Abstract

A comprehensive program of water institutional reforms has been implemented in South Africa since 1994. These reforms followed some major reform on the political and economic fronts. The institutional changes that occurred in the water sector covered the policy legal, and organizational dimensions of water allocation and management and affected all water sub-sectors including environmental allocations. The reform process has culminated in a new national water policy, a national water act and a national water resources strategy. Substantial organizational changes have also occurred with a focus on management decentralization, user participation and license-based allocation of water. This paper aims to provide an overview of these and other changes, especially from the perspective of irrigation and agriculture. It also attempts to explain the emergence and implementation of the water institutional reforms process in the light of the results reported in recent literature on water institutional reforms. The paper provides evidence for the role of transaction cost and political economy considerations as well as the use of reform design and implementation principles such as institutional sequencing and reform timing.

Keywords: Agricultural sector; Institutional reform; Irrigation sector; Political economy; South Africa; Transaction cost; Water institutions; Water sector

1. Introduction

Ever since the start of an active irrigation policy in the Cape Colony of South Africa in 1875, major policy and institutional changes have been prompted by a combination of political, economic, social and natural events in the country. In all cases, including the recent reforms, since 1994, changes occurred during or immediately after an extended drought period. Fundamental changes, in the form of new water legislation in 1912, 1956 and 1998, were also preceded by political changes such as the unification in 1910, election of the National Party in 1948 and the election of the African National Congress in 1994. Additional changes during the early 1950s were motivated mainly by development-related factors such as industrialization and urbanization.
whereas those during the late 1990s were prompted by social and equity factors such as the provision of water to the disadvantaged and poor communities (Backeberg, 1994; Bate & Tren, 2002).

Over this period, South Africa has also been transformed from an agrarian system to an industrial economy. During each stage, incremental changes to irrigation policy and water legislation were made, which were then followed by comprehensive legislative reforms. At the same time, the water economy has also moved from an expansionary phase of water development and use to a maturing phase of water allocation and management (Backeberg, 1994). The South African water sector is now characterized, among others, by an increasing water demand, intensive competition among water uses and users, high rehabilitation requirements for water supply infrastructures, pressuring externalities caused by water pollution and the high social cost attached to subsidization of increased water supply (Randall, 1981; Backeberg & Groenewald, 1991).

In the new political dispensation after 1994, the second generation socio-economic rights including those related to water are enshrined in the constitution. These rights are specified in positive terms in the sense that they require government action taking “...reasonable legislative and other measures within its available resources”. Both in the case of economic policy and water policy, there has been a change in priorities, with access to water and improved water supply and sanitation becoming major issues moving on the reform agenda (RSA, 1996; Backeberg, 1996). Against a brief description of the physical features of the water sector and its present challenges, this paper aims to provide an overview of water institutional reforms observed in South Africa over the past decade. This review is used both to highlight best-practices cases of reforms as well as to reflect on some of the results reported in the recent literature on water institutional reforms (e.g. Dinar, 2000; Saleth & Dinar, 2004). These results relate to the role of transaction cost and the political economy factor, the stage-based process of institutional change, and reform design and implementation principles, such as institutional sequencing, packaging and reform timing.

2. Key features of the South African water sector

2.1 Water resource potential and allocation

Various estimates have been made over the last four decades on the water resources potential and its sectoral pattern of allocation in South Africa. During 1970, the estimates predicted that the country’s water requirements will exceed the maximum yield potential by 2000 (Commission of Inquiry into Water Affairs, 1970). Following a report on the management of water resources in South Africa (Department of Water Affairs and Forestry (DWAF), 1986), the crisis time was changed to the year 2020 (Weaver, 1990) or to the period 2020–2030 (Odendaal, 1992). But, based on the estimates in the recently published national water resource strategy (DWAF, 2002), it is now concluded that South Africa is not going to run out of water by 2025 (Muller, 2002). While the chances for absolute water shortages are low, efficient allocation and use of water still remain a top priority for South Africa.

The water resources of South Africa and their source-wise pattern and sector-wise allocation are given in Tables 1 and 2. Surface water is the dominant source of supply accounting for 92.5% (including usable return flow) of total yield. Irrigation accounts for 59% of the total water
requirements, followed by urban use with about a 25% share. Although the share of irrigation is only 59% at the national level, it varies from 9.5% in the Upper Vaal areas to 93.5% in the Lower Orange areas (DWAF, 2002). While the overall water supply and demand situation in the country looks comfortable, seasonal and regional variations in rainfall pattern often complicate the national water balance. Seasonal and cyclical patterns as well as regional variations in rainfall are serious in South Africa.\(^1\) With an annual average runoff only 8% of rainfall, the water that is actually used for irrigation is only 2.5% of rainfall.

Inter-sectoral allocation of water clearly shows that the South African water sector has largely utilized the potential of its irrigation segment. The water available for irrigation supports 1.59 million hectares representing 10% of the cultivated area in South Africa, compared to 2.4% for sub-Saharan Africa (WRC, 1996; World Bank, 2003). Irrigation is very important to support the key role of agriculture in the South African Economy. The share of agriculture in the gross domestic product (GDP) is relatively low ranging between 4.2 and 5.3% (NDA, 1996). But, because of its backward linkages with input supplies and service provision and its forward linkages

\(^1\) For instance, rainfall varies from over 800 mm/yr in the east to below 200 mm/yr in the west. As a result, about 65% of the area in the country receives less than 500 mm/yr of rainfall.

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### Table 1. Source-wise water yield, South Africa, 2000.

<table>
<thead>
<tr>
<th>Sources</th>
<th>Million m(^3)/yr</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface water</td>
<td>10,928</td>
<td>78.5</td>
</tr>
<tr>
<td>Groundwater</td>
<td>1,042</td>
<td>7.5</td>
</tr>
<tr>
<td>Usable return flow</td>
<td>1,941</td>
<td>14.0</td>
</tr>
<tr>
<td>From irrigation</td>
<td>(672)</td>
<td>(4.8)</td>
</tr>
<tr>
<td>From urban sector</td>
<td>(1,015)</td>
<td>(7.3)</td>
</tr>
<tr>
<td>From mining sector</td>
<td>(254)</td>
<td>(1.9)</td>
</tr>
<tr>
<td>Total</td>
<td>13,911</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: DWAF 2002

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### Table 2. Sector-wise water requirements,\(^a\) South Africa, 2000.

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Million m(^3)/yr</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation</td>
<td>7,836</td>
<td>59.0</td>
</tr>
<tr>
<td>Urban</td>
<td>3,332</td>
<td>25.1</td>
</tr>
<tr>
<td>Rural</td>
<td>572</td>
<td>4.3</td>
</tr>
<tr>
<td>Mining and bulk industrial</td>
<td>756</td>
<td>5.7</td>
</tr>
<tr>
<td>Thermal power generation</td>
<td>296</td>
<td>2.2</td>
</tr>
<tr>
<td>Afforestation(^b)</td>
<td>488</td>
<td>3.7</td>
</tr>
<tr>
<td>Total requirements</td>
<td>13,280</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: DWAF 2002

\(^a\) Water requirements are reckoned with allowance for environmental reserves and standardized with 98% dependability

\(^b\) Quantities given refer to the impact on yield only, while the incremental water use above natural vegetation is estimated at 1 460 million m\(^3\)/yr
to processing and marketing, the total impact of agricultural economy rises to more than 30%. These macro economic considerations as well as the direct role of agriculture in contributing to income generation, food security and poverty alleviation justify the orientation of the South African water sector towards the irrigation sector. With agriculture, irrigation supports 25–30% of national agricultural production, 80–90% of the areas under high-value crops, such as potatoes, vegetables, grapes, fruit and tobacco and 25–40% of the areas under industrial crops, such as sugarcane and cotton (WRC, 1996).

2.2 Challenges facing water sector

The South African water sector is facing a number of challenges related to water scarcity, water quality and water sharing conflicts in international river basins. With an annual mean runoff of 49,228 million m$^3$ and a total population of 44.8 million, the per capita water availability works out to be just 1,099 m$^3$/yr. This is only marginally above the level of 1,000 m$^3$/yr considered to indicate the state of water stress (Abernethy, 1997). It highlights the importance of designing institutions to manage conflicts effectively owing to water scarcity. As waterlogging and salinity afflict 6–26% of the irrigated areas in the country, soil- and water-quality problems are also emerging as a major challenge for land and water management. Research done in the worst affected irrigation schemes of Northern Cape Province has shown that leaching and artificial drainage when combined with proper choices of crops and irrigation method can successfully counter salinity problem (Armour & Viljoen, 2002). On a policy level, a system for charging waste discharge is also currently being developed with plans for its eventual implementation.

Four major river systems in South Africa, i.e. the Orange, Limpopo, Incomati and Usutu/Pongola, are shared with its six immediate neighbors, i.e. Botswana, Lesotho, Mozambique, Namibia, Swaziland and Zimbabwe. Various bilateral and multilateral commissions and committees have been established, which serve as fora for discussing cooperative arrangement for the utilization and development of shared water resources. Quantitative provisions for meeting international water sharing obligations are reported in the national water resources strategy (DWAF, 2002). In the above-mentioned river systems, the water requirements for irrigation in South Africa vary from at least 58% to as high as 93% of total requirements. Apart from conflicts over water sharing owing to increasing water scarcity in the specific river systems, competition also exists in regional and international markets for crops such as table grapes, citrus, cotton and

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2 Expressed differently, the output multiplier of agriculture in South Africa is in the order of 1.51. It varies from 1.38 for maize and 1.55 for sub-tropical fruit to 1.63 for cotton and 1.70 for forestry (Mullins, 2002). It is these effects that explain not only the larger impact of agriculture but also how a drought can reduce GDP growth by 0.5–1.2% (Finance Week, 2002, 2003).

3 The extent of these problems is noteworthy as, with the exception of the irrigated land in the KwaZulu Natal province, the area with high water tables and salinity levels is more than the area of what are classified as risky soils (WRC, 1996).

4 The charge system will be based on the polluter pays principle and will address both point and non-point sources of pollution. With the introduction of financial and economic incentives, this new approach will supplement the traditional regulatory approach. However, key pollutants to be covered are yet to be identified and methods for determining the charges are still to be developed (DWAF, 2002).
sugarcane. Political agreements on water sharing therefore have far-reaching economic impacts on irrigated agriculture in all of these countries.

3. Water institutional reforms: nature and extent

3.1 Reform environment

Prior to 1994, public policy in South Africa was exercised within a system of minority rule or what can be called a “limited majoritarian democracy”. Essentially, this involved centralization of authority, government interference in the economy and social life, with parliamentary sovereignty (Terreblanche & Nattrass, 1990; Marais, 1991). Under these circumstances, improvements through incremental policy changes or providing more information for better policymaking would serve little or no purpose. The reason is that it is impossible to change the role of the government (i.e. public policy), without changing the political structure within which the government functions (Wagner, 1989). In South Africa, all changes in water policy between 1984 and 1994 have occurred in the context of the absolute power of parliament. There was an urgent need for political reform to move to a participatory or contractarian state within a constitutional democracy that can discipline the government with the constitution and promote policy formation through public participation and support (Wagner, 1989). The political reform undertaken since 1994 has changed the political power structures and also led to drastic policy reforms (Zusman, 1994). Such reforms covered the water sector as well.

The framework needed to analyze the impact of political change on institutional reform can be developed based on a hierarchy of decision making at three levels within an integrated water system. The first is the operational level, i.e. the management of the allocation and use of water resources by individuals and organizations as influenced by the institutions within which decisions are made; the second is the institutional level, i.e. the set of institutions (e.g. authority, water rights and water legislation) as determined by policy; and the third is the policy level, which is an output of the political process set within the boundary of the constitution (Ciriacy-Wantrup, 1985; Bromley, 1989; Backeberg, 1994). This analytical framework can be used to explain institutional change in South Africa. Developed and applied properly, this can provide an alternative approach to the stage-based perspective of institutional change proposed by Saleth & Dinar (2004) and can be used independently either to confirm or challenge their findings.

3.2 Constitutional change

The nature of institutional change in South Africa since 1994 can best be described as a combination of a sudden (big-bang) and gradual change. It consists of a drastic and fundamental political change, which is, in extent, more far-reaching than any previous political change: This was a negotiated, peaceful transition to majority rule in a constitutional democracy. Thereafter, water policy and legislative reform followed and implementation is gradually progressing. During the first phase of the political transition from 1990 onwards, constitutional principles were agreed to and included in the interim constitution. Following democratic elections in 1994, the new
constitution was drafted by the Constitutional Assembly during the second phase and submitted for certification by the Constitutional Court (Eloff, 1996). After some specific clauses were referred back for reformulation, the constitution was accepted as the supreme law of South Africa. The constitution requires legislative measures for promoting sustainable socio-economic development and use of resources such as land and water (RSA, 1996).

3.3 Water policy and legislative reform

In the third and final phase between 1994 and 1997, wide-ranging consultation took place with stakeholders, through provincial and national workshops, symposia and public hearings. Key documents such as the Water Law Principles (DWAF, 1996) and the Resource Pricing Policy for South Africa (DWAF, 1997a) were published. Many professionals, including agricultural economists have also contributed to the policy process with their verbal or written submissions (see SANCID, 1995) and analysis of draft proposals (see Backeberg, 1996, 1997). The process culminated in the declaration of the Water Supply and Sanitation Policy (DWAF, 1994) and the enactment of the Water Services Act (RSA, 1997). These were quickly followed by the White Paper on a National Water Policy (DWAF, 1997b) and the National Water Act (RSA, 1998) as well as the Pricing Strategy for Raw Water Use Charges (DWAF, 1999). The National Water Act (NWA) requires that, as soon as reasonably practicable, a national water resources strategy (NWRS) be established. This must provide information about ways in which water resources will be managed. The draft NWRS was published for comment in August 2002 and is currently under review (DWAF, 2002). With this brief background, key elements of the reform process and institutional sequencing will be discussed.

4. The process of institutional reforms

4.1 Linkages between water and agricultural policy

Parallel to the process of water policy reform, agricultural policy reform was undertaken, with particular attention to irrigation policy. Between 1996 and 1997 provincial and national consultation workshops were organized and efforts were made to involve representatives of both black subsistence farmers and white commercial farmers. A discussion document on Agricultural Policy in South Africa was then published, which contains a section on irrigation policy (NDA, 1998). An important overall objective of agricultural-policy reform is “to create opportunities for small-holders and resource-poor farmers”. It is explicitly stated that “irrigation policy is intrinsically linked to water policy” and that provisions of the NWA have “implications for the development of irrigation works and the application of water in agricultural production”. The four principal challenges for irrigation policy are, therefore, rehabilitation of existing irrigation schemes, determination of the development capacity of new irrigation, establishment of effective organizations to implement policy and increased efficiency of water use. The focus is on subsistence farmers so as to address the inequities resulting from past policies, but this has a number of important dimensions, which will be explored further below.
4.2 Water rights and pricing

The system of water rights based on riparian ownership of surface water and private ownership of groundwater has now been abolished.\(^5\) According to the 1956 Water Act, these property rights were already attenuated and in government control areas they consisted only of use rights. The NWA makes provisions that “existing lawful water use” of riparian rights, water quotas or pumping permits held by all farmers can continue under the same conditions, until such time as it is formally licensed. This process of authorizing water use in terms of the NWA has begun with registration of all water users and will be followed by compulsory licensing. A water use license is *inter alia* specific to a particular user, property and use, must be reviewed every five years and is valid for a specific time period which may not exceed 40 years.

In the NWRS, it is specifically stated that in calling for license applications, the responsible authority must identify users especially from marginalized or disadvantaged groups, to ensure that available water is allocated fairly (DWAF, 2002). This should accommodate all subsistence farmers, including resource-poor farmers, as well as emergent farmers who either had no access or no lawfully recognized access to water resources. If the due process is followed, it will also meet the requirement of obtaining general acceptance of the initial apportionment of water use rights or water licenses. Many issues are obviously still to be clarified, especially the expropriation or deprivation of existing lawfully exercised water use rights. Culture and customs in communities functioning under traditional authority may also prevent licenses being apportioned to individuals, in particular women, who are actually cultivating the land and using water (Backeberg, 1997). In this regard, a pilot process of compulsory licensing in the Mhlatuze water management area of the KwaZulu Natal province will show the way forward.

A directly related concern is that of pricing of water use rights. According to the National Water Policy, a legal framework for allocation must be set up to achieve the “best possible use of water”. This concept involves more than productive use of water since it explicitly provides for weighing up of social, economic and environmental objectives by government authorities to achieve equity, efficiency and sustainability. Although it is argued that the proposed allocation could function purely on an administrative basis, it is also stated that water pricing and allocation through markets could be considered in future. If introduced, these water markets will be subject to varying degrees of control, amongst others, to ensure practical implementation and safeguard the interests of the poor (DWAF, 1997b). Accordingly, Section 25 in the NWA provides for temporary and permanent transfer of water use authorizations. The NWRS elaborates that trade in water licenses may be used to achieve equity of access to water or to increase efficiency of water use by moving water use from lower-value to higher-value uses. Regulations will be introduced, specifying the conditions under which trade will be permitted (DWAF, 2002). It must be accepted that these regulations will *prevent*, for instance, the subsistence farmers from selling their water use rights for short-term gain. Equally important is also the *promotion* of the opportunity to raise, for instance, cash for development of subsistence farming by leasing water use rights.

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\(^5\) According to riparian ownership (i.e. common property rights) of surface water, a group of landowners who live along a riverbank have reasonable and proportional access to water. In the case of private ownership (i.e. private property rights) of groundwater, individual landowners have exclusive access to water underlying their farm.
4.3 Formation of user associations and cost recovery

One of the important objectives of the National Water Policy is progressively to decentralize water management responsibilities (DWAF, 2002). Similarly, the intention of Agricultural Policy is to move towards farmer-operated irrigation schemes by transferring operation and management to users (NDA, 1998). To realize these goals, water user associations (WUAs) were created under the provisions of the NWA. WUAs are cooperative associations of individual water users who undertake water-related activities at a local level for their mutual benefit. Besides the transformation of 300 existing organizations of commercial farmers, such as the irrigation boards, many new WUAs were also created for subsistence farmers (DWAF, 2002). With the target of full cost recovery, water charges were also to be progressively raised over time. On government water schemes, charges will include depreciation as well as operation and maintenance (O&M) costs and agreements in this regard will be negotiated with organized agriculture (DWAF, 2002). However, the policies on management transfer and cost recovery are not free of problems as there are still unresolved issues as well as larger economic ramifications.6

4.4 Institutional sequencing

The mere fact of advanced approval of the Water Supply and Sanitation Policy as well as promulgation of the Water Services Act, confirm the fact that priority was given to domestic water provision, in particular to members of communities without access to potable water and minimum acceptable sanitation. However, the National Water Policy recognizes the importance of agricultural water use for rural economic growth and development. The following statistics highlight some of the key challenges. At least, 10.5 million persons or 25% of the total population in rural areas are below the poverty line (Hirschowitz, 2000). There are also an estimated 3 million subsistence farmers (NDA, 2001) of whom approximately 1 million are dependent on irrigated agriculture. Of the approximately 1.5 million hectares under irrigation, nearly 47,500 hectares are occupied by smallholders. There is scope for upgrading an additional 66,700 hectares in existing schemes and further expansion of maximum 200,000 hectares for irrigation (WRC, 1996; NDA, 1998). These facts support the priority assigned to the reforms in urban water supply and irrigation sectors within the overall framework of institutional sequencing.

Even within the irrigation sector, institutional components that will have a more direct impact on system performance and cost recovery got a higher priority than others. A range of factors have contributed to partial or total failure of most smallholder irrigation schemes in South Africa and various measures were suggested for corrective action (Van Averbeke et al., 1998; Bembridge, 2000; Crosby et al., 2000). The most important among these measures are enhancing management capacity, improving land-tenure security on state and tribal land, enabling increase in the size of holdings, providing access to appropriate technology, markets and finance, improving training and extension services, reducing the dependency on the government and providing commercial-support

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6 For instance, in the case of cost recovery, three main issues require solution, i.e. whether to levy charges on a unitary or two-part basis, or on a volumetric or area basis and to subsidize subsistence farmers (WRC, 1996). There is also the need to account for the consequences, such as the business risk from the cost-push effects of the water pricing policy as well as the equity and economic effects on subsistence farmers.
services. These measures are essential to improve the economic performance of subsistence farming in irrigated areas as a means of ensuring the success of irrigation management transfer (IMT) and cost recovery. It is encouraging to see that these measures have received clear attention in the strategy document on Guidelines for Integrated Management of Agricultural Water Use (NDA, 2002, draft approved in 2003). But concerted efforts are still needed, both at the national and provincial levels, to ensure an effective implementation of these measures so critical for sustaining subsistence and emergent farmers.

4.5 Reform timing

As noted already, institutional reform after 1994 was initiated because of a combination of political, social and economic pressures. The establishment of a new constitution and the democratic election of a new government were the driving force behind water policy reform and drafting of new water legislation. These changes were introduced at the end of a drought period and finalized during a phase of generally above-average rainfall and adequate water storage levels in summer rainfall areas. A crucial implementation stage has now been reached in terms of, for example, licensing water use, establishing WUAs and revitalizing smallholder irrigation schemes. Indications are that rainfall patterns are shifting from a wet to a dry cycle (see Tyson, 1987) and droughts have already been serious in many parts of summer-rainfall areas over the last few years. The real test of institutional reform for the effective management of water resources therefore still lies ahead.

5. Explaining institutional reforms

Within the political economy and national water policy framework described above, the why and how of institutional reform will be explained by taking the market-based exchange of water use rights as an illustrative case. This explanation, as we will see, highlights the roles of some economic, social and resource-related factors as well as their transaction cost and political economy implications of reforms observed both at the micro and macro levels. As reported by Armitage & Nieuwoudt (1999: 52–53):

“The water policy until 1997 was based largely on (a) supply augmentation to arising water scarcity problems, (b) water allocation as a strictly government function; and (c) water resources management through the centrally controlled bureaucratic function by the Minister of the DWAF.

Until 1992, the official public policy of the DWAF was that transfer of water use authorizations was a legislative function and market trades were not considered as a policy option. Section 63(6) of the 1956 Water Act made provision for water transfers subject to ministerial approval. This policy, along with the preference for supply augmentation in times of shortages, made it very difficult to obtain approval for water transfers. The authority to permit transfers in certain instances was only delegated to regional DWAF officials in 1989 as per the Government Notice 966 of May 19, 1989, pending the acceptance of an internal policy for this purpose. The
formulation of this policy was concluded in 1993 by the DWAF. As a result, no water market activity occurred prior to 1994 because (a) there were institutional failures stemming from the lack of private decision-making powers over water management and water transfer issues, (b) there were high transaction costs arising from common property problems of riparian rights to water and stringent legislative requirements for water transfers by the Minister, (c) water rights were linked to landownership or use through riparian rights to water and (d) there was a preference for judicial and bureaucratic allocation of water rights was retained by the DWAF (Backeberg, 1994, 1997).

It appears that this policy was not implemented in the same way by the regional DWAF offices and a more pragmatic approach was followed by some. This explains first why water rights transfers only began in 1994 and second why water transfers occurred more in some catchment areas than in others, even though there was water scarcity and more profitable cropping alternatives existed. Water transactions in the study area of the Lower Orange River were first initiated in late 1994 and were driven by the desire of large-scale table grape producers to expand their operations. These farmers typically possessed considerably more high potential “outer land” suitable for cultivation than their basic water right encompassed, generating a gradual escalation in demand for water rights for this land. These observations are consistent with the assessment that in any market-orientated economic activity, entrepreneurial initiative and identification of new opportunities or underutilized resources are the driving force in market-trade of rights.

Increasing water demand culminated in the DWAF notifying farmers within the irrigation scheme of their opportunity first, to incorporate a basic water right into their “outer land” and develop this land for irrigation purposes and second, to purchase any additional water rights for irrigable “outer land” from other farmers with unused water rights. Until this time, most farmers with unused “outer land” water rights were unaware of their ability to sell these rights. A lack of buyers and limited opportunity to expand irrigation rendered a water right a negligible opportunity cost. Following the subsequent interest displayed by table grape farmers in purchasing “outer land” water rights and the indication by the DWAF of farmers’ ability to sell water rights, the unused “outer land” water rights acquired value and fostered an incentive to these farmers to sell water rights. Facilitating water rights sales between farmers represented an internal shift in policy by the DWAF to reallocate existing but unused water rights. Such a change aimed to encourage economic growth within the irrigation scheme without the need for new claims to be made on the river.”

Similar observations have been reported by Bate et al. (1999: 29–30):

“A letter from the Director General of DWAF on 2nd March 1993 was to inform interested parties in the region of the institutional changes which had made trading easier”. According to the Secretary to the Crocodile River Main Irrigation Board (CRMIB) and the man in charge of processing trades in the Crocodile region, most people were unaware that trading could legally take place until this letter was circulated.
Against a background of water shortage, the letter prompted trade. Between 1992 and 1994, the Crocodile region was experiencing a severe drought and according to the CRMIB secretary, farmers had already been attempting to ascertain their entitlements in anticipation of a shortfall. Their water quotas could be fully met and were being proportionally reduced as allowed for in the regulations. The Kwena Dam, which normally assures a flow of 7 m³/s was down to less than 1 m³/s. Owing to reductions in instream flows the farmers themselves were discussing the possibilities of trading rights, as some were not using any of their entitlement, whereas others were unable to irrigate all their crops. According to the secretary of the CRMIB, even before the letter, “it became evident that the Department of Water Affairs and Forestry was quite willing to transfer water rights on a permanent basis”, but this was not widely understood. The CRMIB advised their members that trades could take place and started the process of registering such trades with the DWAF.

Although the legal rules allowing water exchanges were in place in 1989 and approval for these trades could be granted at the local administrative level, it is instructive to examine why trades did not occur immediately. One has to assume that as the drought affected all of the farming regions of South Africa, most farmers would have been interested in exchanging water use rights, but most did not. From the farm surveys, the reasons for this reticence seem to be chiefly that the water rights holders believed water to be a fixed-asset appurtenant to the land that they owned, and that any exchange of water quotas would have been informal and temporary. Some farmers believed that trades were not true alterations in property relations, but were more like exchanges of short-term licenses. Secondly, even if farmers were aware in 1989 that a trade might be approved, they may have been deterred by the time and effort involved in persuading various levels of authority to allow the trade. Finally, trading partners were also hesitant about setting an appropriate price for water owing to the absence of a reliable reference price.

North (1990) maintains that the constitution or other legal rules that make up the institutions which enable water allocation, are insufficient without cultural norms – what is and is not acceptable to the people involved in administering and taking part in the trades. The water trading literature is full of examples of the importance of water user associations in coordinating water exchange, which link the users (mainly farmers) to the central administrative body (in this case the DWAF). A clear point that arises from the literature is that unless the water using institutions are in favor of trade, it will not happen. The CRMIB and its secretary formed a vital role in initiating trade in the CRC. All but two of the farmers interviewed said that the CRMIB informed them about the possibility of trading. The Secretary of the Board also acts as lawyer for the trades and draws up the contracts. Most of the farmers regularly stay in contact with the board about their needs and state that the board keeps them informed about possible trades. The administrative and coordination work of the CRMIB, as well as its encouragement, seem essential to effective water rights markets.”

These case studies clearly illustrate how incremental institutional change before 1997 facilitated water trading. Water resource limitations caused by drought, and economic incentives associated with increased market potential of high-income crops, furthermore stimulated trade of water use rights. Trade was, however, taking place exclusively amongst commercial farmers in specific
irrigation schemes. There is evidence that the broader institutional changes contributed to lowering the micro-level transaction costs, which had previously (i.e. before 1994) inhibited water trades. Following the comprehensive institutional reforms after 1997, the NWRS states that the market process will now, for the first time, formally be a policy option for reallocation of water use rights. The decentralization of water resources management is an important component of the new policy. It also appears that the change in policy guidelines, enactment of new legislation and creation of organizations to enable local participation in water management, reduced the macro-level transaction costs of introducing a market trade of water use rights. Nonetheless, the political economy implications of market trade between subsistence and commercial farmers, between agriculture and other water use sectors and between use sectors in different water management areas, still have to be considered fully. The requirements for successful implementation of the new policy and institutional arrangements will be discussed further under the heading of best reform practices.

6. Best practices in South African reform

6.1 Authorizing water use

Past discriminatory policies and land-related legislation undoubtedly contributed to unequal access to water resources. The new constitution ushered in a bill of human rights, rule of law and equality before the law. A system of water rights based on Roman-Dutch and English common law, which has evolved over nearly three and a half centuries (Hall, 1939; Vos, 1978) has been replaced through legislation by the NWA. The NWA is currently being implemented through reserve determination for basic human needs and to maintain ecological balances, as well as authorized water use for all other water use sectors in terms of the NWRS (DWAF, 2002). Compulsory licensing of water use will be done over a relatively short period of maybe 5 to 10 years or longer. The reality in South Africa of a heterogeneous society with cultural diversity has nonetheless to be seriously taken into account in this process. Therefore, a balance will have to be achieved between the following: broadening access to water resources by subsistence and emergent farmers; ensuring secure water use entitlements for license holders in both traditional and modern farming; and improving water productivity, competitiveness, food security and profitability of existing and new farming operations.

6.2 Trading of water use rights

Recent studies in South Africa have shown the potential efficiency gains from trade in diverse river catchments such as the Berg River (Louw & Van Schalkwyk, 2002), the Great Fish and Sundays Rivers (Conradie et al., 2002) and the Crocodile River (Bate & Tren, 2002). Further improvements in facilitating trade in water use rights can be achieved by increasing physical security through clearly defined and specified water use entitlements, reducing transaction costs by providing better information on, for example, potential buyers and sellers, lowering contracting costs and more effective administrative processes, and identifying and constraining potentially negative environmental, social and economic externalities.
6.3 Local participation in water management

Decentralization of water management functions through the establishment of catchment management agencies (CMAs) and WUAs is one of the progressive changes brought about by the NWA. Guidelines for financing CMAs have been published (Pegram & Palmer, 2001) and the role of WUAs in water management has been evaluated (Pegram & Mazibuko, 2003). From a comprehensive set of recommendations, only two will be highlighted, i.e. effective transformation and establishment of WUAs must be linked to reform in the allocation and authorization of water use entitlements by the CMA and DWAF, and WUAs should not be established primarily to perform functions or activities for which other bodies are more appropriate. This latter point is of particular relevance to smallholder irrigation schemes that often lack basic support services for farming.

6.4 Water conservation and demand management

With increasing water scarcity, a major shift in policy has occurred from supply management to demand management. In the NWRS, it is maintained that substantial improvements in water use efficiency are possible if water conservation measures are adopted. Water management plans, benchmarks and best management practices have to be developed and several pilot projects are under way on irrigation schemes for this purpose (DWAF, 2002). The economic incentives to achieve efficient use and allocation of water are provided by cost recovery water use charges and tradable water use rights. The appropriate policy framework and incentive structures are therefore in place and the question is how water managers on farms and within WUAs can be assisted to implement water conservation practices. In this regard, it is important to point out that over the last 10 to 15 years the WRC has funded various research projects, which have delivered models for decision support of water management from field and farm to irrigation scheme level. The integrated application of these models has been demonstrated and appropriate technologies are available (Van Heerden et al., 2001; Benade et al., 2002).

7. Reflections on the reform experience

Discussion of the characteristics of the process of water institutional reforms provides evidence for the use of some of the reform design and implementation principles suggested by Dinar (2000) and Saleth & Dinar (2004). For instance, clear linkages were seen, not only between political reforms and water sector reforms, but also between water institutional reforms and agricultural reforms. The same is also true of the linkages between the organizations for farmers’ participation and the cost recovery policies. Theses sorts of reform and institutional linkages actually characterize the packaging approach suggested by Saleth & Dinar (2004). From a wider perspective, the water sector reforms themselves formed part of an overall program of political and economic reforms. Still more importantly, sequential linkages can also be seen between the initial creation of transferable water entitlements and the eventual development of water market arrangements. Thus, institutional packaging and reform sequencing have the potential for generating significant scale economy effects in institutional transaction costs, as the cost of creating
the initial institution such as water rights could reduce the cost of transacting a subsequent and higher level institution of water markets.

There is also evidence for the role of timing in creating tactical and strategic advantages for promoting the reform process. The clear case for this is the use of the favorable political context provided by drought conditions. The reform experience of South Africa is also amenable to an interesting interpretation within the framework of institutional transaction cost theory as outlined by Saleth & Dinar (2004). The transaction cost logic, in fact, explains not only the reforms initiated since 1994 but also those undertaken during the earlier periods. Although various social, economic, political and natural factors provide joint explanation for the nature and extent of water sector reforms, their relative importance varies across the reforms observed during various periods. Thus, for instance, it is the political factors (e.g. unification and elections) that led to the legal reforms undertaken in 1912, 1956 and 1998. The reforms of the 1950s were motivated mainly by factors such as industrialization and urbanization whereas those undertaken during the late 1990s were prompted by social and equity factors. However, reforms initiated in 1994 had a larger context where political reforms were implemented to take the country to a post-apartheid period. Although the factors prompting the immediate reform may be external to the water sector, those that sustained the reform process include endogenous factors such as water scarcity, conflict and poor finance and productivity in the irrigation sector.

The stage-based perspective of institutional change proposed by Saleth & Dinar (2004) is also applicable to characterize the path of water institutional reforms observed in South Africa, though with a somewhat different emphasis and with an iterative process of interactions. For instance, political change has initiated a mind change amongst policy advisers and policymakers at the macro level. Through a process of political reflection and articulation of such a changed perception at the macro level, there have also been concurrent changes at the micro level amongst various stakeholders. Operationalization of the reform program began first with procedural changes, such as the declaration of the national water policy, and then followed by effecting substantive changes in the form of undertaking the reforms in the legal and organizational spheres. In fact, most of the changes in various components of water institutions (such as water law, water policy and water administration or organization) can be traced to a stage-based framework of institutional change. Although it is too early to have any objective or conclusive evaluation of the reforms already undertaken, an assessment based on learned judgment can indicate that with the institutional changes that are currently underway, the South African water sector is well placed to “treat water as an economic good, strengthen allocation capabilities, increase the reliance on market forces, revive the payment culture, ensure financial self-sufficiency, promote decentralized decision structures and encourage the adoption of modern technology and information inputs” (see Saleth & Dinar, 2004).

8. Conclusion

Over the last five years, comprehensive institutional reforms have been introduced in the water sector of South Africa. These changes, creating fundamental changes in people–people relationships with respect to water, have taken place across all water use sectors. But these changes are of particular importance to the agriculture sector because of its large share in total use, linkages
with the larger economy and direct effects on livelihood generation, food security and poverty alleviation. The reform process has led to a new national water policy, NWA, and a national water resources strategy. Links between water and agricultural policy are also explicitly recognized. Considering the hierarchy of decisions on the policy, institutional and operational levels, it is apparent that constitutional change and political reforms have initiated a new water policy with the objectives of achieving equity, efficiency and sustainability goals in water resources allocation, use and management. Three key elements of the policy are the environmental reserves, water rights system and management decentralization. To implement the strategy of demand management, market allocation within administrative regulation and full cost recovery through user charges are being pursued.

On the institutional level, compulsory licensing of existing lawful uses is undertaken under the provisions of NWA. At the same time, CMAs and WUAs are being established on the operational level, to enable user participation in water management. Based on available research results, technology and models are available to provide decision support to water users. These main components of the policy and institutional reform in South Africa are comparable to and conform with the relative role and significance of water policy, water law and water administration aspects as the determinants of the performance of water institutions established by Saleth & Dinar (2004) based on their cross-country empirical analysis. However, the stage-based perspective of institutional changes proposed by Saleth and Dinar (2004) is also relevant to trace the path of long-term institutional evolution, as it allows one to see the specific roles that factors such as the objective realities, stakeholder perception, learning, transaction costs, political bargaining and bureaucracy play in different stages of reform. Based on the South African experience with water institutional reforms, it can also be said that reform, design and implementation principles, such as institutional sequencing and reform timing are also important in reducing the transaction costs and improving the political prospects of reforms. Similarly, the generic set of factors prompting and sustaining the reforms also largely conform to the political economy and transaction cost frameworks suggested by Dinar (2000) and Saleth & Dinar (2004). However, in view of a somewhat different constitutional and political history of South Africa, economic and political factors have played a role in prompting the reforms, but ethical factors such as poverty, equity and fairness are also playing a major role in their practical implementation.

References


