

Bosch, H.J. and Gupta, J. 2020. Access to and ownership of water in Anglophone Africa and a case study in South Africa. *Water Alternatives* 13(2): 205-224



Access to and Ownership of Water in Anglophone Africa and a Case Study in South Africa

Hilmer J. Bosch

University of Amsterdam, Amsterdam; h.j.bosch@uva.nl

Joyeeta Gupta

University of Amsterdam, Amsterdam; j.gupta@uva.nl

ABSTRACT: Access to water can be through public, private or community 'ownership', that is, the riparian rights that are associated with landownership, payments, contracts, markets and permits; these rights are often institutionalised in (customary) legal systems. Most countries are now revisiting such ownership rules in the light of growing water challenges, but there is little systematic understanding in the scholarly literature of what these rules are and how they are changing. This paper thus addresses the question of what is the state of de jure and de facto ownership of water in Anglophone Africa? A review of the scholarly literature on water ownership is accompanied by an analysis of the laws of 27 Anglophone African countries and field work in South Africa. The paper concludes that even though in all the studied countries the state has put water in the public domain, there remain situations where water is de facto owned by different actors; these cases of private ownership stem from the difficulties of changing Existing Legal Use permits, the implicit recognition of long-term entitlements that are based on permits, and the likely requirement of compensation in cases where entitlements are expropriated. The implication is that, in fact, water can be owned and that the law does not preclude the development of property-like rights over water.

KEYWORDS: Water rights, property rights, water ownership, water governance, water law, South Africa

INTRODUCTION

The history of water ownership can be traced back 5000 years (Dellapenna and Gupta, 2009: 394). Through history, conflict around the control over water resulted in the development of water laws, including the institutionalisation of rules on water ownership and access (Gupta and Dellapenna, 2009). These rules vary depending on a country's political system, and have included traditional and customary ownership, riparian rights associated with landownership (in English colonies), state ownership (in communist countries), private ownership that accompanies liberalisation and, more recently, the reallocation of water that resulted from the introduction of new management instruments such as integrated water resource management, payments, markets, contracts and permits¹ (Dellapenna and Gupta, 2008). Water laws have evolved continuously; in some cases they have become stronger or been modified on the basis of new science, and at times they have been subject to contestation (von Benda-

¹ The word 'permit' refers generally to formal water entitlements created on the basis of law; it does not have a uniform legal meaning (Hodgson, 2016:18). Some countries, such as Ethiopia and Kenya, use this term; some (Botswana and Ghana) use the term 'water rights', some (Nigeria and South Africa) refer to 'licences', and still others, such as Rwanda, use the word 'concessions'. In this paper we understand permits to be water allocations that are based on 'modern permit systems' which (1) find their basis in primary legislation, (2) are clearly defined and specify their conditions, including the volume, location and duration of water abstraction, (3) are subject to registration, monitoring and enforcement, (4) are legally backed by the state, (5) may be transferred with or without government approval, and (6) are granted without the applicant owning land (Hodgson, 2006: 1-3).

Beckmann et al., 2009: 2). In the past decades, most countries have revisited water ownership rules in the light of the wider challenges of water governance; in the process, two strong trends have emerged and have been superimposed on existing institutional frameworks. First, there are frequent cases where states aimed to regain absolute control over water from the landowners who held riparian rights, as water came to be seen as a critical natural resource (Cullet, 2012). This gaining of absolute control was combined with a system of individual control over, and access to, water for limited time periods (Cullet, 2011). In some Indian states, water was put into the public domain so that the state government could manage water in the public interest as owner or under the public trust doctrine; in many cases there was no clearly defined criteria for how this control should be manifested (ibid). Additionally, in a democratic context the expropriation of existing water ownership is a difficult process. A second observed trend in water governance has been the (simultaneous) increase in support for private sector involvement that came with globalisation and liberalisation; in some cases private property rights have been expanded with the aim of achieving greater efficiency in water use, allocation and distribution. The World Bank and the International Monetary Fund, for example, have been inviting the developing world to adhere to a market paradigm in which they are required to commercialise, if not privatise, their water supplies (Zellmer and Harder, 2008: 680). Despite the growing domination of neoliberal ideas, the future course of the ownership debate is unclear (Dellapenna and Gupta, 2008: 442).

There is little comprehensive understanding in the scholarly literature of the nature of these water ownership rules and how they are changing; this understanding must be a fundamental first step in determining what adaptive water governance should look like. To that end, this paper asks what is the state of de jure and de facto ownership of water in Anglophone Africa. We selected Africa for three reasons; first, its population is likely to grow by 3 billion by the end of the current century (UN-DESA, 2017); second, the continent may be at the brink of economic take-off, which will bring with it new demands on water; and third, climate change is likely to have a major impact on Africa (IPCC, 2014). We focused on the water laws in 27 Anglophone African countries (see Appendix A and B) because there is a degree of similarity in their water law histories as most were either British colonies or protectorates² and thus inherited, or were influenced by, the British common law system.

METHODS

This paper builds on three main approaches; the first of these is a literature review of water ownership and the second is an analysis of the water laws in 27 Anglophone African countries (out of the 48 sub-Saharan African countries), namely Botswana, Burundi, Cameroon, Eritrea, Eswatini, the Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mauritius, Namibia, Nigeria, Rwanda, Sierra Leone, South Africa, South Sudan, Sudan, Seychelles, Tanzania, Uganda, Zambia, Zimbabwe, Ethiopia, Madagascar and Somalia (in the last two of these English is the unofficial spoken language). Based on the literature review and on an analysis of the national water laws of these 27 countries, five elements were identified for review in order to gauge the extent to which national laws determine ownership of water. The third approach undertaken was an in-depth case study of South Africa including (1) an analysis of the *National Water Act No. 36 of 1998* (NWA, 1998) and related laws; (2) in-depth interviews with 28 key stakeholders, including government officials holding key positions in water use licensing, compulsory licensing, litigation, water resource planning, and water authorisation and registration management systems of the Department of Water and Sanitation, water users associations, NGOs (law firms, activists), and key researchers at research institutes and universities; and (3) analyses of relevant government reports, of data from the water authorisation registration and management system, as well as of the relevant scholarly literature. While South Africa has been chosen as a case study, findings should be only cautiously extrapolated to other Anglophone African countries; South Africa is by no means representative of the other countries,

² Burundi, Eritrea, Rwanda, Liberia and Namibia were not colonised by the British; Ethiopia was never colonised.

since each has its unique history and context, and faces its own challenges. Based on the gathered data, we analyse and draw conclusions with regard to the state of de jure and de facto ownership of water in South Africa.

UNDERSTANDING WATER OWNERSHIP

Defining water ownership

In law, ownership refers to having exclusive title to a property. Black's Law Dictionary (2004) defines property rights as "[t]he rights given to the person or persons who have a right to own the property through purchase or bequest". Throughout history, communities and states have grappled with the development of 'property rights' over water; property rights are basic rights everywhere, though the granting of the absolute right to a property is rare in any society. Property rights can range from an individual or organisation having title to almost all rights to a property and virtually absolute control of every single aspect of it, to limited control where the individual or organisation controls only certain rights. This paper focuses on mapping the existing water ownership trends. (Increasingly, in the context of the Anthropocene, the question is whether the nature of water requires us to revisit the issue of property rights itself; this, however, is not the subject of this paper.) Property rights are 'socially enforceable rights' and emerge as an organising principle in social relations among people; they can derive from state law, religion, and/or customary and traditional law (Alchian, 2017: 1; Pradhan et al., 2018: 4). Property rights determine how those who hold them can gain access to water, either through a formal or informal system, and for either the short- or long-term (Hodgson, 2016). We distinguish between de jure ownership (which is ownership according to a recognised customary or statutory law) and de facto ownership (ownership in practice) (Black's Law Dictionary, 2020a, 2020b).

Unpackaging water ownership

In analysing the water laws of 27 Anglophone African countries we hope to identify whether and how these laws provide for water ownership. Based on the literature and on a review of the existing water laws, we look at the current de jure organisation of the ownership of water in terms of (1) what the law says about water ownership and how customary ownership or historical trends are addressed; (2) to the extent that the state is the owner, whether this is organised in terms of 'public trust' (Burchi, 2012), and what this implies; and (3) how people access water (through payments, permits or some other means). Since 'legal' water ownership may deviate from what happens in practice – and this is certainly the case in most developing countries where legal pluralism exists – we have identified five elements that may determine whether water is de facto owned. The first is the recognition of customary rules, rights and/or laws. Customary practices continue to play a significant role in water allocation decisions in many developing countries, particularly at the community level (Burchi, 2012; Gupta et al., 2013; Hodgson, 2016). Recognising traditional water rights in contemporary law may result in people's ownership of water being based on historical (uncodified) water use; furthermore, historical rights emanating from the riparian system may lead to land-based water ownership rights. The question thus is how water law has tried to address that. Second, based on initial research we have also identified the permit system as a possible form of de facto water ownership in cases where the permit is of a duration such that users are guaranteed a reliable long-term supply of water (Hodgson, 2016; McKenzie, 2009). The third element relates to the review, amendment or cancellation of permits, in that when a permit is not subject to periodic review, water access under the permit may amount to de facto ownership. Fourth is the ability to object to, or appeal, a decision by the responsible authority to change a permit (Almeida et al., 2012); when there are limited procedures in place which enable a state authority to rescind a permit, it may imply that there is de facto ownership by the permit holder. The fifth determinant of de facto ownership is the question of compensation; in cases where the revoking of a permit is perceived as expropriation

and the permit holder receives compensation, it may be said that de facto ownership exists (Almeida et al., 2012). The extent to which water laws allow for compensation is often unclear, as are the circumstances under which compensation can be claimed; however, where there is a requirement for compensation to be paid, de facto ownership is implied.

Inventory of the position of water ownership in 27 African countries

Prior to the arrival of the British, African customary law governed Botswana, Burundi, Cameroon, Eswatini, Ghana, Kenya, Lesotho, Liberia, Namibia, Nigeria, Rwanda, Tanzania, South Africa, Uganda, Zambia and Zimbabwe (Ramazzotti, 1996; Gupta and Dellapenna, 2009; Willy, 2012). In the African tradition, communities had ownership over water resources; this was organised through the chief's control, and private ownership was not permitted (Tewari, 2009). In several other countries the legal system operated according to African customary law subject to Islamic influences; these countries included Ethiopia, Eritrea, Madagascar, Malawi, Sierra Leone, Somalia, South Sudan and Sudan (Ramazzotti, 1996). Under Islamic law, water was seen as a "substance that cannot be owned unless it is taken in full possession"; this was based on the belief that water is a gift of God and thus belongs to His community (Naff, 2009: 42). The Gambia has a legal system that is mainly under Islamic influence (Ramazzotti, 1996). Mauritius and Seychelles had no population predating the arrival of the Europeans (Caponera, 1979: 9).

With the arrival of the British, some countries were colonised (British common law was imposed) and others became British protectorates (the country's national law was aligned with British law). Under British common law, riparian rules with respect to water were recognised; this implied that surface water flowing along private property could be accessed by landowners up to a reasonable extent, taking into account the needs of others; groundwater flowing under private property was subject to the rule of capture, allowing landowners to withdraw as much water as they wanted (Getzler, 2004). The superimposition of British common law on customary laws resulted most often in a plural system in which British statutory law coexisted with customary law; for example, crown lands were governed by statutory law and native lands by customary law, creating plural systems within a single country (Nilsson and Nyanchaga, 2009). Sometimes, however, different legal systems applied within the same jurisdiction; this occurred in cases where formal legal changes were not implemented and thus customary law continued in practice (Cullet and Gupta, 2009). Following the independence of many of these countries there was confusion regarding who 'owns' the water, as different water laws coexisted; most of these countries, however, went on to promulgate new water laws. We have prepared a database of these laws and presented an overview of the findings regarding the current de jure organisation of water ownership in Anglophone Africa (Table 1). Based on our analysis of the water laws, some general conclusions are drawn. The database is limited in that we only considered water laws and not other laws in which water ownership is directly or indirectly addressed; it is also limited in that we did not consider court cases that may have led to different interpretations of the text in these laws.

Key commonalities and differences in the treatment of water ownership

Subject to availability of data, we first conclude that since about the 1990s all countries have taken control over their water resources by pulling jurisdiction over water into the public domain. A distinction can be made between countries in which the ownership of water is vested in the state/government/president/nation, such as in, for example, Ethiopia, Ghana and Lesotho; and countries in which private ownership of water is not allowed. Examples of the latter are Botswana, Eswatini and Zambia; also, in South African and Mauritian water laws there is no mention of ownership or of water as private property (NWA, 1998: Art. 3(1)); Appendix A: *Central Water Authority Act 1971*). In all the countries studied (17 out of 18 countries), water cannot be legally owned by water users. According to the new laws, people no longer have a customary, riparian and/or permanent right to water, but they

Table 1. State of access to, and ownership of, water in Anglophone Africa.

Country	Ownership		Organisation of access			Control	Protection of permits			Custom	
	No private ownership of water	Ownership vested in the state	Public trusteeship of water	Permit system	Domestic use exempted	Provision on existing water use	Mid-term variation of permit	Period in years	Compensation for revocation	Appeal against revocation	Customary rights
Botswana	√			√	√	√	√	**	√	√	Implicit
Eswatini	√	√		√	√	√	√	5	√		
Ethiopia		√	√	√	√	√	√		√	√	
The Gambia*		√	√	√	√	√				√	
Ghana		√	√	√	√	√	√		√		
Kenya		√	√	√	√	√	√		√	√	Implicit
Lesotho		√	√	√		√	√	5		√	
Malawi		√		√	√	√	√		√		
Mauritius			√	√	√	√					
Namibia		√	√	√	√	√	√	5		√	Implicit
Nigeria		√		√	√		√				Implicit
Rwanda		√		√	√	√	√				
Sierra Leone		√	√	√	√	√					Implicit
South Africa			√	√	√	√	√	40	√	√	
Tanzania		√	√	√	√	√	√		√	√	Explicit
Uganda		√		√	√	√	√			√	
Zambia	√	√	√	√	√	√	√	25	√	√	Implicit
Zimbabwe	√	√	√	√	√	√	√	20		√	

Note: * The Gambia has no water laws in place, hence, the Gambia Water Bill 2014 (post-validation workshop version) has been reviewed. Because the water laws of Burundi, Cameroon and Madagascar were written in French and those of Sudan were written in Arabic, they were not considered here. The Seychelles Water Act (1982) could not be accessed. South Sudan, Eritrea, Liberia and Somalia do not have comprehensive legislation on water in place (Appendix A: South Sudan 2007: 8; FAO, 2020; USAID, 2010; FAO, 2005). ** = period in years: 'definite or indefinite', meaning a fixed time period or an indefinitely long time period. The grey ticks in the second column under 'Ownership' represent laws that do not use the word ownership explicitly (see Appendix B); the grey ticks in the third column represent laws in which water is managed in the public interest or benefit. Names of specific laws and policies referred to here can be found in Appendix A.

are entitled to use water subject to state permission; this amounts to state expropriation of existing ownership. In Tanzania, customary water rights are recognised subject to state control³. We further conclude that, each country (except Nigeria) has a provision in place stating that either existing water use under the previous law(s) can be continued, or that new water use permits will replace previous laws after a transition period. All water use – barring domestic use, which is approximately 13% of total water use in Africa (FAO, 2015) – is subject to some version of a nationwide water use permit system; this system is considered to be the main tool for managing and allocating freshwater resources in Anglophone Africa. All the countries studied have either strengthened the existing colonial permit system or have introduced a new modern permit system (van Koppen et al., 2014); hence, all water users (domestic use being exempted) are obliged to apply for a water use permit. The only exception to this is Lesotho, where a water use permit is also needed for domestic use (Appendix A: *Lesotho Water Act 2008*: Art. 20(1)). In the case of municipal water, people gain access through a household connection for which they pay a fee or through direct access to wells. In all these countries, all water use that is not authorised by means of a permit, is subject to a transitional provision, or does not fall under domestic water use, is considered unlawful. Six countries explicitly include a maximum period for which a license can be issued, ranging from 5 years in Lesotho (Appendix A: *Lesotho Water Act 2008*: 24, Art. 20(8)), and 20 years in Zimbabwe (Appendix A: *Zimbabwe Water Act 2002*: Art. 36(1)), to 25 years in Zambia (Appendix A: *Zambia Water Resources Management Act, 2011*: Art. 77(1)), and 40 years in South Africa (Appendix A: *National Water Act, 1998*: Art. 28(1)(e)). In Botswana, a permit can be granted for an indefinite period of time (Appendix A: *Botswana Water Act 1968*: Art. 15). Our investigations further show that, most countries (except the Gambia, Mauritius and Sierra Leone) have a provision in place which allows for the alteration of a permit; in all cases where these provisions exist, the responsible authority can amend, cancel or vary the conditions of the permit, including the volume of allocated water, if, for example, it is in the public interest to do so in drought situations or in cases of non-compliance. In these countries, the state has a certain power to control water resources and to take it back when it is needed. The water laws of 11 countries make provisions for people who hold water use permits to challenge a responsible authority to change the permits. It is explicitly stated in the laws of nine countries that when the conditions of a permit are cancelled, amended or varied, and when this results in a negative economic consequence to the permit holder, the permit holder can in certain cases claim compensation; in Ghana, Malawi and Tanzania, for example, this applies when the conditions of a permit are changed for 'public purpose'.

CASE STUDY OF SOUTH AFRICA

Introduction

We now discuss in more detail how water ownership is organised in the law, and how it is experienced in practice. South Africa has a unique history when it comes to water ownership, one where ownership of water has been subject to back-and-forth change. In the precolonial era – that is, prior to the arrival of the Dutch in 1652 – water resources were community owned (Tewari, 2009). During the 150 years of Dutch colonisation (1652 to 1805), all the country's public rivers and water bodies were brought fully under state control (Tewari, 2009). Subsequently, under British rule (1805 to 1910), ownership of water moved towards the riparian rights system. According to this system, the state did not own the water; rather, ownership of a piece of land conveyed the reasonable right to use the water that flowed through it and the right to capture the water below it (Hall, 1939). Between 1948 and 1990, during apartheid,

³ The *Water Resources Management Act, 2009*: Art. 11(1), ("Right to Use of Water for Domestic Purposes") states that, "The powers to confer a right to the use of water from any water resource is hereby vested in the Minister save to the extent that it is alienated by any other written or customary law". According to the *Water Resources Management Act, 2009*: Art. 52(1), ("Incidents of Customary Water Rights"), "[c]ustomary rights held by any person or community in a watercourse shall be recognised and is in every respect of equal status and effect to a granted right (...)".

water moved back to being under state control and away from the riparian rights principle, following the Roman-Dutch law of state control of public water; even so, riparian rights still strongly prevailed in many parts of the country (Kidd, 2009) leading to multiple coexisting systems. With the first democratic election in 1994, and after that under democratic rule, the South African *National Water Act*, Act 36 of 1998 (hereafter referred to as the Water Act), was promulgated. Under this Act, water cannot be owned; water resources are managed in the public trust with the Water and Sanitation Minister as the custodian (NWA, 1998: Art. 3(1)). The only water right specified in the Water Act is that of the Reserve (DWAf, 2001: 26); however, the Reserve "is not a water use right per se" (Perret, 2002: 293) but rather allows the state to reserve water for basic human needs and for ecological reasons.⁴

Analysis of the South Africa National Water Act, 1998

The *National Water Act* has been analysed as a starting point for understanding water ownership in South Africa. Our in-depth case study of the situation specifically looks at the ways in which the Water Act entitles a person to use water: all water use must be licensed unless it falls under Schedule 1, is an Existing Lawful Use (ELU), or permits a person to access water under a General Authorisation (NWA, 1998: Art. 22(1)(a)).

To elaborate on these individually: *Schedule 1 water use*: In this case, a person is allowed to use water for domestic purposes without the need to apply for a water use licence (hereafter referred to as a 'licence') (ibid: Art. 4(1)), though the law offers no protection by way of legal security of water access. Since Schedule 1 is not a formal legal right under the Water Act, it cannot be enforced against a third party, in contrast to the Reserve which is considered a right⁵ under the Water Act and the Human Right to Water which falls under the Constitution 27(1)(b). *Existing Lawful Use*: The Act also allows for the continuation of past and existing water use as an ELU (ibid: Art. 4(2)), by which water use that took place two years prior to the commencement of the Water Act is allowed to be continued under the new Act, under the old conditions; this implies legitimising and legalising existing uses. *General Authorisation or Licence* (ibid: Art. 4(3): A General Authorisation (or blanket approach) allows people to withdraw water up to a certain threshold above Schedule 1 without a licence; the amount that may be abstracted is determined by period, by water management area, and even more specifically by drainage region and tertiary/quaternary catchment (DWS, 2012). A granted licence allows a person to withdraw water under the conditions specified by the authorising body, the Department of Water and Sanitation; any use that is not covered under the law is considered to be unauthorised and is thus illegal (NWA, 1998: Art. 151). In this paper, we focus only on the implications of a water use licence and an ELU, and how these influence what is deemed to be ownership.

Examining property rights: Existing lawful use

The ELU provision was intended to be transitional, maintaining as legal under the Water Act the water use that complied with former (colonial) acts (van Koppen and Schreiner, 2018: 19). The reason to make provision for existing water uses was and is to prevent complete disruption of the existing system (van Koppen and Schreiner, 2014). When discussing ELU entitlements and in order to fully understand who actually has access to water, the history of South Africa must be considered. During apartheid, 87 per cent of the land was owned by 15 per cent of the population (Bassett, 2017); under the strong riparian water rights regime of those years, water rights were overwhelmingly in the hands of the advantaged. The remaining 13 per cent of land was in the so called 'reserves' or 'homelands'; these were declared to be state land, and ownership of water was thus vested in the state (RSA, 2011). While the Water Act

⁴ The Basic Human Needs Reserve "provides for the essential needs of individuals served by the water resource in question" (NWA, 1998: Chapter 3, Part 3: The Reserve). The Ecological Reserve "relates to the water required to protect the aquatic ecosystems of the water resource" (ibid).

⁵ "The NWA specifies only one right to water in law, that of the Reserve" (DWAf, 2001: 26)

protects ELU entitlements under the old laws, in South Africa there is complete silence "about the legal standing of customary water rights regimes within or outside the former homelands" (van Koppen and Schreiner, 2018: 19). While a person "may apply to a responsible authority to have a water use (...) declared to be an existing lawful water use" and the responsible authority itself may "declare a water use, on its own initiative (...) to be an existing lawful water use" (NWA, 1998: Art. 33(1) and (2)), these articles have never been applied regarding water use in the former homelands (van Koppen and Schreiner, 2018: 19).

Property rights in Existing Lawful Use

With the promulgation of the Water Act, landowners de jure 'lost' the existing riparian right to water that was based on the *Irrigation and Conservation of Waters Act* (No. 8 of 1912) and on the 1956 *Water Act* (Act 54 of 1956), as the new Water Act discarded the riparian principle (NWA, 1998: Schedule 7 Acts repealed). Nevertheless, holders of an ELU still see their water entitlement as a right based on the old Water Act of 1956, believing it to be legitimised by the concept of existing legal use. Since the promulgation of the new Water Act, this has led to tension; riparian owners challenge what they see as the expropriation of their rights under the Constitution and the tension has not yet been resolved.⁶ The entitlement to use water under the ELU clause continues to be lawful until such time as compulsory licensing leads to its replacement by a water user licence; this protocol is unique compared to other African countries (Schreiner et al., 2017).

Redistributing water

Compulsory licensing is the primary legislative tool and administrative mechanism provided by the Water Act for redressing the inequalities embodied in Existing Legal Uses entitlements (NWA, 1998: Chapter 4, Part 8: Existing lawful water uses; Rawlins, 2019; Seetal, 2012). Compulsory licensing is "the process that allows the [Department of Water Sanitation] to review how water is allocated and used in a catchment area and to reallocate water, if necessary, to achieve certain objectives" (Seetal, 2012: 18). While the nation's water resources are managed in the public trust (NWA, 1998: Art. 3(1)), compulsory licensing basically assumes that all water belongs to the state (by, in effect, expropriating ELU entitlements and licences) and that the state can thus redistribute it as it sees fit between existing and new users.⁷ In catchments that are closed – for example, Inkomati, Sand and Crocodile, which are all over-allocated (Denby et al., 2016) – there is essentially no water left to allocate (Falkenmark and Molden, 2008); hence, the only way to free up water, and then reallocate it, is by taking it away from the 'haves'. With the commencement of the Act, it was expected that within two years the Department could convert the ELU entitlements of 60,000 water users with 80,000 different water uses into licences without substantially compensating the previous rights holders.⁸ The officials at the time did not work out what was required to actually process a licence; they also assumed that previous rights holders would accept the changes meekly. This has resulted in a situation in which, for the past 20 years, the majority of ELU entitlements have been left untouched; as such, the racially skewed water use continues under the new Act. It may indeed continue into the future, as a person's successor in title is allowed to continue to use water in the same manner (NWA, 1998: Art. 34), this use being subject to the existing conditions and obligations and to other limitations or prohibitions by or under the NWA. In 2016, after 15 years, three small compulsory licensing pilot cases were finalised, but these are equal to only 2.77% of the total water (Kidd, 2016). Compulsory licensing is very difficult to operationalise in a democratic context.

⁶ R1: Interview on 28 November 2017.

⁷ R4: Interview on 11 December 2017.

⁸ R1: Interview on 28 November 2017.

Challenges in compulsory licensing

Five factors contribute to the challenge of compulsory licensing: (1) There is a concern that the redistribution of water may negatively affect national food security, since most of the ELU is for agricultural use (van Koppen and Schreiner, 2014); (2) There is a lack of capacity and knowledge at the Department of Water and Sanitation. The process is very complex and technically demanding;⁹ for example, the Inkomati catchment, a fourth pilot case of compulsory licensing, was not completed because of its complexity (Kidd, 2016); (3) The land reform programme is generally considered to be unsuccessful.¹⁰ A report by the Presidential Advisory Panel on Land Reform and Agriculture reads, "The extent to which the land reform programmes have met their respective targets remains contested, however, there is broad consensus that land redistribution and restitution has not progressed at the rate originally envisaged" (PAPLRA, 2019: 50). Allocating water to historically disadvantaged citizens implies that they also need land for agriculture; however, the Department of Water and Sanitation was unable to put in place a coordinated land, water and agrarian reform programme.¹¹ (4) There is a legal backlash: the previously advantaged are doing everything within their power to maintain what they see as their right to water (and land) and are using the court system to demand adequate compensation or restitution.¹² They are allowed to challenge decisions by the responsible authority, appeal against any decision at the Water Tribunal, and appeal against the decision of the Water Tribunal at the High Court. Regarding compulsory licensing, the NWA allows people to object to the proposed allocation schedule (NWA, 1998: Art. 45(4)(b)); they may make an appeal to the Water Tribunal regarding the preliminary allocation schedule (ibid: Art. 46(1)(b) and 148(1)(g)), and may appeal to the High Court regarding the decision of the Water Tribunal (ibid: Art. 149). Litigation can hold up progress in the implementation of compulsory licensing for years. The process of compulsory licensing in Mhlathuze (a small pilot case) took five years to finalise; in this process, however, none of the holders of an ELU entitlement appealed to the Water Tribunal or Court with respect to the proposed allocation schedules (Kidd, 2016). (5) When the application of compulsory licensing results in a holder of an ELU permit being economically prejudiced, compensation can be claimed.

Any person who has applied for a licence (...) in respect of an ELU (...), and whose application has been refused or who has been granted a licence for a lesser use than the ELU, resulting in severe prejudice to the economic viability of an undertaking in respect of which the water was beneficially used, may (...) claim compensation for any financial loss suffered in consequence. (NWA, 1998: Art. 22(6))

Hence, compensation is payable when two criteria are met: (1) the deprivation must result in "severe prejudice" to an undertaking, and (2) the water must have been beneficially used (Glazewski and Du Toit, 2013: 16-29). There are situations, however, in which the state is not required to pay compensation (Schreiner et al., 2004; Seetal, 2006). The NWA reads that,

⁹ *ibid*

¹⁰ The 'willing buyer willing seller' approach has failed (PAPLRA, 2019: V). Targets set by government have failed, including the original target of transferring 30% of agricultural land to black beneficiaries by 1999 and the later target of transferring 30% of total productive land by 2014 (ibid: 50, 11). The government also failed to settle all restitution claims by 2009 (ibid: 11) and to solve the existing problems with the leasehold model of redistribution (ibid: 12). According to a PAPLRA document, "Parliament has failed to enact legislation pursuant to section 25(5) of the Constitution, which directs the state to enact legislation in order to foster conditions that will enable citizens to gain access to land" (ibid: 13). Records of the President's Advisory Panel proceedings (ibid: 26) go on to say that, "The *Provision of Land and Assistance Act* (Act 126) is highly inadequate as a means to effect redistribution of land contemplated in section 25(5) of the Constitution, which requires the state to take reasonable legislative and other measures, within its available resources, to provide citizens with access to land on an equitable basis". Additionally, the implementation of the *Land Reform (Land Tenants) Act* No. 3 of 1996 is widely known to have failed (ibid: 28).

¹¹ R1: Interview on 28 November 2017.

¹² R1: Interview on 28 November 2017.

[t]he amount of any compensation payable must be determined (...) (b) by disregarding any reduction in the existing lawful water use made in order to – (i) provide for the Reserve; (ii) rectify an over-allocation of water use from the resource in question; or (iii) rectify an unfair or disproportionate water use (NWA, 1998: Art. 22(7)(b)).

Notwithstanding, litigation can be expensive and time-consuming for the state and may actually affect its ability to implement compulsory licensing. It will be difficult to prove that the removal of riparian rights does not cause severe prejudice including hampering national food security and income generation.

Examining property rights: Water use licences

Property in water use licences

The Water Act allows people that require or wish to obtain a water use licence to apply for one (NWA, 1998: Art. 40(1)); this licence can be granted for a period of up to 40 years (ibid: Art. 28(1)(e)). Although the NWA is silent on the nature of the right to a licence (see, for example, Art. 3(1)), and although the licence is subject to a system of state regulation and allocation, property-like rights in water, per se, are not necessarily excluded (Soltau, 1999; Glazewski and Du Toit, 2013). Soltau (1999, cited in Glazewski and Du Toit, 2013: 16-29) "suggests that [licences] are possible 'new property' rights which are definable 'water-use rights', subject to the limits imposed by the nation of the public trusteeship and the requirement of beneficial use". His argument is supported by two points: (1) the NWA's provision of compensation (NWA, 1998: Art. 49(4)), and (2) possible constitutional protection which does not limit the protection of property to land (Constitution of the Republic of South Africa, 1996: Art. 25 (4)(b)). Accordingly, the notion of constitutional property is wider than traditional private law classifications of property, since corporal and incorporeal property, movables and immovables, real rights and some personal rights have been recognised as subjects of constitutional protection (Glazewski and Du Toit, 2013: 16-29).

Challenges of the water permit system

The licensing system is seen as the main tool for managing South African water resources. Once a person has been granted a licence by the Department of Water and Sanitation, it is subject to the conditions attached to the licence (NWA, 1998: Art. 28(1)(d) and 29). The attached conditions are subject to a periodic review (ibid: Art. 49), which must be at intervals of not more than five years (ibid: Art. 28 (1)(f)).

On reviewing a licence, a responsible authority may amend any condition of the licence, other than the period thereof, if – (a) it is necessary or desirable to prevent deterioration or further deterioration of the quality of the water resource; (b) there is insufficient water in the water resource to accommodate all authorised water uses after allowing for the Reserve and international obligations; or (c) it is necessary or desirable to accommodate demands brought about by changes in socio-economic circumstances, and it is in the public interest to meet those demands. (ibid: Art. 49(2))

Hence, the Department of Water and Sanitation is able to manage the water through granting licences and through the review of licence conditions. The granting of licences, however, creates four challenges for governing water. (1) Licences can only be amended when all licences for similar water uses from the same water resource have been reviewed in an equitable manner through a general review process (ibid: Art. 49(3)); as with compulsory licensing, this is a resource-intensive and complicated process. (2) Currently, the review and amendment of licences is not happening at all. Since the commencement of the Act in 1998, no licences have been reviewed, nor has volume been curtailed; this limits the ability of the state to redistribute water to adapt to changing circumstances. (3) The holder of a licence can enjoy legal protection and financial security. Compensation can be claimed when the review "severely prejudices the economic viability of any undertaking in respect of which the licence was issued" (ibid: Art. 49(4)). A claim must be lodged at the Water Tribunal (ibid: Art. 22(8)), which will determine the viability

of the liability and the amount of compensation payable (*ibid*: Art. 22(9)). No compensation can be paid, however, if water is needed for the Reserve, to correct an over-allocation, or to rectify an unfair or disproportionate water use. (NWA, 1998: Art. 22(7)(b)). (4) The process of reviewing and amending licences is not meant to allow for new water allocations.¹³ The legislative tool in the Water Act to make water available for new entrants is compulsory licensing (NWA, 1998: Art. 43). New water users, according to the Water Act, are required to obtain a licence; however, when all the water has been allocated, additional allocations can only be made at the expense of existing users, and these users can appeal to the Department of Water and Sanitation to block the granting of a new licence (NWA, 1998: Art. 148(1)(f)). As a result of this protocol, licence holders can legally continue to abstract water for their allocated period (which can be up to 40 years) without fear of losing their entitlement.

ANALYSIS

De facto ownership – country inventory

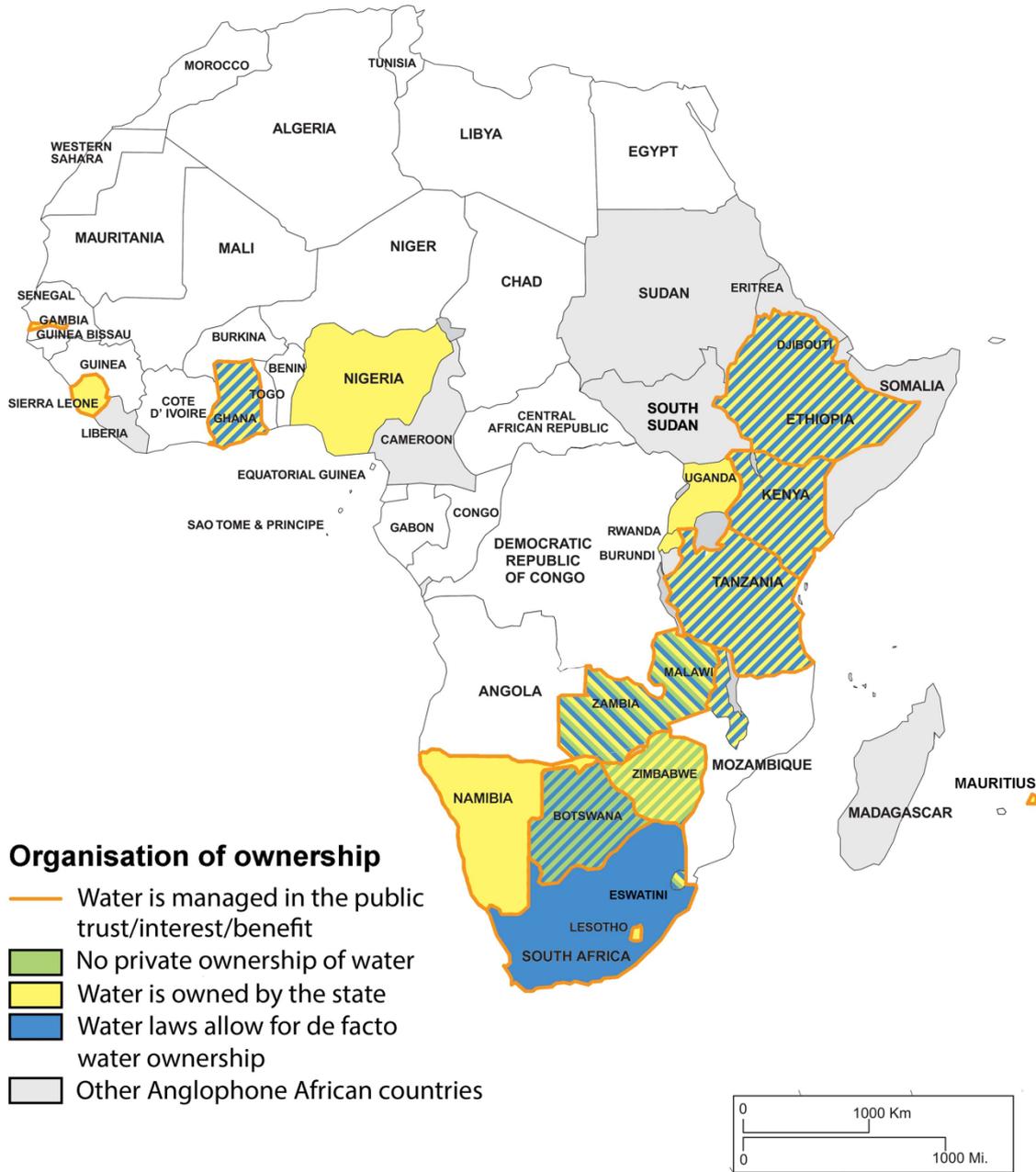
In the countries studied, water resources have been brought into the public domain and the state holds all property rights over water; by law, the state – and no individual citizen – 'owns' the water. Though under formal state water law individuals may not have *de jure* ownership of water,¹⁴ water laws may have provisions in place that can provide for *de facto* ownership. As discussed above, the preliminary analysis looked at five different elements of the water laws. The first big challenge is to address the legality, legitimacy and fairness issues that are involved in expropriating existing (historical) water rights, whether they arise from customary or colonial rules. An example of this is the difficulties faced by South Africa in their process of gradually converting Existing Legal Uses through a compulsory licensing system. In all the countries considered in this study, water is being managed through the issuing of abstraction permits which are valid for an allocated period. The second big challenge thus arises when the state loses the ability to control the water for that allocated period, while at the same time the permit holder may enjoy legal protection when the water is taken away and can claim compensation when negatively impacted. The state cannot simply revoke allocations or expropriate water; in some cases it may be required to pay unaffordably large amounts of compensation to landowners, especially when these landowners stand to lose significant amounts of income if allocations are revoked, and when there may be a heavy short- to medium-term impact on food production, industrial productivity and national income. Riparian landowners – as compared to indigenous and local communities – would be expected to have stronger claims and more power and knowledge to resist expropriation, and may be able to use the legal system to claim compensation under the Water Laws or even under the law of torts or constitutional law (Gray and Lee, 2018); this can be considered *de facto* ownership of water. Additionally, the longer the state waits to act, the more the landowners may be able to increase their water-related revenues, which in turn increases the amount that the state may have to pay in compensation.

Based on the content analysis of the national water laws, the map in Figure 1 shows that in nine countries the permit holders may be considered to *de facto* own the water (Botswana, Eswatini, Ethiopia, Ghana, Kenya, Malawi, South Africa, Tanzania and Zambia). Decisive factors with regard to *de facto* ownership include the length of time for which the permit is granted, the ability to use the court system to protect their entitlement, and the possibility of claiming compensation when a permit holder is economically disadvantaged by the expropriation of water. Industrial or agricultural permit holders base their cost calculations and business investments on an assumption that their water licenses will be valid for a certain number of years; from their point of view, therefore, it is fair that they be compensated if such a licence is suddenly revoked.

¹³ D1: Interview on 12 January 2018.

¹⁴ This may still imply that individuals have customary rights that are recognised under customary law or under the laws and policies protecting indigenous peoples; however, this is not dealt with in the paper.

Figure 1. Organisation of water ownership in Anglophone Africa.



De facto ownership – South Africa

In South Africa, by law, the Minister of Water (acting on behalf of the state) is the custodian of water resources and holds all the property rights to water. Based on an in-depth case study in South Africa, we conclude that holders of an ELU entitlement and water use licence can legally protect their entitlement by making use of the court system and can claim compensation when any expropriation of their allocated water use results in financial loss. We argue that this implies de facto ownership of water, since the state is not legally able, in the short term, to regain control over water that falls under an ELU entitlement or water use licence. Regarding ELU entitlements, the main legal tool for redistributing water is compulsory licensing. The state, however, is unable to actually implement this tool in a manner consistent with the

rule of law; this results in the holders of an ELU entitlement being able to continue existing water use patterns without fear of losing their entitlement, even after the promulgation of the Water Act. The state's launching of a compulsory licensing process does not automatically mean it can regain control over water, as holders of ELU entitlements enjoy a certain level of legal protection; they have multiple opportunities to appeal a compulsory licensing decision, which enables them to obstruct the process for years, even decades. They can also claim compensation if they suffer economic loss resulting from the amendment of conditions. Because the Department of Water and Sanitation is considered to be bankrupt, this is difficult to address and, as a consequence, the existing commercial farms have been able to secure their access to water for the past two decades (Peters and Woodhouse, 2019).

The licensing system is the main tool in the Water Act for managing South Africa's freshwater resources. Water use licences come with conditions; these include specifications of the volume of water that may be abstracted and the requirement of a review at least once in five years. However, between 1998 when the Water Act was put in place, and January 2018, no licences were reviewed or amended, neither have any procedures been put in place at the Department of Water and Sanitation to carry out such reviews or amendments. The amendment of a particular licence can only occur when all similar licences for that same water resource have been equitably reviewed in a general review process. The license holder can enjoy legal protection of his water allocation and can claim compensation if it is revoked; a license holder can thus continue to use that water for the duration of the licence, which can be up to 40 years, and the state de facto loses the power to manage and control the water. Only in an emergency, for example a drought, can the government (by means of publishing a notice in the *Gazette*) temporarily curtail water abstraction, as has been seen in the Western Cape (DWS, 2017, 2018). Even in such a situation this is only a temporary measure, since the issued licence is not being withdrawn nor are the conditions permanently changed. This is therefore not a long-term solution as it does not free up water for new users and does enable a response to changing water demands.

In the case of South Africa this results in four problems. First, South Africa is considered to be a water-constrained economy. By the year 2000, it had already allocated about 98% of its national freshwater resources (Turton and Botha, 2014: 3); moreover, several of the 19 Water Management Areas are over-allocated, some by as much as 120% (ibid). South Africa can, in fact, be considered to have a closed water system, in the sense that there is no more water left to be allocated. Second, ELU entitlements and water use licences together account for the majority of all water allocations in South Africa (Schreiner et al., 2017); for the past 20 years, therefore, the state has had little control over most of the allocated water (Marcatelli and Büscher, 2019). This has been the case despite the fact that the whole aim of managing the water in the public trust was to "ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate" (NWA, 1998: Art. 3(1)). Third, through granting permits to (inter)national companies, the state gives these companies de facto ownership over the water for a significantly long period. Fourth and finally, not controlling water hampers effective water governance. Adaptive management is seen as a key principle underlying the governing of freshwater resources, including achieving the broader water reform objectives of social welfare and environmental protection (McKenzie, 2009). A developing society requires ever more water, and already new users with a high water request are being refused a water allocation, a situation which stands to impede economic growth.¹⁵

CONCLUSION

An analysis of the history of water use in the region makes clear that there have been back-and-forth shifts and changes in the conditions of water ownership. In the precolonial era, water was community

¹⁵ D1: Interview on 12 January 2018.

owned and was managed according to traditional African rules, which were in some cases influenced by Islamic culture or laws. With the arrival of the British, the common law system was imposed in colonies and was 'borrowed' in protectorates, in such a way as to give landowners a riparian right to water. With independence and the rise of democracy, water resources have been pulled into the public domain, not allowing for, or at least limiting, the private ownership of water; however, as this paper has shown, the de facto ownership of water may be in private hands.

The 27-country review and the case study in South Africa show that Anglophone African countries are facing major challenges with respect to managing their scarce and irreplaceable water resources. Even though all these states are ostensibly trying to take control of their water resources by formally curtailing private ownership of water, there are two ways in which a state may lose control over its national freshwater resources. First, reorganising existing water rights is not easy, especially when they are held by commercial farms; attempts to do so amount to expropriation, and holders of these rights are unlikely to give them up without prolonged litigation. Reorganising water rights by granting new water use permits is complicated and requires the payment of compensation (Gray and Lee, 2018). Second, under some circumstances permit holders de facto own the water, limiting the state's ability to control the nations' water resources. The state's capacity to reallocate water among users is a key concern, as demand for water is subject to constant change in response to economic growth, droughts and social policy (Slaughter and Wiener, 2007: 308). Understanding ownership is thus of critical importance in the development of a "legitimate, equitable, and effective governance system" (Gupta et al., 2013: 575).

This paper has thus shown how difficult it can be for a postcolonial state to set up a fair and equitable system for effective and sustainable water governance. While most papers discuss adaptive and integrated water governance, they overlook the key challenge that states face in gaining and retaining control of a country's water. This is the case with permit systems and is even more relevant in regions where a full-scale process of commercialisation is underway.

ACKNOWLEDGEMENTS

The fieldwork in South Africa has been financially supported by the Prince Bernhard Cultural Foundation (Project No. 40010927_MAK_ILE); the foundation had no involvement in the research. Ethical norms of conducting interviews were followed. The research was conducted at the Governance and Inclusive Development Programme Group, at the Department of Geography, Planning and International Development Studies of the Amsterdam Institute of Social Science Research, of the University of Amsterdam.

REFERENCES

- Alchian, A.A. 2017. 'Property rights'. In *The New Palgrave Dictionary of Economics*, pp. 1-6. London: Palgrave Macmillan UK.
- Almeida, F.; Hatcher, F.; White, A.; Corriveau-Bourque, A. and Hoffman, A. 2012. What rights? A comparative analysis of developing countries' national legislation on community and indigenous peoples' forest tenure rights – Rights and Resources Initiative. www.rightsandresources.org (accessed 14 May 2019)
- Bassett, T.J. 2017. Signs of the times: Commercial road mapping and national identity in South Africa. In Akerman, J.R. (Ed.) *Decolonizing the map: Cartography from colony to nation*, pp. 339-376. Chicago, USA, University of Chicago Press.
- Black's Law Dictionary Free 2nd Ed. and The Law Dictionary (2004. 'What is property rights?'. <https://thelawdictionary.org/property-rights/> (Accessed 6 December 2018)
- Black's Law Dictionary Free 2nd Ed. and The Law Dictionary (2020a. 'What is De Jure?'. <https://thelawdictionary.org/de-jure/> (Assessed 24 February 2020)

- Black's Law Dictionary Free 2nd Ed. and The Law Dictionary (2020b). 'What is De Facto?' <https://thelawdictionary.org/de-facto/> (Assessed 24 February 2020)
- Burchi, S. 2012. A comparative review of contemporary water resources legislation: Trends, developments and an agenda for reform. *Water International*, pp. 613-627.
- Caponera, D.A. (Ed.) 1979. Water law in selected African countries (Benin, Burundi, Ethiopia, Gabon, Kenya, Mauritius, Sierra Leone, Swaziland, Upper Volta, Zambia). Rome: Food and Agricultural Organization of the United Nations. www.fao.org/fileadmin/user_upload/legal/docs/1_ls17-e.pdf (Assessed 31 March 2020)
- Constitution of the Republic of South Africa, 1996. Act No. 108 of 1996. Government Gazette, 378. Republic of South Africa.
- Cullet, P. and Gupta, J. 2009. Evolution of water law and policy in India. In Dellapenna, J. and Gupta, J. (Eds), Gupta, J. and Dellapenna, J. (Eds), *The evolution of the law and politics of water*, pp. 3-19. Dordrecht: Springer Netherlands.
- Cullet, P. 2011. Water law in a globalised world: The need for a new conceptual framework. *Journal of Environmental Law* 23(2): 233-254.
- Cullet, P. 2012. Water use and rights – India. In Geall, S.; Liu, J. and Pellissery, S. (Eds), *The Berkshire Encyclopedia of Sustainability*, Vol. 7: China, India, and East and Southeast Asia: Assessing Sustainability, pp. 393-395. Great Barrington, MA: Berkshire Publishing.
- Dellapenna, J.W. and Gupta, J. 2008. Toward global law on water, *Global Governance*, 14(4), pp. 437-453. doi: 10.2307/27800723.
- Dellapenna, J.W. and Gupta, J. (Eds) 2009. The evolution of global water law. In Dellapenna, J. and Gupta, J. (Eds), *The evolution of the law and politics of water*, pp. 3-19. Dordrecht: Springer Netherlands.
- Denby, K.; Movik, S.; Mehta, L.; van Koppen, B. 2016. The 'trickle down' of IWRM: A case study of local-level realities in the Inkomati Water Management Area, South Africa. *Water Alternatives* 9(3): 473-492. www.water-alternatives.org/index.php/alldoc/articles/vol9/v9issue3/332-a9-3-7/file (Accessed 31 March 2020)
- DWAF (Department of Water Affairs and Forestry) (2001. Government Gazette, 14 December 2001, No. 22929 – Department of Water Affairs and Forestry, Government Notice No. 1357, First Edition Environmental Implementation and Management Plan in Terms of Chapter 3 of the National Environmental Management Act, 1998.
- DWS (Department of Water and Sanitation) 2012. Digital Map Library: RSA Drainage Region Boundaries & 2012WMA. www.dwa.gov.za/SLIM/DML.aspx (Accessed 2 November 2018)
- DWS (Department of Water and Sanitation) (2017. Government Gazette 12 December 2017, No. 41317, Department of Water and Sanitation Notice No. 1394, Breede-Gouritz and Berg-Olifants Water Management Areas: Limiting the use of water in terms of item 6 of schedule 3 of the *National Water Act*, 1998 (Act No. 36 of 1998) for urban, irrigation and industrial (including mining) purposes. https://juta.co.za/media/filestore/2018/01/GG_41317.pdf (Assessed 31 March 2020)
- DWS (Department of Water and Sanitation) (2018. Government Gazette 12 January 2018, No. 41381, Department of Water and Sanitation Notice No. 15, *National Water Act*, 1998: Breede-Gouritz and Berg-Olifants Water Management Areas: Limiting the use of water in terms of item 6 of Schedule 6 of the Act, for urban irrigation and industrial (including mining) purposes. www.dwa.gov.za/Documents/Gazettes/41381_12-1_WaterSanitation.pdf (Assessed 31 March 2020)
- DWAF (Department of Water Affairs and Forestry) (2001. Government Gazette 14 December 2001, No. 22929, Department of Water Affairs and Forestry Notice No. 1357, First Edition Environmental Implementation and Management Plan in Terms of Chapter 3 of the National Environmental Management Act, 1998. https://www.gov.za/sites/default/files/gcis_document/201409/22929.pdf (Assessed 31 March 2020)
- Falkenmark, M. and Molden, D. 2008. Wake up to realities of river basin closure. *International Journal of Water Resources Development* 24(2): 201-215.
- FAO (Food and Agriculture Organization) 2005. Irrigation in Africa in figures-AQUASTAT Survey 2005. www.fao.org/nr/water/aquastat/countries_regions/SOM/SOM-CP_eng.pdf (Accessed 2 November 2018)

- FAO (Food and Agriculture Organization) 2015. AQUASTAT – FAO’s Information System on Water and Agriculture – Water withdrawal ratios by continent. www.fao.org/nr/water/aquastat/water_use/image/WithRatio_eng.pdf (Accessed 2 November 2018)
- FAO (Food and Agriculture Organization) 2020. FAOLEX Database: Eritrea – Aqualex Profiles. www.fao.org/faolex/aqualex/general-profile/en/?iso3=ERI (Assessed 31 March 2020)
- Getzler, J. 2004. *A history of water rights at common law*. Oxford: Oxford University Press.
- Glazewski, J. and Du Toit, L. 2013. *Environmental law in South Africa*. Durban, LexisNexis Butterworths.
- Gray, J. and Lee, L. 2018. Water entitlements as property: A work in progress or watertight now? In Holley, C. and Sinclair, D. (Eds) *Reforming water law and governance*, pp. 101-122. Singapore: Springer Singapore.
- Gupta, J. and Dellapenna, J.W. 2009. The challenges for the twenty-first century: A critical approach. In Dellapenna, J. and Gupta, J. (Eds), *The evolution of the law and politics of water*, pp. 391-410. Dordrecht: Springer Netherlands.
- Gupta, J.; Pahl-Wostl, C. and Zondervan, R. 2013. "Glocal" water governance: A multi-level challenge in the Anthropocene. *Current Opinion in Environmental Sustainability* 5(6): 573-580.
- Hall, C.G. 1939. *The origin and development of water rights in South Africa*. Oxford University Press, Oxford.
- Hodgson, S. 2006. Modern water rights – Theory and practice. Rome: Food and Agriculture Organization of The United Nations (FAO). www.fao.org/3/a-a0864e.pdf (Assessed 24 February 2020)
- Hodgson, S. 2016. Exploring the concept of water tenure. Rome: Food and Agriculture Organization of The United Nations (FAO). www.fao.org/3/a-i5435e.pdf (Accessed 1 November 2018)
- IPCC (Intergovernmental Panel on Climate Change) 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (Eds)]. IPCC, Geneva, Switzerland, 151 pp.
- Kidd, M. 2009. South Africa: The development of water law. In Dellapenna, J. and Gupta, J. (Eds), *The evolution of the law and politics of water*, pp. 87-104. Dordrecht: Springer Netherlands.
- Kidd, M. 2016. Compulsory licensing under South Africa’s National Water Act. *Water International* 41(6): 916-927.
- Marcatelli, M. and Büscher, B. 2019. Liquid violence: The politics of water responsabilisation and dispossession in South Africa. *Water Alternatives* 12(2): 760-773.
- McKenzie, M. 2009. Water rights in NSW: properly property? *Sydney Law Review* 31(3): 443. <https://heinonline.org/HOL/Page?handle=hein.journals/sydney31&id=443&div=27&collection=journals> (Accessed 31 July 2019)
- Mineral and Petroleum Resources Development Act (MPRDA), 2002. (Act 28 of 2002). Republic of South Africa.
- Naff, T. 2009. Islamic law and the politics of water. In Dellapenna, J. and Gupta, J. (Eds), *The evolution of the law and politics of water*, pp. 37-52. Dordrecht: Springer Netherlands.
- NWA National Water Act. 1998. Act No. 36 of 1998. Republic of South Africa.
- Nilsson, D. and Nyanchaga, E.N. 2009. East African water regimes: The case of Kenya. In Dellapenna, J. and Gupta, J. (Eds), *The evolution of the law and politics of water*, pp. 105-120. Dordrecht: Springer Netherlands.
- Perret, S.R. 2002. Water policies and smallholding irrigation schemes in South Africa: A history and new institutional challenges. *Water Policy* 4(3): 283-300.
- Peters, R. and Woodhouse, P. 2019. Reform and regression: Discourses of water reallocation in Mpumalanga, South Africa. *Water Alternatives* 12(3): 1-16.
- Pradhan, R.; Meinzen-Dick, R. and Theis, S. 2018. Property rights, intersectionality, and women’s empowerment in Nepal. IFPRI Discussion Paper 1702. <https://ssrn.com/abstract=3118400>
- PAPLRA (Presidential Advisory Panel on Land Reform and Agriculture) (2019. Final Report of the Presidential Advisory Panel on Land Reform and Agriculture. https://www.gov.za/sites/default/files/gcis_document/201907/panelreportlandreform_0.pdf (Assessed 26 February 2020)
- Ramazzotti, M. 1996. *Readings in African customary water law / Anthologie du droit coutumier de l’eau en Afrique*. Rome: Food and Agriculture Organization of the United Nations.

- Rawlins, J. 2019. Political economy of water reallocation in South Africa: Insights from the Western Cape water crisis. *Water Security* 6: 1-7.
- RSA (Republic of South Africa) (2011). National Development Plan: Our Future Make it Work. 2030 Vision. National Planning Commission, The Presidency, National Planning Commission, Pretoria.
www.poa.gov.za/news/Documents/NPC%20National%20Development%20Plan%20Vision%202030%20lo-res.pdf (Accessed 01 June 2018)
- Schreiner, B.; Mohapi, N.; van Koppen, B. 2004. Washing away poverty: Water, democracy and gendered poverty eradication in South Africa. *Natural Resources Forum* 28: 171-178.
- Schreiner, B.; Sithole, P. and van Koppen, B. 2017. Water permit systems, policy reforms and implications for equity in South Africa. <http://africa.iwmi.cgiar.org/wp-content/uploads/sites/2/2017/04/Water-Permitting-South-Africa-Country-Report-PI-IWMI-March-2017.pdf> (Accessed 2 November 2018)
- Seetal, A. 2012. Compulsory licensing "first ever" project. *Water Sewage and Effluent*: 18-24
- Seetal, A. 2006. Progress with water allocation reform in South Africa. In *Water and Agriculture Sustainability, Markets and Policies*, pp. 437-452. Paris: OECD Publishing.
- Slaughter, R.A. and Wiener, J.D. 2007. Water, adaptation, and property rights on the Snake and Klamath rivers. *Journal of the American Water Resources Association* 43(2): 308-321.
- Soltau, F. 1999. Environmental justice, water rights and property. *Acta Juridica*.
<https://heinonline.org/HOL/Page?handle=hein.journals/actj1999&id=241&div=15&collection=journals> (Accessed 2 November 2018)
- Tewari, D.D. 2009. A detailed analysis of evolution of water rights in South Africa: An account of three and a half centuries from 1652 AD to present. *Water SA* 35(5): 693-710.
- Turton, A.R. and Botha, F.S. 2014. Anthropogenic aquifer: New thinking. In Eslamian, S. (Ed), *Handbook of engineering hydrology: environmental hydrology and water management*, pp. 1-15. CRC Press.
- UN-DESA (United Nations: Department of Economic and Social Affairs – Population Division) (2017). World Population Prospects. The 2017 Revision, World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. Working Paper No. ESA/P/WP/248. doi: 10.1017/CBO9781107415324.004.
- USAID (United States Agency for International Development) 2010. Liberia Water and Sanitation Profile.
www.washplus.org/sites/default/files/liberia2010.pdf (Accessed 2 October 2018)
- van Koppen, B.; van der Zaag, P.; Manzungu, E. and Tapela, B. 2014. Roman water law in rural Africa: The unfinished business of colonial dispossession. *Water International* 39(1): 49-62.
- van Koppen, B. and Schreiner, B. 2018. A hybrid approach to decolonize formal water law in Africa. IWMI Research Report 173. <https://reachwater.org.uk/wp-content/uploads/2018/10/IWMI-Research-Report-173-002.pdf> (Assessed 24 February 2020)
- van Koppen, B. and Schreiner, B. 2014. Priority General Authorisations in rights-based water use authorisation in South Africa. *Water Policy* 16: 59-77.
- von Benda-Beckmann, F., von Benda-Beckmann, K., and Wiber, M. 2009. The properties of property. In von Benda-Beckmann, F., von Benda-Beckmann, K., and Wiber, M. (Eds), *Changing properties of property*, pp. 1-39. New York: Berghahn Books.
- Willy, L.A. 2012. Customary land tenure in the modern world rights to resources in crisis: reviewing the fate of customary tenure in Africa – Brief #1 of 5. <https://rightsandresources.org/wp-content/exported-pdf/rightstoresourcesincrisiscompiledenglish.pdf> (Assessed 31 March 2020)
- Zellmer, S.B. and Harder, J. 2008. Unbundling property in water. *Alabama Law Review* 59: 679-745.

APPENDIX A

- Botswana Water Act 1968, c.34: 01.* Republic of Botswana. <http://extwprlegs1.fao.org/docs/pdf/bot42105.pdf> (Assessed 31 March 2020).
- Burundi Water Code 2012.* Loi n°1/02 du 26 mars 2012 portant code de l'eau au Burundi. Republic of Burundi. <http://extwprlegs1.fao.org/docs/pdf/bur129952.pdf> (Assessed 31 March 2020).

- Cameroon Water Code 1998*. Loi N°98-005 du 14 Avril 1998 Portant Régime de L'eau. Republic of Cameroon <http://extwprlegs1.fao.org/docs/pdf/cmr33974.pdf> (Assessed 31 March 2020)
- Constitution of the Republic of Namibia 1990*, Act No. 1. Republic of Namibia. https://www.constituteproject.org/constitution/Namibia_2010.pdf (Assessed 31 March 2020)
- Constitution of the Republic of South Africa 1996*, Act No. 108. Government Gazette, 378. Republic of South Africa. https://www.constituteproject.org/constitution/South_Africa_2012.pdf?lang=en (Assessed 31 March 2020)
- Ethiopia Water Resources Management Proclamation 2000*. No. 197/2000. Federal Democratic Republic of Ethiopia. <http://extwprlegs1.fao.org/docs/pdf/eth44004.pdf> (Assessed 31 March 2020)
- Gambia Water Bill 2014*, Post-Validation Workshop Version. Republic of The Gambia. Not available online; text with authors.
- Ghana Water Resources Commission Act 1996*, Act No 522. Republic of Ghana. <http://extwprlegs1.fao.org/docs/pdf/gha10691.pdf> (Assessed 31 March 2020)
- Kenya Water Act 2016*, Act No. 43. Republic of Kenya. <http://extwprlegs1.fao.org/docs/pdf/ken160877.pdf> (Assessed 31 March 2020)
- Lesotho Water Act 2008*, Act No. 15. Kingdom of Lesotho. <http://extwprlegs1.fao.org/docs/pdf/les139287.pdf> (Assessed 31 March 2020)
- Madagascar Water Code 1999*. Loi n° 98-029 du 20 janvier 1999 portant Code de l'Eau. Republic of Madagascar. <http://extwprlegs1.fao.org/docs/pdf/mad19324.pdf> (Assessed 31 March 2020)
- Malawi Water Resources Act 2013*, Act No 2. Republic of Malawi. <http://extwprlegs1.fao.org/docs/pdf/mlw167598.pdf> (Assessed 31 March 2020)
- Mauritius Central Water Authority Act 1971*, Act No. 20. Republic of Mauritius. <http://extwprlegs1.fao.org/docs/pdf/mat74271.pdf> (Assessed 31 March 2020)
- Namibia Water Resources Management Act 2013*, Act No 11. Republic of Namibia. <http://extwprlegs1.fao.org/docs/pdf/nam134273.pdf> (Assessed 31 March 2020)
- National Water Act 1998*, Act No. 36. Republic of South Africa. <http://extwprlegs1.fao.org/docs/pdf/saf123836.pdf> (Assessed 31 March 2020)
- Water Resources Decree 1993*, No. 101. Federal Republic of Nigeria. www.fao.org/faolex/results/details/en/c/LEX-FAOC004832 (Assessed 31 March 2020)
- Rwanda Water Law 2008*. Law N°62/2008 of 10/09/2008. Republic of Rwanda. <http://extwprlegs1.fao.org/docs/pdf/Rwa182098.pdf> (Assessed 31 March 2020)
- Sierra Leone Water Company Act 2017*. Act Supplement to the Sierra Leone Gazette, Vol. CXLVIII, No. 48. Republic of Sierra Leone. <http://extwprlegs1.fao.org/docs/pdf/sie176312.pdf>
- South Africa Mineral and Petroleum Resources Development Act (MPRDA) 2002*, c.28. Republic of South Africa. <http://extwprlegs1.fao.org/docs/pdf/saf45287.pdf> (Assessed 31 March 2020)
- South Africa Water Act 1956*. Act No. 54. Republic of South Africa. <http://extwprlegs1.fao.org/docs/pdf/saf1272.pdf> (Assessed 31 March 2020)
- Swaziland [Eswatini] Water Act 2003*. Act No. 7. Kingdom of Swaziland.
- Tanzania Water Resources Management Act 2009*. Act No. 11. United Republic of Tanzania. <http://extwprlegs1.fao.org/docs/pdf/swa45031.pdf> (Assessed 31 March 2020)
- Uganda Water Act 1997*, Cap. 152. Republic of Uganda. <http://extwprlegs1.fao.org/docs/pdf/uga5251.pdf> (Assessed 31 March 2020)
- Irrigation and Conservation of Water Act 1912*, c.8. Union of South Africa. <http://extwprlegs1.fao.org/docs/pdf/nsw9224.pdf> (Assessed 31 March 2020)
- Zambia Water Resources Management Act 2011*, c.21. Republic of Zambia. <http://extwprlegs1.fao.org/docs/pdf/zam117433.pdf> (Assessed 31 March 2020)
- Zimbabwe Water Act 2002*, c.20: 24. Republic of Zimbabwe. <http://extwprlegs1.fao.org/docs/pdf/zim26168.pdf> (Assessed 31 March 2020)

APPENDIX B

Country	De jure organisation of water ownership
Botswana	"Use of Public Water and Construction of Works: Notwithstanding anything to the contrary in any other written law there shall be no right of property in public water, and the control and use thereof shall be regulated as provided in this Act or in accordance with the provisions of the Waterworks Act". (<i>Botswana Water Act 1968</i> : Art. 4)
Eswatini	"The Right in Water: (1) All water found naturally in Swaziland is hereby declared a national resource. (2) There shall be no private right of property in any water found naturally in Swaziland". (<i>Eswatini Water Act 2003</i> : Art. 34 (1) and (2))
Ethiopia	"Public Ownership of Water Resources: All water resources of the country are the common property of the Ethiopian people and the state". (<i>Ethiopia Water Resources Management Proclamation 2000</i> : Art. 5)
(The) Gambia	"Entitlement to Water: The entire property in and control of all watercourses, surface freshwaters, springs and groundwater shall be vested in the State". (<i>The Gambia Water Act 2014</i> : Art. 5(1))
Ghana	"Public Water Vested in President – The property in and control of all water resources is vested in the President on behalf of, and in trust for the people of the Republic". (<i>Ghana Water Resources Commission Act 1996</i> : Art. 12)
Kenya	"Every water resource is vested in and held by the national government in trust for the people of Kenya". (<i>Kenya Water Act 2016</i> : Art. 5) "Upon the commencement of this Act, no conveyance, lease or other instrument shall convey, assure, demise, transfer or vest in any person any property, right, interest or privilege in respect of any water resource except as may be prescribed under this Act". (<i>Kenya Water Act 2016</i> : Art. 7)
Lesotho	"The ownership of all water resources in Lesotho is vested in the Basotho Nation and held in trust by the King on behalf of the Basotho Nation". (<i>Lesotho Water Act 2008</i> : Art. 4)
Malawi	"All water resources are hereby vested in the State, subject to any rights of a user granted by or under this Act or any other written law". (<i>Malawi Water Resources Act 2013</i> : Art. 5)
Mauritius	"Establishment of the Authority (1) There is established for the purposes of this Act a corporation to be known as the Central Water Authority. (2) The Authority shall be a body corporate" (<i>Central Water Authority Act 1971</i>) "Objects of the Authority: The Authority shall be responsible for the control, development and conservation of water resources" (<i>Central Water Authority Act 1971</i>)
Namibia	"The State, in its capacity as owner of the water resources of Namibia by virtue of Article 100 of the Namibian Constitution has the responsibility to ensure that water resources are managed and used to the benefit of all people in furtherance of the objects of this Act". (<i>Namibia Water Resources Management Act 2013</i> : Art. 4)
Nigeria	"Vesting of Rights and Control of Water in the Federal Government: The right to the use and control of all surface and groundwater and of any water-course affecting more than one State as described in the Schedule to this Act, together with the bed and banks

	thereof, are by virtue of this Act and without further assurance vested in the Government of the Federation for the purpose of (...)"'. (<i>Nigeria Water Resources Decree 1993</i> : Art. 1)
Rwanda	"Ownership and Control of Water Resources: The State owns and controls water resources". (<i>Rwanda Water Act 2018</i> : Art. 18)
Sierra Leone	"The property in and control of all water resources is vested in the Government and people of Sierra Leone". (<i>The Sierra Leone Water Company Act 2017</i> : Art. 3(1))
South Africa	"As the public trustee of the nation's water resources the National Government, acting through the Minister, must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate". (<i>South Africa National Water Law 1998</i> : Art. 3(1))
South Sudan	"Water is an important natural resource which is commonly owned by all riparian people". (<i>South Sudan Water Policy 2007</i> : page 8, 2.3.1)
Tanzania	"All water resources in Mainland Tanzania shall continue to be public water and vested in the President as the trustee for and on behalf of citizens". (<i>Tanzania Water Resources Management Act 2009</i> : Art. 10(1))
Uganda	"Rights in Water Vested in the Government: All rights to investigate, control, protect and manage water in Uganda for any use is vested in the Government and shall be exercised by the Minister and the director in accordance with this Part of the Act". (<i>Uganda Water Act 1997</i> : 5)
Zambia	"Subject to this Act and notwithstanding any other law, instrument or document, all water, in its natural state, in Zambia vests in the President and is held by the President on behalf and benefit of the people of Zambia. (...) Notwithstanding any other law, a person shall not own any water, in its natural state, in Zambia and no property in such water shall be acquired". (<i>Zambia Water Resources Management Act 2011</i> : Art. 3) "The management of water resources in Zambia shall be governed by the following principles: (i) there shall be no private ownership of water and no authorisation for its use shall be in perpetuity; (j) the State shall be the trustee of the nation's water resources and shall ensure that water is allocated equitably, protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, in the public interest while promoting environmental and social values and protecting Zambia's territorial sovereignty". (<i>Zambia Water Resources Management Act 2011</i> : Art. 6(i) and (j))
Zimbabwe	"Water Vested in President: Subject to this Act, all water is vested in the President". "No Private Ownership of Water: (1) No person shall be entitled to ownership of any water in Zimbabwe and no water shall be stored, abstracted, apportioned, controlled, diverted, used or in any way dealt with except in accordance with this Act". (<i>Zimbabwe Water Act 1998</i> : Art. 3 and 4)

THIS ARTICLE IS DISTRIBUTED UNDER THE TERMS OF THE CREATIVE COMMONS *ATTRIBUTION-NONCOMMERCIAL-SHAREALIKE* LICENSE WHICH PERMITS ANY NON COMMERCIAL USE, DISTRIBUTION, AND REPRODUCTION IN ANY MEDIUM, PROVIDED THE ORIGINAL AUTHOR(S) AND SOURCE ARE CREDITED. SEE [HTTPS://CREATIVECOMMONS.ORG/LICENSES/BY-NC-SA/3.0/FR/DEED.EN](https://creativecommons.org/licenses/by-nc-sa/3.0/fr/deed.en)

