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ORIGINAL ARTICLE

South Africa's water regulatory and policy framework: a new institutional economic review

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Abstract The institutional dynamics, policies, and legislation that were prevalent during the apartheid era have left imprints that are difficult to ignore as they still dictate the interaction between different elements in the water sector to date. The existence of riparian water rights made the legislation excluding and racist as far as water access was concerned because of the indisputable link between land ownership and access to water. Post-apartheid, the National Water Act (NWA) of 1998 has transformed the water regulatory landscape from the riparian system to a system aimed at achieving equitable water allocation for the benefit of all. It has done away with a private right system of water allocation by detaching water rights from land ownership. However, the water sector in South Africa is still facing a number challenges, leading to a delay in achieving some of the goals of the post-apartheid water law. This paper provides a review of relevant water policies and/or statutes from a new institutional economics (NIE) perspective to assess the success, or lack thereof, of post-apartheid water policy in South Africa. This paper found that South Africa's water policy is premised largely on neoclassical economics framework. It concludes that the failure of the NWA and other institutions to incorporate social norms and customs is more likely to the persistence of skewed distribution of water resources.

Keywords Water policies · Riparian water rights · New institutional economics · Water access · South Africa

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Introduction

The institutional landscape for water resource management in the Republic of South Africa (RSA) has changed significantly since the general review of water laws in 1995. The review subsequently led to the publishing of the White Paper on National Water Policy (RSA 1997), followed by the promulgation of the National Water Act (NWA) (RSA (Republic of South Africa) 1998) which focused more on a decentralised participatory governance model to redress disparities in the water sector.

Notwithstanding the noticeable and notable reforms, water resources in South Africa are still not being managed in a sustainable manner and the country remains water-stressed. According to Global Policy Forum, the term 'water stress' is used to describe conditions in which the amount of water available for access for each person in a country is less than 1500 cubic metres per annum (UNESCO 2012). In South Africa, the current water supply is severely constrained by insufficient aquifers, unpredictable rainfall patterns, and low levels of rainfall. The situation of water stress is expected to get worse by 2030. The estimated water supply will be 15 billion cubic metres, while water demand is expected to be 17.7 billion cubic metres in 2030 (Boccaletti et al. 2010). According to Boccaletti et al. (2010), the effects of climate change could aggravate the problem significantly, resulting in an increase in the deficit gap by 1.1 billion cubic metres.

This article provides a review of relevant water policies and/or statutes from a New Institutional Economics (NIE) perspective, focusing on property rights, transaction costs, and community participation to assess the success, or lack thereof, of post-apartheid water policy in South Africa. The acronym 'NIE' shall only be used in reference to the field and/or branch of study of economics. However, the

scholars or practitioners in this field shall be referred to in full in this paper as 'new institutional economists'.

In addition to analysing some of the governance indicators within the South African context, this paper also provides a brief overview of the water policies and legislation pre-1994. This study is not only important in describing the underlying institutional factors influencing water management, supply and access in South Africa, but also in defining the underlying economic theory behind the South African National Water Policy (NWP), as well as its impact on the overall institutional design and operations of Water Users Associations (WUAs).

Methodology

This study adopts a desktop methodological approach to research in making a review of available and relevant literature. It is largely based on the document analysis of available literature and/or official documents such as policies and statutes and journal articles. Document analysis is a methodical technique of academic research for studying or evaluating both electronic and printed documents (Bowen 2009).

A systematic mapping process to review available literature related to the topic and objectives of interest was used in this study. Systematic maps are used to collate, describe, and catalogue available data directly related to the research questions of the study (James et al. 2016).

Academic databases, e.g., Google Scholar, ScienceDirect, EBSCO Discovery Service, and Environment Index, were searched systematically using keywords which among others included: water policies, riparian water rights, new institutional economics, water access, and South Africa. The selected papers were then screened and relevant papers were selected using automatic snowballing method. Snowballing involves recursively pursuing relevant references cited in the retrieved literature and adding them to the search results.

The results of the literature search were analysed through the application of content analysis technique. The content or results of the analysis have been grouped or classified into related themes under the "Results and Discussion" of this paper.

Conceptual overview: the essence of new institutional economics

Economic theorists and other scholars of various disciplines have, over the years, given increasing attention, not only to understanding the position of institutions in the economic systems' web (Saleth and Dinar 2004; Rossiaud and Locatelli 2010). They have focused on developing paradigms necessary for evaluating problems of resource mismanagement, misallocation, and scarcity from an institutional perspective (Rossiaud and Locatelli 2010). This interest has been encouraged by, among other factors, the fact that economists have come to appreciate that the discipline does not fully define and describe how various factors relate to one another in a complex interconnected system. Hence, it has failed to satisfy the effectiveness in policy implementation (Saleth and Dinar 2004).

It has been observed that institutional economics have become one of the most interesting and liveliest areas in economics and this is because this field of economics has turned on two propositions: first, "institutions do matter" and, second, "the determinants of institutions are susceptible to analysis by the tools of economic theory" (Matthew, 1986). Institutional economics seek to demonstrate how institutions influence public choice and human behaviour. Institutional economics is hence the field of economics that use a wide range of the literature from other fields of study such as law, sociology, ecology, socio-biology, and many others in an effort to establish the role played by institutions in defining the direction of economic development and behaviour (Brousseau and Glachant 2008). This field of economics seeks to demonstrate how formal and informal institutions such as contracts, property rights, firms, and other social arrangements may lead to positive economic growth and a reduction in transaction costs.

New institutional economists argue that certain factors, e.g., the opportunistic behaviour of agents, transaction costs that are greater than zero, information asymmetry, and property rights, should be infused into economic analysis as they could affect the conclusions of the study (Rossiaud and Locatelli 2010). These economists view institutions as key structures necessary for moulding the behaviour of economic agents in the real world of imperfect information.

New institutional economists have identified a number of critical features of an effective water resource institution, including: unambiguous objectives, adaptiveness, compliance ability, technical rationality, good interaction with other institutions, political and organisational rationality, as well as appropriateness of scale and scope (Nystrom and Starbuck 1981; Ostrom 1992). An equitable water resource institution should provide enhanced opportunities for social inclusion, be responsive to the needs of disadvantaged groups, and be sensitive to local needs (Ostrom 2011).

Results and Discussion

Water policies and legislation in South Africa pre-1994

The institutional dynamics, policies, and legislation that were prevalent during the apartheid era have left imprints that are difficult to ignore as they still dictate the interaction between different elements in the water sector to date (Nash 2012). During the apartheid era, the formulation of policies was informed by racial segregation, resulting in a socio-economic pattern that dictated the distribution and access of resources for the people of different races in the country. Policy formulation was based on the notion of "separate development" (Thompson et al. 2001) and white supremacy.

The Native Land Act of 1913 introduced stern restrictions on their property rights, leading to poor potable water access, poverty, illiteracy, and malnutrition amongst black South Africans. Under apartheid, highly unequal access to water and water services by the country's population became entrenched. As a response to that anomaly, the post-1994 democratic government in South African recognised that an important aspect of the government's economic development is to meet a minimum set of 'basic needs' of the population and to reconstruct the social base of the country.

The National Water Act (RSA 1998) has established the basis for management of water resources on a catchment basis (for equity, efficiency, and sustainability), and the Water Services Act (RSA 1997) aims to ensure that everybody has access to basic water supply and sanitation services (Mokgope et al. 2001). Regardless of the improvements in water supply to the rural sector made by the South African government, many of the current patterns of water use are still characterised by inequality, inefficiency, and inadequacy. The poor remain marginalised, and emerging farmers and poor rural communities have limited access to water resources, while water continues to be used inefficiently by some farmers in the agricultural sector with few incentives to improve its water use efficiency (Brown 2013).

Post-apartheid water institutional arrangements

The Constitution of South Africa: water law, property rights, and equity

In South Africa, as in other democratic states, the Constitution is the supreme law of the country and any other law should conform to its provisions. Water law in South Africa is aligned consistently with the provisions of the Constitution (RSA 1996). In essence, water matters with regard to determination of public and/or private rights towards water resources are pre-described in the Constitution.

The new water laws are more inclusive insofar as water allocation is concerned. According to Stein (2005), in South Africa, water is a public, not a private, good which is managed by the state on behalf of all South Africans. Sections 27(1) (b) and 27(2) of the Constitution state that everyone in South Africa is entitled to adequate water resources, and the state is duty bound to achieve realisation of sufficient water provision through the use of legislature and other measures (RSA 1996).

The Constitution, however, does not explicitly provide for the right to obtain and hold water rights under its property clause. Section 25 of the Constitutions states that no one should be subject to deprivation of property and that the state can take legislative measures to redress water and land matter regardless of the property rights provided during a given time (RSA 1996). New Institutional economists have established that for efficiency, sustainability, and optimal allocation of natural resources to be achieved, property rights should be well-defined (Thiel et al. 2012). Property rights should define the nature of the resource to be exploited, the timeframe for exploiting such a resource, and the maximum amounts exploitable in a given time. Subjecting the property rights clause to the proviso that legislation and other procedures comply shows uncertainty and information vacuums which may act as disincentives for individuals and organisations given water rights.

Ecologists and economists assert that water access, distribution, and sustainability display emergence properties, hence qualifying them as complex systems (Audouin et al. 2013). According to Corson and Aziz-Alaoui (2009), a complex system displays emergent properties if the behaviour of the system cannot be simply defined from the behaviour of its components. Essentially, emergent properties cannot be identified through functional decomposition. Corson and Aziz-Alaoui (2009: 258) define emergent properties as "properties of the "whole" that are not possessed by any of the individual parts making up the whole". Institutional economists postulate that water is complex or "at least very special" compared to other economic goods because of its roles as a social, environmental, financial and economic resource, as well as its role as a basic need (Savenije 2002). Therefore, lack of clarity on the circumstances within which measures should be taken could create complications in the decision-making processes of those in power.

The Constitution of South Africa under the Bill of rights has effectively enshrined various socioeconomic rights including the right to access of water, and they have been viewed as progressive. Section 27 of the Constitution places responsibility of provision of sufficient water resources

on government, not individual entities. Therefore, "a person who is deprived of access to sufficient potable water must assert that the government's action (or inaction) is unconstitutional within the meaning of Section 27" (Francis 2005: 45). Inequitable water allocation and distribution reflects the failure of the government to fulfil its Constitutional obligations.

The National Water Act: property rights, regulation, and pricing strategies

As stated above, the National Water Act has transformed the water regulatory landscape from the riparian system to a system aimed at achieving equitable water allocation for the benefit of all. The national government has replaced the riparian rights system with an administrative permit system (Department of Water Affairs 2013). Subsequently, the National Water Act has established a public rights system in the water sector, wherein the government plays the role of "public trustee" (Stein 2005: 2167). The public trust principle not only gives the state a set of constitutional obligations, such as equitable provision of water resources, but also provides ways through which the state could give effect to such obligations.

In South Africa, the public trust doctrine gives the state monopoly power over water resources, as the National Water Act entrusts the ownership and control of water resources to the state (Stein 2005). Despite the state's ownership of water resources, Section 56 (1) the Act makes provisions and/or considerations for water allocation through the market by instituting price strategies for users and polluters. Through the imposition of pricing strategies, the Act aims to create incentives for effective and efficient water allocation as well as water use. The National Water Resource Strategy stipulates that in order for the supply of water to be reliable, three sets of costs should be considered; namely, direct infrastructure and management costs, economic costs, and full costs. Direct infrastructure and management costs include costs of planning, monitoring and regulating, the cost of capital, as well as operation and maintenance costs. These are summarised in Fig. 1.

The first post-apartheid Minister of Water Affairs and Forestry, Kader Asmal's first policy proposed that the supply of water to consumers should be done at the marginal cost, that is a price equivalent to the operating and maintenance costs. According to the National Water Resources Strategy of 2012, a sustainable price for water resources should promote provision of water at the least possible cost, incorporate and reflect true costs of water supply, implement cost-sharing that will promote equity for all classes of people in the society, and should also ensure that water institutions' viability is enhanced in the long run (Department of Water Affairs (DWA) 2012). In essence, South Africa's White Paper on a National Water Policy recognises and appreciates that the transaction costs involved in the water allocation process are positive.

New institutional economists argue that economic agents are faced with greater than zero transaction costs (Challen 2000). The Coasian viewpoint, enshrined by the Coase Theorem, is that positive transaction costs often have the potential of constraining 'efficiency-enhancing' reallocations (Cole and Grossman 2002). Williamson (2000) argues that adopting transaction costs minimising and incentive-enhancing governance strategies not only contributes to the realisation of mutual gains between concerned parties, but also the crafting of conflict mitigation mechanisms.

The incentive-enhancing governance strategies encapsulated in the National Water Act can be argued to be a reflection of the recognition of economic externalities. The Act is mandated to curb negative externalities, such as pollution of water bases, through pricing strategies.

National Water Policy: water as an economic good and the complexity of water

The White Paper on a National Water Policy states that, "Under the new system, allocations will be made on the basis that it promotes water use that is optimal and for the achievement of equitable economic and social development" (RSA 1997). In essence, it acknowledges that water has economic and socio-ecological value. It also recognises water as a complex system in which it is difficult, if not impossible, to disentangle socio-economic benefits from socio-ecological costs and benefits attached to the use of water resources. A complex system portrays properties, e.g., rich, dynamic and non-linear interactions, and water qualifies as one (Cilliers 2000).

According to Dent (2008), ideal water institutions should make certain considerations when dealing with water demands. First, a commitment should be made by stakeholders to work cooperatively despite their competing water uses (Dent 2006). Furthermore, institutions should maintain constant communication dialogue and eliminate communication barriers between the management of institutions and the beneficiaries (Dent 2006; Meissner et al. 2013). Well-functioning and long-term relationships should be built between end users of water resources and water institutions. Moreover, water management institutions should not only invest in innovation and technical advancement, but also in environmental management. Finally, water management institutions should appreciate the multi-sectoral uses of water resources and understand the existence of inter-linkages of stakeholders in various hierarchs in the water sector (Meissner et al. 2013).

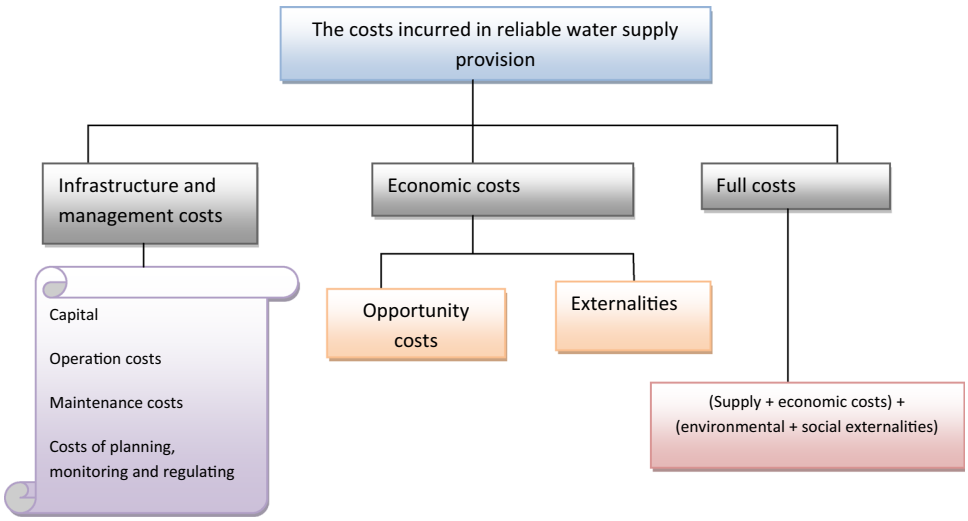

Fig. 1 Costs incurred in reliable water supply provision (*Source*: adapted from RSA 1998)

In a nutshell, the decision on how best to allocate water between contesting uses necessitates a complex and multidimensional assessment, which takes into account a range of social, economic, and ecological values emerging from various water uses. It can be argued that the NWP of South Africa not only acknowledges the interconnectedness of levels of economic institutions in the water sector, but also recognises the multi-sectoral uses of water resources. However, the relevant policies seem to adopt a one-size-fits all approach, without special regard to social norms, traditional values, and customs. For instance, the National Water Act of 1998 mandates Water Users Association to be accountable to government institutions such as the Department of Water Affairs Regional Office (DWA-RO). As argued by Kapfudzaruwa and Sowman (2009: 691),

> "Failure to acknowledge and incorporate aspects of these traditional governance systems may undermine the very purpose of the [National Water] Act, namely to facilitate access to water for productive purposes for the poor, through establishment of new water management institutions and equitable allocation of water resources".

The failure of the National Water Act to recognise and incorporate social norms and customs is more likely to lead to the persistence of skewed distribution of water resources and other problems that the Act aims to redress. Some of the malfunctions of the water sector are partly due to failure of the relevant water policies to incorporate social norms, rules and behaviours of agents.

National Water Policy: decentralisation, community participation, and cooperative governance

The National Water Act makes provisions for cooperative governance and decentralisation in the water resource management processes. These provisions are in line with world trends wherein decentralisation is largely embraced in an effort to promote public participation as well as local socio-economic development (Funke et al. 2007). There are two distinct interpretations for the trend: positively as a potential model for good governance, or negatively as an admission of lack of accountability and failure of the state. The National Water Act and the Constitution of South Africa use the former argument to validate the role of the community in the management, protection, conservation, and sustainable use of water resources (RSA (Republic of South Africa) 1998). Theoretically, the participative approach is enhanced by decentralisation of governance. For efficient and effective accomplishment of water management processes, it has been noted that local governance should be promoted and water management responsibilities should be transferred to water users associations (Meissner et al. 2013).

Various sections of the National Water Act seek to promote community participation in the water sector in South Africa. For instance, Chapter 2 advocates for the establishment of appropriate institutions that enable community representation and participation (RSA 1998). Section 9 (g) proposes that a catchment management strategy must empower community members to play an active role in managing the water resources within its water management area (RSA 1998). Section 80 (e) acknowledges the role of the community in the effective and efficient management and conservation of water resources (RSA 1998). Chapters 2, 7, and 9 of the National Water Act call for the establishment of catchment management strategies that enable public participation, establishment of catchment managements agencies that closely work with communities within a formal setup, and the development of necessary capacity of the catchment agencies through establishing advisory committees respectively (RSA 1998). Catchment Management Agencies are accountable for ensuring sustainable water use through community

participation and overall cooperative governance. The relationship between various sections of the National Water Act is represented in Fig. 2.

The cooperative governance enactments in the National Water Act of 1998 conform to the ideas NIE, in terms of their view of cooperative governance as a potential way of dealing with the free-rider problem and managing externalities. Cooperative governance plays a crucial role of managing common property resources (Ostrom 2010). Some literature uses the terms cooperative governance and collective action interchangeably to refer to public participation (Ostrom 2010; Meissner et al. 2013).

According to new institutional economists, cooperative governance can take a multiplicity of forms, ranging from highly structured processes of cooperative and inclusive decision making, enactment, and accountability, to informal structures at microlevels (Cox et al. 2010). By implication, microlevels related to agriculture, natural resources, and institutional development need to be considered when making public policies. According to Ostrom (2010), individuals almost never possess perfect information, as per the assumptions of behavioural theory, but they are capable of absorbing knowledge through interaction in a particular setting. Therefore, cooperative governance could serve as an effective strategy for achieving sustainable development, equitable distribution and allocation of water resources as well as internalising ecological externalities (Adhikari 2002). Institutions that embrace cooperative governance are arguably at an advantage because of the creation of a large pool of shared ideas to help overcome water management challenges in an inclusive manner.

Policy and water challenges currently faced by South Africa

Despite the fact that the regulatory framework and institutional landscape for water management have reformed since the attainment of democracy in South Africa, the water sector is still facing challenges. Some of the goals of the post-apartheid water law and policy have not been achieved. South Africa had made considerable progress in widening of access to water and sanitation across races, but this progress has decelerated in recent years (DWA 2012). The number of poor people without access to adequate water resources is still too large (DWA 2013).

The share of the population without access to an improved water source declined from 17% in 1990 to 9% in 2010 (WHO 2011). However, the performance of the sector has fallen short of expectations. One of the direct effects of lack of access to water resources is poverty especially in communities, where livelihood activities are dependent on water resources. South Africa is thus faced with the challenge of developing water resources management as a tool, and not an end in itself. This means that water resource management should be treated as a component in the general attempt of the country to achieve socio-economic equity, environmentally just and inclusive growth objectives.

Moreover, there has been overall poor performance in the water sector due to lack of clarity with respect to institutional roles and responsibilities in the sector (DWA 2012). For effective and efficient management of water resources, well-defined institutional relationships should exist to eliminate uncertainty and ambiguity in the roles of the agents. Maintaining clear institutional relations contributes to the promotion of accommodative and cooperative conflict resolutions and reduces transactions costs.

Some of the institutional reforms proposed by the National Water Act are the establishment of catchment management agencies are yet to be implemented in many areas (DWA 2012). These agencies are primarily responsible for crafting and managing of catchment management strategies through which they would be able to perform duties a number of duties, e.g., water resource planning in a

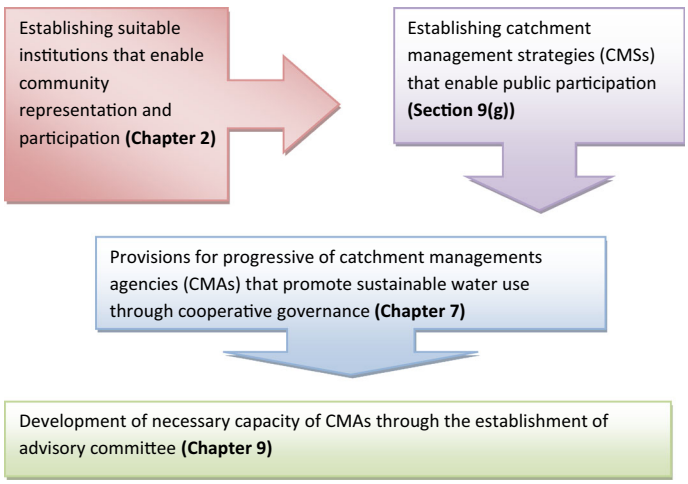

Fig. 2 Relationship between various clauses of the NWA of 1998 (*Source*: adapted from RSA 1998)

particular catchment, licensing, water charge collection, and water use authorisation with ease. They are also responsible for regulating and controlling water demand to assure socio-economic development for all. In terms of Chapter 7 of National Water Act, management agencies are responsible for ensuring sustainable water use through community participation and overall cooperative governance. These duties are aligned with international water management theory which argues that managing water within a catchment or river basin is both a necessary and sufficient condition for effective and efficient management (Malzbender et al. 2005).

The National Water Resources Strategy-1 proposed the establishment of the 19 CMAs (DWA 2004a, b). However, due to financial, capacity, skills, and expertise constraints, the successive National Water Resources Strategy-2 has since proposed the 19 Water Management Areas initially recommended by National Water Resource Strategy-1 be consolidated into nine, as reflected in Fig. 3 (DWA 2013).

The creation of new boundaries would lead to broader inter-sectoral communication as well as better cooperative governance. A more inclusive cooperative governance is argued to be a more effective water resource management strategy as it is likely to be more responsive to the needs of the marginalised and the poor in the community (DWA 2012; Meissner et al. 2013).

According to Grafton et al. (2011), cooperative water institutions, such as Water Users Associations, should be of an appropriate and size, comparable with their institutional capacity as well as available resources. New institutional economists argue that such institutions should operate within clear boundaries, with adequate financial and human capital resources (Grafton et al. 2011). Notwithstanding, there seems to be a consensus among scholars of NIE that small water institutions with well-defined boundaries generally perform more effectively than large water institutions (Meinzen-Dick 2007).

Water policy: equity considerations

Equity is one of the fundamental principles of the National Water Act. Addressing equity concerns through water policy to deal with skewed allocation which was a legacy of apartheid remains a paramount national priority. The Nation Water Resources Strategy of 2012 draws a distinction between 'equity in access to water services', 'equity in access to water resources', and 'equity in access to benefits from water resource use through economic, social and environmental development and management'. The concept and/or principle of equity in water provision is multi-faceted, and the various interrelated definitions are captured and discussed at length below.

Equity in access to water resources refers to the provision of quality and reliable water supplies to various water users in the economy. Despite financial and infrastructural investment that has enabled the provision of water supplies to a mixed array of water users in the economy, there is a still a sector of the population that lacks access to reliable water supplies and remains water insecure (DWA 2013).

Equity in access to water resources refers to "the concept of direct access to water for productive purposes such as water for irrigating crops or water for a business or an industry" (DWA 2012). Although it is socially ideal to allocate water resources in an equitable manner, it is practically impossible to allocate equal amounts of water to each person in South Africa. Equity in access to water resources should be pillared on the productive usage of water resources and the benefits derived from water use such as poverty eradication, job creation, sustainable economic growth, and overall reduction in socio-economic inequalities (Grafton et al. 2011).

Finally, equity in access to the benefits from water resource use refers to allocation of water resources in a manner that attains maximum benefits for all, either directly or indirectly. In terms of Section 6(1) (b) (iv) of the National Water Act, most priority in water allocation is given to water uses that contribute to national economic growth and development (RSA 1998). In water-scarce countries, relative power relations within the society determine access to water resources as well as planning and management processes in the water sector (Brown 2013).

Although the legislation and water policy of South Africa have been widely commended for being advanced and progressive with regard to their equity considerations, the water sector has over the years experienced significant challenges that have hindered the progressive attainment of the water sector's equity objectives. Such challenges include inefficient internal organisation, management and integration, legislative and policy gaps, water authorisations under the control of whites and commercial farmers, unregulated trading of water use between parties, and lack of external integration and alignment with other enactments (DWA 2013).

Despite having equitable water allocation as one of its core principles, the National Water Act has achieved minimal substantive progress in realising its objective of providing equitable water allocation across all races regardless of gender and location. The Department of Water Affairs has established the water allocation reform programme in an effort to redress disparities and inequities in the water sector (DWA 2013). Chapter 4 of the National Water Act outlines the general principles, essential requirements and considerations for permissible water use in South Africa (RSA 1998). This chapter is of key significance to the water allocation reform programme.

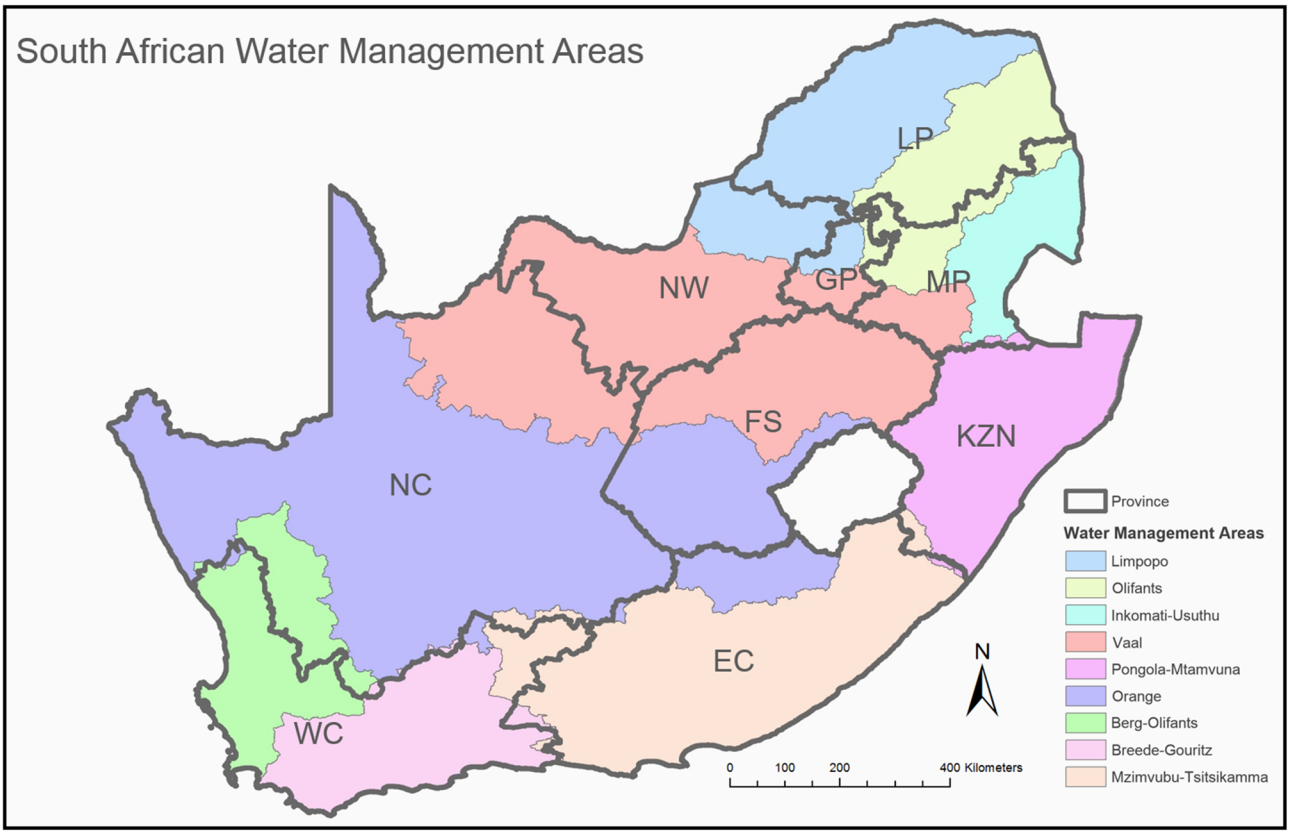

Fig. 3 Map of the proposed nine water management areas (*Source*: NWRS 2012)

The water allocation reform programme proposes to achieve equitable water access through supporting resource poor and emerging farmers financially, compulsory licensing to promote equitable water allocations within catchments, and giving historically disadvantaged groups priority in licensing processes. Resource poor farmers are legal citizens of South Africa who are involved in farming activities and are members of the historically disadvantaged population groups (DWA 2004a, b). In 2004, the Department of Water Affairs formulated a rule to support the irrigation needs of poor farmers financially as per requirements of Sections 61 and 62 of the National Water Act. The rule was as follows:

$$\mathbf{R} = {}^{1}/_{2}\,(\mathbf{F} - \mathbf{C})$$

where "R (%) is the percentage reduction in the total grant to the legal entity, with R always bigger than or equal to zero ($R \geq 0$); F (%) is the percentage of the irrigated area on a scheme which is under the control of historically disadvantaged female decision makers/farmers, as reflected in the legal entity's official list of scheduled areas; and C (%) is the proportion of historically disadvantaged women on the management committee of the relevant Water Users Associations or other approved legal entity" (DWA 2004a, b).

According to the rule, if the proportion of women in the management committee of the relevant Water Users Association is equal to or more than the percentage of the scheduled area on a scheme driven by historically disadvantaged female decision makers and/or farmers, then no reduction in the total grant is applied (DWA 2004a, b).

The implementation of the rule as well as of the water allocation reform programme has faced a number of challenges that have prevented the achievement of greater equity in water allocation for historically disadvantaged groups. One of such challenges is lack of appropriate institutional arrangements. Through the National Water Resources Strategy-2, the Department of Water Affairs intends to intensify its working relations with the Department of Agriculture, Forestry and Fisheries to ensure that both male and female historically disadvantaged farmers are given priority in the water reallocation process. The

Department of Water Affairs has appreciated that well-resourced and effective institutions with sufficient administrative authority are crucial for equitable water access.

The formulation of the water allocation reform programme could be seen by institutional economists as a way of correcting the inefficiencies and unintended effects of path dependency and unequal power relations generated by existing institutions.

Over the years, a significant body of literature has emerged within NIE providing insights with respect to the relationships between power relations, path dependence, and the operation of institutions (March and Olsen 1989). New institutional economists argue that public or government institution sometimes reform public policies in an effort to achieve equity by taking a "sharp break from established procedures" (Williamson 2000: 598). The sudden shift of the public policy to effect reform within a short space of time, often in less than a decade, is described as a "opening a rare window of opportunity" (Williamson 2000: 598). However, it is common for such institutions to implement reforms within longer periods of time, often in phases divided by time, regions, and other measures.

In South Africa, the post-apartheid water laws and policies created a window of opportunity for broader social inclusion in the water sector. However, the country has not fully taken advantage of the window of opportunity due to factors such as lack of greater public and stakeholder participation in the policy formulation and decision-making processes, and unutilised cooperation opportunities. Furthermore, the post-apartheid policy entrusts a resilient political and social agenda to local water management institutions, such as the Water Users Association, without providing enforceable solutions required for balancing social equity and political obligations with their finances as well as embedded interests.

Water governance and integrated water resource management principles

The policies and legislation related to the water sector in South Africa are founded on the principles of Integrated Water Resource Management (IWRM). IWRM is a framework within which policy makers try to move the skewed water reallocation towards greater equity (Haigh et al. 2010). IWRM operates within various ideologies which reflect political philosophies as well as governance paradigms embraced by societies.

Section 6(1) (l) of the National Water Act proposes that water resources need to be managed in an integrated manner to achieve efficiency, equity and sustainability in the water sector (RSA 1998). However, there is no explicit mention of the statute of 1998, nonetheless, it encompasses and endorses the 1992 Dublin Principles for Water Resources Management.

Integrated management requires the recognition of interlinkages of water uses and the relationships that exist between water and the biophysical environment. The recognition of such relationships is argued to be a vital step in proper planning and informed decision-making processes in the water sector (DWA 2012). One of the key elements of the Nation Water Resources Strategy is the promotion of inter-sectoral and civil society partnerships and integrated governance to achieve good water governance (DWA 2012).

The attainment of efficient and effective water management is dependent on good water governance. Other elements of good water governance include accountability, wider participation, greater equity, ethical decision making, transparent operations, predictability, coherence and responsiveness to the needs of users (DWA 2012). The elements of good water governance outlined by the National Water Resources Strategy of 2012 are in line with characteristics of effective water institutions proposed by NIE (Saleth and Dinar 2004; Shen and Speed 2010). Ostrom 2011 argues that some of elements of an effective common pool resource institution are: "(i) economic efficiency, (ii) equity through fiscal equivalence, (iii) redistributional equity, (iv) accountability (v) conformance to values of local actors, and (vi) sustainability".

According to NIE, good governance consequently leads to effective and efficient institutional performance. However, the proposed characteristics of effective water institutions are a principle, rather than a rule. According to institutionalists, no two institutions are identical; hence, it is practically impossible to propose a one-size-fits-all model for all institutions (Muller 2008).

Institutionalists argue that Integrated Water Resources Management framework cannot fully address emerging challenges in the water sector such as; inefficiencies created by fragmentation and duplication of authorities, information asymmetries, lack of greater general public and stakeholder participation in the decision-making processes, and unutilised cooperation opportunities (Imperial 2012). According to Imperial (2012), contradictory "policies and priorities that work at cross purposes" often produce inefficiencies through embedded problems such as fragmentation and duplication of authorities and unutilised cooperation opportunities.

The Nation Water Resources Strategy of 2013 proposes that the National Water Policy of South Africa should be revised with emphasis and focus on the balancing of power among various stakeholders with dissimilar water interests and uses (DWA 2013). Furthermore, effectiveness of water institutions should form the core of the revised National

Water Policy (DWA 2013). This will require extensive development of skills and expertise of relevant stakeholders and personnel in the water sector.

New institutional economics and its applicability to water policy

Economists argue that neoclassical economic concepts and paradigms have influenced most policy formulation processes over the years (Savenije and Van der Zaag 2002; Lieberherr 2009). Neoclassical economics' analytical tools and conceptual framework have played a pivotal role in the implementation of regulatory enactments, as well as in the design of optimum pricing of water resources. Because of the neoclassical economics foundations of water resource allocation, in most developing countries such as South Africa, water policy has not yet yielded consistently desired results.

Proponents of NIE note that some of the underachievements of the water sector are in part due to failure of the water policy to incorporate social norms, rules and behaviours of agents and the reliance on neoclassical economic paradigms of pricing strategies and production efficiency (North 1990). Furthermore, they posit that the lack of achievement can be attributed to failure to recognise the interconnectedness of levels of economic institutions during the formulation and implementation stages of water policy (Williamson 2000; Brousseau and Glachant 2008; Lieberherr 2009).

According to NIE, there are four interconnected and interdependent levels through which the roles of economic, political, social and cultural institutions of economic activity can be examined (Lieberherr 2009). Level 1, which is the uppermost level of the institutional hierarchy, consists of embedded or cultural institutions (Williamson 2000; Lieberherr 2009). These institutions include informal institutions, norms, ethics, traditions, religion and customs that influence choices and individuals as well as the principles of the society.

Level 2 outlines elements that make up the basic institutional environment (Brousseau and Glachant 2008). These include formal institutions such as the constitutions, property rights, courts, law and other institutions that enforce the government's power to allocate and distribute water resources effectively, efficiently, sustainably and equitably (Williamson 2000; Lieberherr 2009).

The third level encompasses governance institutions (Lieberherr 2009). Governance institutions are necessary for regulating the relationships between agents in the water sector to offset conflict, provide stability and to allow agents in the sector to maximise their gains at the least possible cost. Governance institutions vary from one country to the other, depending on the economic and political environment of the country at any given point in time.

Finally, level 4 comprises of institutions of resource allocation and employment creation (Williamson 2000; Brousseau and Glachant 2008; Lieberherr 2009). These institutions allow for the daily operations of the economy given the preceding institutions encompassed by the other three levels. The levels are summarised in Fig. 4.

NIE argues that level 4 is the "purview of neoclassical economics" (Lieberherr 2009: 6), which focuses on derived outcomes of the institutional foundations laid by the first three levels. Their argument is that at this level, neoclassical market imperfections such as oligopoly and monopoly are used to determine incentives, wages, prices and quantities of water resources needed for allocation and conservation in the water sector (Williamson 2000; Brousseau and Glachant 2008; Lieberherr 2009).

In South Africa, the government is regarded as a public trustee of water resources; hence, it is afforded monopoly power and control over the country's water resources (Conradie et al. 2001). Section 56 (1) of the National Water Act allows the state to use price strategies to influence efficiency, sustainability, effectiveness and equity in water allocation (RSA 1998). Neoclassical economists argue that "economic pricing of water will facilitate the reallocation of water from sectors with lower added value (such as agriculture) to sectors with a higher added value (such as urban water use)" (Savenije and van der Zaag 2002: 98). In terms of Section 6(1)(b)(iv) of the National Water Act, utmost priority is given in the water allocation processes to sectors that contribute to national economics growth and development such as commercial agriculture and the mining sector (RSA 1998).

Furthermore, given the current water resource allocation stipulated by the National Water Act and other policies in South Africa, it can be argued that there is potential prohibition of any reallocation, and consequently the policy will fail to accommodate the emergence of social and economic uses of water resources. Based on these arguments, it can hence be concluded that the water policy in South Africa is centred largely on neoclassical economics framework.

However, certain aspects of the policy embrace NIE principles in an effort to achieve optimal allocation of water resources, even though they are mostly not implemented. This is in part due to the noticeable inertia displayed by some stakeholders, such as commercial farmers, who benefit from the status quo. In a study by Brown (2013), it was concluded that the potential of participatory institutions such as Catchment Management Agencies and Water Users Associations, to achieve some of the social goals of national-level policies is rendered void due to the paralysis of the status quo and resistance of commercial farmers. Brown (2013) argues that the forms of resistance

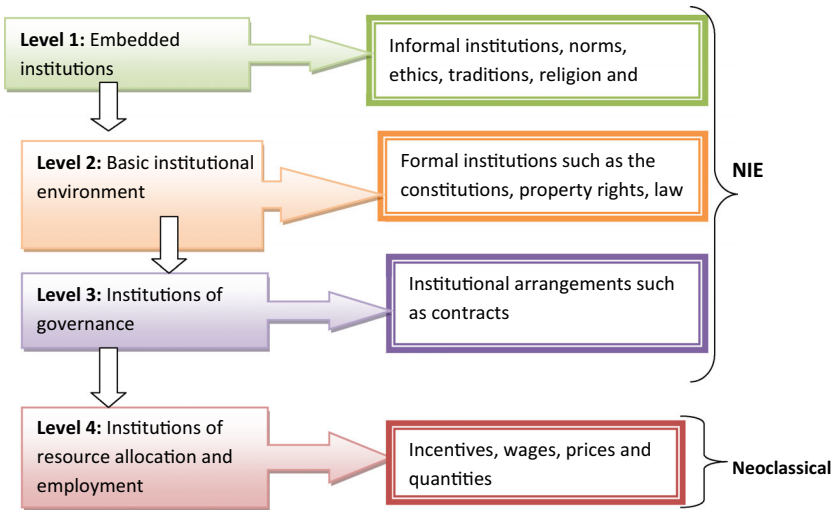

Fig. 4 Levels of economic institutions (*Sources*: Williamson 2000; Brousseau and Glachant 2008; Lieberherr 2009)

include commercial farmers in Water Users Associations withholding payment, thereby threatening the financial viability of the associations which are established to serve the interests of those farmers.

It can hence be argued that although the concept of Integrated Water Resources Management proposed by water policy in South Africa, which appreciates the complexity and multi-sectoral characteristics of water, restrains the applicability of neoclassical economic paradigms in water resource management, pricing based on market principles can undercut some of the social goals of national-level policies.

The post-apartheid South African National Water Policy is largely influenced by neoclassical economics foundations; the desired results in the water sector, such as equitable distribution of water resources, have not yet been fulfilled completely. Driving the implementation of the post-apartheid water policy towards equitable, efficient, effective and participatory management and allocation remains a challenge at local level as social norms and customs are not recognised. The swiftly changing world, which entails emerging water users, requires policy-makers to embrace NIE principles such as institutional governance and arrangements in policy development. This could be done through incorporating local needs and knowledge during the formulation stages of water policy. NIE is thus recommended to be the alternative to the prevailing neoclassical economics influenced water policies which have failed to address issues of equitable and effective participatory water management model.

Conclusion

The apartheid laws resulted in skewed distribution of natural resources. The enactment of the current legislations calls for participation of all stakeholders in the water sector as well as for equitable distribution of water resources for the benefit of all as a direct response to the previous laws. This paper reviews South Africa's water statutes using NIE theoretical underpinnings to assess the success, or lack thereof, of the country's water institutions post-apartheid. This paper discusses that South Africa's water policy is internationally regarded as progressive and forward thinking, as it is reflective of the broad aims of IWRM proposed by the 1992 Dublin Principles for water resources management.

This paper concludes that despite the positive developments post 1994, the water sector in South Africa is still facing a number challenges which are attributable to policy and legislative gaps among other factors. Furthermore, the one-size-fits-all approach to policy formulation and implementation, without special regard to social norms and traditional customs, is more likely to lead not only to persistence of inequities in the distribution of water resources, but also in persistence in other problems that the institutions seek to redress. The review puts forward that, although post-apartheid water laws and policies created a window of opportunity for broader inclusion in the water sector, the country has not fully taken advantage of the opportunity.

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