Evolving property rights in water and their impact on water allocation and reallocation

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Chapter 2

Methodology and research approach
2.1 Introduction

This chapter discusses the approach and methods applied in this thesis. In the first part of this chapter, I discuss the approach taken in this thesis (see 2.2), including: (i) why I focus on the Global South and the reason to focus on countries in Africa and Asia specifically (see 2.2.1), (ii) the criteria used in selecting the countries and documents for the content analysis (see 2.2.2), and (iii) the reasons why I chose India and South Africa as case studies (see 2.2.3).

In the second part, I discuss the three methods used in this thesis (see 2.3). The first method is a literature review (see 2.3.1). The second method is a content analysis (see 2.3.2) of: (i) legislation, regulations and policy documents of 60 African and Asian countries, (ii) 80 investor-state contracts, and (iii) water related legislation of the 28 Indian States and South Africa. Results were triangulated to the extent possible through an exploration of the scholarship on the subject and twenty semi-structured online interviews.

In the last part, I discuss my positionality (see 2.4), followed by discussing the ethics of the research (see 2.5), and lastly inferences (see 2.6).

2.2 Case study approach

In this thesis I applied a two-stage multimethod case study design to address the research and sub-research questions. The first stage aimed to understand how water ownership and property rights in water are organised across Africa and Asia. In this stage, I conducted (1) a scoping review on water property rights and water ownership (see 2.3), and (2) a content analysis of legislation, regulations and policy documents of 60 countries (see 2.3.2.1) on (i) the organisation of water ownership and water allocation instruments, (ii) what water allocation and reallocation instruments are in place, (iii) how property rights in water have evolved through granting water use permits specifically, and (iv) how property rights in water have evolved through 80 investor-state contracts between foreign investors and host states (see 2.3.2.2).

The second stage included an in-depth case study of two countries that were considered in the first stage: India and South Africa. The case studies build on, and test the results of the first phase, focusing on how property rights in water access and allocation instruments are organised, including how these rights affect water reallocation and the effectiveness of the existing water reallocation policies. This includes a content analysis of water related legislation of the 28 Indian States (see 2.3.2.3) and of South Africa (see 2.3.2.4), triangulated where possible with context specific literature and interviews.
2.2.1 Focus on Africa and Asia

This research specifically focuses on countries in the Global South, which face different challenges in respect to water governance compared to the Global North. Not only do many countries in the Global South already face water scarcity (Boretti & Rosa, 2019), the effects of climate change are predominantly felt in the developing world (Morton, 2007), especially through water (Nath & Behera, 2011). In my focus on the Global South, I focus specifically on countries in Africa and Asia because: (i) in both continents water is getting scarcer – increasing demand, decreasing supply, exacerbated by climate change; (ii) the fresh-water demand will grow consequent to the expected population growth of 1.1 billion people by 2050 compared to 2020 in Africa and Asia (UNDESA, 2019: 2020–2100 – Medium variant); (iii) by 2050, fresh-water demand will also grow because of economic growth, for example industrial water demand is expected to grow by 800% in Africa and 250% in Asia (Schoderer et al., 2020). This will result in new and increased demands for water; (iv) Africa holds 30% of global mineral reserves, and mineral exploitation will likely rise (ICMM, 2020) putting an additional demand on water. In Africa, natural capital represents between 30% and 50% of their total wealth (Lange et al., 2018); and (v), many countries in Africa and Asia have a history of being colonised. These post-colonial states are relatively young, and the governments often have limited financial and human capital (see e.g. South Africa 8.2.3.2). This poses different challenges compared to the more developed countries in the Global North.

2.2.2 Case selection content analysis

This section discusses the sample size and criteria for selecting the documents and case studies included in the analysis. A sample size determines the confidence with which the research questions can be answered (Bengtsson, 2016).

In selecting the cases and documents, specific criteria were used. Table 2.1 shows a summary of the criteria I applied, which will be discussed in more detail in the sections below.

2.2.2.1 Content analysis of laws, regulations, and policies

In the first content analysis, I looked at the water laws, regulations, policies and Constitutions because these documents form the ‘framework’ that governs a country’s freshwater resources, which allows me to assess how: (i) ownership in water is organised, (ii) how water is allocated and reallocated, and (iii) how property rights have evolved by the allocation of water through the different instruments.
Table 2.1 Summary criteria for selecting documents and case studies

<table>
<thead>
<tr>
<th>Chapter 4: Analysis of water ownership and water allocation instruments of 60 countries in Africa and Asia</th>
<th>Chapter 5: Analysis of 47 countries in Africa and Asia – water property right inventory in permits</th>
<th>Chapter 6: Analysis of 80 investor-state contracts of 53 countries*</th>
<th>Chapter 7. Case Study India</th>
<th>Chapter 7. Case study South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis of water legislation and policy</td>
<td>Analysis of investor-state contracts</td>
<td>Analysis of water State legislation and policy</td>
<td>Analysis of water legislation and policy</td>
<td></td>
</tr>
<tr>
<td>Excluding island States</td>
<td>Excluding small island states</td>
<td>Federal government system</td>
<td>Unitary government System</td>
<td></td>
</tr>
<tr>
<td>Africa: countries included if official language is English and/or French</td>
<td>Written in English, French, Portuguese, Spanish</td>
<td>Colonised by England, now a democracy, water governed by the individual States</td>
<td>History of colonisation, apartheid, and now democracy</td>
<td></td>
</tr>
<tr>
<td>Africa: countries included if their laws are written in French and/or English</td>
<td>Signed between 1 January 2000 and 1 September 2021</td>
<td>Part of the BRICS (Brazil, Russia, India, China, and South Africa) group of emerging economies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asia: countries included if their laws are written in English</td>
<td>With developing countries in Africa and Asia</td>
<td>Both are among the most water scarce countries in the world</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only focus on countries with a water use permit system in place</td>
<td>Petroleum: onshore operations</td>
<td>Focus on all 28 Indian States</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land: agricultural contracts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The 53 countries show an overlap of 38 countries with the 60 countries.
Source: Author

In selecting which countries within Africa and Asia to include in the analysis, I applied the following criteria:

(i) Island states are excluded from the analysis, as they face different challenges from mainland countries (e.g. groundwater is particularly prone to salt water intrusion, little water storage capacity, limited freshwater availability, limited surface water (White et al., 2007)) and have small surface areas and fewer people;

(ii) In Africa, countries are included if English and/or French is the official language (referred to in this thesis as Anglophone and Francophone countries);
(iii) African countries that have their laws written in French or English; documents written in French have been translated using the translation software DEEPL; and
(iv) Asian countries are included if their laws are written in English.

I aimed to analyse a large sample of countries because it allows me to: (i) cover a variety of countries with a different context, e.g. different histories, legal systems, and water economies; (ii) identify how quasi-property rights come about in these different contexts and (iii) identify the key elements of property; and (iv) compare and show possible differences between countries and regions.

2.2.2.2 Content analysis of Investor-state contracts

In the analysis of investor-state contracts, I focused on land, mining and petroleum because water is crucial in all three industries – for mineral extraction (e.g. dust suppression, transport of waste in slurries and suspension, and separation of minerals through chemical processes) (Prosser et al., 2011), for petroleum operations (e.g. drilling, cooling and discharging waste) (Allison & Mandler, 2018) and on land (e.g. irrigation, livestock and afforestation). Although mining uses small volumes of water, at the regional and local level, it impacts freshwater quantity and quality (Meißner, 2021; Schoderer et al., 2020).

I aimed to analyse a large sample of investor-state contracts, because it allows me to: (i) identify the development of water property rights through investor-state contracts across a variety of countries in both Africa and Asia; (ii) identify how quasi-property rights come about and what the elements of property through investor-state contracts are; and (iii) compare and show possible differences between countries and regions.

The criteria applied in the selection of contracts are:

(i) I only focus on investor-state contracts;
(ii) written in English, French, Portuguese, or Spanish. Contracts written in French, Portuguese, or Spanish have been translated using the translation software DEEPL;
(iii) signed between 1 January 2000 and 1 September 2021;
(iv) with developing countries;
(v) especially in Africa and Asia; and
(vi) excluding small island states;
(vii) for petroleum, I focused on onshore petroleum operations; and
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(viii) for land, I included only agricultural (not land for wind and solar energy) contracts.

Since countries work with model contracts, I included one contract per country from each contract group (mineral, petroleum, land) in the analysis. I prioritized signed over model contracts.

2.2.3 Case study selection
Both India and South Africa have been chosen as case studies. The objective of the case studies is to (i) get an understanding of the current situation in respect to water ownership and property rights, (ii) identify the direction in which ‘property’ rights in water are changing and/or developing, and (iii) assess the challenges regarding the allocation and reallocation of water. (iv) Specifically in South Africa, I am testing the results of the analysis of how property rights in water have evolved through the granting of water use permits.

For both countries I conducted (i) a literature review (see 2.3.1.2) and (ii) a content analysis of water legislation, regulations, and policies (see 2.3.2.3). This section discusses the reasons for selecting India and South Africa.

2.2.3.1 India
India is chosen as a case study because: (i) it is one of the most water scarce countries in the world. According to the World Resources Institute, India is in place thirteen among the world’s list of 17 ‘extremely water-stressed’ countries (WRI, 2019). A report by the National Institute for Transforming India Aayog (2018: 15), the Government of India’s apex public policy think tank writes: “India is suffering from the worst water crisis in its history and millions of lives and livelihoods are under threat. Currently, 600 million Indians face high to extreme water stress and about two [hundred thousand] people die every year due to inadequate access to safe water. The crisis is only going to get worse. By 2030, the country’s water demand is projected to be twice the available supply, implying severe water scarcity for hundreds of millions of people”; (ii) India has a federal State system. Because ‘water’ is a State matter (see 7.2.3), water legislation is enacted by States, while the national government has an advisory role; and in addition (iii) it has a history of being colonised and is now the world’s largest democracy. This makes India a relevant case to see how legislation has evolved since and continues to develop today – how the individual states have dealt with the history of colonisation and related water rights, and how the States allocate and reallocate water today. Because I look at all 28 States, this gives a broad overview of trends, which comes at the cost of in-depth detail; and (iv) India is part of the group of BRICS countries, a coalition of countries considered as the
world’s fastest-growing emerging economies. With economic growth, water demand will most likely increase too. Because India is already water scarce, this brings with it great challenges in respect to the allocation and reallocation of water.

2.2.3.2 South Africa
South Africa is chosen as a case study because: (i) it is a water stressed country, being the 30th driest country in the world (DWA, 2013), and it is very susceptible to effects of climate change on water availability; (ii) as opposed to India, South Africa is a unitary state, meaning the country is governed as a single entity; (iii) South Africa has an history of colonisation followed by apartheid, and now democracy. This makes it a relevant case study from a water property rights perspective. Especially since it has one of the most progressive (if unimplementable) water laws in the world, it could serve as an example for many other countries. It is particular interesting to see how it has dealt with the historical water rights, and how it allocates and reallocates water today. With most of its water already allocated (Turton & Botha, 2014), reallocation of water is inevitable (Rawlins, 2019); and (iv) South Africa is also one of the BRICS countries. It is at the brink of economic take-off, which will bring with it new demands on water.

2.3 Methods
In this section I discuss the two methods applied in this thesis, including a literature review (see 2.3.1), content analysis (see 2.3.2), and semi-structured interviews.

2.3.1 Literature review
I conducted (1) a scoping review of the literature on water property rights and water ownership to: (i) understand the current state of water ownership and property rights in water in the main legal regimes in the world, (ii) capture how private (quasi-)property rights are embedded in the existing legal constructs (e.g. water use permits, tradable water permits, contracts), and (iii) identify the gaps in knowledge (see 1.3). I also conducted (2) a literature review on the existing scholarship on the two case studies on the state water ownership and property rights in water.

The reasons for conducting a scoping review is twofold (Arksey & O’Malley, 2005: 21):

(1) “To examine the extent, range and nature of research activity: ... a useful way of mapping fields of study where it is difficult to visualize the range of material that might be available.” And;

(ii) “To identify research gaps in the existing literature: ... designed to identify gaps in the evidence base where no research has been conducted, the study may also
summarize and disseminate research findings as well as identify the relevance of full systematic review in specific areas of inquiry.”

2.3.1.1 Scoping review on water ownership and water property rights
In order to identify the most relevant literature on the research topic, two searches with different word combinations have been conducted. Through citation tracking, more relevant papers have been identified. This was done by backward citation tracking (reference list) and forward citation tracking (cited by) (Arksey & O’Malley, 2005; Jalali & Wohlin, 2012).

The scoping review covers the legal literature and the works of legal scholars in other journals, and addresses the question: How has the state of legal knowledge on private property rights in water evolved worldwide and how are these rights embedded in the existing legal constructions? I used the key words 'property rights' within five words of 'water' (see Appendix A), which resulted in 810 results from HeinOnline, and 321 results from Scopus for the period 1990 – 2021 (see Table 2.2), and ‘ownership’ within one word of ‘water’, which resulted in 299 results from HeinOnline and 203 results from Scopus. Figure 2.1 shows that from 1970 – 2003 few papers were published on the topic, but since 2003 publications on the topics have shown an increase.

Based on the question asked, I shortlisted 136 papers. In scoping down the literature to the shortlisted papers, I included papers that: (i) are concerned with the conceptual development and understanding of water property rights beyond the de jure understanding, and (ii) apply and operationalize the concept of ‘property’ rights in water. The search may have inadvertently left out literature on Indigenous peoples rights as they do not often use the terminology of property rights. This has been corrected by a focused review of such rights. The results of the review are discussed in chapter 3.

2.3.1.2 Literature review on case studies: South Africa and India
For both case studies, an exploratory literature review was conducted on the existing scholarship on the state of: (i) water ownership, (ii) water property rights, and (iii) water allocation and reallocation – specifically on the existing policy instruments in place and its implementation.
Table 2.2  Results search Scopus and HeinOnline

<table>
<thead>
<tr>
<th>Database</th>
<th>Key words</th>
<th>Document results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scopus*</td>
<td>water W/1 ownership</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>water W/5 (property W/0 right)</td>
<td>383</td>
</tr>
<tr>
<td>HeinOnline **</td>
<td>water W/0 ownership</td>
<td>219</td>
</tr>
<tr>
<td></td>
<td>water W/1 (property W/0 right)</td>
<td>258</td>
</tr>
</tbody>
</table>

* Key words search in: 'Article title, abstract, keywords'. Documents include: Article; Conference Paper; Book Chapter; Review; Book

** Key words search in: 'Full text'. Documents include: Article.

Source: Author

2.3.1.2 Literature review on case studies: South Africa and India

For both case studies, an exploratory literature review was conducted on the existing scholarship on the state of: (i) water ownership, (ii) water property rights, and (iii) water allocation and reallocation – specifically on the existing policy instruments in place and its implementation.

13 This figure is included in a paper: Bosch, H.J., & Gupta, J. (2022). The tension between state ownership and private quasi-property rights in water. WIREs Water, e1621. doi: https://doi.org/10.1002/wat2.1621.
2.3.2 Content analysis

A qualitative content analysis method, used in an inductive way, is applied in answering the questions: (i) how is water ownership organised in the Africa and Asia, (ii) how are private water ‘property’ rights embedded in contemporary policy instruments, and (iii) how does this affect water allocation and reallocation. It allows me to take a pragmatic approach towards understanding and operationalizing the concept of ‘property’ rights in water.

The content analysis consists of three parts: (1) an analysis of legislation, regulations, and policies of 60 countries in Africa and Asia (see 2.3.2.1), (2) an analysis of 80 mineral, petroleum, and land investor-state contracts, signed by states in Africa and Asia (see 2.3.2.2), and an analysis of water legislation of all 28 India States (see 2.3.2.3) and of South Africa (see 2.3.2.4).

A content analysis can be defined as “a research technique for the objective, systematic and quantitative description of the manifest content of communication” (Berelson, 1952: 18). A content analysis differs from document analysis as the former focusses on a document as an information resource, while the later on the processes of production: “the meaning-making of documents to be subjected to critical scrutiny; intended meaning, received meanings” (Coffey, 2014:370-371). Qualitative content analysis is a “method for describing the meaning of qualitative material in a systematic way” (Schreier, 2012). Documents serve as a key source of social scientific data (Prior, 2008). Documents “are socially defined, produced and consumed” (Coffey, 2014: 370), and can be considered as “conduits of communication” containing valuable information which serves as an intermediary between, for example, a legislator and the public (Prior, 2008: 230). The analysis of documents requires scrutinizing the information contained in the documents. Hence, documents can be seen as sources of information that can be “mined” (Coffey, 2014: 370). An inductive analysis can be understood as an approach “that primarily use detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data by an evaluator or researcher” (Thomas, 2006: 238).

Content analysis is concerned with the systematic description of data through coding (Schreier, 2014:174; FRIESE, 2019). By systematically describing the meaning of content, qualitative content analysis can elucidate latent meaning, and thus be used to test propositions (Corbin and Straus, 2008 in Bowen, 2009: 27). It allows for the development of coding frames built in a concept-driven way (Schreier, 2014:173). Coding is characterised by three features, namely the: (1) reducing of data by focussing on the data that can be related to the research question; (2) following of a systematic approach by examining the parts of the material that are in any way relevant to the
In terms of ensuring the quality of the qualitative content analysis, the objective is to obtain data relevant to the research question in a reliable and valid manner. With regard to the validity of the operationalization of the concept of quasi-property rights in water, the question is whether the method of content analysis accurately captures the concept it aims to analyse (Bryman, 2012). Reliability refers to the ‘consistency’ of the research results, and is concerned with the question whether the findings of the research can be replicated (Bryman, 2012). Thus, are the same results obtained if the analysis is replicated (Morse & Richards, 2002).

When developing criteria for evaluating research, qualitative researchers have a tendency to use the terms reliability and validity in very similar ways to quantitative researchers (Bryman, 2012). Mason (2002: 39) says about qualitative research, your research is valid when “you are observing, identifying, or ‘measuring’ what you say you are.” Since I am analysing documents, which are relatively static compared to the more vibrant social settings, I apply evaluation criteria that are normally used in a more qualitative content analysis.

To achieve validity and reliability in the content analysis, I follow four stages including decontextualization, recontextualization, categorisation, and compilation (Bengtsson, 2016: 9-14). These stages are followed in the content analysis of: (i) laws, regulations, and policies of 60 countries, (ii) 80 investor-state contracts, (iii) water related legislation in India, and (iv) water legislation South Africa.

Below I first discuss the ‘planning’ part of the content analysis, including the: (i) aim, (ii) data collection method, and (iii) sample. This is followed by discussing the four stages of the data analysis.

2.3.2.1 Content analysis of laws, regulations, and policies of 60 countries

Planning analysis of laws, regulations, and policies of 60 countries

Aim

The aim of the content analysis of legislation, regulations, and policies of the African and Asian countries is formulated in two questions: (1) How is water ownership organised in Africa and Asia, and through which policy instruments do states allocate their freshwater resources? (see Chapter 4), and (2) How have property rights in water evolved including through granting water use permits in Africa and Asia, and what are the implications for water allocation and reallocation? (see Chapter 5). In the analysis I assess what the key ‘elements’ of property rights in water are, since there is not a set of definitive criteria for proving the existence of property rights (McKenzie, 2009: 452). In identifying and
determining the elements, I was guided by the extent to which the elements would add to guaranteeing and ensuring certainty and security of the water use right (Hodgson, 2006).

**Data collection method**

The data has been collected from two online databases, including the Food and Agriculture Organization of the United Nations AQUALEX database[^14] – a thematic database specifically focussing on water (FAO, 2022), and the Law Library of Congress (Library of Congress, 2022).[^15] To validate whether the documents were the most recent, the search engine Google was used. In a very few instances, e.g. when a new law was just enacted, the documents were retrieved from another source.

**Sample**

Based on the criteria, 60 countries in total (20 Anglophone and 21 Francophone African countries, and 19 Asian countries) have been included in the analysis, see Appendix C and D – 41 out of 54 African countries and 19 out of 48 Asian countries (see Figure 2.2).

(i) The 20 Anglophone countries are: Botswana, Eritrea, Eswatini, Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Namibia, Nigeria, Sierra Leone, South Africa, South Sudan, Sudan, Tanzania, Uganda, Zambia, Zimbabwe. Ethiopia has also been included as their laws are written in English.

(ii) The 21 Francophone countries are: Benin, Burkina Faso, Burundi, Cameroon, Central African Republic (CAR), Chad, Congo, Côte d’Ivoire, Democratic Republic of the Congo (DRC), Djibouti, Equatorial Guinea, Gabon, Guinea, Mali, Niger, Rwanda, Senegal, Togo. Algeria, Mauritania, and Morocco are included as their laws are written in French.

(iii) The 19 Asian countries are: Armenia, Azerbaijan, Bangladesh, Bhutan, Cambodia, Georgia, Indonesia, Kyrgyzstan, Lao, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Tajikistan, Thailand, Vietnam.

Of these 60 countries, 47 countries (16 Anglophone and 19 Francophone African countries and 12 Asian countries) allocate water through a water use permit system. Thirteen countries do not have a permit system in place.

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[^14]: “FAOLEX is a comprehensive and up-to-date legislative and policy database, one of the world's largest online repositories of national laws, regulations and policies on food, agriculture and natural resources management.” (FAO, 2022)

[^15]: “[T]he Law Library … has amassed the world's largest collection of law books and other legal resources from all countries, now comprising more than 2.9 million items.”
(i) The 16 Anglophone African countries are: Botswana, Eritrea, Eswatini, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Namibia, Nigeria, Sierra Leone, South Africa, Tanzania, Uganda, Zambia, Zimbabwe. Four Anglophone African countries are not considered in the analysis. The Gambia, Liberia, and South Sudan do not have a water law in place. Sudan’s water law is written in Arabic, hence not included.

(ii) The 19 Francophone African countries are: Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Côte D’Ivoire, Democratic Republic of the Congo, Djibouti, Guinea, Mali, Mauritania, Niger, Rwanda, Senegal, Togo. The official language in Algeria and Morocco is Arabic, but the laws are in French, thus included. Two Francophone African countries are not considered. Gabon does not have a water law in place, and Equatorial Guinea’s water law is in Spanish, hence not included.

(iii) The 12 Asian countries are: Armenia, Bhutan, Cambodia, Georgia, Indonesia, Kyrgyzstan, Malaysia, Mongolia, Nepal, Philippines, Tajikistan, Vietnam. Seven Asian countries do not have a permit system in place: Myanmar, Pakistan, Sri Lanka, and Thailand do not have a water law in place, and Azerbaijan, Bangladesh, and Lao do not have a water use permit system in place.

Data analysis of Laws, regulations, and policies of 60 countries

The process of analysing data by applying a qualitative content analysis that is used in an inductive way follows four main stages, including the (i) decontextualization, (ii) recontextualization, (iii) categorisation, and (iv) compilation (Bengtsson, 2016: 11). To maintain a certain level of quality, not only is each of the stages is performed more than once. Also, the validity and reliability are assured throughout the analysis.

Stage 1 Decontextualization

First, I familiarised myself with the data by reading a few of the selected documents to get a sense of the whole, for example, what provisions are in place in the water laws, and what do these provisions specifically state. This also gave me an idea of the meaningful unit – “the smallest unit that contains some of the insights [needed] … , and it is the constellation of sentences or paragraphs containing aspects related to each other, answering the question set out in the aim” (Bengtsson, 2016: 11). I coded the relevant sentences, paragraphs, or legal provisions that I could link to the aim, including water ownership and concept of property rights in water. To avoid a change of understanding of the codes, I developed a coding list including an explanation about the codes. I systematically analysed the documents through a recursive and iterative coding process (Friese, 2019).
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Stage 2  Recontextualization

After the initial coding process, I redid the exercise by ensuring the coding is still appropriate to the text. Then the omitted text is read again to make sure that this part of the text is correctly excluded and has no apparent connection to the aim.

Stage 3  Categorisation

After finishing stage one and two, I was left with a group of codes. The third step included a categorisation process – creating specific categories and broad groups, and condensing data by reducing the number of codes. Some codes were more straightforward than others. For example, codes related to the organisation of water ownership and water allocation instruments were clearer than codes related to conceptual understanding of ‘property’ rights in water. This process has been well documented, and I made sure all categories were rooted in the data from which they arrive. Because I documented the categorisation well, including maintaining the link to the initial data, I was able to develop broad categories while maintaining a very detailed substantiation of these categories. Again, this was a time-consuming back-and-forth process until a ‘reasonable’ number of categories emerged that met the aim of the analysis, and which allowed me to clearly and concisely answer the questions I initially asked.

Stage 4  Compilation

The fourth and last stage involved the writing up of the results (see Chapter 4 and 5). In the process, I tried to make sense of the different categories, how they related and add to each other, which allowed me to show the phenomenon of ‘property’ rights in water. In this process, I tried to bring to life the more abstract categories and conceptualisation by showing examples of the original text and using quotations. Furthermore, I presented a clear summary of the categories in a table of: (i) water ownership, (ii) water allocation instruments, and (iii) a conceptual development and understanding of ‘property’ rights in water. Furthermore, although I am conducting a qualitative inductive content analysis, because I look at 60 countries, I am also adding information by performing a quantification that shows the magnitude of the phenomenon across the different countries. I triangulated the results also through submitting my analysis for peer review which led to a publication.
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Figure 2.2  Map of countries that are included in the content-analysis

The blue and orange countries represent the 60 countries considered in the content analysis of the laws, regulations, and policies. The orange and green countries represent the 53 countries considered in the content analysis of the 80 investor-state contracts.

Source: Author

2.3.2.2 Content analysis of 80 investor-state contracts

Planning analysis of 80 investor-state contracts

Aim

The aim of the content analysis of 80 investor-state contracts is formulated in the question: How have property rights in water evolved through investor-state contracts on minerals, petroleum and land in Africa and Asia, and what are the implications for water allocation and reallocation? (see Chapter 6). In the analysis I assess what the key ‘elements’ of property rights in water are based on investor-state contracts. In identifying and determining the elements, I was guided by how much the elements would contribute to assuring and safeguarding the security and predictability of the water usage right.

By conducting an analysis of investor-state contracts (primary data), I assess whether and how water property rights evolved through investor-state contracts, and how this affects water allocation and reallocation. I do not assess whether water included in contracts is considered de jure property in water, as this is determined by legislation and case law. Instead, I show how implicitly and explicitly contracts may lead to the creation of ‘quasi-property rights’.
Data collection method

The data was obtained from two publicly available online databases: the petroleum and mining contracts from “ResourceContracts.org” (Natural Resource Governance Institute (NRGI) et al., 2021), and land contracts from “OpenLandContracts” (CCSI, 2021). The data, the investor-state contracts including concession agreements, production and profit-sharing contracts, exploration permits and licenses, and joint venture agreements, has been collected in the period July 2021 – October 2021.

The online database on hydrocarbons and mineral contracts contained 2813 hydrocarbons and mineral contracts, and the online database on land contracts contained 1570 contracts and associated documents.

Sample

Based on the selection criteria and subject to data availability, the number of contracts was narrowed down to 62 petroleum and mineral contracts and 18 land contracts. A total of 80 contracts were included in the analysis (see Appendix I) from 34 African and 19 Asian countries (53 countries in total) (see Figure 2.2) including:

(i) 40 petroleum contracts (involving 24 African and 16 Asian countries);
(ii) 22 mineral contracts (18 African and 4 Asian countries); and
(iii) 18 land contracts (14 African and 4 Asian countries).

Of these 53 countries, there is an overlap of 38 countries with the 60 countries (see 2.2.2.1).

Data analysis of 80 investor-state contracts

The same approach has been applied as to the analysis of laws, regulations, and policies of 60 countries (see 2.3.2.1).

Stage 1  Decontextualization

First, I familiarised myself with the data in the investor-state contracts. Because I had already conducted an analysis of the water legislation, I had developed a good ‘hunch’ of what the key elements of property rights in water in investor-state contracts could be, based on the analysis of water use permits (see 2.3.2.1). I coded the relevant sentences and contractual provisions that I could link to the concept of property rights in water. I updated the existing coding list based on the coding of the contracts. The analysis was not a single straightforward process, but rather a recursive and iterative coding process.
Stage 2  Recontextualization
After the initial coding process, I redid the exercise by ensuring the coding is still appropriate to the text. I then read provisions I did not code, making sure I did not make a mistake by leaving them out.

Stage 3  Categorisation
Step three includes the categorisation of the codes. This categorisation largely follows the categorisation I made based on the analysis of the laws, regulations, and policies of 60 countries. Although similar, there are significant differences. The whole process was well documented, maintaining a very detailed justification of these categories, allowing for transparency and tractability. The back-and-forth process resulted in the identification of key elements of ‘property’ rights in water based on investor-state contracts, allowing me to answer the question posed at the beginning of the analysis.

Stage 4  Compilation
The fourth and last stage involved the writing up of the results (see Chapter 6). In the process, the identification of the different categories, and how they related and add to each other, allowed me to show the phenomenon of ‘property’ rights in water through investor-state contracts. In this process, I tried to bring to life the more abstract categories and conceptualisation by showing examples of the original text and using quotations. Furthermore, I presented a clear summary of the categories in a table of the conceptual development and understanding of ‘property’ rights in water in investor-state contracts.

2.3.2.3 Content analysis of water related legislation India
The content analysis allows for the analysis of documents across many countries, which gives an understanding of the breadth of the problem of ‘property’ rights in water. The case studies in turn allow for a more contextual, in-depth exploration and analysis of a real-world subject (Bryman, 2012). Although case studies are often associated with qualitative research, case studies can be studied by employing quantitative research methods (Bryman, 2012). Finally, I submitted the analysis for peer review through a journal and the paper was eventually published.

Planning case study India
Aim
In the Indian case study, I conducted a content analysis on water legislation of all 28 States. I ask the question: How are property rights in water access and allocation instruments organised, and how do these instruments affect water reallocation in India? (see Chapter
7). This case study builds on the results, including the highlighted potential problems, of the content analysis of Chapters 4, 5, and 6 (the organisation of water ownership and water allocation instruments; how property rights in water have evolved through permits).

Data collection
For India, three online databases have been used to identify and assess the relevant documents, including the Food and Agriculture Organization of the United Nations AQUALEX database (FAO, 2022), the database of the International Environmental Law Research Centre (IELRC) on the Indian legislation (IELRC, 2022), and the database of the India Code (India Code, 2022).

Sample
I focus on all 28 Indian States (excluding the eight Union Territories): Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha (formerly known as Orissa), Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal. This makes it possible to analyse how the water legislation developed in India as a whole, and what the trends are regarding property rights in water.

I identified 153 relevant laws in total (primary data) based on whether they governed surface water, groundwater, or both, of which I shortlisted 63 documents. The laws included in the analysis have been clustered as: (i) irrigation acts, (ii) groundwater acts, and (iii) water resource regulation authorities acts. Of the 28 Indian States (see Appendix M):

(i) 14 States have an irrigation law in place governing surface water resources;
(ii) 15 States have a groundwater law in place governing groundwater;

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17 Groundwater Act (10): Assam Ground Water Control and Regulation Act, 2012; Bihar Ground Water (Regulation and Control of Development and Management) Act, 2006; Goa Ground Water Regulation Act, 2002; Himachal Pradesh Ground Water (Regulation and Control of Development and Management) Act, 2005; Jharkhand State Ground Water Development & Management (Regulation & Control) Act, 2019; Karnataka Ground Water (Regulation and Control of Development and Management) Act, 2011; Kerala Ground Water (Control and Regulation) Act, 2002; Maharashtra Groundwater (Development
(iii) two States\(^\text{18}\) have a Water, Land and Trees Act governing both surface and groundwater water; and

(iv) 10 States\(^\text{19}\) have a law in place establishing a water resources regulatory authority that is mandated with the governance of both surface and ground water resources.

Data analysis case study India

The process of analysing data by applying a qualitative content analysis that is used in an inductive manner follows four main stages (see 2.3.2). In the analysis I look at: (i) what water allocation instruments are in place, and what policy is in place that allows for the reallocation of water, (ii) what water (surface- or groundwater) these instruments and policy govern, and (iii) what ‘property rights’ are allocated through these instruments.

Stage 1 Decontextualization

In the content analysis I focus on three types of laws: irrigation laws governing surface water resources; groundwater laws governing groundwater; and laws establishing a water resources regulatory authority that is mandated with the governance of both surface and ground water resources. Because these laws differ significantly to those assessed in the content analysis of the water legislation of 60 countries (see 2.3.2.1), I first familiarised myself with the content of the laws. During this process, I started coding and developing a coding list.

Stage 2 Recontextualization

I repeated the exercise after the first coding procedure to make sure the coding was still reflecting the text. The content that I did not consider initially is then examined again to...
confirm that it was appropriately not considered and has no discernible relationship to the purpose.

**Stage 3 Categorisation**

The third stage involved the categorisation of the codes developed in the first two stages. These were very different from the codes of the content analysis of permits and investor-state contracts. This process is similar to the content analysis described above (see 2.3.2.1).

**Stage 4 Compilation**

The fourth and last stage involved the writing up of the results (see Chapter 7). This included the categorisation of the relevant water related laws that are still in place. Per category of laws, I look at: (i) how water ownership is organised, (ii) what water allocation instruments and reallocation policy are in place, and (iii) discuss how the codes feed into the conceptual development and understanding of ‘property’ rights in water.

**2.3.2.4 Content analysis of water legislation South Africa**

**Planning case study South Africa**

The content analysis of the South African water policy and legislation builds on the vast amount of literature on water allocation, reallocation and inequality (see 2.3.2.1).

**Aim**

The aim of the South African case study is to provide insight into the actual situation regarding quasi-property rights in water, and how this affects water allocation and reallocation for inclusive development. I ask the question: *How are property rights in water access and allocation instruments organised, and how do these instruments affect water reallocation in South Africa?* (see Chapter 8). This case study builds on the results, including the highlighted potential problems, of the content analysis of Chapters 4, 5, and 6 (the organisation of water ownership and water allocation instruments; how property rights in water have evolved through permits; and how property rights in water have evolved through investor-state contracts, respectively).

**Sample**

In the South African case study, I look at the water related policy and legislation. The documents that have been included in the analysis are the:

- South Africa’s Constitution of 1996 (with Amendments through 2012);
- National Water Act 1998 (Act no. 36 of 1998);
- Mineral and Petroleum Resources Development Act, 2002 – as amended;
- Water Use Registration Regulations (R. 1352, 1999);
- Notice on the request to register a water use (GN. 212 of 2000);
- General Authorisations in Terms of Section 39 of the National Water Act, 1998 (No. 1191 of 1999);
- Revision of General Authorisations in terms of section 39 of the National Water Act, 1998 (Notice No. 399 of 2004);
- Water Allocation Reform Strategy (2008);
- Revision of General Authorisation in terms of section 39 of the National Water Act, 1998 (GN No. 665 of 2013);
- National Water Act: Establishment of nine new water management areas (GN. 1056 of 2016);
- Water Use Licence Application and Appeals Regulations, 2017 (No. R. 267 of 2017);
- National Water Policy Review: Updated Policy Positions to Overcome the Water Challenges of Our Developmental State to Provide for Improved Access to Water, Equity and Sustainability (2013);
- Establishment of the Pongola-Umzimkulu Catchment Management Agency in Terms of Section 78(3) of the National Water Act, 1998 (Act No 36 Of 1998);
- Establishment of the Inkomati Catchment Management Agency, in the Province of Mpumalanga, Southern Part of the Limpopo Province and the Northern Part of the Kingdom of Swaziland, Water Management Area Number 5;
- Establishment of the Breede-Overberg Catchment Management Agency (Water Management Area Number 18), in the Western Cape Province;
- Establishment of the Olifants Catchment Management Agency in Terms of Section 78(3) of the National Water Act, 1998 (Act No. 36 Of 1998);
- Establishment of the Vaal River Catchment Management Agency in Terms of Section 78(1) of the National Water Act, 1998 (Act No. 36 Of 1998);
Methodology and research approach

- Proposal for the Establishment of the Single Catchment Management Agency in Terms of Section 78(3) of the National Water Act, 1998 (Act No. 36 of 1998);
- Guide to Verifying the extend of Existing Lawful Water Use, Edition 2.1 (2006);
- Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (2017)
- South African Association for Water User Associations and others v Minister of Water and Sanitation and others (71913/2018) [2020];
- CJ Lotter N.O. and others v The Minister of Water and Sanitation and others 42072/2018 [2020];
- FGJ Wiid and others v The Minister of Water and Sanitation and others (90498/2018 [2020]);
- Case no: 42072/2018 (“the Doornkraal application”);
- Case No. 90498/2018 (“the De Kalk application”);
- Case No. 71913/2018 (“the Associations’ application”);
- Ramah Farming v Great Fish River Water Users Association and Others (2614/2019) [2020] ZAECGHC 119; 2021 (2) SA 547 (ECG) (13 October 2020);
- Lötter N O and Others v Minister of Water and Sanitation and Others (725/2020) [2021] ZASCA 159 (8 November 2021);
- Circular 18 of 2001 (29 March 2001);
- Legal Services Circular 1 of 2017 (19 January 2018);
- Notice requiring persons to apply for a Water Use Licence in terms of section 43(1) of the National Water Act for the purpose of Compulsory Licensing (No. 734 of 2010);
- Notice requiring persons to apply for a Water Use Licence in terms of section 43(1) of the National Water Act for the purpose of Compulsory Licensing (No. 709 of 2010);
- Notice requiring persons to apply for a Water Use Licence in terms of section 43(1) of the National Water Act for the purpose of Compulsory Licensing (No. 708 of 2010).

Data collection

For South Africa, the data was obtained from two publicly available online databases: from the official website of the South Africa government (South African Government,
2022), and the Food and Agriculture Organization of the United Nations AQUALEX database (FAO, 2022). The documents were retrieved in November 2021 – January 2022.

**Data analysis case study South Africa**

The South African case study allows me to show how in practice quasi-property rights in water come about, and how they affect water allocation and reallocation and inclusiveness. I systematically analysed the relevant through a recursive and iterative coding process.

The analysis includes:

(i) an assessment of how water ownership is organised;
(ii) an assessment of how South Africa handles historical water rights;
(iii) identifying through which instruments water is allocated;
(iv) an assessment of the water allocation instruments, by looking at what 'property' elements they endow on the holders (based on the content analysis, see 2.3.2.1);
(v) an assessment of the *de facto* situation regarding the implementation of the water legislation, including the water reallocation policies, and how this affects the creation of quasi-property rights in water; and
(vi) how the quasi-property rights affect water allocation and water reallocation and inclusiveness. I assess the inclusiveness (see 1.5.3) because of South Africa’s history of colonisation and apartheid, and because one of the main aims of the National Water Act, 1998 is to redress inequality.

The content analysis of South African water policy and legislation has been performed both inductively and deductively, as it builds on the content analysis performed on legislation, regulations and policies of 60 countries (see 2.3.2.1). It allows me to deepen the understanding of the development of quasi-property rights in water, by examining the situation in practice.

**Stage 1  Decontextualization**

In the first stage I familiarised myself with the National Water Act, 1998 and the many water policy documents (see sample, 2.3.2.1).

Because I had already conducted an analysis of the water legislation of 60 countries (see 2.3.2.1), I had developed a good hunch of what the key elements of property rights in water are. I developed a coding list including an explanation about the codes, which was updated during the process.
Stage 2  Recontextualization

After finishing the first round, I redid the exercise ensuring the encoding still reflects the text. In this stage, I also read the omitted text to ensure no relevant text is left out.

Stage 3  Categorisation

In the third stage, I was able to link relevant sentences and provisions to the categories I developed regarding the conceptualisation of ‘property’ in water. This process is similar to the content analysis described above (see 2.3.2.1).

Stage 4  Compilation

The fourth and last stage involved the writing up of the results (see Chapter 8). In this writing process I showed the creation of ‘property’ rights in water through the different water allocation instruments. This is substantiated by (i) the content analysis which allowed me to identify ‘property’ elements and develop different categories of quasi-property rights in water, which I linked to the existing literature, and (ii) which were substantiated by the interviews I conducted.

The writing process allowed me to show how the more abstract understanding of quasi-property rights in water translates into practice and discuss the outcomes of this in terms of practical consequences, including allocations and reallocation problems. I triangulated my results through existing academic and other literature and 20 semi-structured (online) interviews with key players in the field, including government officials, researchers from NGOs, universities and research institutions, lawyers, judges from the Water Tribunal, and consultants (see Appendix B). In conducting the interviews, the ethics have been considered (see 2.5).

2.4  Positionality and research approach

In this research, I take pragmatism as a philosophy and research paradigm: a conceptual framework that guides the research based on a collection of basic beliefs (Weaver, 2018: 5303), irrespective of whether the study is qualitative, quantitative, or a mix (Morgan, 2014: 1045). Pragmatism is based on the idea that the philosophical and/or methodological approach should be taken that works and best suits the approach to the research problem (Kaushik & Walsh, 2019: 2). It focusses on the practical understanding of concrete, real-world problems (Kelly & Cordeiro, 2020), instead of what may be deemed to “absolutely and objectively ‘true’ or ‘real’” (Weaver, 2018: 5299). This approach is particularly helpful in the operationalization of ‘property’ rights in water, beyond the de jure understanding.
Regarding ontology ("the study of being" (Crotty, 1998: 10)) and epistemology ("the theory of knowledge" (Audi, 2010: 305)), pragmatism is not bound to a specific philosophy or conception of reality (Weaver, 2018). Reality is actively created and always subject to change, based on human interaction in the world and their experience of this world (Weaver, 2018: 5303).

I applied the academic standards to this research to the best of my knowledge, however, I cannot ignore my background and own position in society. I have a Bachelor's degree in Business Administration and a Master's degree in Environmental Entrepreneurship and in Water Management and Governance. In this research I take an international development perspective on 'property' rights in water, water allocation and reallocation, and water. Although I am looking at property rights in water, I do not have a legal background, nor do I consider myself a legal scholar. This 'weakness' I tried to address by publishing in law journals. Furthermore, being a white male from a developed western European country inevitably affected my perception of the world and reality, and thus my research on the Global South and I have tried to be sensitive to this in my writing.

### 2.5 Ethics

In considering the ethics of this research, the relevant ethical review questions of the Amsterdam Institute for Social Science Research have been answered (AISSR, 2021). This thesis focused on primary data analysis of laws, policies and contracts. The few interviews conducted have been subject to ethical reflections. The research subjects include government officials, researchers from NGOs, universities and research institutions, lawyers, judges from the Water Tribunal, and consultants. Based on information available online, and by using the snowball sampling method the interviewees have been identified. The research does not involve vulnerable people. No monetary or other kind of compensation is provided. Interviewees were contacted by email or phone with the request to participate in my research, including the research topic I wanted to ask them about. At the beginning of each interview, I introduced myself and the research topic, followed by stating that they can decline to answer any question, and that they can end the interview at any time. I verbally asked for their consent to record the interview, which would be safely stored. Participation was entirely voluntary. I kept a record of their consent. No interviews have been conducted with juvenile respondents, i.e., younger than 18 years old. At the beginning of each interview, I would guarantee and ensure the anonymity of the participants. In the cases where the interviews have been recorded, the recordings have been destroyed following transcription. The transcribed records do not reveal the name and address or any characteristic that can lead to the identification of the interviewee. The key code which links the interviewee names, emails with the
pseudonyms has been encrypted and is only available to my supervisors. This key code ensures the integrity of the research while the anonymization protects the privacy of the interviewees. The research results are saved in an encrypted folder using a 128-bit Advanced Encryption Standard (AES) encryption in iCloud, protected with a password. This way of treating the data will result in transparency because the results can be accessed when needed. After the research project, the data will be stored on an offline hard drive, protected with a password.

2.6 Inferences

In this thesis I applied a two-stage multimethod case study design. The first stage aimed to understand how water ownership and water property rights is organised across Africa and Asia. The second stage builds on this and includes an in-depth case study of two countries that have been considered in the first stage: India and South Africa. It then discussed the different methods applied, including a scoping review on ‘water ownership and property rights in water’ (see Chapter 3), content analysis of water legislation (see Chapter 4 and 5); investor-state mineral, petroleum, and land contracts (see Chapter 6); and water related legislation of the Indian States (see Chapter 7), and of South Africa (see Chapter 8).