

# Towards Water Resources Regulation in South Africa Volume II: **INSTITUTIONAL CRITERIA, FUNCTIONS AND ARRANGEMENTS**

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# **Towards Water Resources Regulation in South Africa**

## *Volume 2: Institutional Criteria, Functions and Arrangements*

Report to the  
**Water Research Commission**

by

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## Executive Summary

The effective regulation of the water sector is an increasingly critical focus of the work of the Department of Water Affairs. While the water services regulatory strategy has been fully developed, a comprehensive regulatory strategy for water resources management is still required – one that focuses on the overall regulation of water resources as a critical part of water resources management.

There is a need to consider regulation in its broadest understanding which includes economic, technical and governance regulation, as defined in the previous report under this project (A Survey of Approaches to Water Resources Regulation, WRC, 2009).

Technical regulation, such as water quality control, is related to, but distinct from governance or economic regulation of water management and water services institutions. Governance and economic regulation in the water sector cover issues such as ensuring good corporate governance, regulating financing and protection of consumers from excessive tariffs/charges.

Water for sustainable growth and development in an increasingly stressed water environment that will experience significant future change (demographic, growth and climate) provides a key sub-text for the project. In this regard, of key importance is that improved regulation provides certainty and stability for investment and job creation, and that the benefits of regulation should outweigh the costs of regulation. In particular, taking into the socio-economic context of South Africa, it is critical that water regulation is consciously pro-poor.

A particular challenge is, thus, ensuring the development of a regulatory framework that is suitable for the needs of a developing country, that serves to protect the interests of the poor and the marginalized, and that contributes to the transformation and democratization of South African society.

This research project, Towards Water Resources Regulation in South Africa, aims to assess international best practice on technical/policy regulation of water resource management and linkages to water services regulatory approaches; clarify definitions, objectives and scope for effective and transparent water resources regulation in South Africa; assess the institutional principles and considerations to guide the roles, responsibilities and institutional arrangements; examine appropriate tools for achieving effective regulation, understand the benefits and risks to using regulatory impact assessments and to disseminate the findings of the project to relevant decision makers.

This report is the second of three in this project, the first being the Survey of Approaches to Water Resources Regulation). The report aims to develop a set of criteria to guide institutional arrangements for water resources regulation, assess the functions associated with water resources regulation, and draw out some lessons and possible institutional approaches for water resources regulation in South Africa. This examination draws on international experience, and is consciously focused on supporting the aims of a transformative state, and addressing a socio-economic context which includes both high levels of poverty and under-development and a highly developed sector of the economy.

The report begins by dealing with the issue of pro-poor regulation in order to provide a clear context within which the rest of the discussion is situated. This is followed by an analysis of international practice in institutional arrangements for water resources regulation, looking at how institutional

arrangements may be influenced by hydrology and by the state of development of the country. Arising from these two discussions, the report identifies some key issues facing South Africa in relation to the institutional arrangements for water resources regulation. The next section draws on international governance literature and interviews with a range of experts in South Africa, as well as South African policy documents, to compile a list of criteria that serve to inform decisions around regulatory institutional arrangements. Following on from this, some space is dedicated to an analysis of the key functions within water resources regulation, and issues of scale in terms of the performance of these functions. This section draws, inter alia, on the international experience described in section 3. The penultimate section raises some issues around possible models for water resources regulation in South Africa, and is followed by a concluding section which pulls some of the key threads together on the topic.

Water resources regulation in South Africa is currently very weak. This can be seen in the high levels of illegal water use, deteriorating water quality, and the increasing concern in the media regarding the state of South Africa's water resources. There are a number of reasons for this, including major issues of regulatory capacity. However, there is also a question of whether the appropriate institutional arrangements are in place.

What emerges from an analysis of international literature and practice is that there is no clear and simple correct answer for the appropriate institutional arrangements for water resources regulation. What does emerge is that there many models that could work, each with its own areas of potential excellence and limitations.

While a decentralised model has a slight edge over a centralised model, largely due to the improved responsiveness to local conditions arising from decentralisation, decentralisation can take place at a range of levels, from the basin level, through sub-basin level, to the truly local. With large basins, such as the Orange-Senqu, for example, it is hard to argue that an institution at this level is likely to be particularly well attuned to local issues and conditions. The issue of scale within the framework of decentralisation is critical in terms of what benefits it will or will not deliver.

In terms of agentising water resources regulation, there are good reasons in the water resources technical regulatory arena for recommending that decentralised agencies be created, such as

- an improved ability to recruit and retain staff
- stronger accountability to local stakeholder needs and therefore
- improved legitimacy and public confidence.

However, decentralised agencies require strong governance and economic regulation, an area in which South Africa has been weak both in the water sector and in other sectors. Without the capacity for strong governance and economic regulation systems, the establishment of decentralised technical regulatory agencies is fraught with potential dangers.

While the establishment of an independent economic regulator for water appears to have strong political support, insufficient work has been done on understanding the nature, purpose and scope of such an institution. Current international discourse suggests a better approach as being an incremental approach to the improvement of economic regulation, rather than the once-off creation of an independent regulator. In particular, more work is needed to understand the role and scope of such a regulator in relation to raw water tariffs.

The technical regulator must be held accountable for performance of its regulatory function. This can be done through DWA regulating the performance of CMAs, or, if DWA is to continue to perform the technical regulation of water resources (such as water quality regulation, protecting the reserve, allocating water, etc.) accountability for performance of these functions must reside somewhere. This does not imply the need for an independent regulator, but rather suggests that the courts, Parliament, the Water Tribunal, NGOs, and other civil society bodies have a more active role to play in this regard.

Ultimately, it is clear that there is no one blueprint for effective water resources regulatory institutional arrangements. A number of models can, and do, work. Each model has its benefits and its drawbacks and risks. What is critical is to identify the potential risks and to ensure that measures are put in place to minimise and manage those risks.

During the course of this research, several questions were identified where further research would be useful. These are outlined briefly here.

In the context of pro-poor regulation, where the issue of access by the poor and the marginalized to water resource regulatory institutions has been identified as being critical (see section 5.2) the failure to delegate the water use authorization function to decentralized structures must be questioned – has this approach served the needs of the poor, or not. While there are intuitive answers to this question, it is an area where further research could be useful in identifying what the actual impact of the centralised approach has been on implementing the ostensibly pro-poor and transformative policies of government.

Reference has been made to the potential for regulatory capture and bias in agencies that are dependent on water user charges. It is possible that government departments reliant on user charges are open to a similar bias, but there is little research available on the extent to which this influences government decision making processes or not. There is an opportunity to investigate both the extent of regulatory capture arising from dependence on user charges, locally and internationally, both in government departments and in stage agencies. Such research would enable an identification of the extent of the problem as well as the identification of possible governance mechanisms to minimise the impact.

Insufficient work has been done on examining the *actual* costs and benefits of establishing basin level agencies for delegated water resources regulation in developing countries, and to what extent the creation of such agencies has improved basin management and what the value of such improvement might be. This is an area where more research is required.

Finally, the perceived objectivity of government is a contested terrain, with very different views espoused by different sectors of the society as to whether government is objective or not. In the context of general concern over the levels of corruption and efficiency in government, locally and internationally, this is of particular concern. However, there does not seem to be much research available on whether the public generally have more faith in the objectivity of government departments or government agencies, so this remains an area for further research, particularly in the South African context and the context of the water sector.



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# 1. Introduction

## 1.1. Purpose and scope

The effective regulation of the water sector is an increasingly critical focus of the work of the Department of Water Affairs. While the water services regulatory strategy has been fully developed, the regulatory strategy for water resources is less well developed. A comprehensive regulatory strategy for water resources management is required – one that focuses on the overall regulation of water resources and water resources management, of which institutional regulation is one part.

There is a critical need to consider regulation in its broadest understanding which includes economic, technical and governance regulation, as defined in the previous report under this project (A Survey of Approaches to Water Resources Regulation, WRC, 2009).

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The report begins by dealing with the issue of pro-poor regulation in order to provide a clear context within which the rest of the discussion is situated. This is followed by an analysis of international practice in institutional arrangements for water resources regulation, looking at how institutional arrangements may be influenced by hydrology and by the state of development of the country. Arising from these two discussions, the report identifies some key issues facing South Africa in relation to the institutional arrangements for water resources regulation. The next section draws on international governance literature and interviews with a range of experts in South Africa, as well as South African policy documents, to compile a list of criteria that can serve to inform decisions around regulatory institutional arrangements. Following on from this, some space is dedicated to an analysis of the key functions within water resources regulation, and issues of scale in terms of the performance of these functions. This section draws, inter alia, on the international experience described in section 3. The penultimate section raises some issues around possible approaches to water resources regulation in South Africa, and is followed by a concluding section which pulls together some key threads.

## **1.2. Definitions**

In this report, the term institutional refers primarily to organisational arrangements, rather than the broader use of the term to include law, practice and customs. Furthermore, in consideration of institutional criteria, the focus included technical, economic and governance regulation, not just technical regulation.

The term ‘governance regulation’ has been coined to refer to the regulation of the governance functions of subsidiary institutions, such as CMAs and WUAs. There are three elements to the regulation of these institutions – the one relates to economic regulation, largely related to regulating the price of water; the second relates to the regulation of their technical performance, e.g. are they meeting reserve requirements or international requirements; are they issuing licences in accordance with national policy and procedures, etc. The third relates to ensuring that water management institutions accountable to the department meet their legal and fiduciary responsibilities of good governance. This latter is referred to as governance regulation.

Technical regulation refers to the regulation of water use, and the impacts of water use on the resource, while economic regulation refers primarily to the regulation of the price of water, be it raw water or treated water.

## **2. Pro-poor regulation**

### **2.1. Understanding poverty**

The South African context of a highly unequal society with high levels of poverty (Seekings, 2007) requires that water resources regulation should have a consciously pro-poor focus. The White Paper on a National Water Policy for South Africa has a strong theme of equity and socio-economic development running through it, as does the current government focus on rural development. However, little examination has been given to the precise understanding of this in the water resources field and in relation to water resources regulation in particular. In order to target water resources regulation effectively in support of poverty eradication, it is necessary to understand the various dimensions of poverty in the country.

Aliber (2003) states that the lack of understanding of policy-makers of the nature of the poverty that they are trying to address is as much a contributor to the failure of poverty reduction programmes as the failure of service delivery or lack of financial resources. An understanding of the nature of the poverty one is addressing in relation to water resources regulation is, thus, critical to developing an appropriate response.

Much has been written about how to define poverty, and a range of approaches and methodologies have been developed for trying to determine poverty. What is important in the context of this report, however, is not the ability to determine the cut-off point of poverty (under \$1.25 per day, for example), but the conceptual understanding of poverty and how this affects how one targets and designs water resources regulation, and the institutional arrangements for water resources regulation.

*“The use to which we, as a society, put our water will come under increasing scrutiny and intensifying management as we move into the 21st century. We will have to stretch our understanding, and apply our wisdom ever more creatively if our aspirations for the growth and development of our society are not to be constrained as a result of limited water resources.*

*“This is a significant challenge for a country where rain falls unevenly in space and time; where the areas of highest rainfall are far from the industrial and urban heartland and from areas of rural poverty; where crippling droughts or devastating floods repeatedly wreak their vengeance on our land and our people; and where available water resources are inequitably distributed and sometimes inappropriately used. (White Paper on a National Water Policy for South Africa 1997)*

Sachs (2005) differentiates between relative poverty, moderate poverty and extreme poverty, the last of which is only found in developing countries, and is characterised by lack of five major kinds of capital:

- “Human capital: health, nutrition, and skills needed for each person to be economically productive;
- “Business capital ...
- “Infrastructure ...
- “Natural capital: arable land, healthy soils, biodiversity, and well-functioning ecosystems that provide the environmental services needed by human society and
- “Public institutional capital: the commercial law, judicial systems, government services and policing that underpin the peaceful and prosperous division of labour.” [Sachs, 2005: 244]

Aliber (2003) equally distinguishes between a number of different types of poverty. Chronic poverty is poverty that is passed down from one generation to another, so that the children of those living in poverty are likely to also live in poverty. Within communities living in poverty, however, a large proportion of households actually transition in and out of poverty. While the ultra-poor are defined as those whose “monthly adult equivalent expenditure is less than half of the poverty line” (Aliber,

2003: 477), even the ultra-poor may transition in and out of poverty over time. In a study conducted in KwaZulu-Natal in 1998, 32% of ultra-poor households had transitioned to above the poverty line 5 years later (Aliber, 2003).

Carter and May (2001), feeling uncomfortable with what they see as a lack of scientific rigour underpinning the definition of chronic poverty referred to above, prefer the concept of structural poverty – where the structurally poor lack the “minimum sufficient combination of assets” to rise out of poverty. A household with access to sufficient assets that can assist them to respond to a setback, would, therefore, not be structurally poor. Those without such assets and who thus lack the resilience to any kind of setback are the structurally poor.

This focus on access to assets mirrors Sachs’ analysis regarding access to different forms of capital, and that of David Reed (2001) who sees control over and access to natural assets as a critical part of reducing poverty in rural areas. Rural areas, in this context, are seen as areas of communally or traditionally owned land, rather than areas of commercial agriculture.

One of the key assets referred to by Sachs is that of infrastructure, and in the water context, that would refer to water related infrastructure, be it storage, domestic water infrastructure, irrigation infrastructure, etc. The provision of appropriate infrastructure is taken, in this report, as a critical factor of pro-poor water resources management. However, the report is focused on pro-poor water resources regulation, which does not deal with the issue of infrastructure provision but with a different suite of activities. Both these streams are necessary to achieve a pro-poor integrated water resources management paradigm (figure 1).

What we see, then, is a description in which lack of access to natural resources and to appropriate infrastructure are key determinants of rural poverty. Equally, we have an understanding in which water is one of the key environmental resources referred to by Reed and part of the natural capital referred to by Sachs. In the analysis of both writers, access to sufficient natural capital is a critical part of the process of reducing the incidence of structural poverty in rural areas in developing countries. In the water context, such natural capital refers to water for both domestic and productive purposes and the water-dependent ecosystem services on which poor communities, households and individuals depend. These latter include wetland services, fish, building materials such as reeds, water quality and so on.

We also have an understanding that poverty is not a static concept, but that households and individuals move in and out of poverty over time. The intention of water resources regulation, therefore, should be to provide support to households that will help to prevent them from falling into poverty in times of crisis, and that will assist in raising them out of poverty in the first place. There are a range of measures that can be addressed in reducing poverty, of which access to water is one.

Soussan et al. (undated) have shown that even small amounts of water can provide important income support to poor households, including through activities such as ice-making, planting fruit trees, brewing beer, and supporting livestock. Their work shows increased income per capita per year of between around USD 6 from tree planting to just under USD 200 for beer brewing. Their work also shows improved household nutrition arising from irrigation of household food gardens. (Soussan et al. undated).

The OECD (2008) reports that natural capital makes up 13% of the wealth in middle income countries and that natural resource-based enterprises can provide important employment and

income opportunities. The report also points out that, in general, the poorer the household the more important is the income generated through common natural resources, including wetlands and water resources. Water related ecosystems can provide a variety of goods, such as food, building materials, and medicinal plants which form a critical part of the income of the poor. Thus the poor depend disproportionately on natural capital and access to natural capital can provide a critical pathway away from poverty.

Reed (2001), arguing from the perspective of natural resources generally, developed a set of six principles aiming “to strengthen the control of the rural poor over environmental assets and natural resource wealth and to provide sustained inputs and support such that the rural poor can use those resources more productively and sustainably.” (Reed, 2001: 147). It is his argument that increased control over natural assets will enable the rural poor to rise out of poverty. The six principles are:

- “Protecting the access of the rural poor to environmental resources...
- “Expanding the control over and access of the rural poor to environmental resources...
- “Redistributing revenues derived from natural resources to the rural poor...
- “Increasing redistribution of revenues from private companies to rural communities...
- “Establishing co-management arrangements... for natural resources ...between private companies, the state and rural communities.
- “Providing supporting inputs to rural producers.” (Reed, 2001: 147-8)

According to Reed, these six principles provide the conditions necessary for those living in poverty in the rural areas to use resources more productively in order to break the cycle of poverty. These conditions would also result in increased resilience for households facing potential crises that might otherwise tip them into poverty. These six principles, and in particular the first five, serve as useful guidelines for a discussion on pro-poor water resources regulation and the appropriate institutional arrangements.

In the report “Survey of Approaches to Water Resources Regulation” (Pegasys/WRC, 2009) three elements of water resources regulation were identified: technical regulation, economic regulation and governance regulation. Taken together with policy and legislation development, and compliance monitoring and enforcement, these five elements make up the regulatory framework for water resources. In order to achieve pro-poor regulation, the anti-poverty objectives of government policy must be taken into account in all five elements.

Within each of these elements, the national and water related policy objectives outlined earlier in this document above must be addressed, so that a matrix of types of regulation and objectives can be formed, as outlined in figure 1 below. Thus addressing poverty, race and gender transformation, sustainable economic development, and so on, must be addressed in each of the regulatory elements.



Figure 1: Matrix of Regulatory Elements and Objectives

### Relative or absolute pro-poor growth

In this discussion, however, there are two different interpretations of ‘pro-poor’ that should be examined. The first is the *absolute* pro-poor approach, in which the socio-economic status of the entire society is improved (see figure 3) and the poor benefit as part of this overall improvement. The second approach, which is a *relative* approach, sees a particular focus on improving the economic status of the poor, resulting in a closing of the gap between rich and poor (OECD, 2008).

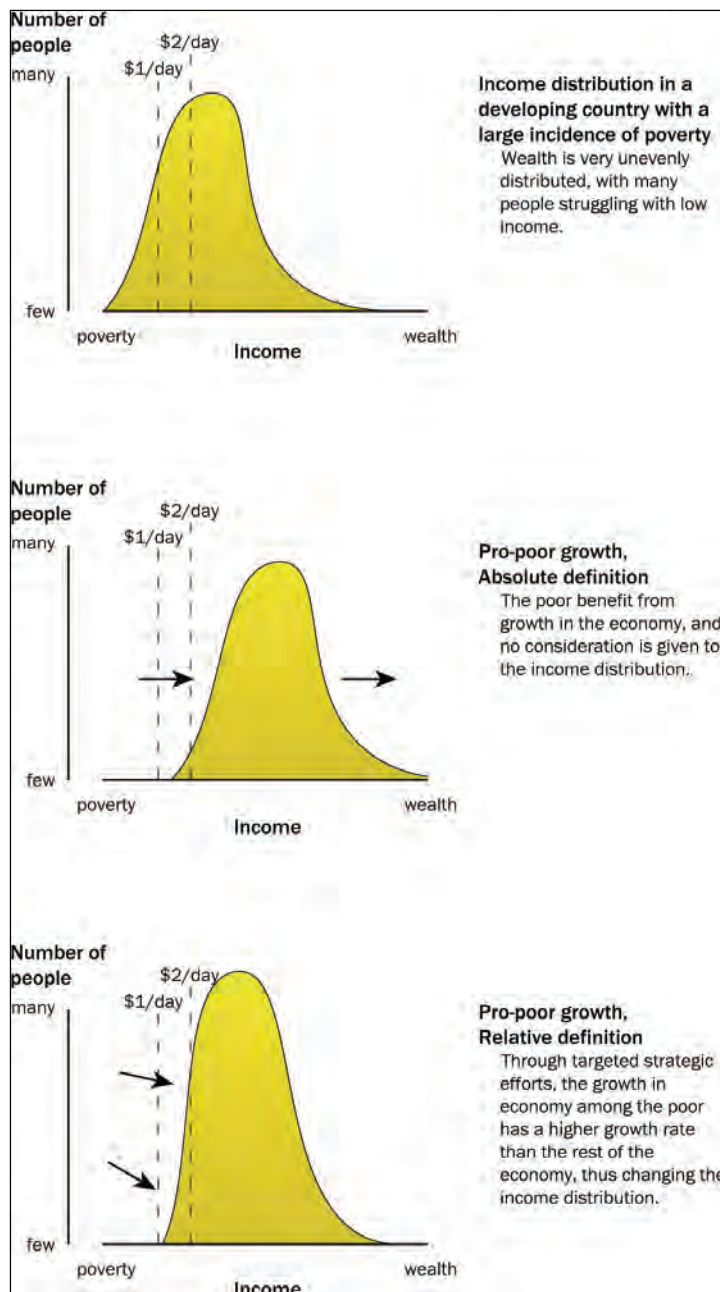


Figure 2: Pro-poor growth, absolute and relative definition (<http://maps.grida.no/go/graphic/pro-poor-growth-absolute-and-relative-definition>)

According to Klasen (2003) there is a weakness in international policy documents regarding the definition of pro-poor growth, although a number of academics have created a range of definitions and indicators of pro-poor growth. He argues that one needs to be able not only to identify what pro-poor growth is, but that one needs to be able to measure the extent of the pro-poor growth. Secondly, according to Klasen, pro-poor growth implies that the poor have benefited disproportionately from growth relative to the non-poor, as is shown in the concept of relative pro-poor growth in figure 3. Critically, he also raises the issue that pro-poor growth should be able to distinguish between the growth in incomes amongst different categories of the poor, with a greater focus on improving the incomes of the poorest of the poor, or the ultra-poor. All these factors

combine to create a clear definition of pro-poor growth, and by extension, the aims to be achieved through pro-poor water resources regulation.

Klasen (2003) also refers to studies that show that countries with lower inequalities appear to have higher rates of growth than countries with high inequalities (see also OECD, 2008). The drive to lower inequality in South Africa should, then, not only be premised on the policy direction of equity and social justice, but equally on the implications for improved economic growth for the country as a whole. Countries with lower income inequality also show signs of reduced latent social conflict. Thus, decreased inequality appears to offer three benefits: an immediate reduction in poverty, increased growth potential overall and increased social stability.

According to Klasen (2003) the issue of gender inequality is equally important, since higher gender inequality appears to increase poverty, and increased female literacy is a key determinant of the impact of growth on overcoming poverty. Reduced gender inequality leads to improved economic growth and makes that growth more pro-poor.

### **Direct and indirect pro-poor growth**

Klasen (2003) describes two approaches to achieving pro-poor growth, both of which are important in the context of water resources regulation. The first is ensuring that the growth path immediately raises the income of the poor and that growth takes place where the poor are found and in the appropriate sectors of the economy. This approach to growth identifies where the poor are located and what factors of production they have access to that can be used in economic growth.

The second approach is driven by redistributive public policy, such as progressive taxation and targeted government programmes to invest in the poor, either to encourage economic activity or as welfare payments.

The first approach must target the areas where the poor are located, which is primarily in the rural areas, and must identify the factors of production to which they have access. While Klasen refers, in this case, to land and labour, access to water is also a key factor of production that can be harnessed by the poor under an appropriate regulatory regime. According to Klasen, ‘... pro-poor growth must be focused on rural areas, improve incomes in agriculture, and must make intensive use of labor’ (Klasen, 2003: 180). At the same time he recognises that labour intensive growth in manufacturing can lead to migration from rural areas, in improved incomes for workers in this sector and for those left behind in the rural areas.

Interestingly, however, studies by Datt and Ravallion (in Klasen, 2003) showed that rural growth reduced poverty in both rural and urban areas, while urban growth only impacted on urban poverty. Further studies by Eastwood and Lipton (2001) show that improvements in labour productivity in agriculture give better pro-poor results than similar improvements in non-agricultural sectors. Unfortunately, such improvements in agriculture have little effect in countries with high inequality, such as South Africa, indicating even more clearly the need to reduce inequality in order to maximise growth opportunities. In this regard, it is important to focus not only on rural areas, but on areas of particularly deep poverty. In the South African context, the ex-homeland areas are just such pockets of deep and structural poverty (Klasen, 2003; Seekings, 2007), and must certainly form a target of pro-poor growth strategies. In such areas high concentrations of poor people lead to poor quality of public institutions (schools, hospitals, etc.), reduced public investment, remoteness from markets and poor access to credit, all leading towards persistent poverty traps. Pro-poor growth should, therefore, focus specifically on these areas.

Klasen (2003) points out that poverty reduction in China, India, and a number of East Asian countries was most effective when built on the use of the assets available to the poor, but was also dependent on the level of human capital of the poor. The returns of economic growth are generally felt by those with some level of human capital, with the result that growth in highly inequitable countries is likely to be less pro-poor than in more equitable countries. Investment in human capital is thus at least as important in a pro-poor growth strategy as is ensuring that the poor have sufficient assets (including access to water) that they can leverage.

Work done by Klasen (2002b) also suggests that closing the gender education inequality gap can boost economic growth by a significant amount – between 0.4% and 1%.

Finally, however, and extremely importantly, Klasen makes that point that any mechanisms to address elements of pro-poor growth will only have the right results if they take place in a context of wider policy support for such redistribution of income.

### What does this mean for water regulation

In South Africa, which has one of the highest Gini co-efficients in the world, the aim must be to achieve relative pro-poor growth, raising the living standards of the poor and closing the vast gap between the rich and the poor. This approach is borne out by the use of the term ‘equity’ in the water resources policy and legislation, where equity refers not to equality of actions for all people, but to fairness and justice. In a context where certain sectors of the society have been disadvantaged for generations, equity calls for redistribution and redress, and in this case, calls for particular actions that will address the needs of the poor and close the gap between rich and poor.

In terms of water resources regulation, this means that regulation must be focused on facilitating improved income generation for the poor, and must be focused on the areas of greatest structural poverty, which are the rural areas and the ex-homelands in particular.

Based on the analysis of poverty and pro-poor as discussed in the section above, there are three key, inter-related areas in which water resources regulation needs to be active to ensure a pro-poor result (see figure 3):

- the **allocation of water**, to ensure water is allocated or reallocated to poor rural households and individuals and ensuring that such water is affordable to the poor (Reed, 2001, OECD, 2008), or that water is allocated to activities that will create jobs in areas with high levels of poverty. The OECD report notes that allocation of water between sectors is often driven by decisions relating to the political economy rather than as a result of specific development policy, thus allowing the capture of water resources by particular powerful groups to the detriment of the poor (OECD, 2008)
- the **regulation of water use by large water users** to ensure that they do not undermine the availability of water to the rural poor who may be either downstream or dependent on the same aquifer; and
- **managing water quality** to reduce negative impacts on rural communities that are dependent on raw water for domestic water purposes.

These processes should be supported by programmes to build the human capital of poor communities in relation to using the water, and infrastructure programmes to ensure access to what when and where it is needed, and to address the needs of poor women in this regard in particular.

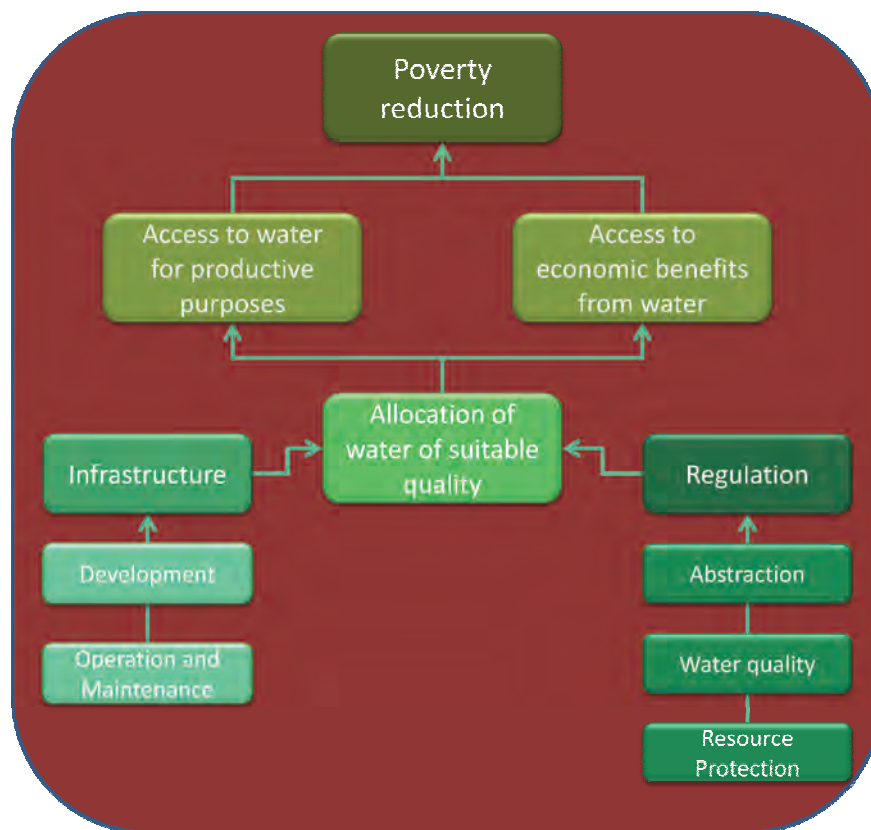


Figure 3: Key elements of pro-poor regulation as part of a larger suite of pro-poor actions

### 3. International and other sector experience

#### 3.1. From infrastructure to regulation

Several factors drive the nature of the institutional arrangements in any particular context. Two significant drivers are highlighted here. The first is the nature of the hydrological environment. Where water is plentiful, such as in the DRC and large parts of northern Europe, the drivers are very different from countries held ‘hostage to hydrology’ (Gray, 2005; OECD, 2008) through low rainfall and high levels of rainfall variability. In the former, the focus tends to be on hydropower and water quality issues. In the latter, the issue of infrastructure development and ensuring sufficient water is of primary concern.

A second key factor is the level of capacity and the level of development of the society (Figure 4). In countries in the relatively early stages of development, where a primary economy is still in place, water resources are relatively undeveloped, and the focus tends to be on the development of water resources infrastructure. As the economy develops and becomes more sophisticated, expenditure on infrastructure increases, to a point where the returns on investment are too low to warrant much more infrastructure development. During this period of infrastructure development, there is some regulation of water resources use, but the primary focus is on infrastructure. As the infrastructure development tails off, and the pressures on the resource increase and become more complex, the focus on water governance gains in importance, with water resources regulation being the key element of that governance focus. Thus regulation becomes the critical driving factor in water

resources management when the water availability and demand lines cross, or where water quality deteriorates to a similar stage of significance.

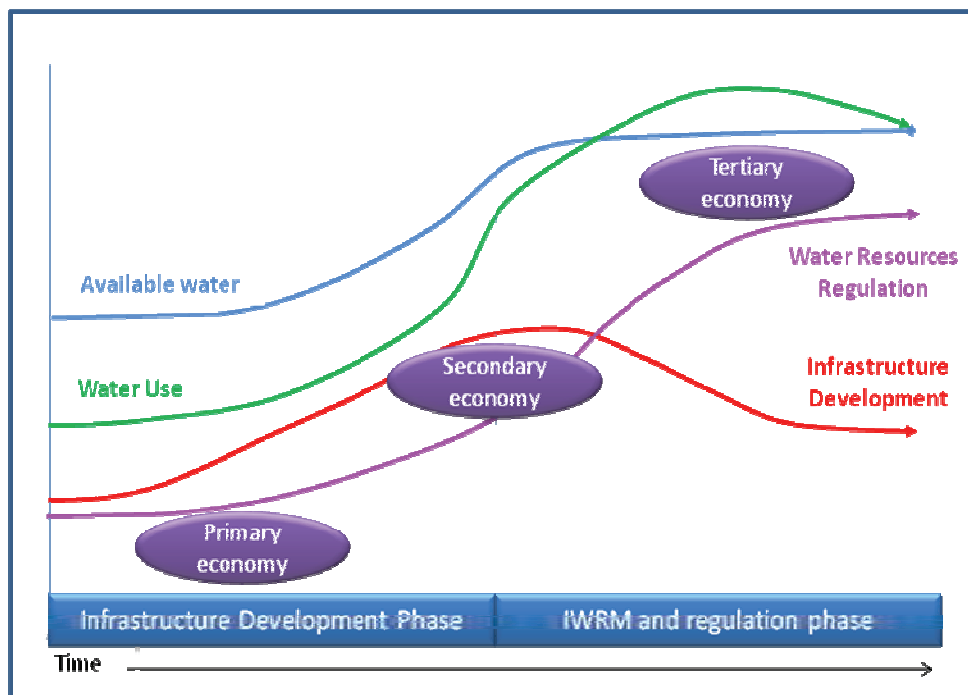


Figure 4: Evolution from Infrastructure to IWRM and Regulation (adapted from Pegram and Schreiner, 2010)

Figure 5 shows the relative position of a number of countries between the two axes of socio-economic development and hydrology. The groupings of countries outlined are discussed briefly below in terms of their institutional approach to water resources regulation in order to draw out lessons, common to each group, which may be useful in informing the South African context. More detail on the country studies is contained in Annexure A.

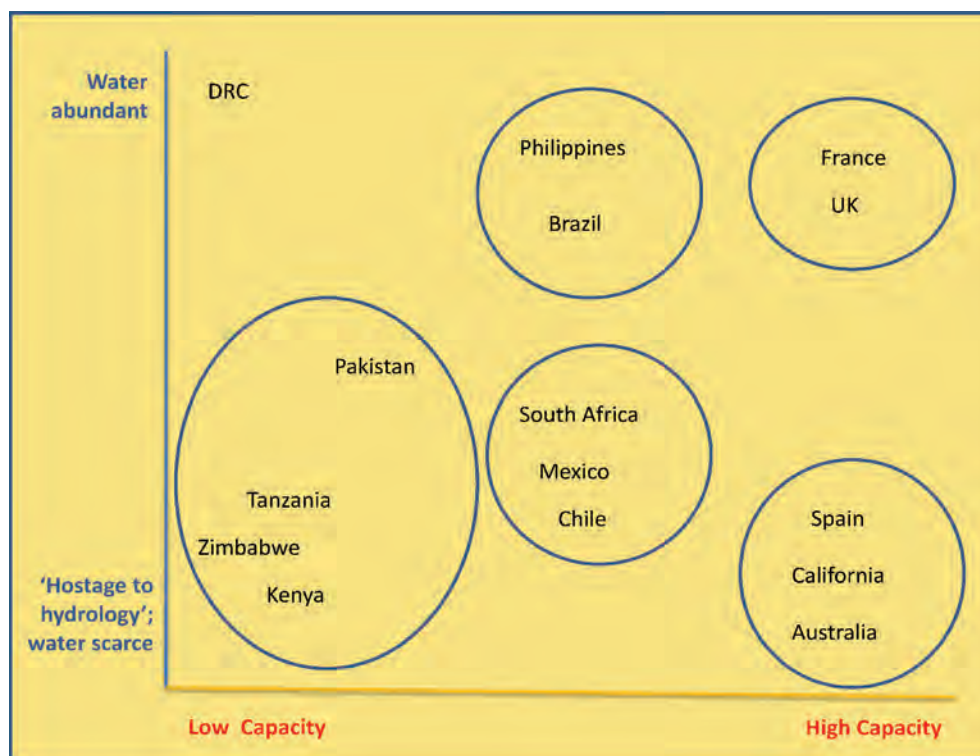


Figure 5: Location of countries according to their hydrological and development status

The following section draws out some common features and issues from the experience of these countries in water resources regulation that may inform the institutional arrangements appropriate to water resources regulation in South Africa.

### 3.2. Issues arising from international experience

In the water scarce developing countries examined (Pakistan, Tanzania, Zimbabwe and Kenya), the departments of water affairs are linked either to irrigation, or to infrastructure, reflecting the developing nature of these economies, and that they are still largely in the phase of focusing on water-related infrastructure development. Clearly, the development of infrastructure is the primary focus for water resources management in developing economies facing water scarcity.

Some form of decentralisation or deconcentration of water resources management and regulation is present in all of these countries. Interestingly, all of the countries have adopted an agency model for water resources management. There are, however, a number of other water-scarce developing countries that have not adopted an agency model, so this should not be seen as the norm.

In Pakistan, there is confusion over mandates between the various institutions involved in water management at national and provincial level, as well as conflicts of interest between these agencies. The erosion of power at provincial level has undermined local management, and increased the incidence of unlawful water use. Governance at the local level is poor – with issues of poor accountability and little transparency. As a result, there is little trust in the water management institutions, and compliance with regulations and allocations is poor.

The case of Zimbabwe is particularly interesting. The national agency, ZINWA, has a catchment manager with a technical support team in each catchment. Each catchment also has a Catchment Council or a Sub-Catchment Council, made up of stakeholder representatives and the ZINWA

catchment management. The Catchment Council is responsible for regulating water use, and permits for water use are signed off by the Chairperson of the Catchment Council, rather than by a full-time official as is generally the case. Pollution control, however, falls under the Environmental Management Agency which issues discharge permits.

However, the Catchment Councils suffer from inadequate funding and technical resources, and have not adequately responded to the concerns of primary water users and the communal areas. The decentralisation process has allowed the local elite, in the form of the commercial farmers, to capture the Catchment Councils and ensure that they serve their interests [P Sithole pers comm. 2010].

The lack of clear mandates and separation of roles between various water management institutions is a common area of weakness in a number of these countries, and one that holds critical lessons for South Africa in developing appropriate regulatory institutional arrangements. Lack of adequate financing and technical resources is also a challenge.

The three middle income, water-scarce developing countries examined (Chile, Mexico and South Africa), which have significant water resources challenges, and which are transitioning out of economic underdevelopment, show different patterns of water resources regulatory structures and approaches. While both Chile and Mexico have opted for agentised models, South Africa has, to date, retained all regulatory control in the department as a result of the stalling of implementation of a decentralized agency model. While the policy and legislation support a decentralized agency model in South Africa, concerns including lack of capacity for staffing a large number of agencies, and the lack of capacity to regulate governance of such agencies, as well as resistance from some Department of Water Affairs staff to delegation of functions out of the department, have stalled the process of establishment of Catchment Management Agencies.

While water still falls under the Ministry of Public Works in Chile, in Mexico and South Africa, water falls under the Ministry of Water and Environment, possibly reflecting the growing quality challenges and the growing focus on environmental sustainability issues with increasing pressure on scarce water resources.

The Chilean model of water resources allocation is an interesting one, which was widely hailed as hugely successful until the flaws in expecting the market to regulate the use of a limited common social and economic good such as water became evident. Chile opted for a strongly market based model of allocating water, an approach that had to be reviewed when it resulted in significant resource capture and speculation in water allocations by large, powerful players at the expense of the poorer and smaller users. There is a key lesson in this regard that the market is not, on its own, a sufficient mechanism for regulating water use, and that intervention by the state to ensure equity of access to this common resource is needed. In the context of needing to address high levels of poverty and historical inequity, this is an issue of particular concern.

Similar to the issue of separation of roles raised in the first group of countries, in the South African context, concerns have been raised by some stakeholders that DWA is both player and referee in terms of being responsible for the construction of infrastructure, planning and managing water resources, and setting the tariffs to fund both of these without effective oversight or regulation. Proposals to resolve this conflict have either seen the establishment of a separate agency responsible for the development, operation and maintenance of national infrastructure, or a separate agency responsible, in particular, for economic regulation of the water sector.

As with South Africa and Mexico, in the two relatively water rich middle income countries examined (the Philippines and Brazil), water is linked with environment at the Ministerial level, reflecting, once again, the transition from an infrastructural focus to a stronger focus on regulating sustainable water use and increasing concerns with water quality management. The federal nature of Brazil means that their institutional arrangements are different from a unitary state such as the Philippines. However, while Brazil has put in place some decentralised institutional arrangements such as Basin Agencies and River Basin Committees, and strong arrangements for stakeholder engagement with water resources regulation, water use authorization is still maintained at the national level through the National Water Commission. However, the river basin committees can, in their Water Resources Plan, establish a priority of use that should be respected by the National Water Commission in granting new water rights. This model therefore shows aspects of centralization and decentralization. The formal water regulation systems in the Philippines' is strongly centralized although the conflict between indigenous and formal water rights systems and lack of access by local groups to decision-making processes may be driving some of the conflict experienced on the ground. The issue of marrying dual legal systems and respecting traditional water regulation practices in communal areas is one that South Africa still needs to grapple with.

While the establishment of river basin committees in Brazil is relatively new, Carlos Hugo Sampaio of the National Water Commission feels that there have definitely been benefits to adopting this approach (pers comm. 2010). One of the most important benefits is the involvement of civil society (users, NGOs, academia, etc.), so that everyone engaged with water resources understands that the river basin committee has the mandate to co-ordinate actions in the basin. He feels, interestingly, that local government has adapted more slowly as the creation of river basin committees has impacted on their decision-making power. This raises the interesting challenge of how institutional reform trespasses on existing power bases and how this may create resistance to new approaches. Nonetheless, both the state and the municipalities have to support the proposal for the creation of a new water basin committee, and initially they provide the resources (money, personnel, building, etc.) for the committee to function. Sampaio feels that the existence of the river basin committees has driven better water resources management, despite many challenges, which include getting the stakeholders to develop a proposal for the creation of a committee, lack of funds, lack of personnel, and the vast size of many of the river basins. A further challenge is that river basin committees do not have the full delegated authority that would make them function effectively.

What is common to a number of the developing and middle income countries is that the decentralised institutions that have been established are hampered by lack of finances, lack of human resources, particularly those with technical expertise, and in some cases, lack of delegated decision-making responsibility. The creation of basin level structures without appropriate delegation of functions in particular is common in a number of developing countries, limiting the potential effectiveness of these structures [GWPSA, 2009; Sampaio pers comm. 2010]

In terms of relatively water rich developed countries, France has run a decentralised system for a long time, although the decentralised bodies are largely funding, rather than regulatory, bodies. The success of the French model has been used to promote decentralised models in developing countries such as South Africa. In the UK water resources regulation is centralised in each of three regions, according to political rather than hydrological boundaries. While the Ministries in the two countries are very differently structured, in both countries, at agency level, the links between environment and water are strong, presumably due to the critical focus on water quality issues.

In Australia and the USA, both water scarce developed countries, the states have a very strong role to play in water resources regulation, partly due to their strongly federal nature. Australia has an extremely dynamic water allocation system designed to adapt to changing conditions and to enable quick trading of water allocations depending on availability, as opposed to the somewhat rule-bound system in the USA which is quite static and unresponsive to change short-term change. The Australian example shows the potential for trading of water rights in improving water use efficiency in a clearly defined context of water entitlements, rather than the free-for-all of the Chilean system. The Australian model presents, therefore, an interesting combination of market forces and state intervention. Such an approach, however, would have to be adapted significantly to be able to address the transformational and equity challenges required of water resources regulation in South Africa.

While decision-making in the USA is delegated downwards, in the Murray-Darling basin recent years have seen a centralization of allocation decision-making as a result of the environmental and water-related crises in the basin. Clearly, while international discourse is still punting decentralization, a pragmatic approach shows that re-centralisation of some functions may be more appropriate in certain circumstances, such as the real water crisis in which Australia has found itself.

### 3.3.South Africa Environmental and Energy Regulation

The electricity and energy sector in South Africa has an independent regulator, the National Energy Regulator of South Africa (NERSA). There have been significant challenges in the effectiveness of this institution, raising some concerns about capacity for independent economic regulation more generally in the country. IDASA, in a report entitled “The Governance of Power: Shedding Light on the Electricity Sector in South Africa” (<http://electricitygovernance.wri.org/publications/governance-power-shedding-light-electricity-sector-south-africa>) highlights the following challenges in regulation of the energy sector in South Africa:

- A ‘profound lack of role clarity and organisational certainty’ which has undermined the functioning of government in this sector, and left the policy process vulnerable to ‘economically and politically powerful interests outside government’.
- Lack of clarity around the ‘precise nature, status, role and functions of the Energy Regulator (NERSA)’. The report identifies that, despite the important role of independent regulation in ensuring affordable access to energy, and balancing competing interests, the effectiveness of the National Energy Regulator (NERSA) has been undermined by ‘shifting responsibilities, opaque appointment procedures and limited capacity’. In particular, its ability to implement its environmental and social regulatory mandate has been undermined, as well as the monitoring and enforcement of licence conditions.
- Underutilisation of its powers to convene ‘advisory, customer and ‘end-user’ forums to advise it on any matters affecting customers and end users’.
- Failure to ‘systematically categorise’ information that it has and to make this information easily accessible to stakeholders. It has, according to the report, allowed Eskom, which is essentially a monopoly, to use confidentiality on the basis of ‘commercial sensitivity’ to prevent public access to documents.

The report does recognise, on the other hand that the decision-making processes of NERSA are generally open and transparent, and that reasons are provided for decisions.

The report recommends, inter alia:

- more transparent processes for appointing NERSA senior management officials to improve its independence and to enhance public confidence in the regulator;
- the provision of sufficient resources to NERSA for them to fully act on their social and environmental mandate;
- that NERSA should improve communication between licencees and consumers, and
- that NERSA should improve access to information that it holds.

Over the past decade, much has changed in the area of environmental regulation, with the introduction of new legislation and regulations. The national Department of Environmental Affairs has considerably improved its capacity for compliance monitoring and enforcement of regulation. However, environmental management is, constitutionally, a concurrent competency and there have been wide-spread concerns about the capacity of provincial departments to implement the legislation effectively, particularly in relation to the delays in the processing of environmental impact assessments (EIAs). There is also concern about the political will for strong environmental regulation. In August 2006, for example, the Mail and Guardian reported that then President Mbeki 'attacked green laws recently, saying they were causing development delays that had contributed to "a quite considerable slowing down of economic activity". Mbeki's statement, made after last weekend's Cabinet lekgotla, came amid growing resistance among national and provincial politicians to environmental impact assessments (EIAs). Minister of Housing Lindiwe Sisulu sparked outrage in the environmental world recently when she told the construction industry housing delivery would no longer be "held hostage by butterfly eggs".' ([http://www.mg.co.za/articlePage.aspx?articleid=280008&area=/insight/insight\\_national/a](http://www.mg.co.za/articlePage.aspx?articleid=280008&area=/insight/insight_national/a))

In large part, these concerns arise from the trade-offs between environmental protection and job creation in a country in which around 40% of the population live in poverty.

#### **4. Institutional Criteria for Water Resources Regulation**

In the first report in this project (Pegasys/WRC, 2009) a set of principles for water resources regulation were developed, as set out in figure 6. In this report, however, rather than looking at the general principles for water resources regulation, the authors have drawn out some key criteria relating to the institutional arrangements for water resources regulation. The methodology for developing these criteria and the criteria themselves are discussed below.

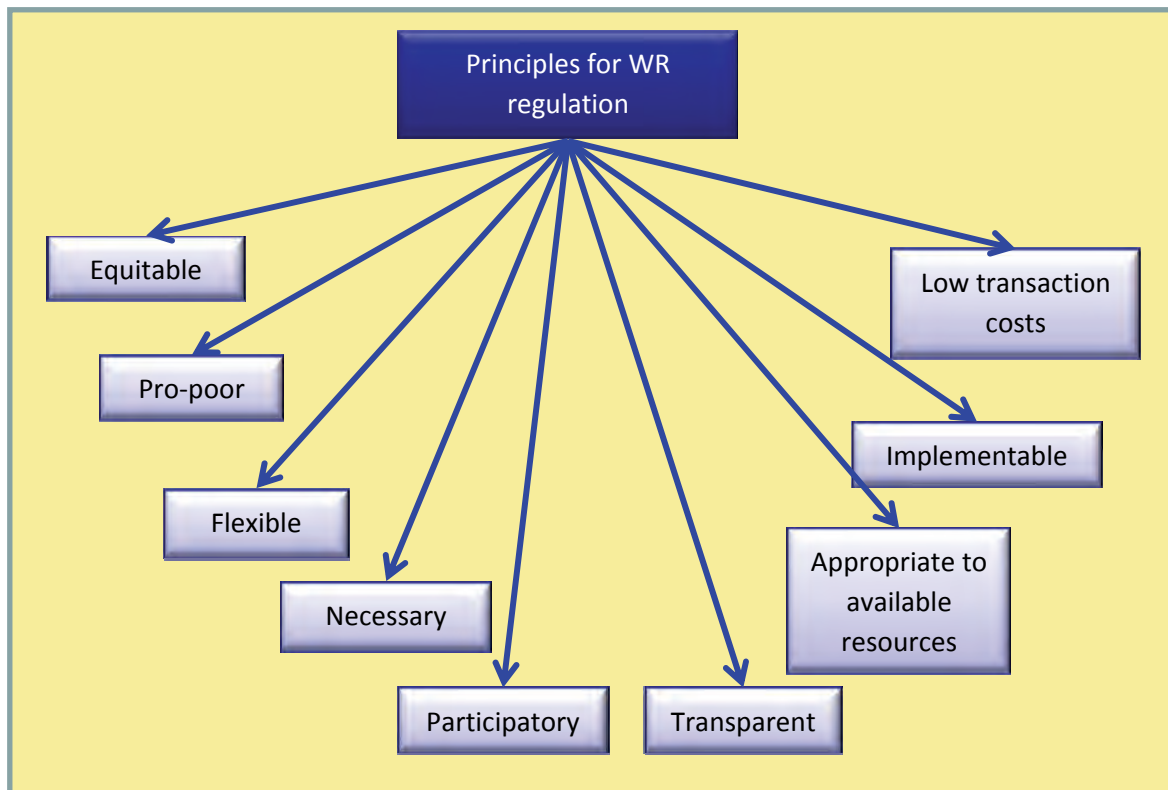


Figure 6: Principles for Water Resource Regulation

#### 4.1. Methodology

In developing what were originally intended to be institutional principles, it became clear that there are very few clear cut principles to be applied to institutional arrangements, and that what was being developed were criteria to be used in the consideration of appropriate institutional arrangements, rather than principles. This can be seen in the discussion of the various criteria, in which some degree of discretion is needed as to how the criterion should be applied and in what contexts it may or may not be relevant. For this reason, the intended ‘principles’ are referred to as institutional criteria from now on.

In developing the institutional criteria for water resources regulation, the project team worked from the overall regulatory principles outlined in the “Survey of Approaches to Water Resources Regulation” (Pegasys/WRC, 2009). Using these as an overall lodestone for the type of regulation required, institutional criteria drawn from the international literature, and from a series of interviews conducted locally, were tested for the best fit. Criteria were also drawn from the South African good governance lexicon, such as is contained in the King Reports and relevant White Papers. This resulted in the development of a set of institutional criteria appropriate to the South African context.

#### 4.2. Institutional Criteria

The discussion that follows highlights some criteria that should be considered in the development of effective institutional arrangements for water resources regulation. There is, as has been mentioned, a substantial difference between the nature of these criteria and the overall regulatory principles proposed in the previous report in this project (Pegasys/WRC, 2009). The overall principles are ones

that should be applied in all contexts. The institutional criteria, on the other hand, are more nuanced, and the degree to which some of them are implemented, and the form that this takes, often depends on particular circumstances.

The institutional criteria discussed above can be categorized under four headings:

- **Responsiveness**, which includes consideration of whether the institutional arrangements best support accessibility, participation, and responsiveness to local social, hydrological and economic conditions;
- **Viability**, which includes consideration of whether the proposed arrangements are affordable, whether the transactions costs are low or too high, and whether the approach is based on making optimal use of available (limited) capacity;
- **Institutional stability**, which includes consideration of the issues of independence, institutional alignment, mandates, transparency and accountability; and
- **Decentralisation to the lowest appropriate level**. Consideration of this criterion will, inter alia, require consideration of some of the issues raised in the previous three criteria, particularly around participation, affordability, and optimal use of available capacity.

These four categories are discussed below.

### 4.3.Responsiveness

As mentioned above, the issue of the responsiveness of an institutional model involves a consideration of the accessibility of the institutional arrangements to the public and to water users in particular, the degree to which it supports effective stakeholder participation, and the degree of responsiveness to local social, hydrological and economic conditions, within an understanding of the national or provincial imperatives.

#### Accessibility

While the issue of accessibility applies to all water users and the general public, in the context of pro-poor, transformative regulation it is particularly important that regulatory institutions are accessible to people living in poverty and to historically disadvantaged communities and individuals. This has implications for the location of offices, languages used, availability of appropriate information, and the culture of the organisation – people must feel welcome to arrive and make their needs felt and feel that they will be taken seriously. Many state institutions can be intimidating to people who are not used to engaging with them, and it is important that water resources regulatory institutions develop a culture of accessibility and openness to ensure that people with limited resources and an experience of marginalisation feel able to engage freely with these institutions.

The issue of accessibility is also influenced by the effectiveness and efficiency of organisations. People will not use or access an organisation where they feel that their queries or concerns are not being dealt with effectively or that there is a significant opportunity cost to them in dealing with that organisation because, for example, of unnecessary time delays.

## Participation

The need to involve stakeholders in the decision-making process in water resources management has been widely cited as a critical part of integrated water resources management, and by extension, water resources regulation. This issue is dealt with in more detail in the previous report in this project (WRC, 2009). It has, in the international literature, largely been raised to the level of a principle. It can also, however, be seen as a tool, rather than a principle, a tool that serves to bring in diversity of opinion and information sources, local buy-in and support, and, ultimately, improved decision-making.

It is also seen as a critical part of enhancing the democratisation of water resources management in general. Institutional arrangements can either facilitate or discourage easy participation by stakeholders. In the South African context, participation of stakeholders requires an understanding of the very unequal resources available to different groups, and as a result, the institutional arrangements must be particularly aimed at ensuring that the poorest and most marginalised communities are able to participate in the decision making process. This has implications for institutional location, culture, and language.

According to Kujinga and Krasposy (2004) there are three degrees of participation,

- Pseudo participation, where development agents/ government officials use a participation technique such as group discussions to persuade the local people to accept decisions that have already been made (manipulation).
- Partial participation where stakeholders can and influence the outcome of decisions through a process of consultation, but government officials have final decision making power; and
- Full participation where every stakeholder has equal power to determine the outcome of the decisions. Local people have joint decision making power together with government officials (Kujinga and Krasposy, 2004: 6,7)

The International Association for Public Participation sees five levels of participation as shown in figure 7. Both approaches recognise that public participation can range from little participation to the position where stakeholders participate in or have complete control over decision-making, although Kujinga and Krasposy recognise too, that the intentions behind public participation may not always be as they appear and where the intention is manipulation rather than consultation.

|                                                                                                                                                                            |                                                                                          |                                                                                                                                                                      |                                                                                                                                                                             |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <b>Inform:</b><br>To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities, and/or solutions | <b>Consult:</b><br>To obtain public feedback on analysis, alternatives, and/or decisions | <b>Involve:</b><br>To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered | <b>Collaborate:</b><br>To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution | <b>Empower:</b><br>To place final decision-making in the hands of the public |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|

Figure 7: Spectrum of public participation (International Association of Public Participation, 2007)

The degree of participation may vary depending on the nature of the issue under consideration – there are some matters on which provision of information is sufficient, and others in which collaboration or empowerment may be more appropriate. In terms of regulation, a command and control approach is likely to require less consultation than, for example, a process of voluntary

regulation in which decision-making may be given to the involved parties or done in partnership with government.

Breyer (1982) raises the question of the balance that must be achieved by institutional efficiency and public participation and where an institution falls on the continuum of two undesirable points – one of total secrecy in decision-making, and one of total openness where participatory processes become lengthy and cumbersome and prevent decisions being made. It is not possible to pinpoint an ideal position along this continuum since, as has been mentioned, the degree and nature of participation in decision making should depend on the purpose of that participation and the nature of the decision to be made.

Irrespective of what type of public participation is being adopted, there are both benefits and risks inherent in consultative processes. While there is not the time or space to address these issues in detail here, two key issues that must be carefully monitored are ensuring the involvement of the most marginalised groups, and preventing capture of the processes by particularly articulate or well-resourced groups. In this respect, it is important to link the issue of stakeholder participation to the comments made by Woodhouse (1997) about the need for the state to provide a platform for marginalised groups to organise and voice their needs. This is critical because, at all levels of society, even the most local, there are differences in power, and it is necessary for the state to provide an enabling environment for the marginalised to organise and be heard. Without a conscious focus on empowering marginalised communities, the potential exists for stakeholder participation to be captured by powerful interests.

A further issue in the regulatory context, however, is the extent to which stakeholders are actually involved in regulation, either through structures such as water user associations with delegated functions, through community policing schemes, through voluntary agreements or self-regulation. In a context of limited state resources it is particularly important for the institutional arrangements to be effective in harnessing this non-state regulatory power.

### **Responsiveness to local conditions**

South Africa is a country of very varied geographical, social and hydrological conditions. The institutional arrangements should be able to respond to these variations in order to achieve optimal regulation in the differing contexts. It has been argued that decentralisation is the best approach to improved responsiveness to local conditions. However, it is equally important that local conditions are seen within the context of a broader national or regional view, particularly in a country such as South Africa with its complex array of interbasin transfers and international basins. Regulatory activities taken locally must align with the broader national and regional imperatives.

#### **4.4. Viability**

The issue of the viability of the institutional arrangements is critical, and will determine the long-term sustainability of a particular approach. This includes consideration of whether the arrangements are affordable, both to the state and to water users, whether the costs of processes are low or too high, and whether the approach is based on making optimal use of available (limited) capacity.

## Low costs

The institutional arrangements should be such that the costs of regulation, such as the costs of applying for a water use licence, are kept low for both the clients and the institutions themselves, while still supporting effective regulation. The costs of water resources regulation are pushed up unnecessarily by factors such as duplication of functions between institutions, slow decision-making processes, excessive information requirements and long decision-making chains. Thus, while the nominal costs of obtaining a water use licence are R114 (the amount paid to DWA with an application for a water use licence), the actual costs to the applicant include the time and money costs of completing the application form, submitting the form, revising it if required, conducting any studies including environmental impact assessments, consultation with other water users or stakeholders if necessary, following up on the processing of the licence, and, critically, the opportunity costs of long delays in the issuing of a licence. The opportunity costs of long delays in issuing licences include the costs of foregone income generation both to the direct water user and to the individuals that might be employed by that water user. The costs to the economy arising from delays in issuing licences or delays in addressing pollution issues because of weaknesses in institutional arrangements are orders of magnitude higher than the immediate costs to the water user of applying for a licence.

There is a critical factor in the long delays in issuing of licences which relates to the length of the decision-making chain of command. The shorter that chain of command, the swifter the process of processing licences is likely to be. This relates to the issue of decentralisation that is discussed later.

## Affordable

The issue of low costs relates, at least in part, to the issue of affordability. Any regulatory arrangements must be able to function effectively within the financial resources available, whether these resources come from the fiscus and/or from water user charges. And the services offered must be affordable to those wanting to use them. It is very important that the cost of accessing services, such as a licence to use water, does not discriminate unfairly against the poor. This is often the case where the same regulatory requirements are placed on small users and on large users. A differentiated approach, such as the improved use of general authorisations, is appropriate in a pro-poor context.

## Optimising available capacity

Throughout Southern Africa the issue of sufficient capacity to implement integrated water resources regulation effectively is a critical challenge (GWPSA, 2009). Despite the higher economic development of South Africa relative to the other states in the region the issue of capacity remains a challenge. Institutional arrangements, in order to deliver an effective result, must be designed to optimise the use of existing capacity while being sufficiently flexible to expand their mandate and scope as capacity develops further. In parallel, however, it is critical to put in place proactive capacity building programmes that will enhance the effectiveness of regulation.

## 4.5. Institutional Stability

The issue of institutional stability includes consideration of factors such as independence, institutional alignment, mandates, transparency and accountability.

## Independent

The issue of independence is a much debated one in governance discourse. There are at least three aspects to this. The first relates to the concept of an 'independent regulator' and the second to the degree of independence of state agencies. A third element relates to the separation of player and referee.

The notion of the 'independent regulator' links strongly to the field of economic regulation, and to sectors in which the private sector is a key player and wishes to see regulation as being independent of the political whims of government. Thus, many countries have established independent (economic) regulators for water services. In the water resources context, the picture is very different. Few countries appear to have economic regulators looking at the issue of raw water pricing, and the technical regulation of water resources is a core function of government and so does not need the independence of economic regulation in other sectors. It is, therefore, not clear that the issue of independence is a critical one in the water resources context, although there are some people who feel it might remove internal conflicts from within the Department (Barbara Tapela pers comm. 2010)

Of concern is the track record of current utility regulators in South Africa, which are seen to have failed in carrying out their mandate fully and in corporate governance issues. This raises the question as to whether South Africa has sufficiently matured as an administrative state to have the necessary culture and skills to run effective independent regulators.

However, independence is not only an issue for the regulator – it is a key element of delegation of functions to other bodies. You cannot properly delegate functions to an agency without establishing some degree of independence for that body. This apparent independence may act as a key driver of stakeholder confidence in decision-making by the body to which functions have been delegated, particularly in a context where government departments have lost legitimacy. Thus the issue of independence is closely related to water resources regulation in a decentralised and agentised model (covering technical and governance regulation).

A separate question relates to the issue of independence of decision-making. Funding for regulatory activities can come from two major sources – the first being the fiscus, the second being user charges. Both sources of funding apply in the agency or departmental context. The challenge in relation to user charges is the possibility of the authority regulating in favour of large users because of the fact that they are a major source of income for the regulator (e.g. CMA), and paying less attention to small, marginalised and poor users who contribute little or nothing to the financial viability of the regulator. This is closely linked to the social and economic good nature of water – as custodian of the social value of water, government must play a key role in ensuring that the economic regulatory function is not dominated by economic considerations only. There are a number of checks and balances that will be necessary to avoid this, such as ensuring that the interests of marginalised communities are strongly represented on the governing and stakeholder structures, and effective regulation by government, as custodian of the nation's water resources and of national policy objectives.

It is possible that government departments that are reliant on user charges are open to a similar bias, but in the case of government departments there is often a substantial proportion of fiscal support as well, which reduces the impact of the water user charges and may therefore reduce the potential bias. This is an area in which further research could well be conducted.

The third issue in this suite of issues relates to the principle of the separation between the roles of referee and player, or regulator and implementer. The nature of any institution, and particularly a government bureaucracy, is that it is very difficult to regulate in-house activities, largely because it is difficult, if not impossible, for one part of an organisation to impose sanctions on another part of the same organisation. As an example, the Department of Water Affairs is responsible for the regulation of dam safety for large dams in South Africa. A number of these dams are owned, operated and maintained by the same department. While the department is able to take legal action against private dam owners who fail to comply with the dam safety regulations, it is unable to take similar action against its own infrastructure branch should they fail to comply with such regulations. There is, thus, a strong rationale in support of a principle that separates regulatory and implementation functions.

### **Institutional Alignment**

For effective and efficient regulation, it is important that water resource regulatory institutions and policies and procedures developed by such institutions are in alignment. It is also important for alignment between the direct water resources regulatory institutions and other relevant regulatory institutions such as those regulating land use, environmental regulation, and natural resource regulation in general. In South Africa, a discussion on allocation of water to the poor for productive use, for example, cannot be done in isolation from issues of access to land and agricultural support. Equally, the environmental department has an important role to play in the regulation of water-related environmental issues. Part of the alignment is to ensure that roles and functions are not duplicated, especially in circumstances where government departments and/or agencies have human resource constraints.

Etache and Martimort (1999) describe the challenge of several regulators controlling complementary activities of any firm. In their analysis, this approach results in too much informational rent being extracted from the company, and increasing costs arising from the arrangement. In the water resources regulatory framework, the challenge exists in aligning environmental and water regulation to prevent such problems. This approach can be achieved by appropriate institutional arrangements, combined with clear mandates, roles and responsibilities, and strong horizontal engagement between regulatory bodies.

Effective institutional alignment links closely to issues of affordability, low costs and clear mandates. Clear mandates are necessary for institutional alignment, and will result in lower costs for the institutions and clients. If one takes the issue of monitoring systems as an example, well aligned institutions may be able to achieve economies of scale through integrated or shared monitoring systems, whereas lack of alignment may well result in duplication and overlap of such systems.

In the South African context, there is a constitutional imperative for co-operative government which mandates that, at the very least, government departments and their agencies work together and in alignment. The challenge, however, is to give force to this in an effective way and to design institutional arrangements that facilitate and support such an approach.

Finally, it is important to recognise that South Africa, like many developing countries, operates within a plural legal system for water regulation: the formal legal arrangements, and the less formal customary water management system which still operates in many rural areas and particularly in the

ex-homeland areas (Malzbender et al., 2005). The institutional arrangements for regulation should, ideally, align these customary and formal arrangements into one seamless system.

### **Institutional predictability**

While the dynamic nature of water resources and the longer term change resulting from climate change demand adaptable and flexible institutions, from the perspective of water users, a sense of institutional predictability and coherence over time is needed. Water users like to know that water use conditions and the institutional arrangements supporting water resources regulation will be stable over a period of time. Lack of such stability may reduce investment in water infrastructure and improved technology for water use.

### **Mandate**

Ideally, all regulatory institutions must have a clear mandate, and a mandate which is communicated to and clearly understood by those being regulated by the institutions. This is important for a number of reasons:

- Compliance with regulation has shown to be better where those regulated understand and support the mandate of the regulator, be it technical or institutional regulation (WRC, 2009). This reduces the need for and cost of enforcement;
- Costs are lower and efficiency higher where institutional mandates are clear and there is a clear division of roles and responsibilities, understood by all;
- Clear mandates for all institutions prevent overlap or gaps between institutions.

However, an equally critical issue in relation to pro-poor water resources regulation is the question of the policy mandate given to any institution. Woodhouse (1997) makes it clear through an examination of local level resource management in Kenya, that 'Any redistributive goals of devolution of control of natural resource management must be contingent on the political nature of the central state. Reform at local level cannot therefore be a substitute for a progressive political agenda at the centre' (Woodhouse, 1997: 546). If the mandate of the central state is not overtly and clearly pro-poor, simply putting in place decentralised management or regulatory systems will not, in itself, translate into pro-poor regulation. This is due to the nature of the power relations that play out at all levels of society, even the most local level. The state, therefore, has a critical role to play in setting and driving the policy context for pro-poor water resources regulation. According to Woodhouse, this involves 'establishing a political climate in which disadvantaged groups have opportunities to organise and negotiate at local level' (Woodhouse, 1997: 546)

### **Transparency and accountability**

The OECD (2008) reports on the high level of corruption in the provision of water infrastructure and in water flows, and therefore in who gets access to water. While this report is not concerned with the construction of infrastructure, which is a particular point of corruption, the same issues pertain in relation to the regulation of water use and the authorisation of and enforcement of water entitlements. Corruption is, inevitably, anti-poor, since the poor lack the resources to pay to corrupt decision-makers. The strongest weapon against corruption is to ensure transparent decision-making

and to ensure that key stakeholders, including the poor, have a voice in the decision-making process and have a role in holding water institutions accountable.

The issue of accountability is the other side of the coin in this regard. It is critical, to maintain effective, corruption free water resources regulation, that regulatory bodies are held accountable for their actions, where accountability means that they are subject to the obligation to report, explain or justify their actions. This demands that a number of elements should be present in the institutional domain, including access to information for stakeholders, and bodies to which the water resources regulator(s) must account. In the current South African value chain, this accountability, ultimately, is to the tribunal, the courts and to Parliament. However, significant information asymmetry makes it questionable to what extent this accountability is exercised effectively.

#### 4.6. Decentralisation

The issue of decentralization of regulation is a particularly interesting one, which has been dealt with to some extent in the previous report in this project. Understanding this criterion requires an examination of some of the issues raised in relation to the previous three criteria, particularly around participation, affordability, and optimal use of available capacity. There are, however, also specific issues relating to decentralization itself that must be considered.

##### Decentralisation

International literature and local experts interviewed largely support decentralising water resources management, and by implication the regulation of water resources, to the lowest appropriate level. Indeed, it is viewed as a principle of IWRM. This is based on the understanding that decentralisation will increase the democratization of water resources management, lower transaction costs and increase stakeholder participation<sup>1</sup>.

To begin with, however, it is important to clarify two different concepts: decentralisation and agentisation. Decentralisation of functions to the lowest appropriate level is a principle of integrated water resources management. Agentisation, on the other hand, is merely one possible vehicle for implementation of water resources management. Accordingly, agentisation is an institutional-organisational response while decentralisation is a policy-legislative and normative imperative.

According to Jaspers (2003) decentralisation can range from taking place within the public administration to semi-public or private organisations. In the context of integrated river basin management one is generally looking at the decentralisation of specific functions of water resources management, through a process of de-concentration, delegation or devolution.

*De-concentration* refers to the assignment of functions to regional offices or lower ranks of the central authority. These functions can be taken back by the central authority at any time, and authority remains within the central authority. *Delegation* refers to a situation where functions are delegated to a separate public or private institution, and there is a transfer of authority which is not irreversible. The central authority creates the regulatory framework within which the other institution functions and while it cannot exercise the delegated functions while they are delegated to

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<sup>1</sup> Department of Water Affairs and Forestry. (2009). *An introductory chapter in regulating the water sector in South Africa: protecting the public interest through effective regulation of water*. Pg 4

the other institution, it can withdraw the delegation as and when necessary. *Devolution*, on the other hand, sees the complete and permanent transfer of both authority and responsibility to another body. Since this largely amounts to giving away a function, it is seldom seen (Jaspers, 2003).

In many of the discussions regarding decentralisation, the concept is conflated with the idea of establishing government agencies, usually in the form of quasi-autonomous river basin organisations. In reality, however, it is quite possible for decentralised water resources regulation or management to take place within a national government department and to achieve, in this manner, the improved involvement of stakeholders, the lowering of transaction costs, and a better understanding of and response to local conditions. In Mexico, for example, basin level water resources regulation is done through regional offices of CONAGUA, the central water agency, rather than through independent basin authorities.

In South Africa, the same approach prevails partially in the establishment of regional offices responsible for specific water management areas. What has not been done, in the South African context, however, is the delegation of sufficient decision-making functions to these regional offices in a way that would make them more able to respond to basin level needs and to lower transaction costs.

Delegation can be done in one short phase as in the case of delegation of functions to the Zimbabwe Catchment Councils, or progressively, as the need for or capacity to implement the delegated functions arises, as is the approach in South Africa.

However, the model proposed in South Africa, and implemented in several other countries studied, such as Zimbabwe, combines both decentralisation and agentisation, with the establishment of basin level agencies with delegated functions for water resources management and regulation.

The challenge remains, however, that despite the global rhetoric about this being the appropriate approach, insufficient work has been done on examining the *actual* costs and benefits of establishing basin level agencies for delegated water resources regulation in developing countries, and to what extent the creation of such agencies has improved basin management, and particularly basin management that benefits the poor. This is an area where considerably more research is required.

The understanding of the effectiveness of the agency approach and decentralisation requires consideration of the actual practice of decentralisation in developing countries. The GWP Southern Africa report on IWRM implementation (GWPSA, 2009) makes it very clear that although a number of countries in SADC have gone the route of both decentralisation and agentisation, at least on paper, implementation has fallen short because of lack of financial and technical resources and lack of delegation to these basin level institutions.

Thus, while the principle of decentralisation remains valid, it must be noted that Agenda 21 refers to delegation of functions to the lowest **appropriate** level, and that what is appropriate requires serious consideration of the human and financial constraints present in developing countries. It also requires consideration of how decentralised institutions, particularly where decentralisation has been through the process of establishing agencies, are to be regulated to ensure good governance, good water resources management, to avoid regulatory capture at the basin level (WRC, 2009), and to ensure that they give force to national government imperatives such as poverty eradication. Finally, if decentralisation is chosen as an option, it requires the political commitment to ensure the actual delegation of the required functions to the decentralised bodies.

In terms of devolution, rather than delegation, National Treasury (2004) in a review of non-business public entities and government business enterprises investigated the options for delegation and devolution of functions and stated that “Devolution to an extra-departmental entity is appropriate only where there are good reasons for independent governance and control.” (National Treasury, 2004: 5)

Their report sees that the delegation of functions within a government department has the advantages over a public entity of

- “Reduced transaction costs in creating new structures.
- “Delegations can be more easily reversed than devolved entities can be dissolved.
- “Maintenance of direct lines of accountability within the department.
- “The structures remain part of the departmental oversight system.
- “The governance system of delegations is less cumbersome and less costly.
- “Delegations reduce service delivery and political risk. (National Treasury, 2004: 7)

The devolution or delegation of functions to a public entity outside of a department, however, is sometimes posed as a solution to slow and inefficient government systems, rather than for clearly articulated reasons related to the issues highlighted by Treasury. Treasury takes their analysis further to highlight 9 reasons for functional devolution to a public entity rather than delegation within a government department:

- In order to comply with an international agreement
- To promote public confidence in objective decision-making
- To access specialised skills that cannot be accessed through a department
- To ring-fence risk
- Where government is involved in an activity for strategic reasons in the absence of an appropriate market mechanism
- As part of a privatisation process
- To facilitate stakeholder participation
- To allow the entity to access investment markets directly and
- Because such an approach is consistent with government policy or specific political decisions.

In the discussion on decentralisation, however, it is critical to remember that the Minister of Water Affairs remains, by legislation, the custodian of the nation’s water resources, and that there is a constitutional obligation on the Minister to ensure access to sufficient water for all, and to ensure, in relation to water, that everyone has an environment not harmful to health or well-being. As a result, although the Minister can delegate various water resources management functions to a range of institutions in the sector, she cannot delegate the ultimate responsibility of being custodian of the nation’s water resources. This responsibility must continue to reside at national level. Nor does the Minister have the authority to devolve functions to other institutions.

## 5. Regulatory Functional Analysis

### 5.1.Key functions for WR Regulation

Water resources management has several different aspects, of which two key streams are infrastructure development, operation and maintenance, and regulation. Both of these are supported by monitoring, assessment and planning. And both have requirements for stakeholder participation. These functions and their relationships are shown in figure 8.

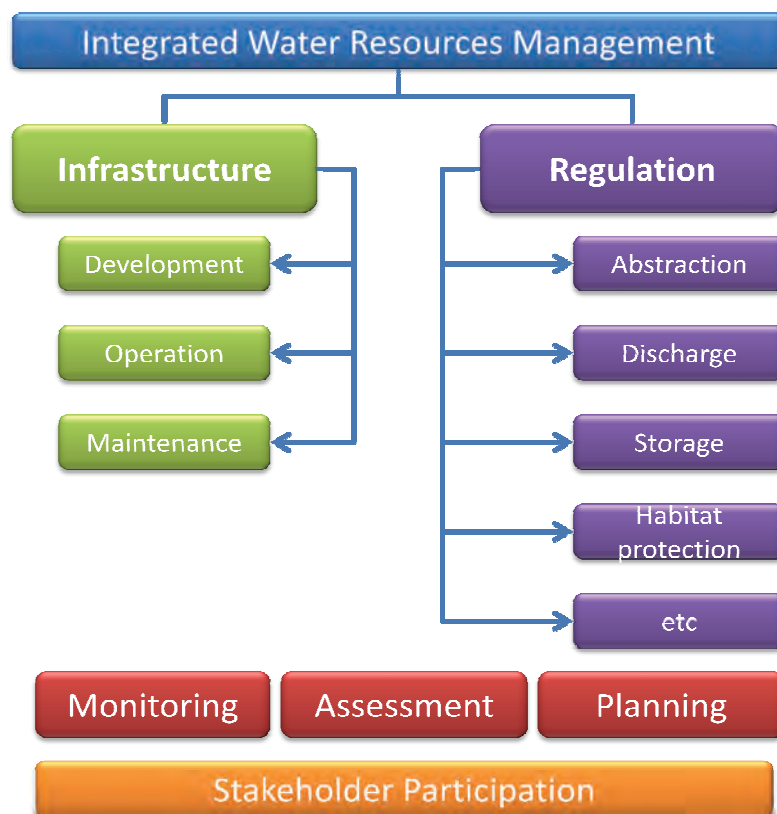


Figure 8: Elements of integrated water resources management

There are several steps that can be identified in the water resources regulatory process (figure 9):

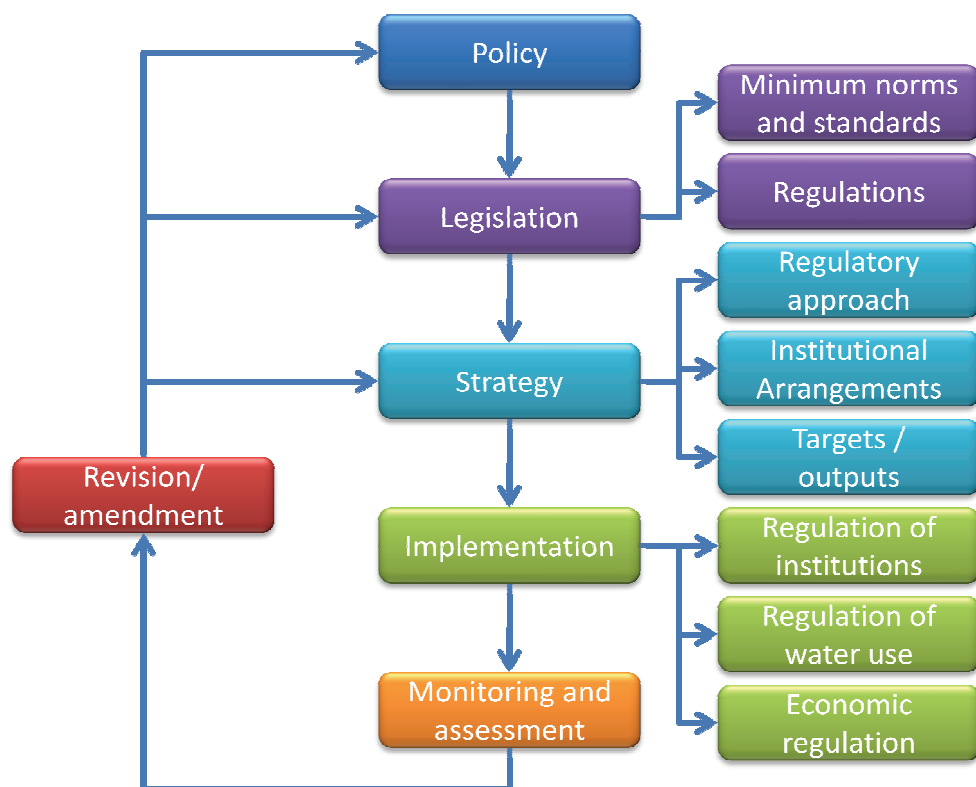


Figure 9: Key functions in water resources regulation

At any point in this circle, decisions must be made with regard to the best approach to serve local conditions. The policy will set out the framework within which all the following activities occur. If the policy fails to take into account key aspects, such as setting a clear pro-poor mandate, this failure will cascade through the process. Similarly, if the legislation fails to convey the authority to regulate particular activities, the rest of steps will be undermined by this weakness. In most developing countries, however, the key weakness appears in the implementation phase, driven, as can be seen in the assessment of international experience, by lack of human and financial resources and the failure to delegate appropriate functions to decentralized bodies.

Further to the functions captured in figure 9, some key regulatory activities relating to the authorization of abstraction in particular can be identified as shown in figure 10.

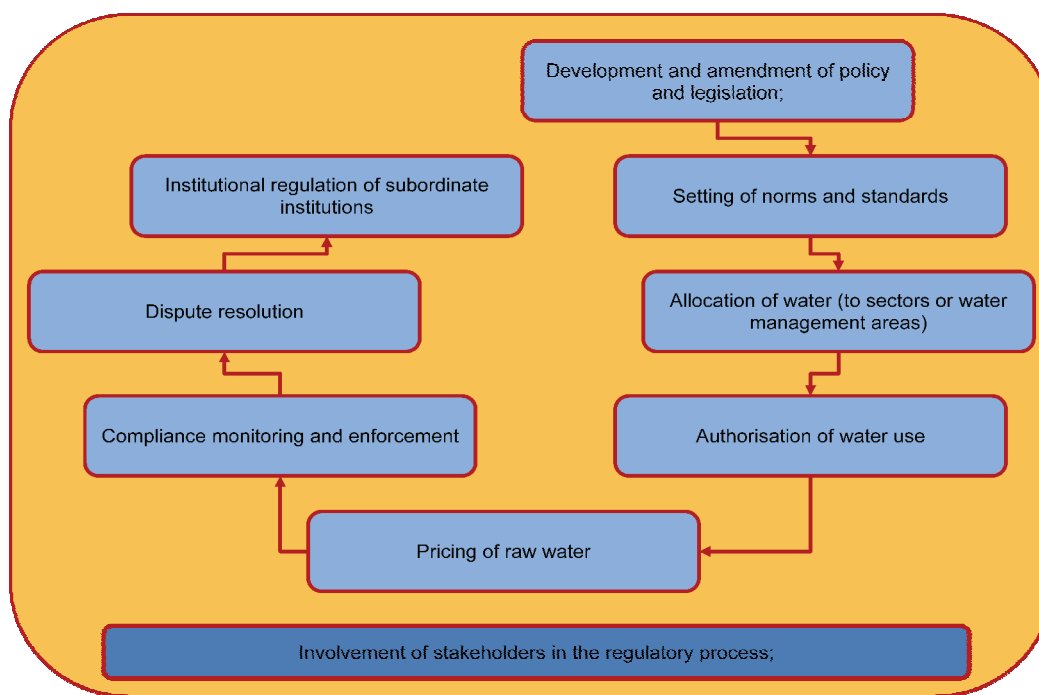


Figure 10: Key functions in water resources regulation

In different countries, with their different cultural, social, political, hydrological and economic contexts, different decisions have been taken regarding the level at which each of these functions should be performed, indicative of the fact that there is no blue-print for regulatory institutional arrangements. In section 3 some indication was given of the institutional arrangements and decentralization decisions taken in a range of countries grouped according to their levels of water availability and development. Bringing this together with the functional analysis related to water use authorisation enables one to develop a picture of the scale at which the identified functions tend to be performed. This is analysed further in section 5.2.

## 5.2. Function and scale

Table 1 summarizes the water resources regulation institutional arrangements in selected countries, divided according to the Ministerial arrangements (column 2), the institutional arrangements at the national level (column 3), and the institutional arrangements at sub-national or catchment level (column 4).

Two interesting elements emerge from this table. The first is that the Ministerial arrangements reflect the political lens through which water is seen, and how this changes as countries develop. In developing countries, water is largely linked to infrastructure development, irrigation and power. In many respects this reflects that the focus in these countries is still on the development of infrastructure, the early phase of water resources management seen in figure 4. The water/power nexus is largely about infrastructure development, as is the irrigation challenge, in most developing countries.

As countries move up the development scale, the association becomes much more between water and environment, reflecting a greater focus on environmental protection and on the sustainable use

of water resources. This linkage reflects a greater focus on regulation and less on infrastructure development.

The second interesting point is that most of these countries have some kind of water resources regulation institutional arrangement at sub-national or catchment level, either in the shape of a basin agency, regional offices of the national department or agency, or provincial/sub-national departments. That a large number of the countries on this table have introduced agencies either at national or sub-national level should not, however, be taken as representative of all countries.

**Table 1: Ministerial, national and sub-national institutional arrangements in selected countries**

| Country                                       | Ministry                                                   | National WR regulatory body                                                                       | Sub-national, basin level, or local regulatory bodies                                                     |
|-----------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Water scarce developing countries             |                                                            |                                                                                                   |                                                                                                           |
| Zimbabwe                                      | Ministry of Water Resources and Infrastructure Development | ZINWA                                                                                             | Catchment Councils and Sub-Catchment Councils                                                             |
| Kenya                                         | Ministry of Water and Irrigation                           | Water Resources Management Authority (WRMA); National Water Conservation and Pipeline Corporation | 6 catchment-based regional offices, Catchment Area Advisory Committees, Water Resources User Associations |
| Tanzania                                      | Ministry of Water and Irrigation                           | Water Resources Management Division                                                               | Basin Water Office                                                                                        |
| Pakistan                                      | Ministry of Water and Power                                | Water and Power Development Authority;                                                            | Indus River System Authority<br>Provincial Area Water Boards;<br>Warabandi system                         |
| Water scarce middle income countries          |                                                            |                                                                                                   |                                                                                                           |
| Chile                                         | Ministry of Public Works                                   | General Directorate of Water Resources (DGA);                                                     | Regional offices of DGA and CONAMA                                                                        |
|                                               |                                                            | National Environment Commission (CONAMA)                                                          |                                                                                                           |
| Mexico                                        | Ministry of Environment                                    | National Water Commission (CONAGUA)                                                               | Basin Agencies                                                                                            |
| South Africa                                  | Ministry of Environment and Water Affairs                  | Department of Water Affairs                                                                       | Regional office                                                                                           |
|                                               |                                                            | Department of Environmental Affairs                                                               | Some CMAs                                                                                                 |
| Relatively water rich middle income countries |                                                            |                                                                                                   |                                                                                                           |
| Philippines                                   | Ministry of Environment and Natural Resources              | National Water Resources Board                                                                    |                                                                                                           |
| Brazil                                        | Ministry of Environment                                    | National Water Authority (Autoridade Nacional da Agua – ANA                                       | Basin Agencies, River basin committees                                                                    |

| <b>Water rich developed countries</b>   |                                                           |                                                       |                                |
|-----------------------------------------|-----------------------------------------------------------|-------------------------------------------------------|--------------------------------|
| France                                  | Ministry of Sustainable Development                       | National Office for Water and the Aquatic Environment | Catchment Agencies             |
| United Kingdom                          | Ministry of Environment, Food and Rural Affairs           | Environmental Agency                                  | Regional Offices               |
| <b>Water scarce developed countries</b> |                                                           |                                                       |                                |
| Australia                               | Ministry of the Environment, Water, Heritage and the Arts | National Water Commission                             | State Departments              |
|                                         |                                                           |                                                       | Murray Darling Basin Authority |
| Spain                                   | Ministry of Environment                                   |                                                       | Basin Agencies                 |
|                                         |                                                           |                                                       | Autonomous Communities         |
| California                              | Secretary for Resources                                   | Department of Water Resources                         | Water Boards                   |

Taking these same countries, and the 9 regulatory functions identified in section 5.1, an analysis can be conducted of the levels at which the various countries have chosen to execute these functions. Although this is by no means a representative or comprehensive list, it is sufficient to give a general picture of the level of decentralization of functions.

The development and revision of policy and legislation is done almost entirely at the central or national level except in Australia and Brazil where water resources management is a state function in a federal political system. Similarly, the setting of norms and standards is generally a national/central function, although in some countries the sub-national or basin structures can also set norms and standards that are more rigorous than those set at the national level. Allocation of water between sectors and basins is still, largely, a national government function, although Pakistan shows some allocation delegated or devolved to lower levels. Water use authorization and compliance monitoring and enforcement tend to be delegated to lower levels, while stakeholder engagement is delegated to sub-national or local level in most countries. This makes sense when seen through the understanding that one of the reasons for decentralization is to improve stakeholder engagement with the decision-making process. Pricing of raw water is largely a national or central process, while dispute resolution is largely conducted at the national level except in certain countries where there is a layer of local dispute resolution as well.

Table 2: Level of delegation of regulatory functions for selected countries

|                                | National | Basin/Sub-national | Local |
|--------------------------------|----------|--------------------|-------|
| Policy and legislation         |          |                    |       |
| USA                            |          |                    |       |
| Zimbabwe                       |          |                    |       |
| Kenya                          |          |                    |       |
| Tanzania                       |          |                    |       |
| Brazil                         |          |                    |       |
| France                         |          |                    |       |
| Spain                          |          |                    |       |
| Mexico                         |          |                    |       |
| South Africa                   |          |                    |       |
| Chile                          |          |                    |       |
| Philippines                    |          |                    |       |
| Pakistan                       |          |                    |       |
| UK                             |          |                    |       |
| Australia <sup>2</sup>         |          |                    |       |
| Setting of norms and standards |          |                    |       |
| USA                            |          |                    |       |
| Zimbabwe                       |          |                    |       |
| Kenya                          |          |                    |       |
| Tanzania                       |          |                    |       |
| Brazil                         |          |                    |       |
| France                         |          |                    |       |
| Spain                          |          |                    |       |
| Mexico                         |          |                    |       |
| South Africa                   |          |                    |       |
| Chile                          |          |                    |       |
| Philippines                    |          |                    |       |
| Pakistan                       |          |                    |       |
| UK                             |          |                    |       |
| Australia                      |          |                    |       |
| Water Allocation               |          |                    |       |
| USA                            |          |                    |       |
| Zimbabwe                       |          |                    |       |
| Kenya                          |          |                    |       |
| Mexico                         |          |                    |       |
| Tanzania                       |          |                    |       |
| Brazil                         |          |                    |       |
| France                         |          |                    |       |
| Spain                          |          |                    |       |
| South Africa                   |          |                    |       |
| Chile                          |          |                    |       |
| Philippines                    |          |                    |       |

<sup>2</sup> Reference here is to arrangements in the Murray Darling Basin largely

|                                       |  |  |  |
|---------------------------------------|--|--|--|
| Pakistan                              |  |  |  |
| UK                                    |  |  |  |
| Australia                             |  |  |  |
| Water Use Authorisation               |  |  |  |
| California                            |  |  |  |
| Zimbabwe                              |  |  |  |
| Kenya                                 |  |  |  |
| Mexico                                |  |  |  |
| Tanzania                              |  |  |  |
| Brazil                                |  |  |  |
| France                                |  |  |  |
| Spain                                 |  |  |  |
| South Africa                          |  |  |  |
| Chile                                 |  |  |  |
| Philippines                           |  |  |  |
| Pakistan                              |  |  |  |
| UK                                    |  |  |  |
| Australia                             |  |  |  |
| Compliance Monitoring and Enforcement |  |  |  |
| USA                                   |  |  |  |
| Zimbabwe                              |  |  |  |
| Kenya                                 |  |  |  |
| Mexico                                |  |  |  |
| Tanzania                              |  |  |  |
| Brazil                                |  |  |  |
| France                                |  |  |  |
| Spain                                 |  |  |  |
| South Africa                          |  |  |  |
| Chile                                 |  |  |  |
| Philippines                           |  |  |  |
| Pakistan                              |  |  |  |
| UK                                    |  |  |  |
| Australia                             |  |  |  |
| Pricing (for raw water)               |  |  |  |
| California                            |  |  |  |
| Zimbabwe                              |  |  |  |
| Kenya                                 |  |  |  |
| Tanzania                              |  |  |  |
| Brazil                                |  |  |  |
| France                                |  |  |  |
| Spain                                 |  |  |  |
| Mexico                                |  |  |  |
| South Africa                          |  |  |  |
| Chile                                 |  |  |  |
| Philippines                           |  |  |  |
| Pakistan                              |  |  |  |
| UK                                    |  |  |  |
| Australia                             |  |  |  |

| Stakeholder involvement/ structures |  |  |  |
|-------------------------------------|--|--|--|
| USA                                 |  |  |  |
| Zimbabwe                            |  |  |  |
| Kenya                               |  |  |  |
| Tanzania                            |  |  |  |
| Brazil                              |  |  |  |
| France                              |  |  |  |
| Spain                               |  |  |  |
| Mexico                              |  |  |  |
| South Africa                        |  |  |  |
| Chile                               |  |  |  |
| Philippines                         |  |  |  |
| Pakistan                            |  |  |  |
| UK                                  |  |  |  |
| Australia                           |  |  |  |
| Dispute resolution                  |  |  |  |
| USA                                 |  |  |  |
| Zimbabwe                            |  |  |  |
| Kenya                               |  |  |  |
| Tanzania                            |  |  |  |
| Brazil                              |  |  |  |
| France                              |  |  |  |
| Spain                               |  |  |  |
| Mexico                              |  |  |  |
| South Africa                        |  |  |  |
| Chile                               |  |  |  |
| Philippines                         |  |  |  |
| Pakistan                            |  |  |  |
| UK                                  |  |  |  |
| Australia                           |  |  |  |

## 6. Institutional arrangements for South Africa

The design of appropriate regulatory arrangements for technical water resources regulation in South Africa must take into account the specific challenges and constraints of the South African context, some of which are shared by other developing countries, and some of which are specific to South Africa.

Of particular importance, in this regard, are the following:

- South Africa is a water scarce country, with significant water resources and water services challenges, and a looming threat from climate change. In this context, there is no leeway to get regulation wrong. The institutional arrangements must be effective and robust;
- South Africa has limited technical capacity in government to drive the effective regulation of water resources, despite relatively good capacity generally for a developing country. The institutional arrangements must be such that they can draw sufficient resources into the regulatory field, be it in government or in a state agency;

- South Africa suffers from extremely high levels of poverty and extreme inequity between rich and poor. The institutional arrangements must be accessible to the poor and the marginalised, and must be able to drive consciously pro-poor water resources regulation and management programmes;
- South Africa faces a mixture of developed and developing world water issues, in terms of access to water, water resources development, and pollution. The institutional arrangements must be able to address these different needs and challenges appropriately.

South Africa, despite the policy on decentralization, in actual fact runs a more centralized system than most other countries studied, including other developing countries. Neither water use authorization nor compliance monitoring and enforcement have been delegated to the extent that they have in other countries. Indeed, under both the Water Act of 1956 and the National Water Act of 1998, water use authorization has been retained at the central level except for some limited delegations to regional offices. The two existing CMAs have not received any delegated functions. The White Paper on a National Water Policy for South Africa states that:

“At a regional level, water management is presently carried out by offices of the national department. These offices continue to function as part, and respond to the priorities, of a central office and do not necessarily reflect the intent of Principle 23 which requires the responsibility for the “development, apportionment and management of available water resources” to be delegated to a “catchment or regional level in such a manner as to enable interested parties to participate” (DWAF, 1997: 50)

This statement reflects clearly that regional offices had little delegated authority for water resources management, and the system was, in fact, highly centralised, a system that still pertains post the new policy and legislation. According to Willie Enright, a long-term official in the Western Cape regional office, “Water Affairs had a high profile and enforcement was done by regions – sometimes without formal delegations but with perceived authority (bluff?), but it worked! It was always an effort to get delegations down. If delegations are not on lower levels, things are just not done.” (pers comm. 2010)

The White Paper went further, however, to state that:

“The present generalised lack of technical and managerial expertise means, however, that a mechanical decentralisation or delegation of functions is unlikely to achieve the objectives of more responsive and effective water management. The goals of public policy will only be achieved if such delegation goes hand in hand with systematic capacity building and effective monitoring and support from the national Department. This should include specific attention to make sure that the objectives of equity and corrective action are promoted and that existing differences in economic and social power are not strengthened.” (DWAF, 1997: 50)

Despite ongoing capacity building and training programmes of one form or another, DWA is still suffering from lack of technical capacity in particular, which requires a close examination of the issue of decentralization and what its pro and cons may be.

In the context of pro-poor regulation, where the issue of access by the poor and the marginalized to water resource regulatory institutions has been identified as being critical, the failure to delegate the water use authorization function to decentralized structures should be examined further to see to

what extent this approach has served the needs of the poor, or, indeed, disadvantaged the poor, and those marginalized by race, class and gender.

### **6.1. Water Resources Economic Regulation**

There has been considerable discussion in South Africa about the need for an independent economic regulator, particularly for water services, but, more recently, for raw water pricing as well. This issue arises from fact that the Department of Water Affairs sets raw water tariffs according to a strategy determined by themselves, to fund actions implemented by themselves. There is, therefore, a concern that there is no objective regulator reviewing the appropriateness of these tariffs.

However, a recent international review conducted on behalf of DWA suggested that the issue of an independent regulator should be thought about in a more dynamic sense, in terms of how one moves from the current position to one of improved economic regulation, rather than whether one should set up an independent regulator or not. This approach is driven, at least in part, by the lack of success in setting up independent regulators from scratch (Kugel Legal Consulting et al., 2006). This is particularly important where there are limited resources with expertise in economic regulation in the water sector, and a great deal of capacity building in this regard is needed to staff an economic water regulator either within government or outside it.

Whether the economic regulator sits inside a government department or external to it, what is important is that the economic regulator considers the entire value chain, from source to tap and back again. Only in this way will the real costs of water, and the relationship between value-add and tariffs, be fully established and regulated. This approach may also serve to reduce the negative externalities that are currently being paid for by downstream users.

The Australian IPART model is one that should be considered in more depth in terms of the economic regulation of water resources, and lessons drawn from their experience.

### **6.2. Water Resources Governance Regulation**

Governance regulation really becomes an issue when one or more agencies are created that fall outside the direct governance framework of government departments. In South Africa it has become clear that the biggest challenge in relation to governance regulation is not the institutional arrangements per se, but the capacity to regulate governance effectively, the understanding of governance roles and responsibilities, and the systems in place for governance regulation. Recent debates around, for example, the dismissal of the Eskom CEO show a general confusion as to the responsibility of the Board as opposed to the Minister. In any Agency, the Board is primarily responsible for good governance of the institution, and the Minister to which it reports only has the authority to intervene as determined in the legislation. In terms of the Water Boards which fall under the Water Services Act, the powers granted to the Minister are, in fact, severely limited making it difficult for her to intervene if there are problems. Under the National Water Act the Minister has much stronger powers to intervene in relation to Catchment Management Agencies.

An important element in relation to governance regulation is to understand the impact of the creation of new agencies on the costs and capacity requirements for effective governance regulation. The greater the number of agencies established, the greater the capacity required to regulate all of them effectively. There is, thus, a balance to be achieved between the creation of a

large number of agencies at a sufficiently local level to respond to local needs, and the increasing capacity requirements to regulate the governance of these institutions.

## 7. Conclusion

Water resources regulation in South Africa is currently very weak. This can be seen in the high levels of illegal water use, deteriorating water quality, and the increasing concern in the media regarding the state of South Africa's water resources. There are a number of reasons for this, including major issues of regulatory capacity. However, there is also a question of whether the appropriate institutional arrangements are in place.

What emerges from an analysis of international literature and practice is that there is no clear and simple correct answer for the appropriate institutional arrangements for water resources regulation. What does emerge is that there many models that could work, each with its own potential areas of excellence and potential limitations. A range of criteria have been proposed that should be considered in the process of determining the appropriate regulatory arrangements for a particular context.

While a decentralised model has a slight edge over the centralised model, largely due to the improved responsiveness to local conditions, decentralisation can take place at a range of levels, from the basin level, through sub-basin level, to the truly local. With large basins, such as the Orange-Senqu, for example, it is hard to argue that an institution at this level is likely to be particularly well attuned to local issues and conditions. The issue of scale within the framework of decentralisation is critical in terms of what benefits it will or will not deliver.

In terms of agentising water resources regulation, there are good reasons in the water resources technical regulatory arena for recommending that decentralised agencies be created, such as

- an improved ability to recruit and retain staff
- stronger accountability to local stakeholder needs and therefore
- improved legitimacy and public confidence.

However, decentralised agencies require strong governance and economic regulation, an area in which South Africa has been weak both in the water sector and in other sectors. Without the capacity for strong governance and economic regulation systems, the establishment of decentralised technical regulatory agencies is fraught with potential dangers.

While the establishment of an independent economic regulator for water appears to have strong political support, insufficient work has been done on understanding the nature, purpose and scope of such an institution. Current international discourse suggests a better approach as being an incremental approach to the improvement of economic regulation, rather than the once-off creation of an independent regulator. In particular, more work is needed to understand the role and scope of such a regulator in relation to raw water tariffs.

The technical regulator must be held accountable for performance of its regulatory function. This can be done through DWA regulating the performance of CMAs, or, if DWA is to continue to perform the technical regulation of water resources (such as water quality regulation, protecting the reserve, allocating water, etc.) accountability for performance of these functions must reside somewhere. This does not imply the need for an independent regulator, but rather suggests that the courts,

Parliament, the Water Tribunal, NGOs, and other civil society bodies have a more active role to play in this regard.

Ultimately, it is clear that there is no one blueprint for effective water resources regulatory institutional arrangements. A number of models can, and do work. Each model has its benefits and its drawbacks and risks. What is critical is to identify the potential risks and to ensure that measures are put in place to minimise and manage those risks.

### 7.1. Further research questions

During the course of this research, several questions were identified where further research would be useful. These are outlined briefly here.

In the context of pro-poor regulation, where the issue of access by the poor and the marginalized to water resource regulatory institutions has been identified as being critical (see section 5.2) the failure to delegate the water use authorization function to decentralized structures must be questioned – has this approach served the needs of the poor, or not. While there are intuitive answers to this question, it is an area where further research could be useful in identifying what the actual impact of the centralised approach has been on implementing the ostensibly pro-poor and transformative policies of government.

Reference has been made to the potential for regulatory capture and bias in agencies that are dependent on water user charges. It is possible that government departments reliant on user charges are open to a similar bias, but there is little research available on the extent to which this influences government decision making processes or not. There is an opportunity to investigate both the extent of regulatory capture arising from dependence on user charges, locally and internationally, both in government departments and in stage agencies. Such research would enable an identification of the extent of the problem as well as the identification of possible governance mechanisms to minimise the impact.

Insufficient work has been done on examining the *actual* costs and benefits of establishing basin level agencies for delegated water resources regulation in developing countries, and to what extent the creation of such agencies has improved basin management and what the value of such improvement might be. This is an area where more research is required.

Finally, the perceived objectivity of government is a contested terrain, with very different views espoused by different sectors of the society as to whether government is objective or not. In the context of general concern over the levels of corruption and efficiency in government, locally and internationally, this is of particular concern. However, there does not seem to be much research available on whether the public generally have more faith in the objectivity of government departments or government agencies, so this remains an area for further research, particularly in the South African context and the context of the water sector.

## 8. Appendix A: Country studies

### 8.1. Water rich developing countries

In water rich developing countries, such as the DRC, there is little need for much focus on the regulation of water use. While there may still be significant requirements in terms of infrastructure development to ensure that water is accessible to those who want to use it for productive purposes, on the whole, the impact of water use is still too low, generally, for regulation to be high on the agenda of government, although water quality may be a specific challenge in some areas. Flood management may also be a significant challenge in water rich developing countries, and regulatory systems for flood control are in place in some developing countries. However, there are more differences than similarities to the current South African context, and for this reason, the institutional arrangements of water rich developing countries are not considered here.

### 8.2. Water scarce developing countries

Figure 5 identifies four countries that experience difficult hydrology and suffer from low institutional capacity: Kenya, Tanzania, Pakistan and Zimbabwe. A review of these countries reveals some interesting commonalities (and differences) in relation to their focus in water resources management, and their institutional arrangements. A description of the relevant water resources management and regulatory arrangements is provided below.

#### *Zimbabwe*

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Zimbabwe is a semi-arid to arid country, prone to drought, with variable rainfall from year to year and during the year. It has an average annual rainfall of 650 mm. It has an area of 390 580 km<sup>2</sup> with a population of approximately 11.6 million, of which 70% lives in impoverished rural areas and depends on smallholder agriculture. Zimbabwe recognised that productive water use by small farmers in Zimbabwe cannot be achieved by only changing water legislation and accordingly classified 30 million hectares of land as agricultural land for redistribution. Only about half of the classified land has been irrigated due to the unavailability of water (Watenn, 2009).

Water resources are administered by the Ministry of Water Resources and Infrastructure Development which promulgated Zimbabwe's Water Act in 1998. The Zimbabwe National Water Authority (ZINWA) is a state corporation that was established by legislation to manage water resources (see [www.zinwa.co.za](http://www.zinwa.co.za)).

ZINWA is involved in the construction of dams, supplies water to most local authorities and has created a groundwater database. It furthermore controls and monitors water pollution in the country.

Zimbabwe has been divided into seven catchment areas linked to the seven major rivers (Manyame, Mazowe, Save, Runde, Mzingwane, Gwayi and Sanyati). Each of these falls under the jurisdiction of a Catchment Council (CC). Under these Catchment Councils are a series of Sub-catchment Councils (SCCs). The CC managers are employees of ZINWA with decision making powers delegated to this position as per the Water Act. Some have argued that this means that the Water Act disenfranchises local water users, compounded by the fact that the CC manager is accountable to ZINWA itself. None

the less, the CCs have been delegated functions of water authorisation, and compliance monitoring and enforcement.

The Ministry of Health and Child Welfare is responsible for water services and sanitation. Zimbabwe also has an Environmental Management Agency established in terms of the Environmental Management Act, 2002.

### *Kenya*

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Kenya is a semi-arid to arid country with variable rainfall both inter- and intra-annually. It is also prone to drought. Rainfall varies across the country between 200 and 2000 mm per annum. The combination of rainfall variability and lack of storage places a serious constraint on Kenya's economy as agriculture is the main source of income. 20% of the 582 646 km<sup>2</sup> of the country is arable and suitable for agricultural production.

Kenya has a Ministry of Water and Irrigation (MWI) responsible for the management of water resources. The Water Act, 2002 provides for a separation of roles and responsibilities between water resources management and water services. A Water Resources Management Authority (WRMA) was established to be responsible for water resources management. Its duties include water apportionment and allocation; Catchment protection and conservation; water resources assessment; delineation of catchment areas; gazetting water protected areas; protection of wetlands; establishing catchment management strategies; and collecting water use and effluent charges.

The WRMA (see [www.wrma.or.ke](http://www.wrma.or.ke)) has six catchment-based regional offices and also serves as the water resources regulator. At a regional level, stakeholder participation in water resources management is provided for through regionally based Catchment Area Advisory Committees (CAACs) and Water Resources User Associations (WRUA). The MWI works closely with the Ministry responsible for environmental affairs (Olum JP. undated).

There is also a National Water Conservation and Pipeline Corporation (NWCP) which is a parastatal under the MWI. There has been conflict between the WRMA and NWCP when the NWCP failed to obtain legal authorization to construct works for the use of water.

Kenya is still in a phase of water resources management that requires a focus primarily on infrastructure development, rather than a focus on regulation. The focus on infrastructure development should enable Kenya to achieve the minimum infrastructural platform to escape being held hostage to its hydrology (Grey and Sadoff, 2005). Once this has been achieved, a greater focus can be placed on the regulation of water resources.

### *Tanzania*

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Tanzania is a relatively arid country with more than half of the country receiving an average annual rainfall of 800 mm with little or no rainfall for around seven months in a year. Water demands exceed the available water resources with the major water use being irrigation. The economy depends significantly on rain fed agriculture with the majority of the population depending on subsistence farming. 26 million people live in the rural areas.

The management of water resources is situated in the Ministry of Water and Irrigation and its policy has been to involve as many stakeholders as possible by managing water with a bottom up approach for grassroots people to be empowered to participate in planning and decision making. Plans for water resources management are formulated from catchment to basin and then national level.

The Ministry develops policy, strategies and guidelines, and ensures that they are implemented. The Minister appoints the chairperson and members of the National Water Board. The Minister is also responsible for determining the mechanisms for appeals at all levels. The Ministry also provides sectoral co-ordination monitoring and evaluation (including of the Water Boards), and sets the technical standards for water resources management. It ensures dam safety, monitors water quality, and deals with transboundary issues. It is also responsible for the development of water resources of national interest.

The National Water Board coordinates the actions of catchment level water boards and endorses their catchment or basin plans. The National Water Board is also responsible for coordinating transboundary water resources management, resolving inter-sectoral or inter-basin conflicts, coordinating information management and the assessment of water resources. It provides support to basin water boards for the formation of water user associations, and acts as a communication channel between the basin water boards and the government. (Kimaro and Kimwaga, 2008)

The Basin Water Offices (BWO) are responsible for data collection, processing and analysis, water allocation and pollution control, water use planning, and the collection of water charges. They are responsible for resolving conflict between water users and to ensure cooperation between sectors at the basin level. They must ensure that district plans are incorporated into the basin plans (Kimaro and Kimwaga, 2008).

Catchment water committees (CWC) or sub-catchment water committees are responsible for the preparation and implementation of catchment plans and to perform any other functions delegated by the Basin Water Office. They are also responsible for conflict resolution at the local level. District councils participate in both the BWO and the CWC and are responsible for the planning and development of water resources in their area of jurisdiction, in alignment with the basin plans, for the protection and conservation of water, and for the establishment of by-laws for the management of water resources (Kimaro and Kimwaga, 2008).

Water user associations or water user groups are responsible for local level management of allocated water resources, dispute resolution amongst their members, data collection, protection of water resources and enforcement of water use regulations (Kimaro and Kimwaga, 2008).

The provision of water services is entrusted to autonomous service providers and regulated by the Energy and Water Utility Regulatory Authority (EWURA) to ensure that consumers receive quality services at an appropriate price. Prices cannot be changed without involving stakeholders in a public hearing.

### **Pakistan**

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Pakistan, unlike Tanzania, Zimbabwe and Kenya, has highly developed water resources infrastructure, including the world's largest irrigation system. Approximately 65% of Pakistan's 141 million people are rural, with most of this population concentrated in the Indus plain. Not surprisingly, agriculture the predominant activity and accounts for 26% of GDP (FAO, undated).

Agriculture accounts for 96.8% of Pakistan's water use with the balance of water used for domestic and industrial purposes. There is significant reliance on groundwater abstraction with most of this occurring from the large Indus Basin Aquifer which is mostly recharged from the surface flows.

The Ministry of Water and Power is responsible for water resources development and management. The Water and Power Development Authority (WAPDA) was established in 1958 primarily for the planning and development of schemes for:

- generation, transmission and distribution of power
- irrigation, water supply and drainage
- prevention of waterlogging and reclamation of waterlogged and saline land
- flood control, and
- inland navigation (FAO, undated).

The WAPDA develops irrigation and drainage schemes on behalf of the government, which are then transferred to provincial irrigation departments for operation and maintenance. The WAPDA maintains control of large multipurpose reservoirs and inter-provincial canals.

Pakistan is also in the process of establishing Area Water Boards in each province. Each water board is constituted by a number of autonomous Farmers Organisations (consisting of about 2000 farmers) whose role it is to oversee the investment in and operation of irrigation infrastructure and groundwater wells.

Although Pakistan has in place a comprehensive policy and institutional framework for environmental management, policy implementation has been compromised by the lack of administrative and implementation capacity, compounded by the lack of coordination between federal, provincial and local administrative entities.

The Indus River System Authority (IRSA) coordinates water sharing across Pakistan's provinces in the Indus Basin. The authority was formed in 1992 with the intention of managing resources in Pakistan's largest river basin but its short history has been marred by allegations of inequitable distribution of water between various provinces. The IRSA is comprised of one representative from each province as well as a member from the federal Government. It is reported that provincial governments frequently disagree with or ignore IRSA's rulings on water distribution.

The dominance of irrigation in Pakistan has given rise to a unique system of allocation and water sharing referred to as the Warabandi system which refers to the fixing of turns for irrigation of water for each farmer. There are two types of Warabandi sub-systems, namely the Kacha and Pucca. The former is arranged by the farmers themselves whilst the latter is organised by a secondary authority, usually the local irrigation department. The Kacha Warabandi system suffers from exploitation and it is not uncommon for large farmers to digress from agreed arrangements. In such cases the farmers can refer to the canal department and adopt a Pucca Warabandi arrangement. Under a Pucca Warabandi system a farmer violating arrangements is liable for prosecution.

Regarding allocation, the irrigation department records the (cultivable) area to be irrigated by each farmer and the farmer is then allocated sufficient water to irrigate as little as one-third of his/her cultivable area, the intention being to ensure as many people get access to irrigation water as possible in a context where demand exceeds supply.,

The pollution of water resources is a key issue in Pakistan, which several commentators say, has not been adequately addressed. Pakistan instituted a system of National Environmental Quality Standards (NEQS) under the Pakistan Environmental Protection Ordinance 1983, which was meant to address, inter alia, the quality of industrial effluent discharged into water bodies. However, the NEQS had very little impact in abating pollution and many argued that the standards were a merely a combination of standards of different countries that have little relevance to the Pakistani context. The NEQS were subsequently revised following extensive consultation with the business sector and in a move away from command-and-control to a system for self-monitoring and reporting for industry (SMART) was developed. This has seen improved efficiency in resource use and management; however, Pakistan still lags behind its neighbours in addressing its major environmental problems mainly because of political instability, a lack of progress in institution building, a weak environmental information system, weak local government and indifference among the majority of industries.

### 8.3. Water scarce middle income countries

South Africa, Mexico and Chile share common challenges in being middle income countries with limited water resources, although, within that mix, there are, of course, considerable differences between the three countries as well, not least being that Chile has a relatively low unemployment rate, while South Africa and Mexico have high levels of poverty to contend with.

#### Chile

In recent times, Chile's water resources have come under pressure due to economic growth, social development and increasing population growth. The irrigation sector represents almost 85% of water use, domestic uses account for 6.5% while industrial and mining use account for the balance. Chile's decision makers are acutely aware of the role that water has had in driving exports (GWP, 2005) and the GWP estimates that virtual water transfers out of Chile (linked to copper and fruit exports) are in the vicinity of 1 900 million m<sup>3</sup> per annum equating to almost 1.4 times the amount of available drinking water per annum.

Chile is most notable for its reforms in the 1980s which were driven by a need to invest in new service infrastructure. Chile introduced legislation which effectively transformed public water and sanitation services into companies. Apart from the efficiency rationale, another motivation for these reforms was the need to separate the management and regulatory activities of the state.

In 1981, Chile promulgated a new National Water Law, which laid out a vision of water resources development. While the law recognised water as national property, it also established a system of transferable water use rights. The intention was the state would be responsible for allocating the original water use rights *"free of charge, permanently, and without any limit on the quantity demanded, to all private individuals that requested them"*, (GWP, 2005).

Commentators however remain divided on the Chilean case with some arguing that the Chilean model has been a failure, while others argue it has been a success or at least a mixture of fortunes (Bauer, 2010). Bauer (2010) comments that the Chilean model of water markets and allocation is vastly different from other countries. While other countries have allowed water markets and water rights trading, these markets have been a policy instrument *within* the larger context of water law

and regulation, whereas in the Chilean context, water resources management occurs within an institutional context tailored *by* and *for* water markets.

The Chile water law was in some ways successful in encouraging investments and improving water efficiency. However, the allocation of unrestricted and unlimited water gave rise to several challenges, greatest of which was the accumulation of water rights for speculation and for closing the entry of competitors into various markets. Following much debate, Chile eventually passed the Water Code Reform in 2005 in order to correct shortcomings in the law and to deal with social equity and environmental sustainability concerns. Stipulations outlined in the reform include:

- provisions for presidential authority to exclude water resources from economic competition where it is in the public interest.
- provisions which allow the DGA to consider environmental aspects when establishing new water rights – this particularly relates to the determination of ecological water flows and protecting sustainable aquifer management, and
- provisions for charging a license fee for unused water rights and limiting requests for water use rights to genuine needs, as a means to deter hoarding and speculation. (GWP, 2005)

There is no formal sector regulator for water resources. The General Directorate of Water Resources (DGA) under the Ministry of Public Works oversees water resources management together with the National Environment Commission (CONAMA). The latter's responsibilities revolve around implementation and coordination of activities detailed in policies and strategies defined by government. The DGA's responsibilities involve:

- monitoring and measuring all the hydro-meteorological and water quality variables in rivers, lakes, and aquifers,
- ensuring that the private sector measures the use of groundwater and in some cases of surface water,
- regulation of water user organisations and where necessary bringing before the courts any matters of transgression.

Both the DGA and CONAMA operate regional level offices in addition to their national offices. Concerning control and regulation, other institutions involved are the Ministry of Health and the General Directorate for Maritime Territory and the Merchant Marine. The Ministry of Health is responsible for measuring and monitoring water quality. Where necessary the ministry may adopt corrective measures when risky situations are identified. The General Directorate for Maritime Territory and the Merchant Marine is responsible for water quality in coastal seas, at river mouths, and navigable freshwater lakes.

### *Mexico*

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In 2004, Mexico made significant amendments to the National Water Law (*Ley de Aguas Nacionales*), which defined a process of decentralization of water resources management to river basins, through Basin Agencies (*Organismos de Cuenca*) and Basin Councils (*Consejos de Cuenca*) which would ensure the participation of all levels of government, as well as water users associations and civil

society organizations in the decision-making process. The Basin Agencies would be drawn from existing parts of CONAGUA regional offices. The legal reforms also introduced a financing system to finance water resources management. However, there are still gaps in the regulations and bylaws which leave some of the institutional and financial arrangements unclear.

At the federal level, the National Water Commission (CONAGUA) is responsible for integrated water resources management (IWRM). CONAGUA, created in 1989, falls under the Ministry of Environment and Natural Resources. CONAGUA is responsible for water policy, water rights administration, planning, irrigation and drainage development, water supply and sanitation, and emergency and disaster management (both prevention and response) particularly with respect to flooding.

In the mid-1990s, CONAGUA was reorganized to include 13 Regional Offices with jurisdiction over areas based on hydrologic boundaries of one or more river basins. This was the beginning of a process of decentralised of WRM.

In recognition of the key principle of citizen participation, CONAGUA created the Water Citizen Movement (Castro et al., 2004; Tortejada et al., 2004), whose aims are creating a new water culture and in raising awareness around water issues. There are also provincial citizen water councils, which include water-user associations and NGOs. The citizen councils engage with the CONAGUA, and other relevant government departments, but there is little evidence of this engagement producing significant results in the lives of ordinary people. This may be influenced by the fact that the government defines who may participate in the various councils. (Armentia and Jimenez, 2009)

However, a challenge is that the technical capacity in the regional offices of CONAGUA has declined over the years, leaving too little capacity to staff the Basin Agencies effectively. Some suggestions have been made that technical capacity from the national or central office will need to be decentralised to the basin agencies. Such a move could enhance local capacity and build on the capacity present in municipal water companies, irrigation districts, and state water agencies.

Basin Authorities are funded from the federal budget and have no mandate to obtain their own financial resources. They have a mandate to collect and analyse information, to propose priorities and actions, and to estimate the resources required for water resources management in their area of jurisdiction.

25 Basin Councils and several Aquifer Committees (*Comités Técnicos de Aguas Subterráneas* (COTAS)) have been established. The challenge remains, however, in clarifying the precise roles and responsibilities of the various structures.

At the local level there are three main types of irrigation systems: irrigation districts (covering 53% of irrigated area), irrigation units and small private irrigation schemes. The responsibility for operation and maintenance of irrigation districts was transferred to water users associations (*Asociaciones Civiles de Usuarios – WUAs*) in the 90s, except for 5 per cent of the area and some upstream dams and canals that are still operated by CONAGUA.

Mexico uses a range of regulatory instruments for water resources management, including water use rights and well drilling prohibitions. Water transfers can only be approved by CONAGUA, which limits flexibility and makes the process slow.

The institutional arrangements for water resources regulation in South Africa are relatively complex, with a long chain of regulatory players, as shown in figure 6. This chain includes the courts, the Water Tribunal and Parliament who all have a critical role to play.

Parliament establishes the legislation that provides the department with its legal mandate to regulate water use. Parliament also has an oversight role in terms of ensuring that the aims of the legislation are being achieved. Any amendments to legislation in order to enhance the effectiveness of water resources regulation require the approval of Parliament. Parliament has various mechanisms for holding departments accountable, which are set out in the Constitution and the Parliamentary rules (C September pers comm. 2010). Parliament holds the executive accountable by

- Asking parliamentary questions
- Having parliamentary debates about important issues
- Proposing and voting on motions, and
- Requiring the executive and state institutions to report to Parliament.

The courts and the Water Tribunal influence regulation through binding rulings that give interpretation both to the meaning of legislation and regulations, but also to the methods used to implement regulation.

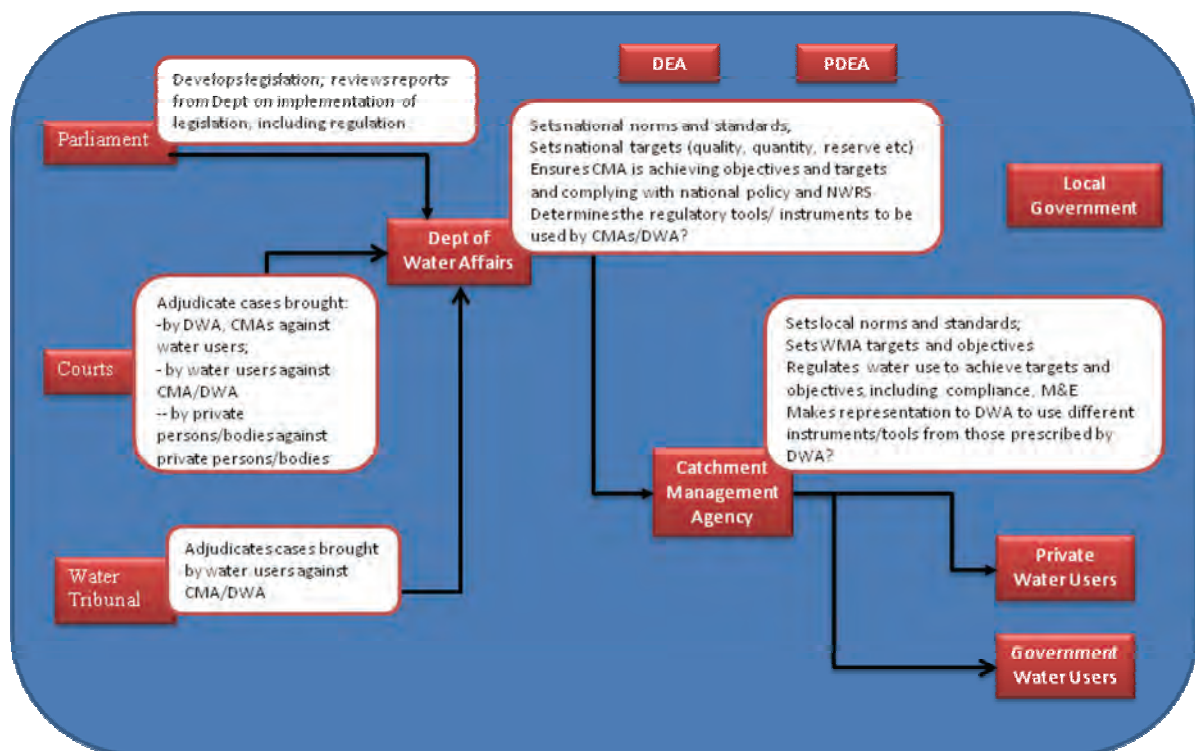


Figure 11: Role-players in the Water Resources Regulatory chain in South Africa

Currently the Department of Water Affairs is responsible for almost all water resource management functions, except, in the two water management areas where CMAs have been established and are functioning, for the initial functions assigned to CMAs in the legislation. All regulatory functions are still performed by DWA, except for limited functions performed by Irrigation Boards and Water User

Associations in terms of ensuring that members use water in accordance with authorisation requirements and scheduling arrangements.

## 8.4. Relatively water rich middle income countries

### *Philippines*

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At a national level, the Department of Environment and Natural Resources formulates and enforces policies and guidelines for environmental protection and pollution control. The department established the National Water Resources Board (NWRB) as the apex body responsible for overall water resources management and coordination of the activities of agencies involved in the water sector (in irrigation, hydropower, navigation, pollution, waste disposal, watershed management, etc.). The NWRB is also effectively the technical regulator and regulator of water utilities in the Philippines.

The National Water Resources Council divided the country into twelve water resources regions in efforts to establish manageable units for water resources planning. Although intentions were to base these regions on hydrological boundaries, the resulting borders generally correspond to existing political regions in the country (FAO, undated).

One of the challenges facing the NWRB as the chief water resources management body is the need to strengthen and regionalize the board. The NWRB largely remains a national body with limited involvement at the river basin level. At the same time, the board also believes there is potential conflict in being both the apex body for water resources and the regulator. As the body responsible for water resources management, the NWRB needs to engage with the water sector, and water users in particular, to facilitate the implementation and coordination of policies. However, at the same time, as the regulator the NWRB feels that it requires independence from users and implementers in order to effectively carry out its regulatory function (ADB, 2004).

Another issue relates to the current approach to water pricing. The NWRB states that the current approach of water pricing does not adequately reflect the true value of water and that the fees charged by it are insufficient to provide for cost recovery and sustainability of water resources (ADB, 2004). In order to address this, the NWRB has put forward proposals for the adoption of a revised Raw Water Pricing strategy aimed at increasing water use efficiency and achieving resource protection. It is however not clear how and who will regulate raw water prices set by the board. The NWRB concedes that, at the same time, the raw water pricing strategy must consider:

- the needs of the poor
- issues in the agricultural sector and those of small farmers in particular
- the concerns of areas where water is critical, and
- the need for public consultations, information and education campaigns

Regarding the regulation of water use and allocation, like Pakistan, one of the challenges besetting the NWRB is that of illegal water use. According to the Network of Asian River Basin Organisations (NARBO), there are more illegal appropriations of water than the ones legally issued by the Board (NARBO, 2003). Added to this is the reported refusal of some indigenous groups to recognize

permits issued by the Board under the argument that they own all natural resources including water within their ancestral domain. This has resulted in a situation where users issued permits by the NWRB are not allowed access to water and where indigenous groups appropriate water without securing a water permit.

### *Brazil*

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Brazil's water resources management operates within a federal political system. At the apex of the water resources management system is the National Council on Water Resources (NCWR) which has a mandate to promote the integration of water resources planning at the national, regional, and state levels and between user sectors. It consists of representatives of the Federal Government ministries, representatives of the State Councils on Water Resources, water user representatives and representatives of civil society organizations. It is chaired by the Minister of the Environment.

The National Water Authority (Autoridade Nacional da Agua – ANA) has the mandate to implement the national water policy and to develop criteria for the granting of water use rights and for pricing. ANA has administrative and financial independence.

At the river basin level, River Basin Committees (RBC) are stakeholder organizations that discuss and decide on the challenges and priorities in the basin, but they have no legal standing. They include water users, representatives of Federal, state and local government, and civil society organisations. River Basin Water Agencies act as executive secretariats for the River Basin Committees. Due to the federal nature of the Brazilian system, the basin agencies were created by the state governments rather than by national government.

## **8.5. Water rich developed countries**

### *France*

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France, with an average annual precipitation of 900 mm had around 3 370 m<sup>3</sup> water per capita per year in 2005, making it a relatively well resourced country from the water perspective. It is also a highly developed country, with a long history of water resources management.

A National Water Committee is responsible for national water policy trends, and for legislative and regulatory matters.

France has been divided into 6 hydrographic basins each with a basin committee, and a Water Agency governed by a Governing Board. The Ministry of Environment is responsible for oversight of both structures. The Basin Committees act as water parliaments and are composed of users, specialists, state officials and elected representatives.

The Water Agencies have a mandate to balance economic development and environmental protection. They do this through providing grant aid, taxing water use and constructing infrastructure. The state is responsible for the authorisation of abstraction and discharge.

Economic regulation takes place at the municipal level, but this system has resulted in significant challenges of corruption and abuse.

## *United Kingdom*

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Strong regulation in all aspects of water – drinking water quality, wastewater quality, environmental improvement and price control – underpins the water industry in the UK. Most of the regulations that affect the water sector directly stem from EU directives such as the Water Framework Directive. Others are specific to all or some parts of the UK, for example economic regulation and customer service standards.

Regulation of water resource management, water quality standards and pollution control is done by the:

- Environment Agency (EA) in England and Wales
- Northern Ireland Department of the Environment in Northern Ireland
- Scottish Environmental Protection Agency (SEPA) in Scotland (Water UK, 2008).

Regulation of the price that people pay for treated water is carried out by Ofwat in England and Wales, the Water Industry Commission in Scotland and the Utility Regulator in Northern Ireland (Water UK, 2008). There does not appear to be any regulation of the price of raw water.

Water suppliers are licensed by the EA in England and Wales to abstract defined amounts of water daily and annually and by the SEPA in Scotland. The EA and SEPA are responsible for maintaining the right balance between abstraction and environmental protection. (Water UK, 2008). Currently a full abstraction licensing system does not exist in Northern Ireland, but is under preparation.

## **8.6. Water scarce developed countries**

### *Australia*

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Australia provides a particularly interesting example of institutional arrangements, particularly in relation to the Murray-Darling Basin, which is the most important basin in Australia. Historically, water resources management has been the responsibility of the states, with relatively little federal authority in the matter. Since the Murray-Darling Basin stretches across several states, the Murray-Darling Basin Commission was established to co-ordinate management of the basin. Decision making power, however, remained in the hands of the states.

The Murray-Darling Basin Commission's mandate was to:

- Manage and distribute the water resources of the basin
- Protect and improve water quality in the basin and
- Advise the Murray-Darling Ministerial Council on water, land and environmental management in the basin.

However, recent challenges, including a prolonged period of low rainfall, driven by climate change, have exacerbated the problems in the basin, and resulted in significant institutional changes, driven by the promulgation of the Water Act 2007, which came into force in early 2008.

This Act establishes the Murray-Darling Basin Authority (replacing the Murray-Darling Basin Commission) which reports to the Minister for Climate Change and Water. The Act requires the MDBA to develop a basin plan, and for the first time, water resources planning will consider the

basin as a whole, rather than in state-level pieces. The Plan has to set limits for water withdrawals, which may have significant impacts on water use in the basin. In essence, this process has removed power to plan water resources from the states and brought it to basin and federal level. Implementation, however, remains with the states, with a proviso for the Commonwealth government to step in if a state consistently transgresses the requirements set out in the plan. A Ministerial Council, made up of a minister from each of the Basin states and the Australian Capital Territory and the Commonwealth Minister of Climate Change and Water has an advisory role in the preparation of the Basin Plan by the Authority.

In addition to the commission's mandate, the new authority's role includes:

- preparing a Basin Plan by 2010 which, amongst other things, sets sustainable limits on water surface and groundwater withdrawals across the Basin;
- advising the minister on the accreditation of state water resource plans
- developing a water rights information service to support water trading across the basin
- measuring and monitoring water resources, collecting information and undertaking research, and
- engaging stakeholders in managing the basin.

States still issue authorisations to take water and determine how much can be taken by users within the parameters that will be set by the new plan of how much total water can be abstracted in each state. Where there is a dispute among the states, the first response is to attempt to resolve it at the level of the officials. If this fails, the dispute goes to a Ministerial Council, and if that fails the States or the Commonwealth can take it to the Courts.

All water trading is now under the control of the National Competition Authority. South Australia is currently taking the state of Victoria to the High Court as Victoria is trying to slow down the trade of water out of its area of jurisdiction. South Australia is arguing that this is unconstitutional as there is supposed to be free trade among states (Mike Young, pers comm. 2010).

The Act also establishes what is called the Commonwealth Environmental Water Holder which will "manage the Commonwealth's environmental water to protect and restore the environmental assets of the Murray-Darling Basin, and outside the Basin where the Commonwealth owns water" (<http://www.environment.gov.au/water/australia/water-act/key-features.html>).

Australia also provides a useful example of economic regulation of water resources. IPART, the Independent Pricing and Regulatory Tribunal of New South Wales, not only regulates water services tariffs, but also considers activities required to address water resource management under the Water Management Act 2000 and the National Water Initiative. IPART determines the maximum price that may be charged by the State Water and the Water Administration Ministerial Corporation for bulk-water related services, including water resource management, provided to farmers, irrigators, industry and municipalities, the Sydney Catchment Authority and Hunter Water ([www.ipart.nsw.gov.au](http://www.ipart.nsw.gov.au)). IPART is responsible for regulation of bulk water prices, metro water prices, and licensing for government utilities and private sector water infrastructure operators, and for access to the network.

## *Spain*

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Spain's water policy changed dramatically between 1985 and 2007 to address environmental degradation, growing water demand, climate change, agricultural policy and economic growth. The 1985 law, amongst other things, consolidated the institutional role of basin agencies by granting them autonomy, financial resources and personnel, to make them the actual decision makers in all water related issues in the basin.

The 1999 Water Law Reform amended the 1985 Water Law but did little to change the institutional arrangements of the previous Act.

The Ministry of Environment is in charge of water resources management. Basin Agencies (Confederaciones de Cuencas Hidrográficas) are responsible for planning, constructing and operating major water infrastructure; undertaking basin studies and developing basin plans; setting and enforcing water quality targets; and granting water use permits to use water. There are 15 Basin Agencies. In areas in which a catchment falls entirely within the territory of an autonomous community, the catchment is managed by the community.

## *California*

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The responsibility for protecting and restoring the waters of California lies with the State Water Resources Control Board and the Regional Water Quality Control Boards (Water Boards). The California Water Boards (the State Water Resources Control Board and nine Regional Water Quality Control Boards) are state government departments that protect and enhance the quality of the state's waters for present and future generations. Development of state-wide policy and regulations for water quality control and allocation of water rights lies with the State Water Board while the Regional Water Boards are responsible for providing local implementation of policy and regulations, developing long-range plans for their areas, issuing waste discharge permits, regulating and enforcing water rights, and taking enforcement actions against violators (California Water Boards undated).

The Water Boards, which are organized by regional watersheds and by programs, regulate water quality and administer a system of water rights in the state. The Regional Water Boards implement water quality programs in accordance with policies, plans, and standards developed by the State Water Board, and are funded by and fall under the oversight of the State Water Board. Statewide enforcement activities are coordinated by the Office of Enforcement at the State Water Board (California Environmental Protection Agency, 2007).

If water quality issues cross Regional Water Board boundaries or have significant state-wide application, development of water quality control plans, policies, including standards, and general permits becomes the responsibility of the State Water Board. The other responsibilities of the State Water Board are approval of regional basin plan, reviewing petitions of Regional Water Board actions, administering financial assistance to water pollution control or cleanup programmes addressing enforcement, and providing administrative and other functions that support the Water Boards. The State Water Board is also responsible for allocating water rights and adjudicating water right disputes.

## 8.7.South Africa

### Environmental regulation

Environmental regulation in South Africa falls under the Minister of Environment and Water Affairs. Two separate departments reside under this Minister: the Department of Water Affairs and the Department of Environmental Affairs. While the former is responsible for the protection, management and development of the country's water resources, the Department of Environmental Affairs regulates

- emissions to air;
- waste from its generation, transport, and storage to disposal, treatment, etc.;
- Environmental Impact Assessments
- sustainable consumption activities with regard to wildlife;
- coastal development;
- release to sea;
- endangered species; and
- biodiversity, including the protected areas system.

The Constitution defines environmental protection as a concurrent function, resulting in 9 provincial departments of environment. In some of the provinces, statutory nature conservation agencies, such as Ezemvelo KZN Wildlife, have been established to take on the particular role of conservation protection. At the national level, SANParks has a similar function.

Regulation of environmental protection is done by the Department of Environmental Affairs, by the provincial Departments of Environment, and, in relation to conservation of biodiversity, by the statutory conservation bodies.

There are two other national statutory bodies in the environmental stable: the South African Weather Service, and the South African National Biodiversity Institute. Neither of these bodies have regulatory functions, being focused rather on information and research.

Both business and NGOs have played a strong role in shaping environmental regulation. Contrary to the common perspective, it is possible for the result to be weaker rather than stronger legislation, and, in fact, to result in inappropriate compromises in the legislation. This may be exacerbated by technical weakness at the level of the Portfolio Committee which is responsible for approving legislation prior to it going to Parliament, and by the lack of good legal drafters in government (Joanne Yawitch pers comm. 2009). This comment derives from the development of the Waste Management Bill, in which, in an attempt to meet the demands of both business and the NGOs, the Portfolio Committee apparently made compromises in the legislation which officials tasked with implementing the legislation find difficult to implement.

The Department of Environmental Affairs has established a unit called the Green Scorpions which are responsible for the enforcement of environmental legislation. The Department is also involved in negotiations with the Department of Justice to open four environmental courts in Gauteng, Mpumalanga, the Western Cape and the Eastern Cape. These will be normal courts in which a certain amount of time will be set aside for addressing environmental cases, including water cases.

The Department has already been training prosecutors and building awareness amongst magistrates about environmental legislation and have compiled both a compendium of environmental legislation and a prosecutors' manual (Sonnyboy Bapela pers comm. 2010).

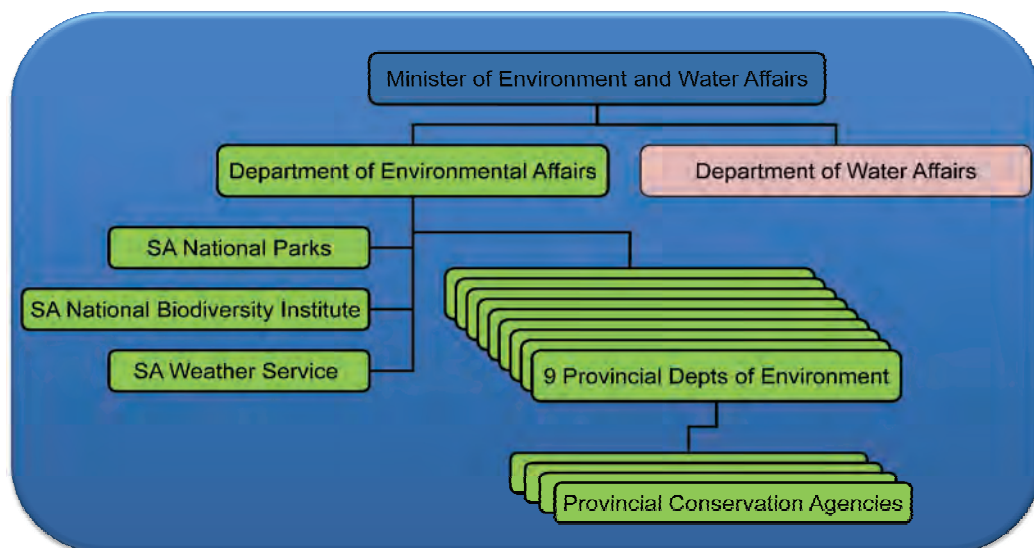


Figure 12: Environmental regulation arrangements in South Africa

## Energy regulation

Recent changes in government structures have resulted in the creation of a stand-alone Department of Energy in South Africa. The department is responsible for the development of energy policy for the country.

Eskom, which was originally established as a public entity, was established to generate and distribute electricity. As from 1 July 2002, it became a public company, Eskom Holdings Limited, under the Eskom Conservation Act, 13 Of 2001. It is governed by a Board of Directors and is accountable to the Minister of Public Enterprises. Each year, Eskom, in consultation with the Minister of Public Enterprises, agrees on its performance objectives, measures and indicators in line with Treasury regulations under the PFMA.

The National Energy Regulator (NERSA) is a regulatory authority established under Section 3 of the National Energy Regulator Act, 2004 (Act No. 40 of 2004). NERSA has five part-time members and four full-time members, and is designed to act as economic regulator for the electricity, piped-gas and petroleum pipeline industries.

The Electricity Regulation division of NERSA has four departments/functional areas:

- The **Licensing and Compliance Department** which issues licences for generation, transmission and distribution of electricity, import/export of electricity, and electricity traders. It also registers anyone who provides such services but doesn't require a licence. And it monitors compliance with licence terms and conditions.
- The **Pricing and Tariffs** section which sets tariff guidelines and structure, determines tariff methodologies (e.g. Rate of Return, Multi Year Price Determination) and pricing frameworks, and evaluates tariff applications. Eskom cannot increase its tariffs until they have been

approved by NERSA and to achieve this, it needs to prove to NERSA that the increase is warranted. In this process, NERSA is expected to protect the interests of consumers.

- The **Electricity Infrastructure Planning** section which is responsible for planning for future electricity demand through the National Integrated Resource Plan; promoting alternative electricity generation technologies such as renewable energy and cogeneration options; and promoting demand side management and energy efficiency.
- The **Regulatory Reform** section which is responsible for designing the regulatory framework, research and development of the Electricity Distribution Industry, and developing the international trading framework

The Energy Regulator is supported by a secretariat which falls under the aegis of the CEO.

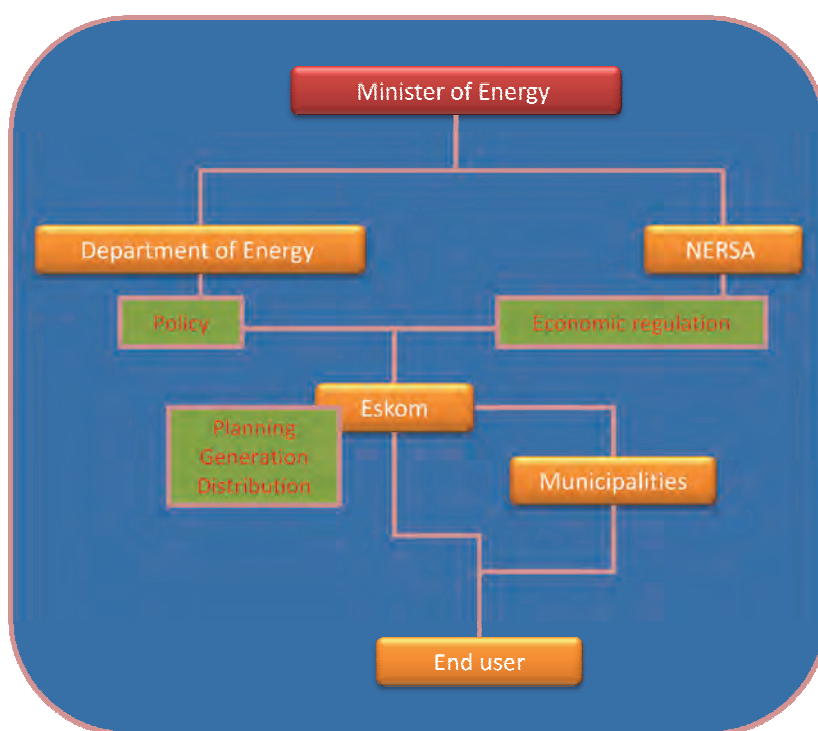


Figure 13: Energy regulation in South Africa

One of the challenges in relation to economic regulation in the electricity sector is that NERSA only regulates the price of energy in relation to Eskom. There is no regulation of the price of electricity charged by municipalities to the end-users. Municipalities are regulated under the MFMA rather than by NERSA.

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| <b>Name</b>       | <b>Organization</b>               | <b>Designation</b>                   | <b>Date</b>    |
|-------------------|-----------------------------------|--------------------------------------|----------------|
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| Beatrice Conradie | UCT                               | Senior lecturer                      | 12 April 2010  |
| Willie Ellis      | UWC                               | Senior Lecturer                      | 15 April 2010  |
| Lewis Jonker      | UWC                               | Integrated Water Resource Management | 23 April 2010  |
| Ricardo Jacobs    | Surplus Peoples Project           |                                      | 28 April 2010  |
| Willie Enright    |                                   | Consultant                           | 29 April 2010  |
| Terry Winstanley  | Environmental Attorney            | Cliffe Dekker Hofmeyr Inc            | 7 May 2010     |
| Jeremicia Seherie | Advocate                          | Blacksash                            |                |
| Joanne Yawitch    | DEA                               | Deputy Director General              | 21 August 2009 |
| Liza McCourt      | DEA                               | Chief Director                       | 21 August 2009 |

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#### **Towards the development of IWRM implementation indicators in South Africa**

***S Braid and A Görgens (editors)***

The aims of the project were to:

- Conduct a comprehensive literature review of both international literature and selected national legislation and policy in terms of how IWRM has been conceived and applied
- Develop indicators for assessing how IWRM will impact on the lives of women and the poor and apply these indicators to South African case studies
- Build research capacity locally and internationally on approaches to implement and monitor IWRM.

The project was conducted in two phases; the first phase focused on the compilation of a literature review in terms of IWRM in a broader context, and the second phase focused on developing criteria for proposed indicators used in assessing the impacts of IWRM and testing these against a case study.

#### **PHASE 1 Literature Review**

The first point of departure was to define IWRM in terms of its conceptual basis and as a 'tool'. The next step was to conduct a legal review of how the National Water Act and other relevant legislation and policy support the IWRM principles. IWRM embodies a broad plethora of requirements, topics, actions, impacts and ideals. In the South African context, the key topics, such as water allocation, groundwater potential, gender aspects and land reform, are summarised.

The literature review also contextualised Mitchell's (2006) Canadian IWRM experience, the findings of which could be ideal for the South African situation, and explored the Shah and Van Koppen (2006) review of India for lessons when setting expectations of IWRM in the South Africa context.

The second phase of the project focused on identifying criteria for the development of proposed indicators for evaluating the impact of IWRM on the lives of women and the poor in South Africa. Before deciding on the methodology to be used to develop the criteria for these indicators, it was important to identify the function and aim of the indicators, and this is discussed in the last section of the literature review.

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