is incomplete, mainly regarding wastewater effluents. Currently, priority issues that require to be regulated, such as aquifer management, are being taken care of. Although the Water Code is generally satisfactory, it requires being improved taking advantage of recent experience and technological progress. One of its main assets is being a frame law leaving details to regulations. Its main weakness is that it recognizes both private and public property of the water resource, thus making legal interpretations that favor private against collective interest possible.

Uruguayan specialists have stated that the main aspects where water legislation should be improved are declaring water resources under public dominion and water use rights under private property, strengthening coordination between governmental units managing water quantity and quality and establishing effective procedures for wastewater discharge permitting and control. In October 31, 2004 a constitutional reform was approved, by which all surface water and groundwater, except rainfall, were declared under public dominion. Also, all water permits issued without taking into account the new National Water Supply and Sanitation Policy (such as sustainable water resource management, stakeholder participation, establishment of water use priorities being drinking water the first one, and water supply and sanitation services to be provided only by public agencies) shall be cancelled

First approach to a set of guidelines

The purpose of these guidelines is to draft “implementable” water legislation, in other words, legislation that can be administered and monitored by the Government and complied with by users. The following guidelines stem from experiences in specific countries, but the essence of such experiences has been distilled in this paper in order to arrive at recommendations that can be generally applied. They are grouped in four sets: (i) guidelines for setting up an enabling environment for implementation, (ii) guidelines for drafting “implementable” water legislation, (iii) guidelines for the implementation itself, (iv) guidelines for addressing plural legislative frameworks through stakeholder participation and (v) guidelines for making water rights administration system true water resources management tool.

Guidelines for Setting Up an Enabling Environment for Implementation

1. *There is no universal rule for water rights administration.* Not every country, or even every region within a country, needs to establish a water rights administration system. It depends on how scarce and polluted water is, how much water is required to address the needs of the poor by developing untapped water resources, or how badly reallocation is required. Furthermore, water legislation and implementation tools must be tailored to the specific history, current social, economic and political circumstances and present institutional capacity of each country.
2. *Perfect is the enemy of good.* Laws, regulations and implementation tools do not have to be perfect, they have to work. The simpler they are the easier it is to implement quality control from the outset.
3. *Water legislation should preferably be flexible.* Being impossible to anticipate all possible situations and design a rule to address it, water legislation should consecrate essential principles and be flexible enough to take care of unforeseen event and enable the administrative authority to make ad-hoc regulations when needed.
4. *Governments should assume both development and regulatory roles, and ensure co-ordination between the corresponding agencies.* Water rights may provide a strong link between water resource management and water development and services such as irrigation and water supply, but government must both (i) fully assume its regulator and developer roles, particularly in developing countries where a large percentage of the population still lacks water services, and (ii) ensure co-ordination mechanisms between development and regulating agencies.
5. *Implementation of water rights administration systems cannot be achieved overnight.* The duration of such a process cannot be measured in months. It must be measured in years and in many cases even in decades. This statement is supported by international experience, which shows that the design and implementation of a water rights administration system is neither a simple process nor can it be achieved overnight. The following examples illustrate this. (i) The process to adjudicate surface water rights in the state of Texas, USA (Wurbs 1995), through detailed procedures including field inspection and determination of each right, which included the participation of the Judiciary, took twenty years, and it relied on public and private organizations with strong capacity. Furthermore, several universities in the state of Texas supported the process. (ii) In Mexico, Congress approved the law on National Waters in December 1992 and it took until 2000 (eight years) to design the implementation tools as well as receive and register applications for water entitlements and for wastewater discharge permits from existing users and wastewater dischargers, following a simplified, user-friendly approach.
6. *Political support at the highest level in a country is a must for successfully implementing water rights administration systems.* Political support is indispensable since strong economic and political interests are usually affected when allocating or reallocating water resources. The following are arguments that

may help in obtaining such support. (i) The main benefit of such systems is that they are the most important tools for integrated water resources management. (ii) They are useful for assessing water balances in river basins and aquifers; setting up water demand management programs; ensuring water resources availability to address the needs of the poor; offering security to investors through a reliable public water rights registry; establishing water charging systems that would make water resources management self-sufficient; and promoting water rights trading after all existing users have been registered.

Guidelines for Drafting “Implementable” Legislation

7. *The adoption of a water policy* is a good starting point before drafting new water legislation or proposing major amendments to existing legislation. It is advisable to draft or update a water policy paper and generate a thorough public debate on it. The policy should include the rationale for amending existing legislation or for drafting new water legislation as well as an outline of the legislative proposals.
8. *Ownership makes things happen.* Government personnel in charge of administering and monitoring the law as well as users should participate by discussing successive drafts of water legislation and as far as possible, drafts of regulations and implementation tools (guidelines, procedures, information systems, organizational arrangements, and user and applicant manuals).
9. *Regulations and implementation tools should be drafted simultaneously.* If this is done, a productive feedback is established between draftspersons and water rights administrators. Furthermore, it is advisable to go one step further and simultaneously draft all the required implementation tools.
10. *Implementation simulation on paper provides valuable inputs to capacity building programs.* Based on the draft legislation and implementation tools, the entire process for granting water and wastewater discharge permits may be pilot tested in selected river basins and aquifers. If the simulation shows insufficient governmental or user capacity, then the legislation should be redrafted, procedures simplified, and capacity-building stressed.
11. *Carry out feasibility and impact regulatory assessments.* It is advisable to test a draft regulatory framework before actually implementing it. That is, carry out a “Regulatory Feasibility Assessment” (RFA) by assessing if the Government would be able to administer and enforce such framework. It is also advisable to carry out a “Regulatory Impact Assessment” (RIA) by assessing how the regulatory framework would affect different sets of users. For instance, Set A of large industries may have the technical and financial means to comply with certain stringent effluent standards, whereas Set B of smaller industries may require more time and probably less stringent standards. The RFA and the RIA could provide inputs in designing capacity-building programs for the Government, the private sector and organized water users.
12. *Water rights administration requires a fine-tuned balance* of regulatory, economic and participatory instruments. Water legislation that includes the three instruments usually provides a better framework for carrying out the job, but no single instrument is ever enough in itself.
13. *Small poor users must be approached differently.* Thresholds for registration and permitting should be realistic and dynamic. Bureaucratic conditions to use water should not be imposed on users under prescribed thresholds, but Government should establish simple mechanisms to keep track of the estimated volume being used in order to introduce controls and make thresholds more stringent when the sheer number of users threatens stressing the resource.
14. *Customary rights should be dealt with comprehensively,* either formally recognized or appropriately compensated.
15. *A realistic transition period* should be considered in the law so as to give existing users enough time to comply with it. Enough time is required in order to implement a user-friendly approach so that the Government works with, not against, users. This would enable the water authority personnel to be perceived by users as knowledgeable and helpful people willing to work hand in hand with them in order to assess their water needs and make realistic assessments of the volumes of water users are in fact utilizing, and not as policemen ready to punish users for not complying with the law.
16. *A two-step approach to appeals is commendable.* If the only channel for appeals is the judiciary, it may be overwhelmed by requests that could easily be handled by the water authority. Therefore, the system for the review of administrative decisions in general permitting, it is advisable that the water legislation provide for the appeal function to be carried out by the water authority itself, in the first instance.

Guidelines for an Implementation Strategy

17. *Beware of amendments!* Taking “imperfect” legislation as an excuse for not implementing it may tempt one to promote amendments before actually testing the legislation in practice (and some times ending with more problems than one had intended to solve). Legal reforms should be attempted only after giving implementation a chance and identifying implementation failures. Furthermore, even then no amendment should be promoted unless one is sure the identified shortcomings could be realistically overcome.
18. *A planning approach makes implementation feasible.* The following planning tools should be developed with whatever information is available, in order to obtain results in a three-month to one-year period.
19. A “users and wastewater dischargers model” is useful in preparing a program for registering existing users and wastewater dischargers. The first approach could be a simple spreadsheet with the number of users and a rough estimate for each one of volume of water which is abstracted and of the volume of wastewater discharged and of polluting loads. When enough information becomes available the model may be improved and more sophisticated software utilized.
20. The “red and blue areas approach”. Usually when new water legislation is adopted it is difficult to cope with new applications because all existing users have not been registered yet. This is aggravated by the fact that in many cases, information on water quality and quantity is not reliable enough. Therefore it becomes impossible to compute a water balance or a polluting load balance in order to assess the suitability of granting a new water or wastewater discharge permit in a specific aquifer or river basin. A pragmatic approach for a transition period during which existing users would be registered and water quality and quantity information improved, is to classify river basins and aquifers as follows: (i) “Red areas”, where because of pollution, scarcity or conflicts among water users, no more new water abstraction and wastewater discharge permits should be granted; (ii) “Blue areas”, where due to the availability of enough water and appropriate conditions of receiving bodies, new developers would be welcome, and permits would be automatically granted up to a certain total abstracted volume or polluting load and; (iii) “Yellow” areas, where a study would be required to make a decision. During the transition period all river basins and aquifers in the country would be classified either as red or blue, with no yellow areas for the time being. However an applicant could be asked to bear the cost of carrying out the required detailed studies. Granting short-duration permits could reduce harm to the environment and not hinder development. When the user asks for permit renewal, a decision would be made based on better information.
21. *Functional integration and/or co-ordination are advisable.* The same organizational unit should issue authorizations for all water users, including abstraction and wastewater discharge, in order to contribute to integrated water resources management. Also, it should bring under one roof technical, administrative and fiscal responsibilities, in order to be self-sufficient, offer timely response to user applications and represent a single interface to the user. If this integration is not possible, strong co-ordination between the agencies involved is mandatory.
22. *Monitoring should be approached realistically.* Monitoring of user compliance with the terms and conditions of their water abstraction and wastewater discharge permits is usually the most difficult component of water rights administration, because of lack of institutional capacity and economic resources. Since it would be impossible to monitor every single user, a feasible alternative would be to select a random sample, according to the existing capacity and thoroughly monitor the users in that sample. Transparency in the process is mandatory in order to ensure fair treatment to all users. When wrongdoing is detected, all the weight of the law should be applied and the cases should be widely publicized using the media. As capacity develops, the sample size can be enlarged.
23. *Information and monitoring technology must fit the country’s institutional capacity.* The best available “soft” and “hard” technology should be used, but only to the extent permitted by the available institutional capacity at any point in time. Also, financial and bureaucratic restrictions such as bidding procedures, procurement requirements, and feasibility to carry out sound maintenance and keep in stock enough spare parts, should be taken into account. Capacity- building requirements should be anticipated and acted upon so as to train qualified personnel before the new purchased equipment arrives.
24. *Quality control ensures credibility and facilitates conflict resolution.* Right from the outset of implementation, quality control should be established for every step. This control should help in assessing whether administrative and technical guidelines and procedures are being properly followed, documents properly filed and decisions made which are respectful of due process requirements. This would result in a user-oriented approach and in making documentation readily available for the disposition of appeals.
25. *Water rights trading is an efficient water allocation tool, but must not be promoted before all water users have been granted a title and registered.* A reliable water rights administration system is the pre-requisite

for a water rights market to develop and take hold, lest one runs the risk of making commercial transactions on inexistent water.

26. *Government must approach differently different groups of users* Large users should carry most of the burden of registration and monitoring of their water use, thus freeing Government's scarce resources to keep track of and support the small rural users.
27. *The most important activity for achieving sustainable implementation is capacity-building.* In developing countries strong and capable governments are required to ensure sustainable water resources management and particularly for running a water rights administration system. Therefore, capacity-building of the civil service, including training and keeping implementation tools simple and updated as well as maintaining an enabling working environment in order to retain capable personnel, is indispensable but not enough. Users' capacity must also be enhanced so they will be able to comply with water legislation.

Guidelines for addressing plural legislative frameworks through stakeholder participation.

The following guidelines (Garduño *et al* 2003) although addressed specifically to the case of groundwater management illustrate the need of including stakeholders. Through their participation customary rules should be taken into account to facilitate different types of rights being valid and efficient.

28. *Stakeholder participation in groundwater management is essential* for the following reasons:
 - management decisions (such as reducing water abstraction rights in an excessively exploited aquifer) taken unilaterally by the regulatory agency without due regard to customary rules and social consensus are often impossible to implement
 - it enables essential management activities (such as monitoring, inspection, and fee collection) to be carried out more effectively and economically through cooperative efforts and shared burdens
 - it facilitates the integration and coordination of decisions relating to groundwater resources, land use and waste management
29. *Government has essential roles to play in participatory groundwater management, such as:*
 - making complex groundwater situations understandable; stakeholders will usually then be willing to consider management interventions and to accept advice to be sure that their own ideas are technically and economically sound
 - empowering stakeholders organizations: a patronizing ('officials know best') attitude should be avoided and it must be recognized that stakeholders must be the main actors in the practical management process (including their customary rules) with the government role being mainly to assist in identifying strategic issues and implementation solutions

Guidelines for making water rights administration systems true water resources management tools.

30. The real challenge is not to make a water rights administration system run smoothly, but to really address with it the water resources management issues which called for its establishment. Notwithstanding the importance of designing and implementing a system that runs well and is efficient, the most important challenge is to insert it into the daily activities and relevant decisions in water resource management. To achieve this, it is advisable to keep asking why was the system established in the first place, and assess regularly whether the established management goals are effectively being achieved (such as reducing excessive groundwater abstraction or improving the quality of water in a river). Otherwise, we may be doing "the thing right, but not necessarily the right thing".

The "parallel track approach"

In drafting water policy, law and regulations, it is not unusual to take one step at a time, namely:

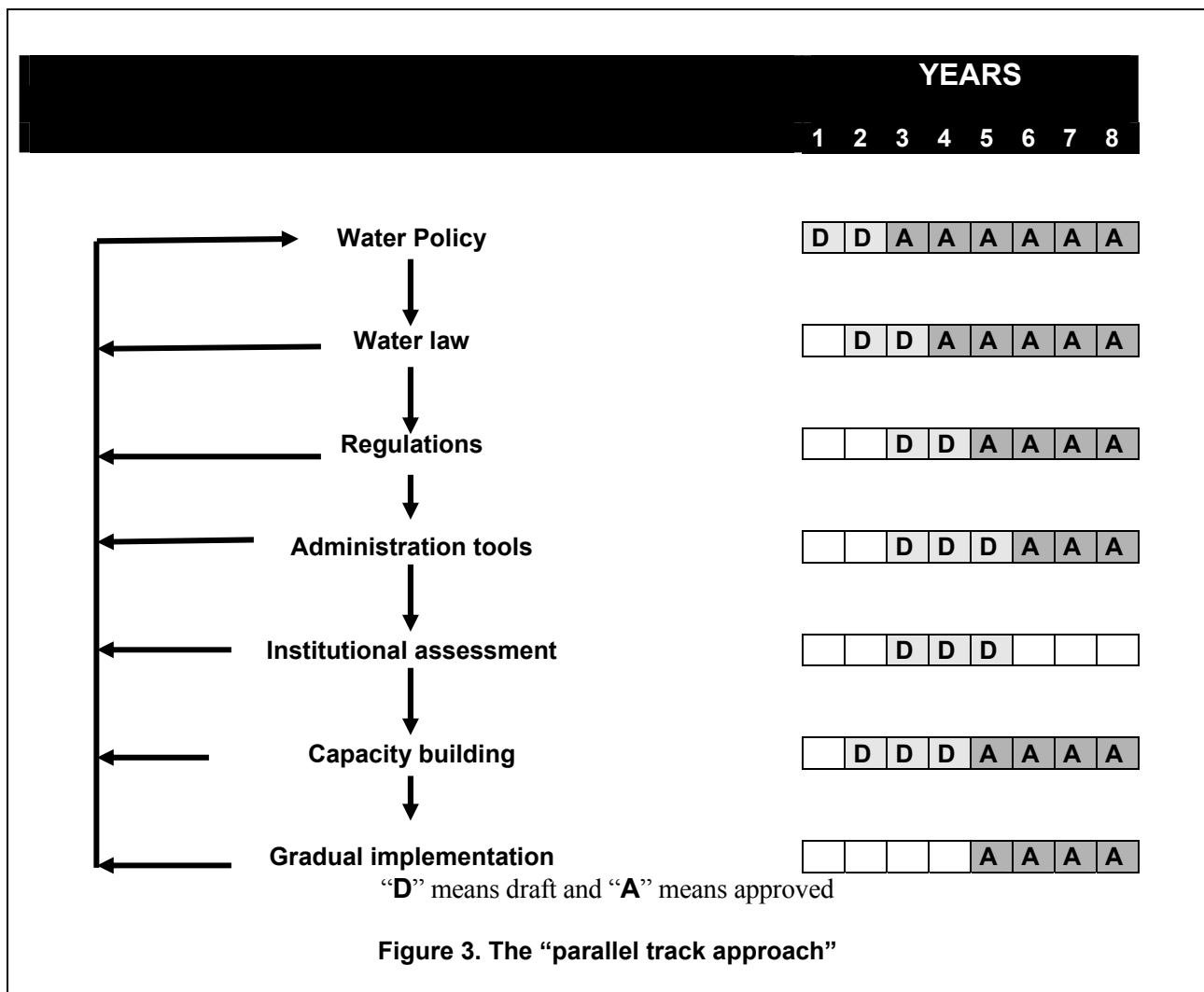
- wait until an official water policy has been drafted, negotiated and approved before producing the first draft water law
- do not even imagine what the regulations will be like before the new water law has been approved and enacted, and so on ...

Figure 3 shows firstly we are facing a very lengthy process, which as stated above should be measured in years or probably decades, not in months. Secondly it shows a “parallel track approach”, which has the following advantages:

- two-way feedback between drafters and implementers
- assessment of the water authority’s capacity to administer and enforce the new legislation, as well as capacity and willingness of the water users to comply with it
- it is cheaper to make mistakes on paper than on the ground
- if a certain goal, regulation or administration tool proves to be unfeasible on paper, they may be modified and/or capacity building programs may be designed and implemented
- once the paperwork has been finished, implementation may proceed on a pilot basis and later cover gradually a whole region or country.

Conclusions

The development of a stable system of water rights has far wider benefits than preventing conflicts among neighboring users, since it provides a sound foundation for the development and protection of water resources and for the conservation of aquatic ecosystems. Also, steps towards more integrated water resources management can only be effectively tackled when water rights have been adequately defined. By the same token, it must be recognized that the administration of such rights should go hand-in-hand with the administration of wastewater disposal permits and of water-resource fees or levies.



"Implementable" legislation is one that the Government is able to administer and enforce, and water users have the ability to comply with. In the particular case of a water use, the most important actor is the water user/applicant/license holder. But other users in the same river basin or groundwater aquifer who may be affected by that use also play an important role.

When designing a water rights administration system and setting up a time frame for implementation, it is wise to be aware of the tools that may be required to implement it; otherwise an unrealistic system may result.

The specific conclusions from the summary case studies presented above are:

- In Chile, Argentina (Mendoza) and Uruguay progress in their respective water rights administration systems has gone hand in hand with recent discussions on how to improve their institutional and legal frameworks. By mid 2003, when Garduno *et al* 2003 was edited, the National Congress in Chile was discussing a proposal to amend the Water Code and the Mendoza legislature had received a proposal to transform the Irrigation Department (in effect, the water authority but still with only partial powers) in a fully fledged Water Resources Department. The issue of public versus private ownership of the water resource, was addressed in October 2004 through a constitutional reform promoted by people's direct democracy in Uruguay
- In Mexico the main issue was that water legislation did not provide for enough time to register existing users, and thus the problems caused by an accelerated formalization process. The 2004 amendments to the National Water Law may make implementation even more difficult than it used to be.
- In Uganda, the water regulations which emerged showed some inconsistencies and institutional capacity needed to be strengthened.
- The issue in South Africa was that the first drafts of the National Water Bill did not address implementation needs, but this was overcome by establishing a policy implementation team that worked hand in hand with the drafting team. After six years of coming into effect the challenges for implementation are addressing water equity issues according to the new democratic South Africa's policies with the existing Water Act and alerting which of these issues cannot be solved only through the implementation of water legislation.
- In the case of Sri Lanka, the first draft of the Water Resources Act and of Regulations was written mainly from the Government's perspective, with little regard to the users' needs. Assessing these drafts through the user/applicant perspective introduced a more realistic approach. The Water Policy has been adopted, but the Water Resources Act has not been approved yet.

The overriding conclusions from the proposed guidelines are:

- There is no universal rule for water rights administration. Not every country, or even every region within a country, needs to establish a water rights administration system. It depends on how scarce and polluted water is, how much water is required to address the needs of the poor by developing untapped water resources, or how badly reallocation is required. Furthermore, water legislation and implementation tools must be tailored to the specific history, current social, economic and political circumstances and present institutional capacity of each country.
- The guidelines were developed from experiences in countries with mainly formal water rights systems, but they deal basically with the processes involved in the design and implementation of such systems, and in this respect they could be also useful in making the best of existing informal systems. Customary practices could be taken into account through stakeholder participation within the fold of formal water resource legislation, but governments need to assume their responsibility in mobilizing and sustaining such participation.

Looking into some experiences elsewhere:

- In many African countries (van Koppen, 2004), as in India (Shah 2005), the majority of water users lives in informal agrarian economy and use water without contact with government, therefore imposing a formal water rights systems can be counterproductive and it may be better to enhance existing informal/customary systems. Nevertheless, in many of these countries large commercial agricultural enterprises, industries and large cities merit a formal system in order to provide them with legal certainty on their water rights, but also to protect the rights of the small rural users.

- Large users should carry most of the burden of registration and monitoring of their water use, thus freeing Government's scarce resources to keep track of and support the small rural users; where the number of rural users are unmanageably large, user associations may be registered and individual rights may be managed through customary rules with Government support to establish and sustain such associations..

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