

Cadastral Mapping of Water as an Individualised Human Right

‘Water, water, everywhere, nor any drop to drink’

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Key words: cadastre, risk management, water security

SUMMARY

Water is a scarce resource worldwide. Unequal allocations of potable water must be anticipated and managed to avoid disease and conflict. An information system that records each human's right to water can be used as a risk management tool. The South African cadastre was implemented by the Dutch in the late 1600's, but is now at a watershed. In 2019 a Presidential advisory panel recommended the creation of a new integrated and consolidated land administration and information system, with all land-related records held in one data portal. If this new system is developed, it will be under very different circumstances, in a fully democratic, constitutional society. Due to South Africa's racially based land titling history, a draft Bill to amend the Constitution is now open for public comment. If passed, it will permit expropriation of land for land reform purposes without payment of compensation to the owners of the land. Notably the three most basic land-related human rights are for shelter, food and water. Later in the 21st century imperialistic wars may be fought over who is given title to water, rather than over land. So while South Africa is still dealing with the fallout of past land titling, the world is at the beginning of a new titling challenge. We must learn from the past. This paper raises certain failures of past land titling, dating from colonial times and thereafter, that speak into this. It then compares this with equivalent problems seen in recent titling for state-subsidised housing that provides shelter for the poor. Free municipal service benefits for indigent households are listed in the name of a household representative alone. This mirrors past titling of land in the name of a man alone. Relationships between people in a household must also be mapped. An integrated cadastre could record water benefits for each member of a household, instead of in the name of a household representative. This would avoid the loss of rights seen in past systems. Proper balancing of group water rights with individual rights could diminish inequality, improve health and promote peace and justice. Ideally the human right to water should be defensible not only by vulnerable individuals, but by every human being. Indigent water benefits offer an opportunity to design an integrated cadastral model for entitlements to potable water that would enable fulfilment of the United Nations Sustainable Development Goals. While rights to water are contested, they are currently less contested than rights to land. If this endeavour is successful, it could shine a light on the way other land-related records should be structured in the integrated land information systems of the future.

Cadastral Mapping of Water as an Individualised Human Right: Water, Water Everywhere, nor Any Drop to Drink
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1. DAY ZERO - THE DAY THE TAPS RUN DRY

The phrase ‘Day Zero’ was used as a rallying call by the City of Cape Town at the peak of the 2018 drought. It referred to a day from which municipalities would no longer be able to supply potable water. The cutoff point was a dam level of 13.5% and below. Most Capetonians rose to the challenge of drastically reducing water use, and the disaster was averted. Had the day arrived, residents would have had to physically collect 25 litres of water per person, per day. Mercifully the Cape has now been blessed with rain and full dams.

A future Day Zero still looms ominously for much of the planet. Severe water loss can be life threatening, making unfair allocations of water a serious problem. If one person goes to three different collection points and gets 75 litres, with others arriving once the daily water has run out, this is a recipe for disease and conflict. An integrated cadastre that is able to link data about individuals with data about benefits based on human rights can be used as a tool to anticipate and manage this risk.

The South African Constitution, like most bills of rights, includes the human right to shelter, food and water. Section 27 protects the right to access sufficient water, and tasks the state with taking ‘reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right’. Later in this century imperialistic wars may be fought over who is entitled to water, rather than land. We are therefore at the beginning of a new titling challenge.

Like land, water is an increasingly scarce resource. A multipurpose cadastral system covers juridical, fiscal and regulatory cadastral aspects. Those involved with mapping and recording information pertaining to water must learn from the successes and failures of past land titling. The way records for entitlements to potable water are structured now will lay the foundation for future rights.

Pro-poor entitlements to state-subsidised land are compared with entitlements to free potable water in this paper. A cadastral model for pro-poor water benefits is suggested that goes beyond the mapping of geographic areas, to the mapping of relationships between people and water. A time may come when every individual's human right to potable water is at risk, with this not only a local issue but an international one. A good cadastral system must aim to pre-empt and resolve conflict. Data for indigent water benefits is a very good place to start taking measures for the progressive realisation of the right to access water.

2. BACKGROUND TO THE SOUTH AFRICAN CADASTRE

A system for recording private title to land in South Africa was implemented by the Dutch, with the first deed of grant issued in 1657. The basic cadastral approach was retained by subsequent colonisers, due to its perceived strengths. Individualised title deeds and surveyors' diagrams have therefore existed in the Cape deeds registry over five centuries. Despite the winds of political change, a deed of transfer (*transportakte*) remains the 'vessel' bearing landed property rights to the Deeds Office. However, this cadastre is now at a watershed, both for land and water records.

In 2019 an advisory panel was tasked with reporting to the President on land reform and agriculture. The panel's report placed a new consolidated, integrated planning and land information system first amongst their recommendations for immediate action. The Cabinet response to this has been inconclusive, but if it goes ahead, all land-related records would be held in one data portal, including water records. The Electronic Deeds Registration Systems Act also came into effect in 2019. This sets the stage for new cadastral processes and adaptations to be considered.

Any new integrated and consolidated system would be developed under very different circumstances to the colonial and apartheid eras. South Africa is now a fully democratic, constitutional society. However, due to its history of legislated racial injustice, the human right to protection of private property is contested. Due to South Africa's racially-based land titling history, the governing party (the African National Congress) is calling for land expropriation without compensation. A draft Bill to amend the Constitution is now open for public comment. If passed, it will permit expropriation of land for land reform purposes without payment of compensation to the owners of the land. Concern that this will trigger a crisis over land ownership has tended to overshadow other land resource issues. Civil unrest over inadequate municipal services is, however, also common – with the focus on shelter, toilets, water and electricity.

3. PRO-POOR HOUSING

Almost a third of the privately-owned properties registered in the South African deeds registry were originally subsidised by the state. South Africa has had an extremely vigorous approach to delivering pro-poor housing since the end of apartheid in 1994. Although there have been varying programmes over the years, this is colloquially referred to as 'RDP' (Reconstruction and Development Programme) housing. Most such housing was awarded free to needy households, with the land transferred direct from the state to the beneficiaries. This has created an important body of private landowners emerging out of poverty.

Millions of South African beneficiaries have received housing. Millions more have provided household information to state databases to apply for it. This housing land information system captures information about people, subsidies and subsidised land. Some of this information carries forward into title deeds registered in the deeds registry. The registry is also called the

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Deeds Office (or the cadastre, when speaking of a cadastre in broad terms). These records represent South Africa's most developed housing and land information system. It incorporates many official facts, upon which the land rights of individuals depend.

The people who apply for housing are by definition vulnerable, as beneficiary households qualify via a means test for household income. Later occupants of such housing (who are not the initial state beneficiaries) are often equally vulnerable. Many 'RDP' properties (and apartheid era properties that have been upgraded to ownership) have been sold. This has created an important secondary market of low-cost housing. A sizeable proportion of this market functions as poor-to-poor alienations. A number of these transactions are conducted as informal sales. There are also large numbers of deceased estates that are not reported, meaning that many properties are not formally transferred to the heirs. As records for people's relationship to land loosens, so boundaries between properties become blurred on the ground. This makes keeping the cadastre up to date and accurate a challenge. Spacial and legal aspects are not easily separated, nor should they be.

The information collected by the state in state-subsidised housing applications is similar to that required from applicants for indigent basic service benefits. The housing information system is however much more developed, as it works towards beneficiaries being registered as owners of a particular land parcel in the deeds registry, with all the precision that entails. As integrated and consolidated planning and land information systems become more sophisticated, such precision is likely to become necessary for individual water entitlements. Pro-poor housing processes that map people's relationships to land offer important insights for record-keeping for free basic services.

4. FREE BASIC SERVICES

Free basic services in South Africa are defined as the minimum amount of basic services that need to be provided on a day to day basis to cover the basic needs of indigent households. They include water, energy, sanitation and refuse removal. Only indigent households can apply for such free services. The application criteria include a means test to prove financial need which identifies the poorest of the poor. This test is similar to that used for awarding state-subsidised housing.

In the City of Cape Town metropolitan area, for example, the household income threshold to apply for state-assisted housing in 2020 is R3 500.00 per month. The income threshold for indigent services support is R4 501.00 to R6 000.00, with benefits on a sliding scale. While it differs throughout the country, free basic services usually include a minimum of 6kl of water, 50kWh of electricity, and free sewerage and sanitation up to R50.00 per month, per household. Services supplied above these thresholds must be paid for.

Local registers of those entitled to free services do not currently form part of the land records held by the Deeds Office. Recording indigent services applications is seen largely as an administrative function. Municipalities set criteria for applicants to qualify for indigent status,

with different categories of subsidies set out in various indigent by-laws and policies. In some municipalities, households qualify for a 100% subsidies, while others might qualify for less.

Needy households living in state-subsidised housing are likely to rent to back yard dwellers to supplement their income. This means there can be more than one indigent household or sets of indigent individuals on one property, who may not necessarily have free service benefits. Free water could then become a commodity traded by the holder of the indigent right, instead of a basic human right, as intended. If an indigent woman and her child is informally evicted by the man of the house, leaving that man in possession of the full quota of free household water, this must be problematised.

Cross-referencing of internal municipal records such as land-based rates records, housing records and indigent records varies from area to area. Large metropolitan municipalities increasingly see the advantage of funding more ambitious systems. Data collection for water benefits should be structured with the same precision as data collection for land benefits. This is not currently the case. We must prepare now for a time when close monitoring of water allocations might become a universal need.

5. PRO-POOR TITLE DEED REGISTRATION

Before comparing cadastral approaches to individual land and water rights, a very basic explanation of land registration in the South African deeds registry is necessary. South Africa's history of land dispossession has rightly resulted in strong resistance to 'second class' legal processes for the poor. Accordingly, a transfer of an 'RDP' house to a beneficiary (from the state) follows essentially the same legal process as land bought by an advantaged landowner. The conveyancing rules for transferring an 'RDP' property are based on the same principles as for other properties.

Transfers to natural persons (ie not trusts or companies) are made to sole owners or co-owners. Conveyancers are required to obtain an affidavit from both the seller and the buyer, in which marital status is confirmed. Marriage in community of property is the default marital regime in South Africa. It is compulsory now to include the name of a spouse married in community of property as a co-owner when a property is registered. Endorsing a subsequent marriage is optional, not compulsory. African customary marriages, being potentially polygynous, use slightly different formalities.

As in the Netherlands, couples can opt for marrying out of community of property with a prenuptial agreement. It is notable that both this matrimonial property arrangement *as well as* South Africa's land titling have Dutch roots. Individual rights to land and shelter are closely linked to family. Matrimonial property principles used in an established economy are not always an ideal fit for use in a country with very high levels of poverty. While the state pays for the cost of transferring and registering a state-subsidised property into the name of beneficiaries in South Africa, there is no legal aid for prenuptial and cohabitation agreements.

Since 'RDP' title deeds follow the same titling conventions as other deeds, they are registered in the name of one beneficiary as sole title holder. Two beneficiaries can also be registered as co-owners. A byline indicating marital status (as either in community of property or out of community of property by prenuptial contract) is included in the deed. Land transferred to poor married beneficiaries is almost always registered in a couple's joint names: as co-owners married in community of property. Couples married in this way are responsible for each other's debts. This is obviously of concern for couples who had to pass a means test indicative of poverty to qualify for ownership of 'RDP' land.

There are currently many problems with 'RDP' and low-cost housing registrations. Some of these problems are triggered by inadequate records leading up to the registration process. One key failure is that it is not compulsory to enter into a cohabitation or matrimonial property agreement before registering ownership of an 'RDP' property. This causes many titling problems that could easily be avoided by presentation of a formal record proving agreed cohabitation and alienation rights. South Africa has a very substantial constituency of poor private landowners. Improved service delivery in respect of registering their title deeds is critical for the integrity of the South African deeds registry.

6. INDIVIDUALISED TITLING OF LAND

Colonial regimes often replaced the African concept of communitarian land with registered title deeds that entrenched rights for individuals. Cadastres were used to facilitate race-based land laws. The injustices of this colonial land heritage are important, but this paper does not focus on land ownership records. It is on an equivalent individualisation of rights, when records for an indigent household group result in one primary right holder. Recording communitarian rights to services (in this case the rights of an indigent household) in the name of one individual from that household, mirrors past land practices that were unjust.

This paper cannot attempt a history of international cadastral approaches. Suffice it to say that historically – in South Africa and elsewhere – patriarchal norms have prioritised men as primary right holders. In Western systems ancestral succession rights, dowry systems and a husband's 'marital power' concentrated land ownership in the hands of men. Family and household rights were conflated into an individual right, with these group rights often recorded in the name of a man alone. Women and children were protected by a second-class system of rights. This meant that the rights of both vulnerable males and females hinged very precariously on those owing them a duty of care.

Lobola agreements underpin African society and its communitarian worldview. These agreements are entered into between the families of the spouses. They are usually informal. A prenuptial agreement between the couple, should they have one, functions alongside a lobola agreement, since the parties differ. Prenuptial agreements are registered in the Deeds Office, but lobola agreements are not. The need for 'family titles' is now under discussion. Lobola agreements fill a serious gap in Western contract law. Statistics show increasing numbers of multi-generational families living together worldwide. Family agreements are equally

necessary outside of Africa. Consideration must be given to how the rights of individuals in groups can be protected, with families the building blocks of society.

Equality principles have prevailed for many years now in South Africa. However, the effects of patriarchal record-keeping still endure in certain instances, to the detriment of dependents. More recent 'RDP' housing policy rightly compels all cohabiting partners (married or unmarried) to be recorded as co-owners in the deeds registry. Notably, however, while there is a process for recording a marriage after acquisition of a property, this process is not compulsory. Meaning it is still possible to have deeds in the deeds office that indicate someone is 'unmarried' when they are married. Therefore, records referring to one right holder alone, when there is in fact a layer of other right holders, still exist. Such individualisation of a right is in fact not individualisation of that right at all. Rather, it is the disempowerment of a group of individuals, by one particular individual.

The names of other dependents such as parents and children (for example at the time of application for a housing benefit) are not included in title deeds unless there is a servitude in their favour. This despite the fact that their names might form part of official applications to obtain 'RDP' housing. In other words, women and men are now treated equally, but rights remain individualised in the names of one or two adults. The absence of records of dependents and those with rights to intestate succession is a pity. State records often have a much greater impact on dependent's rights than the laws that aim to protect them.

7. INVISIBLE INDIVIDUALS

The individualised record-keeping and land titling approach used for pro-poor housing has made the rights of many household dependents invisible. Unequal power relations within a household, or between landlords and tenants, often drive the loss of rights. We men and women in the legal and surveying professions must take responsibility not only for centuries of rights lost due to racial laws, but also due to the absence of women's names in registry and other records. *Invisible women: Exposing data bias in a world designed for men* (Perez 2019) should be compulsory reading for all systems designers.

Like state housing, indigent water allocations are also awarded for the benefit of a household. While local record-bases differ, indigent water benefits are usually recorded in the name of the applicant, who applies on behalf of their household. This applicant is likely to be the owner or the person responsible for the municipal services account. In other words, it follows the recording approach of earlier land records, many of which resulted in gender and child discrimination. Injustices arising from past recording of pro-poor land rights in the name of an individual (rather than a household) must be remembered.

The right to basic local government services accruing to a household representative is likely to be common throughout the world. Record-keeping processes can no longer consign women and children into an abyss of invisibility by recording men as the default primary right holders. In South Africa, for example, the marital power of a husband over a civil wife was only abolished in the 1980's. For African customary wives it was much later. A husband with marital power

over his wife's affairs was automatically seen as the family head. After the transition to the democratic era (1994) some housing information systems continued recording men as the primary right holder. A man's wife or cohabiting partner was seen as his dependent. This resulted in a number of title deeds being registered to men as sole title holders when those records were carried forward. This has now been changed. Information captured under the fields of family or household head – and family, dependent or occupant – can cover a multitude of sins. It was only as late as 2018 that the Rahube case finally called for legislation to bring to an end the practice of using old apartheid records to automatically identify the male 'family head' as the title holder.

New technologies are much better equipped to handle high volumes of data than past systems were. The housing rights of dependent cohabiting partners, unregistered customary wives and their children can be hugely at risk if their partner dies or discards them. Missing records about women pick up where marital power left off. Their absence enables the empowerment of men by disempowering the women they cohabited with in the past. They also disempower children with inheritance rights and vulnerable men, by making them equally invisible. Vulnerable household members need state records to support their rights.

Past titling of land in the names of men alone mirrors the recording of indigent water benefits in the name of a household applicant alone. Water is a fast diminishing resource worldwide. This kind of individualisation of communitarian rights must give land information system practitioners pause for thought. Rights to potable water should be seen as a critical titling challenge, not just an administrative record-keeping challenge.

8. BALANCING GROUP AND INDIVIDUAL RIGHTS

Group rights can only be balanced fairly with individual rights if every individual right holder within any given group is recorded. Young orphans, the elderly and women are particularly at risk of being overlooked. A group – be it a household or other community – cannot be conflated with its head. A 'head' (be it a spouse, an owner, a landlord, or the holder of a municipal account) is often the most empowered person in the household. State pro-poor initiatives give benefits to vulnerable households. Methods of data collection should not empower the most empowered member of a household more than other household members.

We must learn from the past and not allow history to repeat itself. Information system practitioners must create systems that empower vulnerable members of impoverished households. They must keep their identity and their *personal* right to free benefits visible. A cadastre can record details of dependents such as children, parents and siblings. With appropriate privacy protections they can be linked to birth, marriage or cohabitation and death records.

The failure to keep a permanent record of all members in a beneficiary household enables landowners to sell properties out from under the feet of their poor dependents. Court orders can be obtained to prevent this, but in the real world most of the poor do not have access to justice. Otherwise relief comes too late, after the proceeds are squandered. The court process is very

expensive, both for the state and for individuals. Simple records of all right holders circumvent the need for adjudication by the justice system. Individual rights can only be sustainably protected if data about both them and how they are connected to their household or community group is available.

9. DESIGNING INFORMATION SYSTEMS

The phrase ‘charity begins in the home’ is unfortunate, particularly when it comes to the duty of a care-giver to offer shelter and water. Rights should begin in the home. Conflicts within private households (and with those who live close by) are a microcosm of larger group conflicts. This is where information system practitioners must begin to interrogate record-keeping practices. Disputes over who should use free services (and who should pay water and electricity charges after the free allocation is exceeded) are likely to mirror similar disputes between larger groups. Group rights can only be fully protected if the rights of individuals in the group are respected. The legal system cannot protect the rights of a person if it does not know their name. Sustainable enforcement of rights requires easy proof of right holders.

The world’s future data portals will be heavily informed by new technologies. Technologically skilled specialists do not usually come from a legal background. In addition, most lawyers know little or nothing about a cadastre *per se*. Other professions are therefore likely to be the designers of cadastral programmes. Legal input may be absent at key points when decisions are made about how to structure databases and how they interface. Since formal state databases are vehicles for recording enforceable rights, land information systems law needs to be recognised as a distinct field. Professionals from all disciplines involved in designing cadastral systems need to be taught how to ensure no woman, man or child is made invisible. The justice outcomes of record-keeping and cross-referencing approaches can often be identified using basic principles, and averted by using common sense. Conflict avoidance should be a primary design aim of all databases constituting formal state records of rights.

In February 2020 South Africa’s President Ramaphosa announced the establishment of a Presidential Summit on Land. This summit will no doubt discuss the potential for a new consolidated, integrated information system. The Electronic Deeds Registration Systems Act also paves the way for considering new approaches for a future integrated cadastre. The bigger metropolitan areas are increasingly creating databases of indigents that can be cross-referenced with records such as those for housing. Privacy rights will have to be observed, with firewalls between databases that can only be accessed with consent. The time is ripe to analyse current data for pro-poor basic services benefits and how it is structured. A model more fit for the purpose of empowering the disempowered can then be developed.

For those interested in understanding the contemporary issues for the South African cadastre in more depth, and its history, the book *Cadastral: Principles and practice* (Fisher and Whittal 2020) is recommended. The FIG Congress in Cape Town in 2022 is timeous.

10. CONCLUSION

All individuals need the support of official data to defend their human right to housing and potable water. The state also needs such data to fulfil its responsibility to deliver basic services, to improve health, reduce poverty and promote peace and justice. We must begin in the microcosm of poor households if we are to ameliorate the disadvantages of poverty and diminish inequality. Every vulnerable citizen should have access to state records that record both their existence, and their existing land and water rights. Designers must consider the beneficial role of good data for avoiding and resolving conflict, as well as for achieving the United Nations Sustainable Development Goals.

Data modelling for information relating to scarce resources is the cadastral challenge of the 21st Century. Cadastres throughout the world are increasingly sophisticated and advanced. In capitalist societies the justice of allowing individuals to register sole and co-ownership of land is seen as a given. The cadastral processes that bring this about are deeply entrenched and seemingly carved in granite. This makes a paradigm shift to protect vulnerable dependents through new record-keeping mechanisms difficult. Records for pro-poor service benefits have not yet been institutionalised in the same way. This creates a timeous opportunity that should not be missed.

Due to South Africa's apartheid history, its most conflict-ridden debate is the right to land. It is an increasingly scarce resource still owned by an advantaged few. Land titling has been examined in this paper, for pro-poor entitling of potable water to learn from past mistakes. It is suggested that any new design for water information should have an entirely different departure point to past land titling. It must begin by recording individuals, their ancestors, and how people belong to people. This is the African way, defined by the word *ubuntu* – the belief in a universal bond of sharing that connects all humanity. 'I am because we are.' Only after these connections have been understood should it look at recording people's relationship to water, as a scarce resource that must be fairly shared.

The government may not be able to provide potable water in a particular area at a particular time. Its ability to progressively plan and realise this right will be influenced by the availability of data about the individuals needing it. Equally, individuals need such data to be formalised to protect their future rights if water becomes available. An information system approach which focusses on people (before the resource) is more fit for the purpose of protecting individual human rights. While rights to water are contested, they are currently less contested than rights to land. If a potable water information system is successfully designed, it could shine a light on how a new approach to data might resolve land conflicts in the future.

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BIOGRAPHICAL NOTES

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