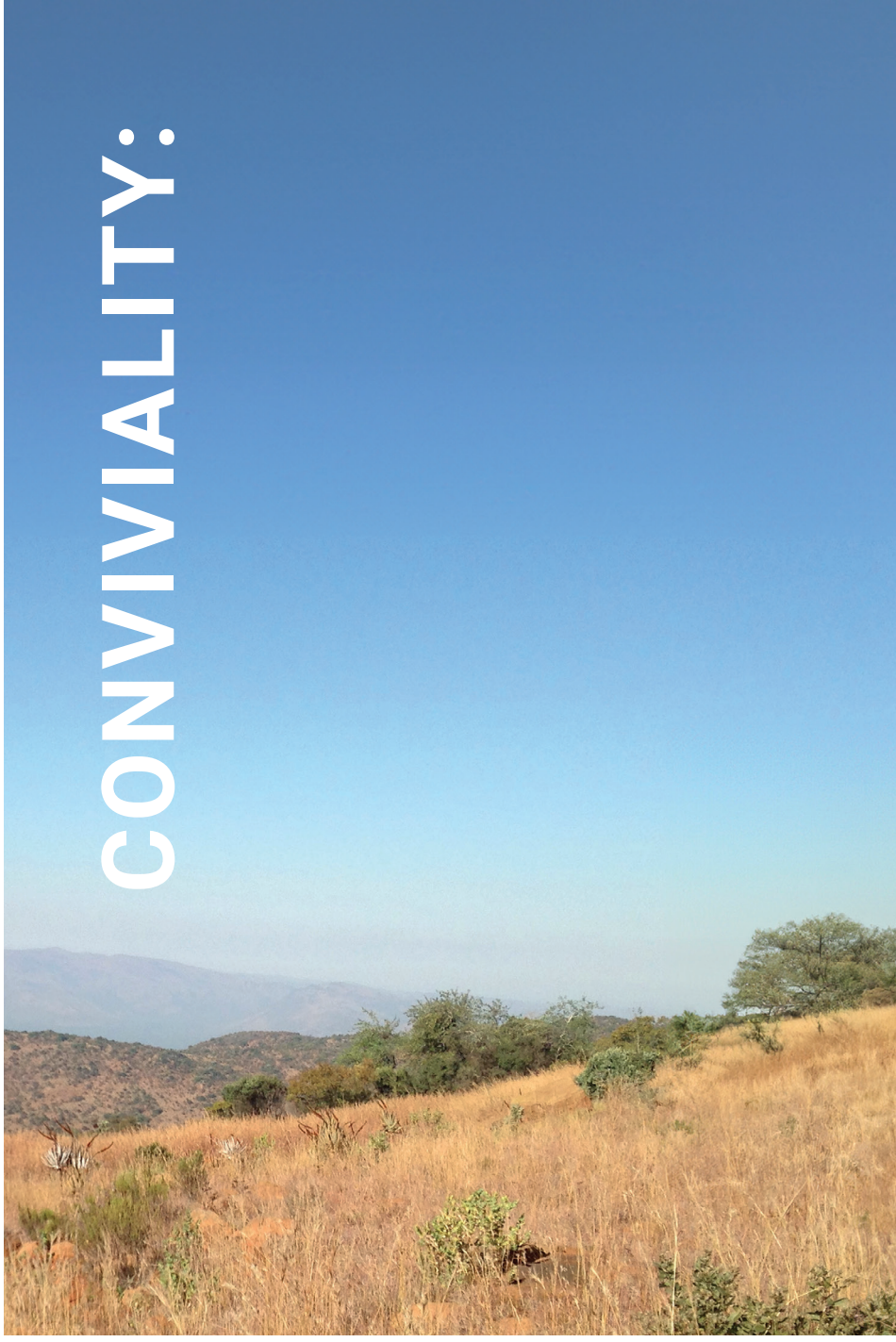
COMMUNITY, MARKETS, AND CONVIVIALITY:



A POLITICAL ECOLOGY OF RURAL WATER SUPPLY

MORITZ HOFSTETTER

Propositions

1. Outsourcing of public water service delivery leads to higher cost and worse delivery.
   (this thesis)

2. Technological progress according to a neoliberal rationale will lead to further concentration of wealth.
   (this thesis)

3. Objectivity is a myth.

4. The dependency on private funding is bad for public science.

5. By replacing humans in productive activities resulting in the concentration of revenue with the few, artificial intelligence will create far more problems than it solves.

6. To tackle the climate crisis the economic living standard in Western countries will have to decrease.

Propositions belonging to the thesis, entitled

Community, Markets, and Conviviality: a political ecology of rural water supply

Moritz Hofstetter
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COMMUNITY, MARKETS, AND CONVIVIALITY:

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COMMUNITY, MARKETS, AND CONVIVIALITY:

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Moritz Hofstetter

Thesis

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1

INTRODUCTION

“LOOK AT THE WORLD THROUGH WATERY EYES”

1.1 "Look at the world through watery eyes"

Rural water supply poses a significant challenge for governments in both western countries and countries of the Global South. The characteristically low housing density makes construction, maintenance and operation of rural water schemes complex and expensive. While Western countries struggle primarily with the high cost of maintaining and refurbishing ageing infrastructure, countries in the Global South are focused on an extension of services to the still underserved. Despite a series of ever-new concepts and approaches that promise a sustainable proliferation of water services in the Global South there are few success stories. In this thesis, I investigate two case studies located in Limpopo Province, South Africa and one case study from the Kanton Luzern, Switzerland, where I grew up. Entry point for this study are the interactions between actors and the institutional arrangements and physical manifestations that emerge from them. By applying a political ecology approach to rural water access, I aim to better understand the underlying and more general societal trends that affect water user families and collectives and, in many cases, generate inequalities.

1.1.1 Rationale of this thesis

While targets were set through Sustainable Development Goals (SDGs) and before that Millennium Development Goals (MDGs) and (at times) great progress was made in extending services, still more than two billion humans do not have access to safely managed drinking water (United Nations, 2023). South Africa is a good example of this. While at the time of the first democratic elections in 1994, 15 million people (38% of the population) did not have access to safe drinking water, services were rapidly extended. Based on a state-of-the-art policy environment focusing on participative development and strong donor support, between 1994 and 2002 new water service infrastructure was constructed to serve an extra seven million people (Muller, 2002). Despite these successes, 15 years later in 2017, still 24% of the rural population relied on unimproved water sources (Statistics South Africa, 2017). Due to a lack of maintenance and substandard infrastructure planning and construction, the share of the population without access to piped water was in 2016 even rising again (Auditor General South Africa, 2016).

This thesis is the result of a seven-year journey which I outline in more detail in section 1.4. It started with the premise and my earlier conviction that, while development has not yet borne the promised fruit, "better development" would be possible and an adequate way to address problems of inequality could be found. The first two empirical chapters were written in this context and epistemological mindset, aiming to learn both from the public service delivery environment in South Africa, but also from communal water schemes in Limpopo province in order to contribute to "better development". Both chapters engage with the question of the "role" of communities in service delivery. I show in these two

chapters, how users engage with the construction, operation and maintenance of (co) owned water infrastructure. Chapter 3 additionally engages with the debate on the reasons for the failure of rural water service delivery in South Africa. The low quality of service delivery in the studied district, with only 17% of the villages receiving piped water reporting satisfaction over the service level, can primarily be explained by a combination of the low capacity of both public and hired private actors and the prevalence of rent-seeking behaviour. I describe in chapter 3 how these key factors are based on underlying patronage and gatekeeping relations, which are in turn sustained by the outsourcing of key planning and construction activities according to neoliberal principles. While I conducted this fieldwork as a well-intended consultant in an international action research project, I concluded that the failure to reach the rural population was not the result of a lack of (Western) expert advice. This experience changed my view on the capacity of the development sector to deliver on its promise to set the unfortunate on a path of incrementally improved services. This insight sparked my interest in the underlying dynamics that define how we think about and conduct "development".

When I then, due to the COVID-19 pandemic, continued my research in Switzerland, I recognised that this push towards a neoliberal, modernist utopia also affects rural water collectives in a Western country context. The urge to modernise existing rural water commons, interconnecting and professionalising them, affects the capacity of these collectives to manage their schemes independently. This guided my interest to the question of how rural water commons and collective action in general are affected by such neoliberal, modernist imaginaries. To address this question, I return in chapter 5 to all three described cases to learn from their similarities and differences. The change in my research interest went hand in hand with a change in my perception and my positioning in the water and development worlds. The empirical chapters of this thesis mirror this conceptual, moral-political, and personal journey and I discuss it in detail at the end of this thesis.

1.1.2 Aim of this thesis:

The aim of the thesis shifted from creating opportunities for better development to creating a better understanding of collective actions around rural water access and the way these are influenced by the broader, embedding socio-technical and institutional-political societal trends. The objectives of this research project therefore are:

1. To enhance the understanding of collective user initiatives to create water access, and the motivation that drives them.
2. To analyse public interventions in water access creation and the resulting interaction of the state with users and other involved actors in South Africa and Switzerland.

3. To develop a conceptual approach that allows for the recognition of values of collective actions to create access to water that goes beyond the benefits considered in conventional cost-benefit analyses.
4. To analyse the effect of a neoliberal/modernising imaginary on the viability of collective arrangements and collective action around the (re)creation of rural water access.

1.2 Research questions

The following central research question follows from the above-stated objectives:

> **How are rural water collectives in the studied South African and Swiss context areas constituted and motivated, and how are these modes of collective water control affected by the dominant market-modernist imaginary?**

While this central research question spans the whole thesis, it consists of two sub-research questions.

> **How are the water collectives studied in South Africa and Switzerland organised, motivated and imagined and how do they relate to external actors?**

This question focuses on the one hand on the emergence and reproduction of collective action around water, while on the other hand analysing the relations that internal and external actors establish within these water collectives and their commons. It aims to create an understanding of what the motivation of users and volunteers is to get engaged with and contribute to their common scheme. How do they perceive these schemes and what position are these commons taking in the social fabric? It further scrutinizes how external actors, such as public service institutions, private service providers and members of development agencies, relate to these commons and how these commons fit into the public service delivery policies. The second and third chapters focus on this first sub-research question. The second chapter describes the emergence of user-initiated, constructed, and managed schemes and the (historical) policy developments around the role of users in service delivery in South Africa. The third chapter then describes an external intervention to pilot a user-driven approach to plan and construct a scheme and provides a grounded analysis of the accountability relationships in public water service delivery in Sekhukhune district, South Africa.

How is the viability of existing rural water collectives and the potential to successfully engender user-owned schemes affected by the dominant market-modernist imaginary?

This question emerged from the observed discrepancies in the Swiss case between the value definition applied by public officials and consultants and the value that water collectives' members themselves assign to their water commons. Knowing from earlier fieldwork, that this discrepancy also exists in South Africa, raised the question if there is even room within a neoliberal/modernising imaginary for collective action. The chosen approach to answer this question is to apply the framework of Rooted Water Collectives to all three case studies. This allows, in the spirit of Lazar (2012), to lay cases at different infrastructural moments and within different contexts next to each other and learn from the differences and similarities that can be observed. The fourth and fifth chapters focus on this second sub-research question. The fourth chapter describes a public project to connect and merge three existing independent water schemes in Switzerland. It introduces the concept of conviviality to extend the narrow value definition applied in a neoliberal/modernising policy environment. The last empirical chapter then applies the concept of rural water collectives to the three case studies to analyse the effect of the neoliberal/modernising imaginary on their viability.

1.3 Conceptualisation

While this thesis makes use of a wide variety of concepts, it is firmly rooted in the tradition of political ecology (PE). PE emerged in the 1980s as a critique of the claims of straightforward objectivism and positivistic truth, which were and still are common across a wide range of disciplines (Robbins, 2012). It is a broad field of research which evades simple definition (Neumann, 2005). Bridge et al. (2015, pp. 6–7) therefore choose to define three common commitments for PE researchers. These are (1) "a theoretical commitment to critical social theory and a post-positivist understanding of nature", (2) "a methodological commitment to in-depth, direct observation involving qualitative research of some sort, often in combination with quantitative methods" and (3) "a normative political commitment to social justice and structural political change". Instead of isolating and simplifying reality to make it possible to test a hypothesis as positivist science teaches us, PE allows for complexity and explicitly considers the context. PE is not only analysing politics but practising politics (Walker, 2007), which means that the researcher has to position her/himself within the network of human and non-human actors. This provides a contrast to objectivist, positivist science, where the political nature of simplifying reality and assigning values is hidden in methods and models, which produce supposedly apolitical and objective truths.

In PE, the concept of power plays a major role when analysing complex situations. In this thesis, I apply a conceptualisation of power inspired by Foucault's work. By introducing discursive power and linking power to knowledge and the ability to establish truths, he guides the attention of our analysis of power away from the obvious and more explicit forms of power as laws and coercion, to "the point where it is in direct and immediate relationship with that which we can provisionally call its object, its target, its field of application, there – that is to say – where it installs itself and produces its real effects" (Foucault, 1980, p. 97). Power understood in this way is no longer perceived as a piece of wealth or a commodity that can be held in anybody's hands, but as something that becomes productive in relations between actors – in particular through discourse on appropriateness, morality, normality, and legitimacy. Such power relations become interwoven with other forms of relations such as family, kinship, production or sexuality and are exercised and employed in a net- or web-like structure (Foucault, 1980). Perceiving power in this way allows an analysis of how the dominance of the market-modernist imaginary was established and how it is reproduced in relations among human actors, while also affecting coexisting imaginaries.

Since my perception on rural water collectives has changed throughout this research journey, the set of applied concepts also has evolved (see Figure 1). The concepts outlined below can be grouped into two main conceptual lenses, one being "developmental" (see Chapters 2 and 3) and the other being "critical" (see Chapters 4 and 5). In the discussion at the end of this thesis, I outline in detail how I introduced and made use of these concepts and how the conceptual lens has evolved. Below I introduce a basic understanding of the key concepts.

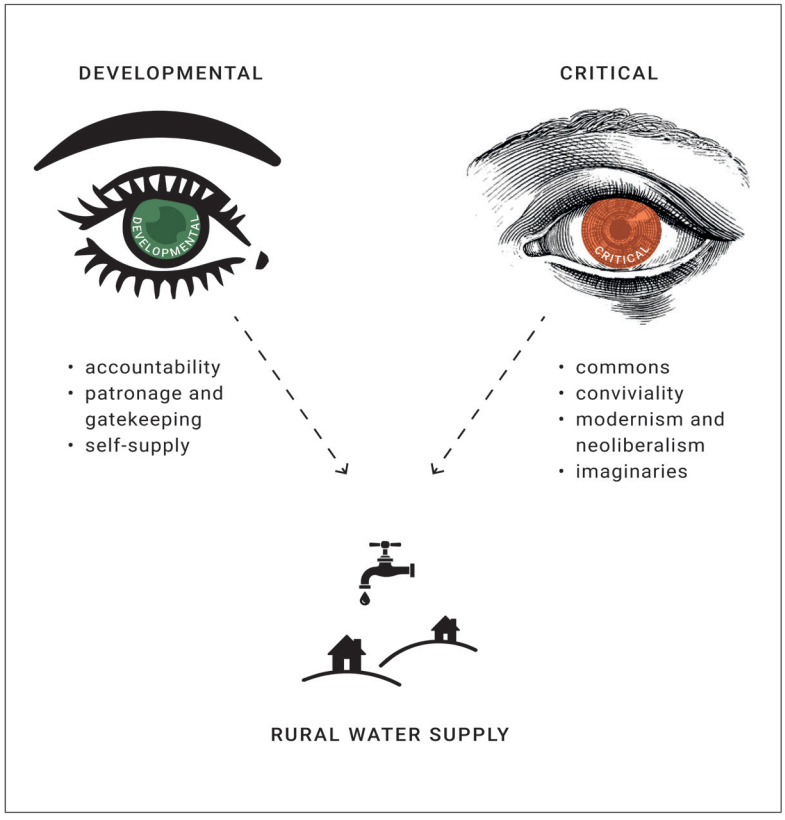

Figure 1. The two conceptual lenses of this thesis (own elaboration)

1.3.1 Gatekeeping and patronage

As I discuss more in depth in chapter 3, Patronage and Gatekeeping are two distinct concepts, that have a lot in common and often occur simultaneously. They both describe relations between actors that are voluntary (Eisenstadt and Roniger, 1980), reciprocal (Arriola, 2009), assumed (i.e. informal) rather than contractually defined (Robinson, 2007) and tend to be asymmetric in a vertical sense (Weingrod, 1968). The two concepts differ in terms of duration and motivation of the relationships. Gatekeeping, which describes the abuse of the control over access to resources and positions for personal or economic agendas (Beresford, 2015) describes a particular event. Patronage on the other hand is understood here as a more continuous relationship, within which a patron distributes favours based on political motivations (Erdmann and Engel, 2007). Such relations are created among public and private actors and individual citizens, or among groups of citizens and are mostly informal yet strong. Since they lead to (groups of) citizens receiving preferential treatment or access and/or public funds being redirected, they tend to negatively affect the strength of both financial and electoral accountability relations.

1.3.2 Accountability

I outline and elaborate in chapter 3 how accountability describes the strength of the relationship between two (sets of) actors. Actors are considered accountable towards another (set of) actors if there are sanctions in place if clearly stated targets and/or agreements are not met (Dann and Sattelberger, 2015). Strong accountability relations towards the water users, as central to ensuring good service delivery, are widely promoted in water governance and policy frameworks (Sosa and Zwarteveen, 2014). The World Bank describes a short and a long route of accountability. The short route symbolises the direct relationship between service providers and water users. The long route describes how users can hold politicians and policymakers accountable through electoral processes or demonstrations. Politicians and policymakers then, in return, exert influence on the service providers (World Bank, 2003). The ability of citizens to reward or sanction public officials based on their performance, which is described as electoral accountability (Hellwig and Samuels, 2008; Smart and Sturm, 2013), is negatively affected by patronage. Financial accountability, which is typically understood as the transparent administration of public funds, aligning with democratically created national budgets and plans to efficiently address public needs (Ngwakwe, 2012), is primarily negatively affected by gatekeeping.

1.3.3 Self supply

Self-supply in the WASH sector has most comprehensively been defined by Sutton and Butterworth (2021, p. 28) as "the construction of, or incremental improvement to water supplies and sanitation by households and small groups, largely using their own means". Such schemes have existed for time immemorial, but only through their conceptualisation as Self-Supply have they more recently caught the attention of NGOs, international scholars and governments (Sutton and Butterworth, 2021; World Health Organisation, 2017). The two main advantages of such schemes suggested by scholars and NGOs are higher sustainability and lower cost of infrastructure. The sustainability is supposed to be increased through co- or full user ownership (Maltha and Veldman, 2016; Olschewski et al., 2017, 2016; Pump Aid, 2016; Sutton et al., 2004) and/or the application of more affordable and simpler technology (Maltha and Veldman, 2016; Sutton et al., 2004). The suggested lower cost of service extension is further explained by (co-) investments of the users (Butterworth et al., 2014; GLOWS, 2012; Olschewski et al., 2017; Sutton, 2018, 2007, 2004).

Since scholars suggested that self-supply schemes can be supported by outside actors (Butterworth et al., 2013; Olschewski et al., 2017; Sutton and Butterworth, 2021), an increasing number of Sub-Saharan countries have either introduced policies or supported pilots of this approach (see Chapter 3). This frenzy was accompanied by a growing body of peer-reviewed literature celebrating the advantages of self-supply systems. The conceptualisation of the development complex of such collective actions as self-supply

is far from unproblematic. It turns autonomous forms of collective action and knowing into (decontextualised) expert knowledge (see, e.g. Dupuits, 2019; Dupuits et al., 2020, 2023; Souza et al., 2019; Wals et al., 2009). It also masks the failure of public service delivery systems by pimping local action as a successful alternative, allowing the absconding of constitutional obligations by public agencies. I discuss the effects of this step in detail in the discussion of this thesis.

1.3.4 Commons

The concept of the commons came to figure prominently in academic and policy debates after the publication of the article "The tragedy of the commons" by Hardin (1968). Hardin claimed that self-interested and rational individuals were unable to collectively manage common pool resources unless there were economic incentives (imposed by the market) or coercion (imposed by the state) in place. It took the work of authors such as Netting (1974) and Ostrom (1990), who described successful cases of collectively managed natural resources and infrastructures, to establish that communities can manage commons in a sustainable and coherent way. Commons as a concept came to stand for a third way of governance, differentiating itself from private and public governance (e.g., De Castro, 2002; Caffentzis and Federici, 2014; Dolenec and Žitko, 2016). This interpretation of the commons as an alternative form of economy has more recently been complemented by scholars, who perceive the commons as an organisational and political alternative (de Angelis and Harvie, 2014; Dolenec and Žitko, 2016; Esteva, 2014). These scholars reject the idea of humans solely taking rational decisions to maximise their own benefit and perceive them as subjects who, through "other-than-capitalist" (Villamayor-Tomas and García-López, 2021) forms of collaborative organisation, shape their commons – a process called commoning (De Castro, 2012; 2020, Dupuits et al., 2020; Hoogesteger et al., 2023a, 2023b; Boelens et al., 2023).

In this thesis, I apply this recent interpretation of the commons as an alternative form of organisation, which is focusing increasingly on questions of justice, equity, values and power (Agrawal et al., 2023). According to this interpretation, commons build on and strengthen communality, which in this context is understood as "a feeling or spirit of cooperation and belonging arising from common interests and goals" or "the state or condition of being communal" (Collins Dictionary, 2023, p. 1). I choose this perception of the commons since it allows for the recognition of other forms of motivation for collective action than simple maximisation of personal benefits. It permits to imagine and elaborate "relationships for a social order in which a select few do not monopolize the vast majority of global resources" (Agrawal et al., 2023, p. 546).

1.3.5 Modernism and neoliberalism

Our time is to a large extent defined by the proliferation of the paradigmatic constructions of modernism and neoliberalism. Modernism initially represented the radical reshaping of societies after the Enlightenment and the French and Industrial Revolutions (Bendix, 1967; Wagner, 2014), but it later came to stand for the core ideas of Development with a capital D (Escobar, 1994; Illich and Cayley, 2005). This conceptualisation of development emerged in the 19th century "to ameliorate the perceived chaos caused by progress" (Cowen and Shenton, 1995, p. 30). It was and still is based on a positivist epistemology. Alternative and subaltern forms of knowledge are in such a perception of the world neglected since only what can be measured within the realms of positivist science can be true and assigned a value. Modernism came to stand for a supreme confidence in progress based on technical and scientific knowledge, a rational organisation of societies and a linear expansion of production (Scott, 1998).

Such monopolising of the meaning of development was accompanied by a proliferation of mathematical principles in economics. The establishment of a new dominant path to defining values, based on the (diminishing) value of an additional unit of a particular good or resource, led in the 1870s to what has been coined the marginal revolution (Escobar, 1994). This still widely recognised perception of value allowed for the creation of the famous supply and demand curves which would meet in a mathematically identifiable equilibrium and laid the ground for neo-classical economics. The increasing application of mathematical models and vocabulary from natural science resulted in economics fading to be a contestable social science and becoming a supposedly exact science free from ideology (Felber, 2019).

'Neoliberalism' emerged as a concept in the 1930s, characterising an ideal economic and social order within the framework of the free market (Connell, 2010). Human well-being is in this perception maximised by unleashing individual enterpreneurial freedoms supported by open trade and strong private property (Harvey, 1990). Its policy implications are market deregulations, privatisation, welfare state withdrawal (Venugopal, 2015) and public sector reforms. Public institutions were encouraged to introduce competitive market principles where possible (Rickenbacher, 1995) and reform their structure and operation based on the example of private companies (Schedler, 2000a).

While modernism and neoliberalism are two distinct concepts, I consider them to be intertwined and therefore chose to apply them as a pair when describing the underlying dynamics affecting rural water commons in both South Africa and Switzerland. The dominance of the paradigm of modernist development and its focus on commensuration, understood here as the measurement of characteristics of realities according to a common metric (Espeland and Stevens, 1998), forms a precondition and the foundation

of neoliberalism. Neoliberal politics, in return, by pushing for the reduction of public capacities and outsourcing to private service providers, creates entry points for actors subscribing to the modernist development paradigm – challenging water collectives and commoning processes (e.g. Dupuits et al., 2020).

1.3.6 Conviviality

I make use of conviviality in this thesis as a concept to describe the additional, more-than-just-instrumentalist and market-based values that rural water commons provide for rural communities, beyond direct access and service delivery. Services and goods in a convivial society are created by members of this society as a result of an autonomous and creative intercourse between people and their material and social environments. Illich, who coined this concept, outlined: "People need new tools to work with rather than tools that 'work' for them" (Illich, 1973a, p. 10). It is important to recognise that Illich does not simply refer to hardware if he writes tools but includes institutions producing tangible and intangible goods (e.g. governance forms, knowledge) (Illich, 1973b). According to Illich, tools are convivial if they can be utilized by anyone as frequently or infrequently as desired to achieve a purpose defined by the user (Illich, 1973b). To allow for a maximum number of possible operators and permit for a collective creation of societal goods, these tools therefore have to be limited in size and complexity. As described by Illich, such tools tend to be labour-intensive, but not necessarily inefficient (Illich, 1973b, see also Chapter 4). They assume that citizens collaborate in socially beneficial activities, which creates purposeful functions within society and assists with addressing the citizens' desire for recognition (Convivialist International, 2020) and counter the meaninglessness of contemporary industrialised societies (Illich, 1973b). Furthermore, tools which allow citizens to cater for their own needs reduce the injustice resulting from the dependence on the few operating, managing or governing complex tools.

Instead of sketching a linear development through technological innovation towards a better, modernist future, conviviality "refers to a specific kind of lived togetherness that is shared between the human and non-human inhabitants of a specific place in time" (Vetter, 2018, p. 161). By imagining an 'alternative realism' (Büscher and Fletcher, 2020) based on a collaborative and non-profit mode of production, conviviality opposes ideas of modernist development and progress and provides a path for de-growth and/or alternatives for Development (Büscher and Fletcher, 2019; Convivialist International, 2020).

1.3.7 Imaginaries

Imaginaries are "societally and institutionally established visions about what is and what ought to be" (Hommes, 2022, p. 28). Several potentially contesting imaginaries can "coexist within a society, in tension or in a productive dialectic relationship" (Jasanof, 2015, p. 4). These visions of the future are influenced by "who you are, where you are, where you have

come from, where you are going" (Wals et al., 2016, p. 21). Imaginaries describe not only a desirable future but also what is to be the social life that should be lived and the ideal social order. They are propagated by a wide range of social actors, ranging from political parties, social movements and public institutions, to think tanks, media, corporations and other professional societies. Their performativity (and therefore impact) is shaped by the support, challenges, or acceptance they receive from relevant actors and the power realtions among them (Hommes, 2022). I make use of the idea of imaginaries here, to conceptualise the different perceptions of rural water access that exist among actors in the described case studies. The description of these coexisting imaginaries allows to analyse the political contestations leading to the establishment and reproduction of dominant imaginaries and their effect on other perceptions of "what is and what ought to be" (Hommes, 2022, p. 28).

1.3.8 Conceptual contribution of this research

The main conceptual contribution of this research is the application of the concept of conviviality in case studies of rural water commons situated in particular market-modernist societies and imaginaries. The link between conviviality and commons has been established by others (see Esteva, 2014; Groenemeyer, 2015, among others), but I developed in this thesis a conceptual lens to study rural water commons. I apply this lens in the fourth chapter to describe a government intervention in an existing water scheme. Further, I conceptualise in the second chapter rural water schemes providing piped household connections as collectively owned self-supply water supply systems. It is illustrative for the research setup of this thesis and the change of my perception (explained in detail in the following subchapter) that at a later stage of the process, I would have chosen different concepts to describe these collectives. I therefore return in the fifth chapter to all three case studies and analyse them according to the Rooted Water Collectives framework (Vos et al., 2020). Laying the cases next to each other allows for the identification of similarities and differences. The application of the framework of Rooted Water Collectives to look at multiple case studies in this way is a third conceptual contribution of this research.

1.4 Positionality and the tale of my research odyssey

This research is guided by the conviction that "the world into which you were born does not exist in an absolute sense but is just one model of reality - the consequence of one particular set of intellectual and adaptive choices that your own ancestors made, however successfully many generations ago" (Davis, 2014, p. 1). There is not just one way of living in, engaging with, feeling for, and therefore, approaching and understanding the world, but many. Since a claim for objectivity and absolute truths would not make sense in this

context, positionality becomes key. Yes, it matters who, under what circumstances and according to which belief system creates specific knowledge. Who we are as individuals (gender, age, skin colour, economic background, personal story etc.), but also the knowledge, convivial tools, and the paths to establish new truths that we are familiar with determines the way we describe the world. I reflect here both on my positionality and on my research odyssey, which was guided by new insights created along the way but also the different (career or livelihood) choices I had to make. I outline here how I have moved my goalposts and changed the framing of my research along this journey.

During the first discussions with Alex (Bolding), at the time my Master thesis supervisor, about the possibility to extend my Master thesis into a PhD, he made it very clear to me that getting funding would be difficult. Since the funding options for social science PhDs in water management were and still are limited, most grants rightfully had diversity policies in place, which would make it challenging for me as a white, Swiss, male student to qualify. I fully agree with these rules. Yet, when Barbara (van Koppen) offered me a contract with the International Water Management Institute (IWMI) to write a first paper, I could start this thesis anyway. However, unlike in this instance, I did not always find it as easy to be aware of privilege. I grew up in Switzerland under very stable social conditions and good economic circumstances. While I was aware of this privilege early on, it was only after high school and while having to decide what I wanted to study that I additionally developed a sense of guilt about my privileged position.

I started my Bachelor studies in agricultural science in Zürich convinced of the need to do something about inequalities and with a clear idea that entering the development sector would be the best way to do so. After my Bachelor, I spent 9 months working on conservation agriculture at the International Maize and Wheat Improvement Center (CIMMYT) in Harare, Zimbabwe. Being confronted by the extremely low adoption rate of methods developed on the research station and demonstrated in fenced plots in villages made me realise that I wanted to have a more direct influence on livelihoods. Irrigation seemed to be the perfect solution since the potential to increase production is proclaimed to be enormous and ergo, there must be demand. I decided to follow an Agrismundus Masters programme in sustainable development in agriculture, specialising in irrigation at the University of Wageningen and Montpellier SupAgro.

When I started my Masters in Wageningen, I found it very difficult to let go of the clear-cut answers that the technical studies of my Bachelors provided. During my Bachelors, I never had to read literature and discussions were almost entirely reduced to questions of understanding. Suddenly, I found myself in small classes with professors who would enter discussions with us on equal footing. While I really came to like my studies, I also found it a quite disorienting experience. I learned that development aid/cooperation, the way I

imagined it, is a thing of the past and arguably is doing more harm than good. It was for the thesis of this Masters program that I then first arrived at IWMI in Pretoria in 2017, still driven by a motivation to do something about inequality and convinced that there must be a way to make development work.

During the 18 months of fieldwork that I then conducted in South Africa, I experienced many of the flawed sides of development that I learned about in lectures. Evaluations focused on quantifiable results and timely reporting, incentive structures led to overreporting of success and spending pressure, and innovation-averse structures protected the privileged in the sector. The idea to create transparency towards the future users on the budget and the cost during the planning of new infrastructure for example (see Chapter 3), met with fierce opposition from the NGO implementing the project. This opposition was not based on an unwillingness to change but grounded in the justified fear of being liable for unforeseen costs, rightful concerns over the additional workload when innovating, and the awareness that within the framework of such a development project, their performance primarily depended on submitting reports on time. During the work on my second article, describing and studying communal water schemes as communal self-supply schemes, my scepsis of expert-driven development deepened. While I only later started to understand the effects of normalising user initiatives as self-supply (see discussion of this thesis), I highlight in this article the many (historical) reasons for the absence of community organisations in public service delivery and the need to develop context-specific solutions. In addition, I highlight, as Galvin has done for the sanitation sector (2015), that there is a danger in romanticising such user initiatives since they can serve as an excuse to evade public responsibilities.

I really enjoyed this fieldwork. It gave me the opportunity to meet, learn from and live with people that I would have most likely never met otherwise. During this period, but also after returning to the Netherlands to write the first two articles, I lived on a very tight budget, always spending what I earned from a diverse array of temporary jobs. This was possible since, due to my background, I had not incurred any debts at the end of my studies and did not feel the same pressure to start saving as others at my age.

While the plan was to return to South Africa for more fieldwork after submitting the second paper, the COVID-19 pandemic made this impossible. Instead, I returned to Switzerland to do a traineeship at the Kanton, working on individual and communal rural water supply. It was Alex (my daily supervisor) who advised me to explore possibilities to continue with my research project within the Swiss context. After 17 Months at the province, I started working at a local engineering consultancy planning rural water schemes. It was the interaction with the users and steering committee members of these traditionally self-owned and -managed schemes that made me recognise the value that these schemes

have for the reproduction and representation of the local social fabric. While the South African and Swiss contexts could not be more different, I started to see that collective solutions struggle with the same normalising, neoliberal policy environment that drives our ambition to reach a modern utopia. My personal curiosity, but also the focus of the thesis shifted at that point towards trying to understand why things are the way they are and what the underlying social dynamics are that stabilise our reality.

1.5 Research methodology

1.5.1 General research setup

I focused my research from the start on the context in which I worked, trying to understand complex situations from within. Since my initially planned work context changed drastically due to the COVID-19 pandemic and the need to pursue work opportunities, I had to adjust my initial research setup.

To be able to learn from the three case studies, conducted in very different contexts, I chose to apply an approach inspired by Lazar. Lazar states that it is methodologically possible "to set two groups (or cultures, societies) alongside one another and see what comes out of an examination of their similarities and differences" (Lazar, 2012, p. 352). He suggests that such an approach can "raise questions that may not emerge through a more strictly representative form of comparison" (Lazar, 2012, p. 352). Hommes (2022, p. 31) adds that comparing cases with dissimilar characteristics assists to "challenge assumptions, bring together different perspectives on the research topic, and inform and further develop conceptual notions through reflexive engagement with the case studies." Both these aspects can be found back in the thesis. My interest in the value of rural water schemes for the social fabric and the underlying factors affecting water commons emerged when I started to work in Switzerland and recognised patterns I observed earlier in the South African context. This led to the second sub-research question. Recognising similarities despite the great differences in contexts further assisted me in challenging my assumptions and enabled the description of underlying factors.

The evolutionary character of this thesis means that the focus of the chapters differs, as outlined in Table 1.

Table 1. Overview of case studies

Village	Type of infrastructure	Infrastructural moment	Focus of analysis
Tshakhuma	User constructed communal water schemes, water abstraction from upstream of the village	Operational water schemes	Emergence and functioning of collective action
Ga-Moela	User co-constructed communal water scheme, water abstraction from two boreholes	Planning and construction of the reticulation	Piloting a user-driven approach, understanding public response
Luzern	Communal water schemes constructed during 1960s, water abstraction from natural wells	Refurbishment and scheme inter-connection/merger	Conviviality of schemes and threats thereof

1.5.2 Research methods

Over the whole span of this study, I made use of an actor-oriented approach, as described by Long (2001). It is rooted in a social constructionist view of change which builds on the observation that due to the co-creation of realities by actors, similar structural contexts can produce different responses. It allows us to recognise the power of actors to make a difference by exerting agency while also considering the influence of structural circumstances. Agency is understood here not as the intention or actual execution, but as the capability of actors to do things and therefore implies power (Giddens, 1984). It is exerted within historically grown structural circumstances that actors interact with and co-create. The methods applied were semi-structured interviews, observations, literature, and archival research.

To enrich my observations during the 18 months of fieldwork for the first two publications, I conducted a thorough literature research and 115 semi-structured interviews with a wide range of stakeholders (24 government officials from local to national level, ten local politicians, six water sector consultants, seven local water committee members, four community infrastructure operators and 64 randomly selected water users). The fieldwork for the third article was then conducted during 21 months. I worked 17 months at the provincial department of agriculture and four months at a local engineering consultancy that plans rural water schemes (where I continued working until January 2024). I additionally conducted a literature and archival review and conducted 17 in-depth, semi-structured interviews (with four current and two former government officials, five scheme officials, three engineers, two local politicians and one contractor). Literature and archival references are given in short form within the text and in full at the end of the dissertation. Interviews are throughout the thesis referred to in an anonymised form in notes placed in the text and listed at the end of this thesis. Further details over the research methods can be found in the specific chapters.

1.6 The regional context of the case studies

The selection of the three case studies was guided by the professional contexts I was working in. The two South African cases are situated in villages that were among the six pilot villages of the research project I was part of as a student and consultant. By including Tshakhuma and Ga-Moela, I selected two villages which not only differ greatly in their social and physical context, but also allowed for studying different infrastructural moments. During the fieldwork for the second part of this thesis, I got involved with the project that forms the backbone of the Swiss case while doing a traineeship at the Kanton. The complexity and the many contestations and interactions of this publicly subsidised water project permit an analysis of the different imaginaries.

Below I outline the local and regional context of the three case studies.

1.6.1 South Africa

Regional context: Limpopo province

At the time of the first democratic elections in South Africa in 1994, the World Bank estimated that a mere 43% of black residents had access to piped water, while there was almost full coverage of water services for the white population (World Bank, 1994). The African National Congress (ANC), was committed to eradicating these inequalities. Since there were initially no local governments in place that could provide services, the government opted to collaborate with NGOs such as the Mvula Trust. The approach chosen focused on the establishment of community-based organisations (CBOs) and was financially supported by international donor agencies. With the establishment of the legal framework, building on the constitution of 1996 which grants everyone the right to sufficient water, the responsibilities for service delivery were gradually transferred from NGOs and CBOs to public institutions. With the first local elections held in December 2000 this process came to a conclusion and the majority of the established rural water commons were suddenly forced to operate in a legal grey zone.

Since the newly established local municipalities initially lacked the capacity to plan and execute water projects (an issue that turned out to be persistent in many cases), the task to further extend water services and ensure sustainable water services was outsourced to consultants who plan and contractors who construct new infrastructure. The continuation of the widespread practice of outsourcing water projects can be perceived as a result of what has been described as the failure of the national government to develop technical capacity at local levels (Atkinson, 2007; Koelble and Lipuma, 2010). Yet, this outsourcing is also the result of government officials' preference since it creates rent-seeking opportunities (see Chapter 3) and must be perceived as part of the global trend at the time to favour outsourcing as a means to make public agencies 'more efficient' (see García-

Mollá et al., 2020). The public water service delivery sector is until today firmly integrated into the capitalist markets, and public policies are based on a firm belief that private sector involvement is good and efficient.

Figure 2. Map of Limpopo Province (Encyclopedia Britannica, 2024)

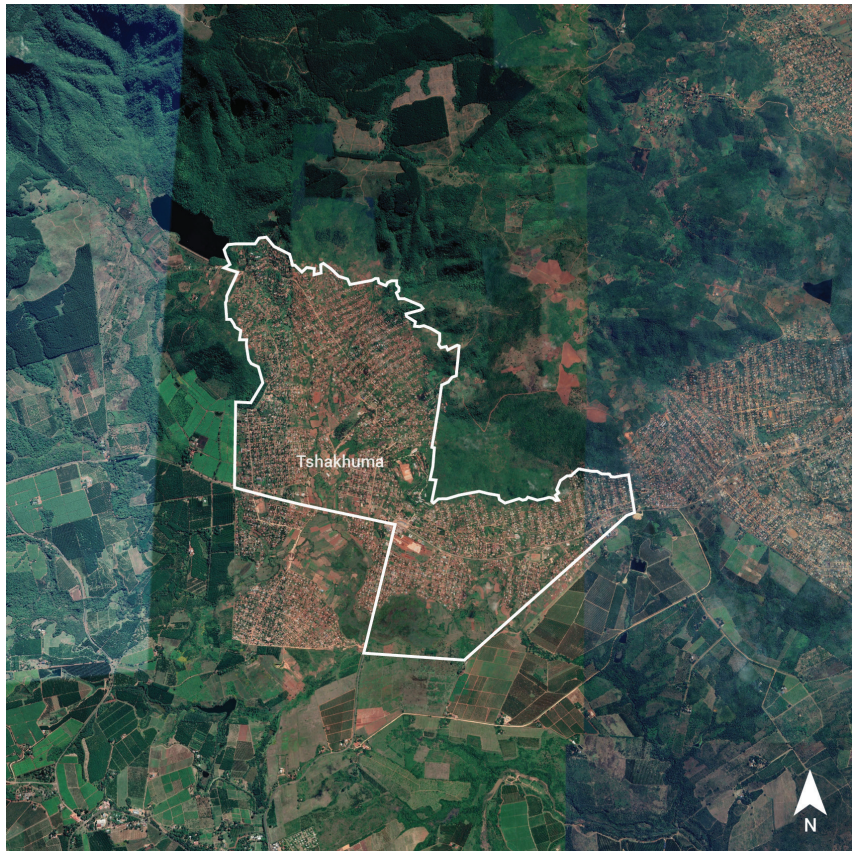

Figure 3. Map of Tshakhuma (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

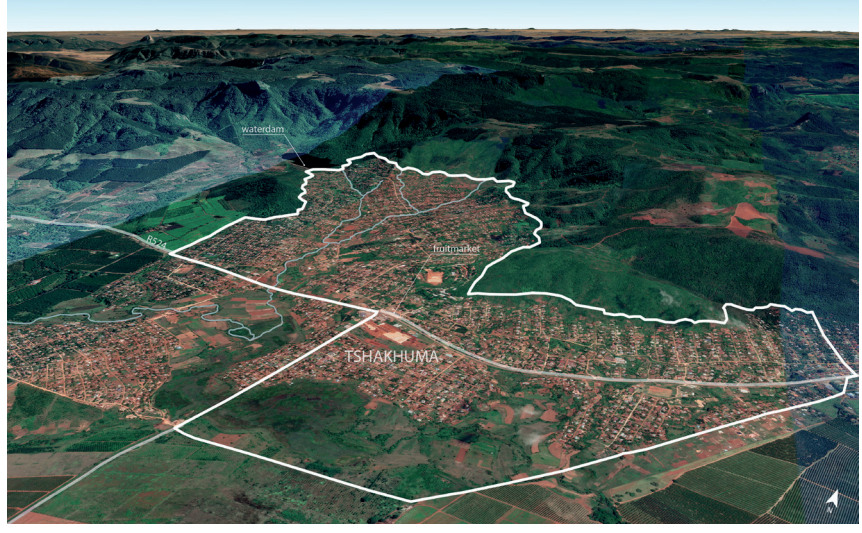

Figure 4. Relief of Tshakhuma (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

Local context: Tshakhuma

tshakhuma is located along a humid mountain ridge in Vhembe district in Limpopo province, receiving a relatively high annual rainfall averaging at 854 mm between 2009–2018 (FAO, 2018). Several perennial streams that flow through the rural-peri-urban village consisting of over 4,000 households allow water abstraction upstream of the village. Owing to its location along the R524 main road between Makhado and Thohoyandou, a vibrant fruit market emerged where both produce from the surrounding commercial farms and produce from homestead production is sold (Dagada et al., 2015). Van Koppen et al. (2020) found that irrigated homestead production is widespread in Tshakhuma, with 25% of the households either producing for home consumption, commercial sale, or both.

A public water supply scheme which abstracts water from a dam and provides household connections was constructed by the former Venda homeland government and finalised in 1990 (van Koppen, 2017a). While this scheme still provides water services to some sections of the village, in others, the services have permanently broken down. Moreover, due to the growth of the village beyond the perimeter of the public scheme, many households have never been connected. In response, so-called self-supply schemes were created.

At the time of the fieldwork for the article on Tshakhuma in 2017/18 there were 13 independent water schemes operating within the perimeter of the village. Six of these were selected for the analysis presented in the second chapter. The selection criteria were: organisational form, existence of monthly contributions and number of households.

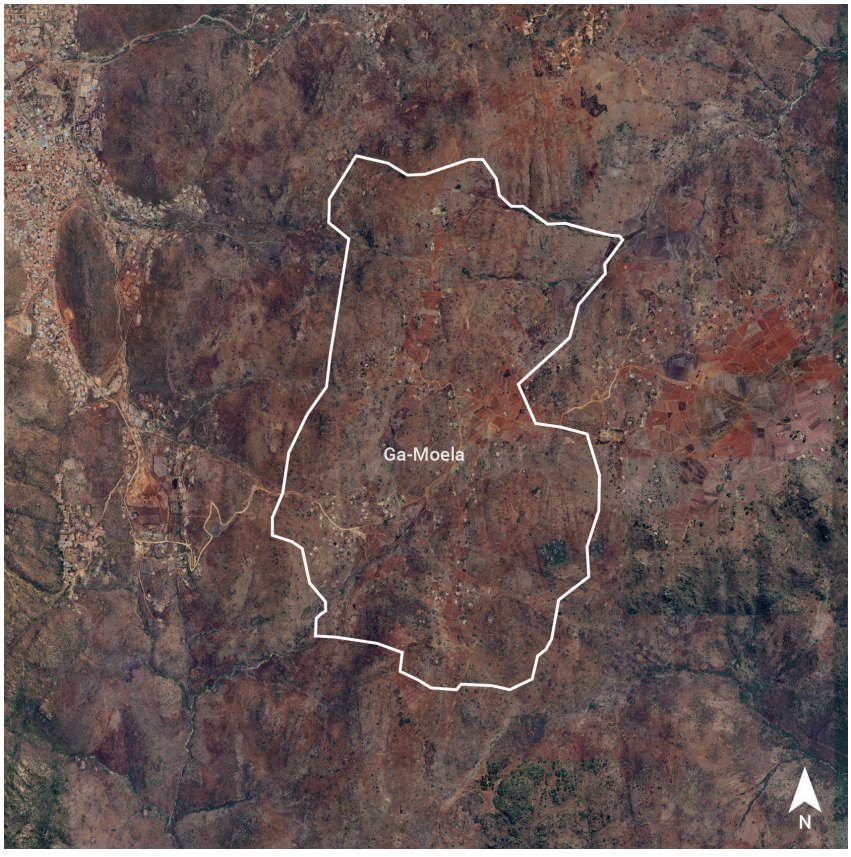

Figure 5. Map of Ga-Moela (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

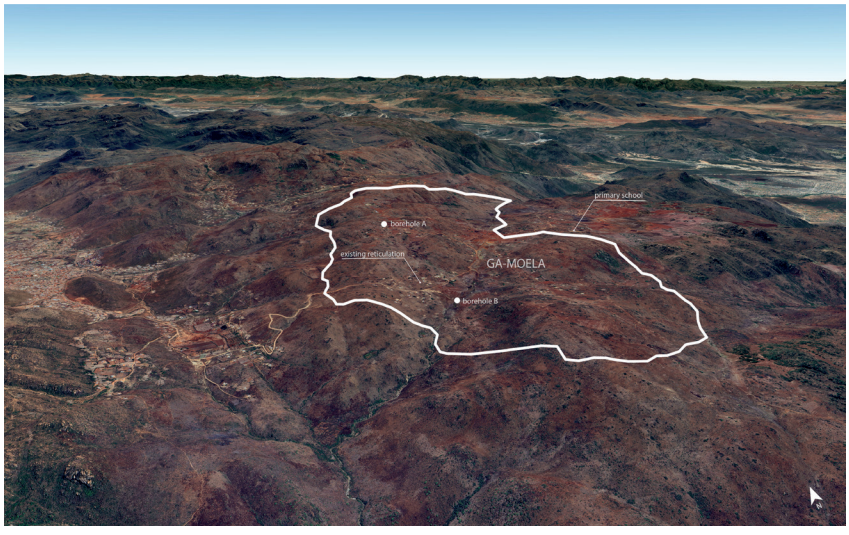

Figure 6. Relief of Ga-Moela (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

Local context: Ga-Moela

Ga-Moela is a small rural village in Sekhukhune District situated on top of a mountain ridge and is only accessible over an unpaved road. The approximately 100 households are spread across the ridge and get their water either from shallow wells or one of two public boreholes. Due to the lack of perennial streams and limited access to groundwater related to a lack of infrastructure, agricultural production is almost exclusively limited to rain-fed maize for own consumption. The fact that there are no formal employment opportunities in and around the village apart from the primary school means that many young residents migrate to work in urban centres. A wealth assessment survey conducted by IMWI in the village in 2017 showed that households commonly either rely on cash transfers from migrant workers, and/or government grants (Van Koppen, 2017b).

In one of three sections of the village there is a reticulation system, supplying water to street taps. The residents in the other two sections still had to cover long distances on foot to collect water, a task that is predominantly conducted by the women of the households. During the time of the first round of my fieldwork, a (supposedly) user-driven approach to planning and constructing an additional reticulation system in these two sections was implemented by the project team that I was involved in. I returned five years later, in 2023, to conduct additional fieldwork studying the forms of collective action that emerged around the bricolage of infrastructure.

1.6.2 Switzerland

Regional context: Kanton luzern

Collective ownership and management of forests, pastures and water has a long tradition in Switzerland, with the first such collective organisations emerging from 1250 onwards on the territory of today's Switzerland (Stuber and Wunderli, 2021). Lacking a central government, these collective forms of organisation became central during the 17th and 18th century, taking on more and more state functions (Schläppi, 2019). With the French occupation at the end of the 18th century, the state was reorganised, and a central government was established, but the cooperatives remained important (Schläppi, 2019). This co-existence, which was later characterised as municipal dualism, still exists today. The provision of water services within the urbanised zone for example is the responsibility of the local municipality (Schweizer Bundesversammlung, 1979), but in most cases this is delegated to cooperatives, with the municipality fulfilling only an oversight role. Households that are situated outside the urbanised zones, traditionally primarily farming households, are still today self-responsible for establishing and maintaining their water access (Schweizer Bundesversammlung, 1979).

Especially in the mountainous regions of the Kanton, this led to many still active collectively organised water schemes, which are usually organised as cooperatives. Since irrigation is uncommon in the region, water demand is driven by animal husbandry and domestic uses. The dependence of farming households on a reliable water supply and the high investment cost per household led to a situation where the State already in 1884 started subsidising projects aiming at the improvement of water access for farmers covering up to 40% of the project cost. During the 20th century, the state built up support services at the level of the Kanton and the total level of subsidies from the national and kantonal government was raised to 60% of construction cost in 1957 (Der Grosse Rat des Kantons Luzern, 1957). With the introduction of neoliberal policies from the 1980s onwards, the public support services came under pressure. While the subsidies remained at the same level, the technical support staff for structural improvement projects was reduced from 14 in 1973 (Meliorationsamt Luzern, 1973) to a mere three by 2008. This privatisation of knowledge meant that, while the construction of water schemes was already outsourced to contractors, now the planning of new infrastructure was also conducted externally by private engineering firms. Despite the great dependency on private service deliverers that resulted from these policies, they are still widely promoted as a success since the number of public employees can be kept low.

Figure 7. Map of Kanton of Luzern (Elaborated by Hestia Zinsmeister, based on encyclopedia Britannica, 2008)

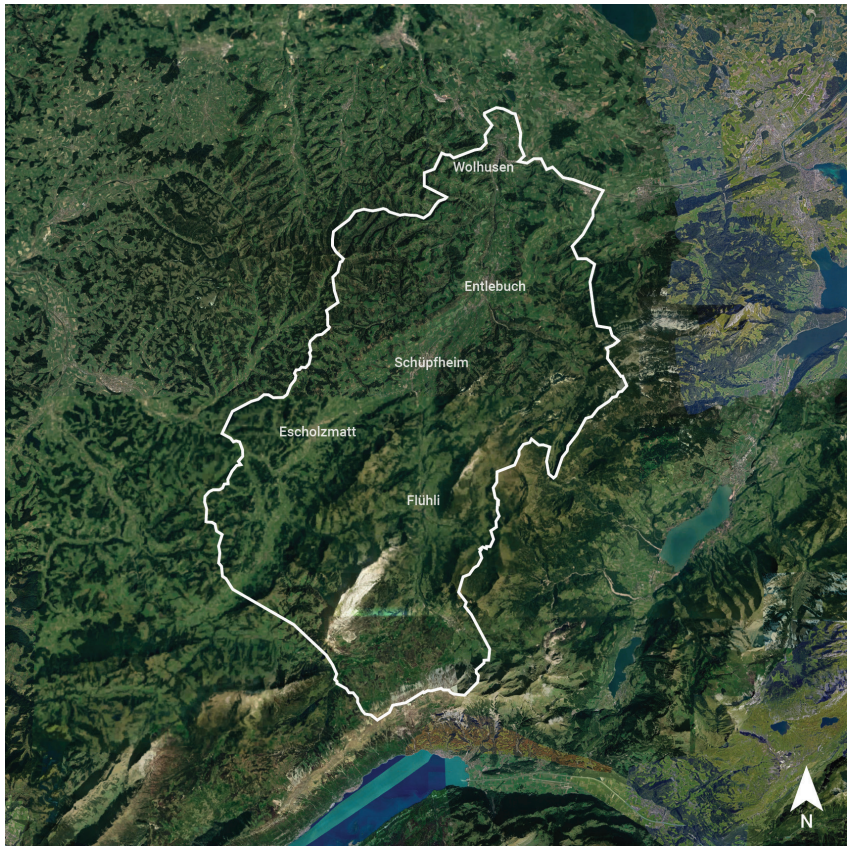

Figure 8. MAP of the region of Entlebuch (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

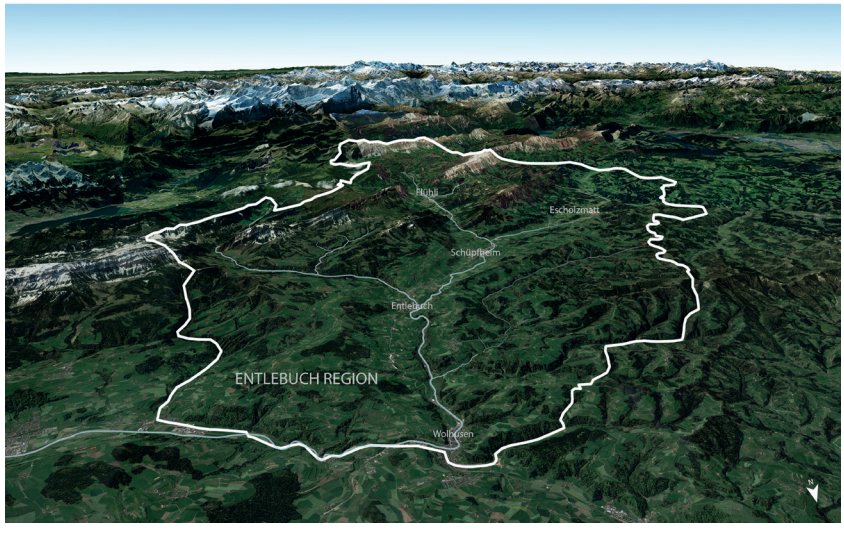

Figure 9. 3D view of the region of Entlebuch (Elaborated by Hestia Zinsmeister based on Google Earth Imagery)

Local context: Entlebuch

the case is situated in a rural municipality located in the mountainous region of Entlebuch, within the Kanton of Luzern. Outside the urbanised zone of the village, there are six independent and user owned water schemes that abstract water from natural springs and deliver it to connected households. While the yield of these springs is not directly subject to temporary changes in weather, many are sensitive to longer dry spells as occurred in 2018 and 2020. The rainfall, despite climate change, is predicted to remain at around 1400mm (Kanton Luzern, 2022), but summer droughts and heavy rainfall events are expected to become more frequent (Regierungsrat des Kantons Luzern, 2021). The high protection status of the remaining natural springs means that collectives aiming to improve their water supply in most cases have to seek collaborations with other existing schemes. Due to the mountainous terrain, such connections are technically challenging and costly.

The described schemes were constructed in the 1960s, at a time when many of these rural water collectives were founded or extended. The economic activity in this rural zone is dominated by dairy farming, which is only possible with a reliable water supply. It does therefore not surprise, that the proliferation of water schemes in the 1960s and 1970s coincided with a rapid intensification of livestock production (LUSTAT, 2022). At the time of my fieldwork in 2021-2023, three of these collective schemes were working out a project to collectively improve their water access and at the same time renew their ageing infrastructure.

1.7 Scientific output

Chapters 2, 3, 4 and 5 of this thesis are based on scientific articles published in open-source, peer-reviewed journals. The first two articles were written within the context of my engagement with the International Water Management Institute in South Africa. They are both (in alternating order) co-authored by Barbara van Koppen and Alex Bolding. Alex also co-authored the next two articles, together with my promotor Rutgerd Boelens. To improve the readability of the thesis, I adjusted these articles slightly and removed redundancies. While the presented research is the result of a close collaboration with my supervisors, I decided to consistently make use of "I" as personal pronoun, throughout the thesis. I acknowledge the indispensable contributions of my co-authors.

The third chapter is based on the first paper published in Water Alternatives in 2020 under the title "Addressing Failed Water Infrastructure Delivery Through Increased Accountability and End-User Agency: The Case of the Sekhukhune District, South Africa". The second chapter was published in Water SA in 2021 as: "The emergence of collectively owned self-supply water supply systems in rural South Africa – what can we learn from the Tshakhuma case in Limpopo?". Chapters four and five were then both published in 2023. The fourth chapter was published in the International Journal of the Commons as: "Conviviality Under Pressure of Market-modernist Expertocracy: The Case of Water Commons in Rural Switzerland" and the fifth chapter in the journal Water under the title: "Rooted Water Collectives in a Modernist and Neoliberal Imaginary: Threats and Perspectives for Rural Water Commons".

1.8 Outline of the dissertation

The present chapter describes the general aim and the question guiding this thesis. It further outlines my positionality as a researcher and the concepts on which the backbone of this dissertation has been built. The following three chapters are based on the case studies and are ordered according to the level of state involvement. In the second chapter, I analyse rural water commons in Tshakhuma village, Limpopo province, South Africa, that emerged and are reproduced independently from government support. These schemes were planned and constructed by community members and provided household-level water connections for their members while operating in a legal grey zone. In addition, I study how the relations of user-driven initiatives with public institutions, NGOs and private service providers evolved historically. In the third chapter, in the same province, in Ga-Moela village, I study an outside intervention aiming to construct water reticulations (providing standpipes) from two existing public boreholes. I do so by describing the implementation of an experimental user-driven approach to planning water infrastructure, focusing on

the creation of a common vision for multiple water uses and strengthening end-user agency. Further, this chapter includes a thorough analysis of the accountability relations in public service delivery in Limpopo Province. The fourth chapter, in the Swiss Kanton of Luzern, describes the process of publicly subsidised rehabilitation and unification of three existing user-owned water schemes providing household connections. Already their establishment in the 1960s was publicly subsidised. I analyse the positions of and dynamics between the different actors involved in this intervention. I make use of the concept of conviviality to describe how market-modernist interventions endanger these water commons.

The fifth chapter returns to all three-case studies, which are viewed next to each other. This is done by applying the Rooted Water Collectives framework to all cases. This approach allows to describe similarities in terms of what position water collectives take in these rural areas, but also in terms of the effects that the market-modernist imaginary has on them. In the overall discussion chapter for the thesis, I reflect on my research journey by looking at the use and evolvement of the conceptual framework in the light of its application in the water control arenas that were studied. I then discuss rural water supply and answer the two sub-research questions by scrutinising the three cases. Next, I reflect on my positionality, by critically looking at the positions I took during this research and my changing perspective. I conclude this thesis by answering the main research question.

2

THE EMERGENCE OF COLLECTIVELY OWNED SELF-SUPPLY WATER SUPPLY SYSTEMS IN RURAL SOUTH AFRICA

WHAT CAN WE LEARN FROM THE TSHAKHUMA CASE IN LIMPOPO?

2.1 Introduction: South Africa's water services challenge[1]

In 1994, the incumbent democratically elected government of South Africa was facing enormous racial and regional inequalities in access to water services. Huge efforts have been undertaken since then to extend service delivery for domestic uses to previously unserved groups. This campaign was successful and resulted in an extension of the total population served by improved water sources from 64% in 1994 (Muller et al., 2017) to 85.5% in 2017 (Stats SA, 2019). However, this progress was mainly achieved in urban areas, while 24% of the rural households are still relying on 'unimproved' water sources like unprotected wells, rainwater harvesting, surface water bodies, bottled water or tanker trucks (Stats SA, 2017). Moreover, the household survey of 2016 showed that 31.4% of the rural population with access to piped water experienced water interruptions of more than 14 days during the previous 3 months, compared to 4.7% of the served population in metropolitan areas (Stats SA, 2017). This points to the operation and maintenance challenges besetting especially rural water infrastructure. The latter is also borne out by the meagre 36.4% of the total population of Limpopo Province that perceives their water service quality as good, despite a coverage of 74.7% with piped water supply in this province (Stats SA, 2019).

In this paper I will first provide an overview of the growing international body of literature describing self-supply as an alternative pathway for public service delivery. I then take a historical perspective on the role of communities in self-supply in South Africa and describe the emergence of six collectively owned, gravity-fed, piped schemes in Tshakhuma, Limpopo Province. I describe and compare these systems on key characteristics like resource access, investment, construction, operation and maintenance (O&M) and institutional governance. I further assess their performance with regard to coverage, service level, reliability, governance, accountability and water quality.

Thus, I hope to contribute to an awareness of what communities are capable of and to filling the knowledge gap on such initiatives. I do not imply that user-owned schemes or supported self-supply represent a solution for the challenges in rural water supply, nor that the aim of policy makers should be to reproduce such schemes elsewhere. I am convinced though, that if these schemes are studied as locally adapted prototypes of water service delivery solutions, lessons can be learned to combine the strengths of communities and municipalities in public service delivery. Finally, I raise additional questions and points of interest for further research.

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1 This chapter is a slightly adapted version of the article that has been published as: Hofstetter, M.; Van Koppen, B. and Bolding, A. 2021. The emergence of collectively owned self-supply water supply systems in rural south africa - what can we learn from the tshakhuma case in limpopo? Water SA 47(2): 253–263.

2.2 Background: the international interest in self-supply

The most comprehensive definition of self-supply in the WASH sector comes from Sutton and Butterworth (2021, p. 28), who define it 'as the construction of, or incremental improvement to water supplies and sanitation by households and small groups, largely using their own means'. It is also suggested that self-supply schemes can be supported by outside actors (Olschewski et al., 2017; Sutton and Butterworth, 2021; Butterworth et al., 2013). While such schemes have existed since time immemorial, they have only recently caught the attention of international scholars, NGOs and governments (WHO, 2017; Sutton and Butterworth, 2021).

Scholars attribute two main advantages to supported self-supply as an approach to service delivery. The first point is the suggested higher sustainability of the infrastructure due to co- or full ownership (Olschewski et al., 2016, 2017; Sutton et al., 2004; Pump Aid, 2016; Maltha and Veldman, 2016; Cranfield University, Aguaconsult, IRC 2006) and simpler and more affordable technology used (Maltha and Veldman, 2016; Sutton et al., 2004). The second advantage is the supposed lower cost of service extension due to the user investments (Olschewski et al., 2017, Sutton, 2007, 2004; Butterworth et al., 2014; GLOWS, 2012; Sutton, 2018).

In the irrigation sector, it has been widely recognised that co-ownership by users of infrastructure improves its sustainability (Marks and Davis, 2012; Yacoob, 1990; Boelens and Vos, 2014; Coward, 1986a, b). This effect has also been shown in rural water and sanitation schemes (Manikutty, 1997; Sutton and Butterworth, 2021). While reliable data for user investments are hard to obtain, calculations of the World Health Organisation (WHO) for seven developing countries suggest that investments in self-supply by households amount to a substantial share of total investments in WASH services. In Ghana, for example, such investments by households were estimated to reach 69% of total investments into the WASH sector in 2014 (WHO, 2017).

The perspective of expanding water services to rural communities at much lower cost for the government and in a more sustainable manner has induced a number of governments to introduce policies and programmes to support such self-supply. Ethiopia has introduced national policy guidelines on self-supply, which include a 50% subsidy for collectively owned self-supply projects (Federal Democratic Republic of Ethiopia, 2012) and Sierra Leone's Rural Water Supply Strategy includes self-supply as an official service delivery approach (Sierra Leone, 2013 as cited in Gelhard, 2014). The governments of Zimbabwe (Olschewski et al., 2016), Uganda (Kyeyune et al., 2011), Benin and Zambia (Sutton et al., 2004) supported projects or have launched pilots to evaluate the potential of this approach. Sutton and Butterworth (2021) recently published a book on the topic

and there is a growing body of peer-reviewed literature describing 'self-supply systems' in Ghana (Grönwall, 2016), Nigeria (Oluwasanya et al., 2011), Madagascar (MacCarthy et al., 2013), Ethiopia (Butterworth et al., 2013), Kenya, and Finland (Arvonen et al., 2017), and reports from Sierra Leone (Gelhard, 2014), Mali (Maiga et al., 2006), Cameroon (Njoh, 2009), Ghana (Nyarko et al., 2010) Uganda (Carter, 2006) and Kenya (Advani, 2010).

2.3 Self-supply and the role of communities in water service delivery in South Africa

While the first public investments in water services date back to 1811, when British settlers in Cape Town constructed the first public reservoir to supply a growing number of fountains (Burman, 1969 as cited in Juuti et al., 2007), such initiatives focused for a long time solely on urban areas like Durban, Johannesburg and Grahamstown (Mäki, 2007). The lack of public services in the vast rural areas of the country meant that self-supply was the norm. In many cases, this situation did not change until the end of Apartheid. While in 'white' apartheid South Africa, municipalities were responsible for water services (Muller et al., 2017), in the so called 'native reserves' or 'homelands' water services were provided by large homeland bureaucracies, which Eales earmarked to have 'poor productivity and corruption well-entrenched' (2011 p. 39). The provision of water services was strongly racialised (Marcatelli and Büscher, 2019), whereby the majority of the population did 'not have access to an adequate supply of safe water at a reasonable distance' (CSIR, 2020 p. 27).

With the end of apartheid, the government faced the challenge that there were no local municipalities in these former 'homelands' to roll out services to the most disadvantaged part of the population (Eales, 2011). The strategy of the then Department of Water Affairs and Forestry (DWAF) for areas without functional administrations was therefore to set up local water committees (LWCs) with the help of existing water boards. These LWCs would then ultimately be subsumed into local government structures once these were functional. It was a period of major capital investments into infrastructure expansion guided by the international best practice of community participation and demand-driven development (DWAF, 1994). To increase capacity, new implementing agent arrangements were drafted with non-governmental organisations (NGOs). NGOs like Mvula trust played a key role in contributing much needed know-how in community-driven development during this infrastructure roll-out (DWAF, 2004). This approach resulted in community-based organisations (CBOs) becoming pivotal in the operation and maintenance of rural water service infrastructure.

With the introduction of new policies and the establishment of local municipalities, the role of community members in water service delivery started to change. The Water Services Act (1997) created the base for all further policies of the sector and established the legal concepts of both water service authorities[2] (WSA) and water service providers[3] (WSP). A WSA can act as a WSP through their own departments, enter a contractual agreement with a WSP or form a joint venture with another water service institution to provide services (RSA, 1997, section 19). Assigning an external WSP was, though, only permitted in case no public entity was able to provide the service. The Water Services Act further prohibited anyone from using 'water services from a source other than a WSP nominated by the WSA having jurisdiction in the area in question' (RSA, 1997, section 6). This new regulation rendered all existing community-based organisations and common self-supply initiatives illegal, unless the municipalities would admit their failure and hand them the responsibilities. The Municipal Systems Act (MSA) (RSA, 2000) then established even more procedural hurdles for the recognition of CBOs as WSPs. The MSA classifies all non-public entities as external service provision mechanisms (sections 76 and 80 of the MSA). This meant that CBOs in rural areas applying for legal recognition now had to go through the same procedure of competitive bidding (section 83 of the MSA) as a private company aiming to privatise service provision in a metropolitan area. These new regulations only became fully effective with the first local government elections in December 2000.

This regulatory push happened despite the considerable change in attitude towards CBOs within parts of the government, away from perceiving CBOs/LWCs as temporary solutions (DWAF, 1994), towards seeing them as valuable partners in rural settings (DWAF, 2000 a; b; c; d; RSA, 1998 a; DPLG, 2000). It was officially argued that these new policies would set the norms and standards (RSA, 1997) to allow for affordable service delivery and universal access (RSA, 2000), but during the interviews for this study, interviewees raised three additional motivations for these new regulations. Firstly, some policy makers considered community-based water service provision to be obsolete or, as a leading official of the Municipal Infrastructure Grant (MIG) put it: 'this was the way [to provide services] when there was no State to cater for the people'.[4] Secondly, labour unions were against any external water service provision out of fear for privatisation of services.[5] Thirdly, and most often mentioned, was the absence of political will to allow community organisations to exist parallel to the newly formed local governments and compete with them for the responsibilities and financial resources related to water services.[6]

The new policy environment created a discrepancy between the legal recognition of the efforts and capacities of community members and their actual role in water service delivery. Local politicians and government officials perceive community members as consumers,[7] whose role is to avoid vandalism and to save water,[8] to make it easy for the municipality to implement projects[9] or to express their wishes in the consultations for the

Integrated Development Pl[10] (IDP).[11] The same community members construct, improve, operate and maintain water infrastructure and fill the gaps in public service delivery. These schemes vary in complexity, ranging from individual wells to collectively owned, piped water schemes. While every household has a right to access water for reasonable domestic uses, watering of animals and gardening for non-commercial purposes (RSA, 1998b),[12] collective schemes that are not registered as WSPs are rendered illegal. Sector officials further raised concern with water quality and the lack of its monitoring in self-supply schemes.[13] Yet, local governments in poorer and remoter districts pragmatically acknowledged the existence of such self-supply schemes (Sutton, 2004).

While self-supply is often associated with poor, black communities, it is a phenomenon that also occurs in middle and upper class, white settings in the form of rate payer associations or individual households going 'off-grid'. The formation of ratepayer associations is often the result of a conflict between municipalities and citizens over the level and quality of services provided. Ratepayers declare a dispute[14] with the municipality and withhold their rate payments (May, 2004; Matebesi, 2017). According to the national taxpayer union, such disputes occurred in 42 municipalities in 2011 (National Treasury RSA, 2011). In extreme situations of service delivery failure, these associations can also create parallel structures and start to provide services themselves (National Treasury RSA, 2011; May, 2004), as was the case with water and sanitation services in Sannieshof (Matebesi, 2017; Gouws et al., 2010). Another form of self-supply among high-income households is to go off-grid by investing into alternative sources such as groundwater, rainwater or greywater. During the 'day zero' crisis in Cape Town, the demand for such technologies surged. At the same time the demand for water from public supplies was reduced from 1.2 million m^3/day 2015, to 0.53 million m^3/day in mid-February 2018, with especially large users reducing their consumption (Simpson et al., 2019a). Since in the South African tariff system the consumers with high abstractions cross-subsidise the services to the poor (DWAF, 2002), this development created immense financial issues for the public service delivery of the City of Cape town (Simpson et al., 2019b). At the same time some of the wealthiest households went off-grid and continued to use large quantities of water (Taing et al., 2019; Oomen, 2021).

2.4 Conceptual notes

Prototyping is a pathway to innovation that consciously operationalises the design principle of trial and error, allowing for adaptation and learning, in contrast to blueprint solutions. It has been asserted that such an approach to technology development can lead to more locally adapted and sustainable systems, as demonstrated by farmer-led

irrigation developments (Nkoka et al., 2014). I consider the studied schemes as such prototypes of locally adapted water delivery systems in order to learn from them.

I first describe the schemes based on five key focus points: emergence; access conditions to the resource; investment and construction; operation and maintenance practices; and institutional solutions for governance. I then assess the strengths and weaknesses of these schemes by discussing three dimensions of their performance: coverage and service level; governance and accountability; water quality. These were selected based on evaluation manuals developed by Still and Balfour (2006) and Mvula Trust (2000).

2.4.1 Five key dimensions for description

Emergence

Many self-supply systems are initiated in response to a failure of public water supply, at the behest of one or a group of important figure(s) in the community. The origins of a self-supply scheme often determine access and governance conditions.

Access conditions to the resource

To describe the rules and regulations related to the access to water, I make use of legal pluralism and hydraulic property creation. Legal pluralism has been described by Meinzen-Dick and Pradhan (2001 p. 11) as 'the coexistence and interaction of multiple legal orders within a social setting or domain of social life'. According to Berman, conflict is unavoidable in situations with such overlapping legal systems (2007). Studying this is important, since the practice of establishing rights to access water is not only defined by a country's statutory legal framework, but also by non-official customary systems (Boelens and Vos, 2014; Von Benda-Beckmann, 2002) commonly applied in post-colonial settings of Africa (Merry, 1988; Pimentel, 2011). While this is key to understanding the creation of rights to access water in traditional contexts, it 'is sometimes interpreted as a threat to the power and rule-making capacity of national bureaucrats' (Boelens and Zwarteveen, 2005, p. 744). The theory of hydraulic property describes how, in farmer-led irrigation schemes, an investment not only creates ownership of infrastructure and the water conveyed, but also allows exclusion of non-investors (Coward, 1986a; Boelens and Doornbos, 2001; Komakech et al., 2012; Boelens and Vos, 2014).

Investment and construction; operation and maintenance

The process of planning and constructing infrastructure is not linear, but prone to deviations, constantly changing and adapting to its physical environment and its use (Sanchez et al., 2019). I consider the process of investing and constructing infrastructure to be a key step especially because the established ownership relationships form the basis for future collective action. Investment determines both the rights and obligations of users towards the operation and maintenance of collective works (Coward, 1986b).

Institutional governance

I build my analysis of the institutional aspects of these schemes on a critical institutionalist perception. Such an approach emphasizes the embeddedness of institutions in everyday social life and the complexity that this creates (Cleaver and De Koning, 2015). It challenges the assumption of mainstream institutionalists that human behaviour is exclusively guided by rational choice and that design principles, as the ones formulated by Ostrom (1993), can guide the crafting of sustainable institutions (Cleaver, 2017; Hall et al., 2014). Instead I apply an institutional bricolage framework, as introduced by Frances Cleaver (2001), that conceptualisnges institutions as being reshaped or pieced together in a conscious or unconscious manner as a result of locally specific relationships, knowledge and previously existing institutional arrangements (Cleaver, 2001, 2002, 2017; De Koning, 2011, 2014). Taking such an approach acknowledges that institutions are shaped by power relations and people's complex social identities (Cleaver, 2017).

2.4.2 Three-fold assessment of performance

In order to assess these schemes, I identify three fields of interest:

Coverage and service level

Coverage refers here to the capacity of the scheme to provide water services to the households in its command area. This includes both an assessment of technical limitations and membership requirements that reduce coverage. The service level describes regularity and predictability of water supply to the member households.

Governance and accountability

In this section I assess the institutional arrangements of the schemes and how they influence the provision of the promised services. I choose accountability as a key concept. While conventional definitions of accountability focus on the relations among formal actors or formal actors and users (Dann and Sattelberger, 2015; World Bank, 2003), I focus here on informal forms of accountability that thrive on mutual norms and trust (Wit and Akinyoade, 2008). In this context where users are the (partial) owners of the infrastructure, I understand accountability as the strength of the established informal relations and their capacity to ensure the delivery of the promised services and providing pathways to respond to emergent performance-related issues.

Water quality

I compare the measures to secure or monitor water quality in the described schemes and how they relate to the national standards.

2.5 Methods

2.5.1 Fieldwork and interviews

This study is based on semi-structured interviews and an in-depth analysis of the international literature on self-supply and the South African water service policies. Interviews were conducted with 24 government officials from local to national level and 6 consultants operating in the water sector. To describe the collectively owned, piped self-supply schemes, additional semi-structured interviews were conducted with 7 local water committee members, 4 community infrastructure operators, 4 local traditional leaders and 64 randomly selected community members living within both the up- and downstream sections of the studied systems (43 using services of one of the schemes and 21 relying on other sources). The fieldwork was conducted between April 2017 and June 2018. During this time, the main author worked as a research consultant for the International Water Management Institute (IWMI) in an action research project, aiming to improve service delivery approaches for rural communities.[15]

2.5.2 Case study setting

Tshakhuma is a growing, rural-peri-urban village with over 4 000 households, located in Makhado Municipality, Vhembe District, in Limpopo Province. Situated along a mountain ridge, it receives ample annual rainfall (average 2009–2018: 854 mm; FAO, 2018) which feeds several springs and perennial streams, that allow for water abstraction above the village. Its location along the R524 between Makhado and Thohoyandou fostered the creation of a vibrant fruit market, where both produce from homestead production and the surrounding commercial farms is sold (Dagada et al., 2015). Van Koppen et al. (2020) found that 25% of the households in Tshakhuma practise irrigated cultivation at their homestead for home consumption or commercial sale or both.

The former Venda homeland government finalised the construction of a public water supply scheme in 1990. This scheme is connected to a dam and provides water directly to the households (Van Koppen, 2017). At the time of the study, this scheme still provided water services to some sections of the village, while in other sections of the village the services had collapsed permanently. Moreover, the village has grown beyond the perimeter of the public scheme, so many new households have never been connected.

At the time of the research, 13 independent self-supply schemes existed within Tshakhuma village, of which six were selected for study based on the number of households served, their organisational form and the existence of monthly contributions (Table 2).

Table 2. The six selected self-supply schemes of Tshakhuma

	Households served	Form of organisation	Monthly payments
Mulangapuma 1	113	COMMUNAL	1.5 USD
Mulangapuma 2	219	COMMUNAL	NONE
Muhovoya	236	PRIVATE ENTERPRISE	3.5 USD
Thondoni	496	COMMUNAL	NONE
Luvhalani	43	COMMUNAL	2.1 USD
Rudanani	20	COMMUNAL	NONE

2.6 Results

2.6.1 Emergence

In the absence of reliable public services, a group of community members in Rudanani Section attempted in the late 1990s to use furrows to supply water to households from springs located upstream of the village. This first attempt was not successful. In 2004, a retired official of the Department of Water Affairs became the first to lay a pipe to the same source. Once successful, many of his neighbours wanted to join and the matter was taken to the local traditional leader.[16] It was decided that this should be a community project. A committee with 6 members was formed and 11 households contributed funds to buy pipes (see Figure 10). By 2010, the system was supplying 39 households. The success of this small scheme triggered other sections to copy their effort. By 2016, 12 more schemes had been established.[17]

2.6.2 Accessing water resources

The relatively humid climate creates the possibility to abstract water above the village and divert it to the households using gravity. While each individual household has a right to this water based on the national water act (NWA) (RSA, 1998b), the interviewees indicated the necessity to obtain the permission of the traditional leaders to access water and construct new infrastructure on their land.[18] This characterises a situation of legal pluralism.

In three schemes, the local headman hosted the first meeting where the idea was introduced to the community, while in another case the permission was obtained by informing the local headman.[19] In the remaining two cases, the initiator either consulted the traditional leader individually, as there was no initial plan to extend the water pipe to other households,[20] or started the scheme independently from the traditional leader, because the local headman had lost his moral authority in an unrelated incident.[21] Once permission of the traditional leader was given and the connection installed, no one else could use the same source, unless earlier users would agree to this. This was manifested in the resolution of a conflict over the use of a source during the 2016 drought, when the

original investor group was able to prove based on meeting notes that they had asked for permission to use a specific source and therefore had the exclusive right to its use.[22]

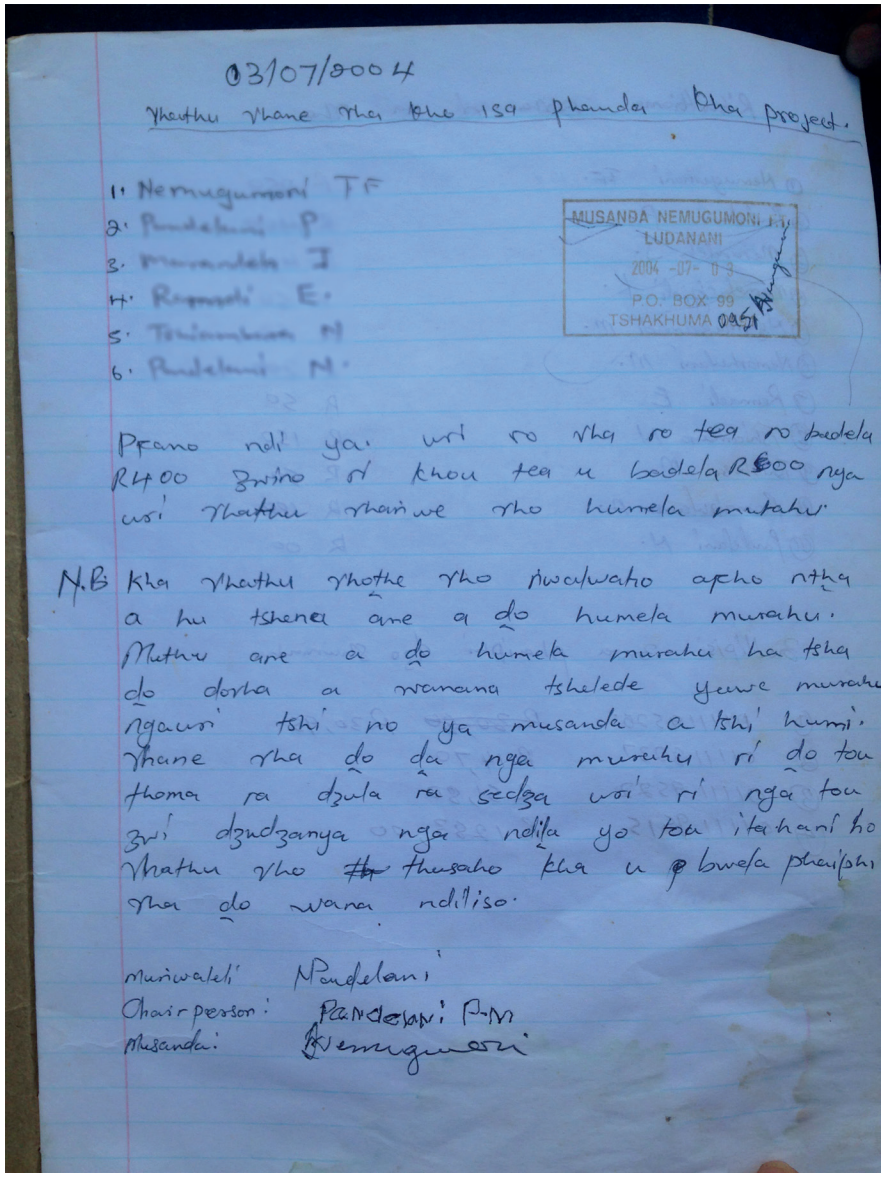

Figure 10. Excerpt from the notes of the traditional leader

Figure 11. Water abstraction point mulangapuma 2

2.6.3 Investment and construction

The technical knowledge for these systems was initially provided by retired government officials living in the community[23] and individuals with relations to the white large-scale farmers in the region.[24] This know-how was then disseminated by artisans among themselves. Plantation owners sporadically supported the construction of these schemes by supplying old pipes and storage tanks.[25] The proximity to the plantations also ensured access to suppliers of material, while local shop owners also assisted with technical advice.[26]

With the exception of the one private supply scheme, where users joined gradually and paid a connection fee, every household would initially contribute 25–150 USD for the construction (depending on the construction cost and number of members joining). In addition, every household had to deploy one member (or hire someone) to help with construction or cooking on the dedicated construction days.[27] The initial meetings were open to all households within the planned service area, but not everyone joined the schemes. The main reasons for not joining were that they had access to public water services,[28] that they did not trust the plan to be successful and therefore did not want to risk the expenditure[29] or that they could not afford to join.[30] Another group of

community members contributed to the construction of schemes and installed pipes to their homesteads, but due to technical issues never received any water.[31] The rules to join schemes at a later stage differ. In one scheme, it was decided that no one can join later, limiting access to the initial users.[32] In three schemes, users could still join by paying a fee and purchasing the materials needed.[33] In two other schemes, service levels were so low that no additional users wanted to join.[34]

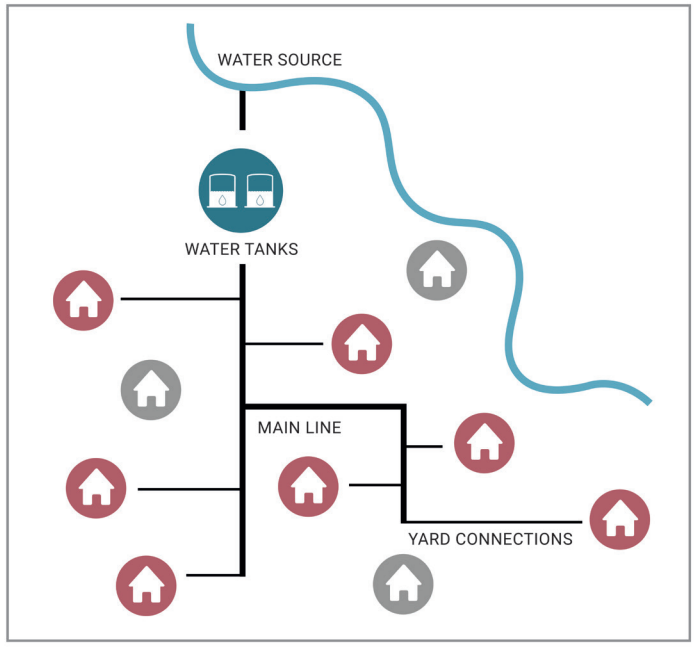

Figure 12. Sketch of the generic setup of the local self-supply schemes

All described schemes are using (high-density) polyethylene pipes connected to a water abstraction point at a spring or small river upstream (see Figure 11) of the served area (see Figure 12). In all schemes, each member has an individual water tap at household level connected to the main distribution network. Only 4 out of the 6 studied schemes collect the water in storage tanks before distribution (see Figure 13), enabling the operator to store water and increase the pressure during times of high consumption. Additional filters at such tanks help reduce sediments entering the piped network. In one scheme, the operator also regularly adds chlorine overnight to the tank to purify the water.[35]

None of these systems can provide services to all users simultaneously. The services in some schemes are therefore irregular, while others have agreed on rotation schedules and one even has a written agreement that guarantees its users access to water every third day.[36] The fact that water services are often not available on a daily basis has led

to individual investments into storage capacity at household level. A household survey conducted by IWMI showed that the average storage capacity in the village amounts to 951 litres per household (Van Koppen, 2017).

Figure 13. storage tanks mulangapuma 1

2.6.4 Operation and maintenance

In three schemes, the right to water services, established through initial contributions in funding and labour, has to be renewed through a fixed monthly payment of 1.5–3.5 USD for operation and maintenance. Users pay either at a meeting or directly to the chairperson.[37] In one scheme, this money is being kept in a collective bank account to pay the operator a fixed stipend.[38] In two other cases, the full amount is given to the operator(s) who in turn take(s) care of the maintenance.[39] In one of the latter cases, there is a written rule that receipts of expenditures are to be collected, since accountability over the use of these funds is considered key to keeping a good paying morale. In the private scheme, the owner collects the fee and takes care of the operation and maintenance himself.[40] One scheme that used to collect fees had to stop collecting, since the former operator allegedly misused funds.[41] While this occurred 2 years before, the scheme's chairperson stated that insufficient trust had been gained for users to resume payments. In this and one more scheme, the operator(s) work voluntarily and users only contributed money when special meetings were called to address issues.[42] In a third scheme, the users have to organise solutions for issues themselves.[43] All systems with regular payments agreed to either fine[44] or disconnect households that fail to pay.[45] They enforce this, since they share

the notion that a lack of sanctions has a very negative influence on the payment morale of their users.[46]

Operational tasks focus primarily on opening and closing of valves and implementation of rotation schedules. Common maintenance tasks concern replacing leaking pipe sections and cleaning of the water intake, water filters and storage tanks.[47] In schemes without regular meetings, users expressed dissatisfaction with the lack of coordination to tackle problems,[48] which can lead to lengthy breaks in service delivery. In two schemes, this even led to permanent breakdowns for some households.[49]

2.6.5 Forming institutions

The relevance of the local leaders is not only manifested in their approval for forming four of these schemes, but also in the fact that these schemes usually cover the area of influence of one headman.[50] One of the two exceptions to this was set up with the approval of the traditional authorities but is based on an existing burial society and therefore includes community members with different local leaders.[51] The other exception is the private scheme, which was initially started as a private water supply to one household and then grew over the years, crosscutting various traditional leaders.[52]

These first meetings of the communal schemes were in three cases initiated by an individual[53] and in two cases by a group of community members, who subsequently took a lead in the planning and construction of the infrastructure . While none of the schemes has an officially recognised structure, the community members that took responsibility are often known by community members and they are referred to as the committee (Van Koppen, 2017).

At the time of the interviews, only two schemes were holding regular/frequent meetings (every month[54] and on several occasions per year[55]) and only one of them had a written collation of their normative system that could be considered as a constitution.[56] The three other communal schemes only met ad hoc when problems occurred.[57] One of these bigger schemes did not hold a user meeting since it had finalised construction 4 years earlier,[58] despite users facing challenges in service provision. While the voluntary operator in one scheme is responsive, users in two of these schemes expressed dissatisfaction with the uncertainty about who is in charge of calling such meetings.[59]

When problems emerge, the committee members try to mediate. In cases where the issue cannot be resolved or involves members of the committee, it is taken to the traditional authorities.[60] While the role of traditional leaders in the resolution of conflicts among users is recognised, it can be problematic. Affected water users can find it difficult to raise issues publicly or accuse someone that they perceive as more powerful of wrongdoing.

An example for this is how in one of the schemes a whole group of tail-end users during interviews accused another user of cutting the connection to their area in an attempt to increase the water pressure at his house. They refused to raise this point publicly though, since the accused community member is known to be a master of black magic.[61] An advisor to the traditional leader is aware of the existence of such issues, but said that the traditional leader would only be able to act on such accusations, once they had been raised in a community meeting.[62] This reluctance to call on traditional leaders to resolve issues opens room for more powerful actors to dominate.

There is one scheme, which is not operating through collective action, but functions like a private service provider. The main pipelines belong to one individual and for a connection fee, households can connect to this system.[63] Each household then pays a monthly fee for the water services provided. Issues with service delivery are being reported directly to the owner, who addresses them personally.

2.6.6 Performance assessment

Coverage, service level and reliability

While these schemes are open to everyone,[64] an initial investment is required to join and in some schemes, the users are asked to contribute each month. Hence, users that are not willing or able to make these contributions are being excluded. This is a major difference to public schemes that are built to serve all community members. Such user contributions also contradict the free basic water policy of 2001, in which each South African has a right to 25 litres of water per day free of charge (Muller, 2008).

The service levels vary not only between schemes, but also between head and tail-end users within the same scheme. While some users are receiving reliable and predictable services (every day or three times per week), others receive water irregularly and only once or twice a week. Increasing the storage capacity at household level is a common strategy to cope with this variability, but again demands investments, which negatively affects access for poor households. A lack of expertise leads to technical shortcomings as manifested by some households having invested but never receiving any water.[65]

Governance and accountability

The emerging institutions for self-supply were primed on existing social structures, especially the traditional leaders. In most cases, the latter provided the platform for their emergence and they remain important for conflict resolution. The example above shows that such a reliance on traditional authorities potentially reinforces existing power structures, inviting clientelism and exclusion of marginalised community members.

The strength of the governance structures and accountability relations created differs greatly between the schemes. This becomes clear when looking at the way breakdowns are handled. Not in all schemes is it clear to users who should be contacted in such instances. In those cases where users were contributing monthly, fewer or no complaints about the responsiveness of the operator and management were raised. This shows that strong accountability relations can emerge in self-supply schemes and suggests that user contributions strengthen these relationships. Yet, even in schemes that are owned and partly constructed by users, many users do not know how to repair broken infrastructure, nor do they feel responsible for it.

Water quality

While policy makers raised concerns about water quality, for the interviewees at scheme level it is of no great concern. Filtering at the level of the source is common in all schemes, but only in one scheme is chlorine regularly applied to improve water quality. According to the national norms and standards for domestic water, all water provided to users should be tested with 'the frequency of testing depending on the size of the community' (DWS, 2017 p. 15), but in none of the schemes is such water testing taking place. Yet, water quality is a main concern for officials when considering the recognition of self-supply initiatives.[66]

2.7 Discussion and conclusion

This chapter shows that community members are capable and willing to take an active role in service delivery. They organise, invest and fill gaps, thus expanding coverage of water supply. At the same time, it is important not to romanticise these community-owned schemes. The described examples suggest that such schemes can be an incremental step to improve access to services, but none of the schemes, in their current form, provide services according to the prevailing national standards. This is due to the fact that community members who cannot or do not want to contribute financially do not receive services. Moreover, traditional institutions reinforce existing power balances to the disadvantage of the marginalised and there is no monitoring of the water quality.

Still, community members could become more central in service delivery. Pathways could be explored to create support services for existing self-supply schemes in order to attain higher service levels. Ideally, the willingness of users to get involved in service delivery would receive recognition in the public approach. In the conclusion I raise some pertinent issues related to this.

While the results presented above indicate the capacities and willingness of community members to take responsibility for water service delivery, this analysis is only a first step.

I identify two fields that could be further investigated: support services for self-supply and potential applications of these lessons in conventional public service delivery. For the development of support services, Sutton et al (2021) propose to first study the efforts of community members, then pilot support services and develop a policy/strategy, before upscaling it. Such an approach could help to evaluate if support services will enable self-supply schemes to overcome the issues related to coverage, equality and water quality, in order to fulfil the national service standards. Only in that case will self-supply become a valuable approach to public service delivery in South Africa. As described by Galvin (2015) in a sanitation context, such community-owned solutions should not become a way for the wealthy of South Africa to abrogate their responsibilities and commitments.

I see collaboration between municipalities and users as a more feasible path to improving public service delivery. To elaborate this potential, I propose a form of prototyping similar to the approach of Sutton et al. (2021) introduced above. Public infrastructure grants can, for example, only be used to build street taps (see Chapter 3): would it be possible to work with users and enable them to extend the basic public infrastructure to add household connections? Or, could the strict regulations preventing community organisations from getting involved in operation and maintenance be adapted to allow for co-management where this is feasible and in the interest of the users? South Africa is unique in recognising access to water as a constitutional right: it would be ironic if such legal recognition leads to the stifling of initiatives from citizens and communities to extend the coverage of drinking water supply.

3

ADDRESSING FAILED WATER INFRASTRUCTURE DELIVERY THROUGH INCREASED ACCOUNTABILITY AND END-USER AGENCY:

THE CASE OF THE SEKHUKHUNE DISTRICT, SOUTH AFRICA

3.1 Introduction[2]

The end of apartheid in 1994 left the first democratically elected government with enormous racial and class inequalities in terms of water services for domestic uses. The World Bank (1994) estimated that only 43% of black people had access to piped water, while the white population had almost full coverage of water services (99.9%). Under the leadership of the African National Congress (ANC), a former movement for independence that became the ruling party, the commitment to eradicate these inequalities was formalised. In 1996, South Africa became one of the first countries in the world to provide their citizens with the constitutional right to health care services, social security and sufficient food and water (Republic of South Africa, 1996). Despite great progress in extending water services, 24% of rural households still rely on unimproved water sources, that is to say unprotected dug wells and springs, tanker trucks, surface water such as rivers, dams, lakes, ponds, streams and irrigation channels, and bottled water or rainwater (Statistics South Africa, 2017); furthermore, the proportion of the population that relies on such unimproved water sources is again on the rise (Auditor General South Africa, 2016). While the state has undertaken enormous efforts to serve previously disadvantaged groups, the inequality in access to water services remains racialised and structural (Marcatelli and Büscher, 2019). So how is it possible that a country with the financial means of South Africa, and with a policy environment that is widely acknowledged to be ahead of its time, faces such difficulties in providing its population with sustainable basic water services?

To understand the underlying reasons, I scrutinise not only the policies of public water service delivery, but also the mechanisms that make the practice on the ground deviate from those policies. In this sense, this research deviates from work that restricts itself to naming problems and proposing policy changes (Smith and Green, 2006; Smith, 2009; Koelble and Lipuma, 2010; Hollingworth et al., 2011; National Treasury of the Republic of South Africa, 2011; Mbecke, 2014; van der Waldt, 2014; Liefferink et al., 2017); it joins a growing body of literature that aims to understand the underlying causes of poor service delivery (Bond, 2000, 2010; Pape, 2002; Smith and Hanson, 2003; Desai and Pithouse, 2004; McDonald and Smith, 2004; Dugard, 2010; Marcatelli, 2017; Bond and Galvin, 2019). Another contribution of this study is its focus on the predominantly rural Sekhukhune District, in Limpopo Province; this rural (rather than urban) focus contrasts with most critical South African water literature (Bond, 2000, 2010; McDonald and Pape, 2002; Smith and Hanson, 2003; Desai and Pithouse, 2004; McDonald and Smith, 2004; Smith, 2004; Smith and Green, 2006; Bond and Dugard, 2008; Dugard, 2010; Bond and Galvin, 2019).

2 This chapter is a slightly adapted version of the article that has been published as: Hofstetter, M.; Bolding, A. and van Koppen, B. 2020. Addressing failed water infrastructure delivery through increased accountability and end-user agency: The case of the sekhukhune district, South Africa. Water Alternatives 13(3): 843–863.

I believe that the poor performance of public service delivery is not the result of flawed policies but rather of the way these policies are being implemented. I therefore raise two questions. First, what are the mechanisms that cause the discrepancy between policy and practice? Second, how can the quality of rural water services in South Africa be improved through community led approaches like the one tested in the Operationalising community-driven Multiple Use Water Services (MUS) project? To address these questions, I first outline the conceptual framework for the analysis and then analyse the current municipal procedures for delivering basic water services in Sekhukhune District in Limpopo Province; finally, I present an experimental approach and show how it might help to counter the underlying mechanisms.

3.2 Conceptual take on failed service delivery

3.2.1 Three dominant discourses

There are three dominant discourses on the poor quality of service delivery in rural South Africa. One claims that both the apartheid and post-apartheid state failed to develop the technical capacity at municipal levels that would allow them to build and operate even basic water and sanitation services (Southall, 2006; Atkinson, 2007; Koelble and Lipuma, 2010; Koelble and Siddle, 2014; Weaver et al., 2017); in many instances, this discourse has been used even by municipalities themselves in order to justify the hiring of private service providers (Pape, 2002). The second discourse emphasises crippling levels of rent-seeking in the tender process and state capture; this results in misallocation of public funds, self-enrichment, and delivery of faulty or incomplete water infrastructure at the village level (Atkinson, 2007; Marcatelli, 2017; Olver, 2017; Muller, 2020). The third discourse focuses on the neoliberal approach chosen by the government to deliver public water services (Smith and Hanson, 2003; McDonald and Smith, 2004); this approach has led to the commodification of, and thus unequal access to, water (Desai and Pithouse, 2004; Bond, 2006; Marcatelli, 2017; Bond and Galvin, 2019). Bond (2006: 4 – 5) defines the commodification of water as,

"highlighting its role mainly as an economic good, attempting to reduce cross-subsidisation that distorts the end-user price of water (tariff), promoting a limited form of means-tested subsidisation, establishing shadow prices for water as an environmental good, solving problems associated with state control of water (…) and in the process, fostering the conditions for water privatisation."

In this study, I acknowledge the validity of all three discourses in explaining different aspects of failed water service delivery. To fully grasp the policy – practice gap, however, we

need to open the black box of service delivery by scrutinising its underlying mechanisms through an actor-oriented approach.

3.2.2 An actor-oriented approach

In trying to unravel the mechanisms behind failed rural service delivery I use an actor-oriented approach (Long, 2001) which is "philosophically grounded in a social constructionist view of change" (ibid: 2). It builds on the observation that similar structural circumstances can lead to different responses, the differences being largely the result of the actors' co-creation of the realities (ibid). Drawing on their own motivations, convictions and resources, social actors can make a difference by exerting agency which, according to Giddens, "refers not to the intentions people have in doing things but to their capability of doing those things in the first place (which is why agency implies power)" (Giddens, 1984: 9). This is not to say that actors make decisions free of structural constraints, since they do so "under circumstances directly found, given and transmitted from the past" (Marx, 1978 (1852): 595); however, "it is theoretically unsatisfactory to base one's analysis on the concept of external determination" (Long, 2001: 13), as is done by both neo-Marxist and rational-choice theoretical approaches. Actor-oriented analysis thus focuses on the actors' room to manoeuvre in exerting their agency, thus combining actor and structuralist approaches (Long, 2001).

I make use of this approach since I share the notion described by Giddens (1984) that, by exerting agency, actors and structures co-constitute each other. Public service delivery is not simply the result of structures and policies; it also depends on how the involved actors interact within this structure and among themselves. In this article, I focus in particular on a limited number of actors who are key to municipal water service delivery, including politicians, professional staff who are responsible for water and sanitation, builders and contractors who are involved in either new construction or repair of infrastructure, and water users of different ilk. It is important to distinguish the different governance levels in which these actors operate; from the bottom level up they comprise the governance realms of ward, local municipality, and district municipality.

3.2.3 Key concepts

The main concepts used in this paper to scrutinise the differences between highly ambitious policies and poor public service delivery are gatekeeping, patronage and accountability relations.

While gatekeeping and patronage are two distinct concepts, they often occur simultaneously and have a lot in common; both describe relations between actors that tend to be asymmetric in a vertical sense (Weingrod, 1968), reciprocal (Arriola, 2009), voluntary (Eisenstadt and Roniger, 1980) and assumed (i.e. informal) rather than

contractually defined (Robinson, 2007). Despite their informal nature, the resultant arrangements are often tightly binding. The asymmetry refers to the differences in access to power, capital, natural resources, knowledge, skills and technology that form the basis of these relationships, which are often also "opposed to [the] official laws of the country" (Eisenstadt and Roniger, 1980: 50). The difference between the two concepts lies in the motivation and duration of the relationships. Gatekeeping politics refers to the control by political or party leaders over access to resources and opportunities, and the way they use this to further personal and economic agendas (Beresford, 2015). Gatekeeping describes a distinct happening in time, while patronage refers to a continuous relationship involving the simultaneous exchange of resources whereby information, contracts and access to new infrastructure are exchanged for preferential treatment, kickbacks or votes.

In his analysis of South African politics, Beresford describes how these two mechanisms can enter a cyclical relationship,

"[in] which resources and opportunities are distributed through patronage networks to regenerate the political power of the patron (or gatekeeper), and political power (access to state spoils) is in turn used to replenish the resources needed to maintain these networks and 'purchase' the affection of their supporters" (Beresford, 2015: 238).

The third key concept applied in this analysis is accountability; this is one way to describe the strength of the relationship between two (sets of) actors. One actor is considered to be accountable to another if they have to face sanctions for not reaching clearly formulated goals or agreements (Dann and Sattelberger, 2015). It is widely recognised that the accountability of the service provider towards the end users is key to good service delivery. There are short and long routes of accountability. The short route describes the direct link between service providers and end users, while the long route describes the link between end users and service providers which holds policy makers and politicians accountable through electoral or contractual accountability or public protest (World Bank, 2003). A World Bank (2011: 95) study on water and sanitation service provision in South Africa concludes that both the short and the long route "are poorly developed and perhaps atrophying". In order to explain this lacuna, one has to understand how accountability can be obstructed or diverted by patronage and gatekeeping.

Patronage relations and, to a lesser degree, gatekeeping, create strong bonds between actors in public office, between the administration and individuals, or among groups of actors such as in a village or region. While this creates strong informal accountability relations for a few, it excludes others; it also weakens or undermines formal accountability pathways such as electoral and financial accountability. Electoral accountability is understood here as the ability of citizens to sanction or reward incumbents of public

offices based on their performance (Hellwig and Samuels, 2008; Smart and Sturm, 2013). Since patronage is a politically motivated distribution of favours by a patron to his clientele (Erdmann and Engel, 2007), it distorts electoral accountability. Financial accountability, as it is used here, is what Ngwakwe (2012: 313) describes as "the effective and efficient management of public finance in a transparent manner in compliance with the national budget and plans that are democratically formulated to address public needs effectively"; as such, it is compromised by gatekeeping.

Finally, to understand the propensity of end users to operate, maintain and benefit from water infrastructure I refer to hydraulic property and access. Hydraulic property is a concept defined by Coward (1986a, 1986b) to describe how the co-creation and co-ownership of hydraulic property can result in responsible behaviour on the part of end users of water infrastructure; for small-scale, farmer-led irrigation schemes it has been established that co-creation of infrastructure strengthens user-based governance and incentivises users to take responsibility for the maintenance of hydraulic property thus created. 'Access' in this article is used according to its definition by Ribot and Peluso (2009: 155) as, "the ability to benefit from things", with water services being the "thing" of interest. Conceptualising access as ability and not as a right creates a focus on "the range of powers – embodied in and exercised through various mechanisms, processes, and social relations – that affect people's ability to benefit from resources" (ibid: 154).

In the case description below, I will distinguish four phases of service delivery: identification, planning, construction, and operation and maintenance; for each phase, I will assess which mechanisms lead to failure or misallocation of access to water services. In the subsequent section, I propose some counter-mechanisms, and go on to discuss their effectiveness; the conclusion then engages with the three dominant discourses introduced above.

3.3 Methodology

This article first analyses the current public service delivery practices in Sekhukhune District; it then goes on to describe an experimental approach that aims to address some of the problems identified in public service delivery. The methodology for these two sections differs. The assessment of public service delivery is based on semi-structured interviews with 15 key local and district-level informants from the Department of Infrastructure and Water Supply (DIWS) for Sekhukhune District, 10 local politicians (ward councillors, ward committee members, and district-level politicians), 6 water sector consultants, and 7 officials from the provincial- and national-level Department of Water and Sanitation. A thorough review of relevant literature was also undertaken. Simultaneously, the main author of this paper was co-leading the implementation of an experimental approach

to service delivery within a project entitled Operationalising Community-Driven MUS in South Africa[67]; it was being carried out in a village selected by officials of the Sekhukhune District Municipality in collaboration with Makhuduthamaga Local Municipality (van Koppen, 2017). The lessons learned from that experimental process form the basis for the "transformative servicing" section of this article. The aim of this article is not to evaluate the project, but to show how certain lessons learned from the experimental approach can help to counter specific mechanisms responsible for failed rural water service delivery.

The data for this article was collected over 13 months in 2017 and 2018. During this time, the main author spent four months in different rural communities, organising and taking part in workshops with end users and the municipality, attending Integrated Development Plan (IDP) outreach meetings and participating in the Sekhukhune District water summit held in September 2018.

3.4 Scrutinising four phases of service delivery in order to identify mechanisms that cause failure

3.4.1 Project identification

To overcome the historic injustice in service delivery, the South African government developed a process for creating Integrated Development Plans. The planning process is meant to be strongly democratic and to substantially enhance the responsibilities of the local government such that they are the key players in bringing about development (Binns and Nel, 2002). Since the implementation of the *Local Government Transition Act Second Amendment Act* in 1996, it became mandatory for all municipalities to develop such an IDP. While there is no precise procedure for generating creative and locally adapted solutions (Oranje et al., 2000), the planning process must be both inclusive and representative of all social categories (DPLG, n.d.). In Sekhukhune, the district municipality is responsible for the provision of water services; it holds two outreach programme meetings annually in which the officials who are responsible for drafting the IDP ask community members for their inputs (Sekhukhune District Municipality, 2016). These meetings are supposed to be ideal points of interaction for community members to influence the development priorities of the municipality; interviewed ward committee and community members, however, considered the link to be weak and their participation in the process a waste of time since the only input collected was a list of problems. They felt that decisions were still being taken by politicians behind closed doors.[68] This was confirmed by interviewees from the DIWS who stated that the IDP was generally not the triggering factor for investments[69]; it was also confirmed by other studies which found that IDPs exert a very limited influence on municipal budget allocation (Todes, 2004; Oranje and van Huyssteen, 2011; van der Waldt, 2014). Other scholars describe insufficient end-user participation in

the formulation of IDPs; this was felt to be due to underfinanced processes and a lack of skilled personnel (Binns and Nel, 2002), and because the process was primarily perceived as a political pursuit (McDonald and Pape, 2002; Mukwevho, 2014) that involved already empowered groups (Cash and Swatuk, 2011). Everatt et al. (2007) also identified a lack of participation of young people and unorganised groups in Gauteng Province; this was attributed to transport problems, inappropriate use of English both in meetings and materials, and complicated technical terms being used to explain the process and plans.

Ward committees are a second official pathway for community members to influence the budget allocation of the municipality. These committees are chaired by the ward councillor; they comprise up to ten members and represent sectors and/or geographical areas of the ward. They were established in order to promote participatory democracy in local government (Republic of South Africa, 1998), which they did by, among other things, identifying needs and complaints related to service delivery and, if necessary, communicating them to higher levels of government (GTZ and DPLG, 2005). This link is considered by community members and local politicians to be weak and tedious mainly because of its dependence on many individuals at different levels of government in order to reach decision makers.[70] Case studies from different parts of the country confirm this view: ward committees only minimally influence the setting of municipal development priorities (Smith and de Visser, 2009; Moyo and Madlopha, 2016; Mtshali, 2016). This might be connected to the lack of legitimacy of these committees due to the fact that every municipal council decides independently on the election process for the ward committees in their area (COGTA, 2020). The *Municipal Structures Act* of 1998 demands that elections promote gender equality and representation of the different interests (Republic of South Africa, 1998: 73), and recommendations for such election processes do exist; there is, however, no standard process in place in order to allow for adaptation to local circumstances (GTZ and DPLG, 2005). Smith and de Visser (2009) describe the deep flaws in the nomination and election processes in many places. Ward councillors tend to nominate their favourite candidates, which "makes some ward committee members to become 'Mickey Mouse' of these councillors because they do not contribute, but are told what to do" (SA Local Government Briefing, 2005: 28, as cited in Smith and de Visser, 2009: 16).

Local officials of the DIWS are the municipal representatives that work most closely with communities on water services. The current procedure allows them to identify needs and to give recommendations; according to several interviewees, however, the assessments of these street-level bureaucrats do not substantively influence decisions.[71]

According to local politicians and officials of the DIWS from all levels, the main actors in directing infrastructure investments are district-level politicians[72] and investments

are primarily directed in response to community protests and in order to maintain patronage relationships. This has been confirmed by Beresford (2015), who describes how communities turn to patronage relationships to access services; Buhlungu and Atkinson (2007) further observe that communities that fail to access patronage relations often resort to protest. While in some communities even the threat of protest can trigger service delivery, other communities must take more drastic measures such as locking up local officials in their village or organising road blocks.[73]

3.4.2 Project planning and financing

Once the area and nature of a project has been identified, the project needs to be officially recognised by the Planning Unit of the DIWS so as to start the planning process. As a first step of this planning process an implementation readiness study (IRS) is undertaken; this contains a pre-feasibility study which identifies the problem, a feasibility study which develops options for tackling the issue and then justifies the choice of one option, and a technical report which details how the chosen option will be implemented.[74] If the IRS is complete and the funding for the project has been secured, the supply chain unit issues a call for tender and hires a consultant to do the detailed planning. While all funding for basic service delivery comes from the national treasury, infrastructure projects can be financed through the Water Services Infrastructure Grant (WSIG) or the Municipal Infrastructure Grant (MIG).[75] Both the WSIG and the MIG aim at reducing the service delivery backlog in impoverished rural areas; the WSIG is specific to water and sanitation, however, while the MIG targets all sorts of service backlogs (Republic of South Africa, 2017). Despite slight differences in the procedures and institutions that must approve the projects,[76] in all water infrastructure investments in Sekhukhune the full set of planning activities is outsourced to consultants.[77] This reduces the responsibility of departmental staff as decisions are made by external 'experts', but it also creates opportunities for gatekeeping politics. It is an open secret within the DIWS that many officials like to be in positions that allow them to exert influence on the awarding of contracts as long as they can do so from the corridors and cannot be held accountable for their actions. While the official explanation for the outsourcing of key steps in service delivery is lack of capacity and lack of mastery over certain computer programmes, officials agree that the planning of simple rural water infrastructure could be done in-house[78]; one leading official explained, however, that earlier attempts to plan and implement rural water infrastructure in-house failed due to pressure from politicians and higher departmental levels to award contracts to private service providers.[79] Other studies further confirm that politicians exert influence in the allocation of these contracts (Thornhill, 2006; National Treasury of the Republic of South Africa, 2015; Munzhedzi, 2016).

Since there is no standard protocol in place for end-user participation, each consultant follows their own procedure,[80] marginalising expensive and tedious end-user input.

Officials said that in most cases end users were aware of upcoming projects but that they were often only informed of the planned intervention once funds had been secured and the contractor appointed.[81] The dominant perception among district-level officials of the role of end users in the planning of infrastructure is that they should "understand"[82] or be "informed"[83] on what is being planned in order to "endorse the scope of works",[84] since planning is "using engineering principles that not everyone will understand".[85] This differs from the perception of the interviewed national-level officials of the DWS who see it as important that end users "are part of the decisions taken"[86] and are included in planning decisions to ensure ownership.[87] The prevailing practice also directly contravenes the legal framework of the *Municipal Systems Act* from 2000 and the 1992 ANC policy guidelines for a democratic South Africa. These documents clearly state that municipalities must create the conditions for local community involvement and must encourage community members to get involved in the affairs of the municipality (Oranje et al., 2000; Republic of South Africa, 2000a). The failure to involve end users also contravenes the global consensus among scholars and practitioners on the benefits of community participation (Claridge, 2004). The inclusion of end users in planning development efforts dates back to the work of Robert Chambers (1983) and community participation has since become the dominant paradigm in development. Extensive evaluation studies by the World Bank have shown how participation of communities in the planning of infrastructure increases the sustainability of these investments by ensuring that they are demand-driven (Sara and Katz, 1997) and by building capacity among community members (Narayan, 1995).

3.4.3 Project implementation

Once finished, the detailed design is handed over to the supply chain management unit together with a recommendation from the consultant on the financial volume of the contract. The supply chain unit then must follow the regulations of the Construction Industry Development Body (CIDB) (Republic of South Africa, 2005). The CIDB is a public entity whose responsibilities are, among others, to define best practice procedures for procurement and to promote a uniform application of these procedures (Republic of South Africa, 2000b). Despite these state-of-the-art procurement regulations and the high fines for non-compliance, the main reason given for the looming problem of incomplete and substandard infrastructure implementation is the low capacity of the contractors.[88] According to DIWS officials, the problem is not that there are no good and competent contractors, but that they do not receive enough work.[89] While most officials struggled to explain on record how the process could be so ineffective, and blamed flaws on the CIDB system and the strong influence of the Broad-Based Black Economic Empowerment (BBBEE) policy, off the record every single interviewee within the department mentioned that kickback payments and personal relations are the main drivers for awarding contracts to incompetent contractors. The latter practice has been confirmed by a series of corruption scandals in Sekhukhune that have been unravelled since 2019 (Ramothwala, 2019; Smith,

2020). Many officials do not seriously question the modus operandi of infrastructure construction, despite the fact that contracts are regularly awarded to contractors of which it is known from the start that they are not able to deliver.[90] Olver (2017: 108-110), in his study of Port Elizabeth, cites several examples of (housing) contracts being awarded to incompetent contractors who were part of the patronage network of key municipal decision makers. He describes how substandard work in housing and infrastructure has the added "benefit" of creating new opportunities "for 'rectification' with works usually assigned to the same pool of contractors" (ibid, 110). The end user's role in implementation is limited to the project steering committee (PSC); the PSC is supposed to represent them and is meant to be formed during the planning phase[91] but is normally only formed once the construction starts[92] and lacks any clear mandate beyond informing the community.[93]

Outsourcing full construction projects creates the opportunity to award large contracts, which again increases the opportunities for gatekeeping politics and patronage; this confirms another main point of this paper, namely that the reason for low performance of the sector is not the policy environment but the way policies are being implemented. Instead of suggesting new policies and regulations, the focus should thus rather be on developing a new modus operandi which strengthens end-user agency within the existing structure and builds acceptance for it through pilot projects, workshops and trainings (see below for further suggestions).

3.4.4 Operation and maintenance

Adequate operation and maintenance are key to obtaining satisfactory services from investments over the planned lifespan of the infrastructure. Poor operation and maintenance practices, on the other hand, are likely to result in what Shah (2009) calls a build – neglect – rebuild cycle, and what Vermillon (2005) calls a construction, rapid deterioration and preliminary rehabilitation cycle. Over half of 77 water service managers interviewed by Everatt et al. (2007) blamed insufficient maintenance for the fact that earlier served communities were again affected by a lack of services and stated that the problem would keep getting more severe. Water users in Sekhukhune are also affected by poor operation and maintenance; 76% of villages with a piped water system are only irregularly receiving service (Sekhukhune District Municipality, 2015).

This situation is a result of both financial and technical/procedural issues. According to the 'back to basics' strategy, infrastructure maintenance is supposed to be assigned 7% of the total operational budget (COGTA, 2004); in practice, however, available budgets are considered too low by DIWS officials.[94] O&M funds are often tapped to construct new infrastructure if the money is considered to be for emergency relief.[95] Underfunding of maintenance is a common issue in developing countries; it is a problem for both irrigation schemes (Gulati et al., 1994; Skutch, 1998; Vermillon, 2005) and Water, Sanitation and

Hygiene (WASH) systems (Atkinson, 2007; Rodriguez et al., 2012; Fonseca et al., 2013; OECD, 2016). Besides the low availability of funds, the procedures by which local operation and maintenance managers access these funds are complicated; the multi-step procedures that are required delay the department's response and create a situation where it is not uncommon for communities to have to rely on existing patronage relationships or protest in order to receive assistance at all.[96]

The operation of existing infrastructure is facing similar issues. Due to low budgets, it has become common for rural water supply infrastructure to be operated by volunteers. In Makhuduthamaga Local Municipality, which is part of Sekhukhune District, there are currently 34 volunteer operators serving 189 villages.[97] The fact that these volunteers get appointed by the municipality without, or with only minimal, consultation with the affected community leads to a situation where they do not feel accountable to the end users; at the same time, the lack of financial incentive creates a very weak accountability relationship with the municipality. The poor performance of these volunteer operators is becoming an additional cause for breakdowns and irregularities in the service delivery.[98] Technical decisions taken during the planning phase add to the problem; for example, the instalment of diesel-powered pumping systems not only increases the workload for operators compared to that of an electrified system, it also increases the risk of fuel being diverted by unpaid staff. The focus on the construction of new infrastructure can be interpreted as an attempt by municipalities to eradicate the enormous backlog (Fonseca et al., 2013) or spend the available grants (Smith, 2009); it can also be seen as a political decision aimed at optimising the opportunities for gatekeeping and patronage. The construction of new infrastructure allows for awarding large contracts and augmenting opportunities for kickbacks while providing certain clientele with additional services. These are both factors that foster gatekeeping politics and patronage.

New approaches for operation and maintenance of rural water schemes are being discussed within the department, with a focus on community-based organisations (CBOs) as water service providers (WSPs). Current policies already allow for such arrangements. In the 1980s, the use of CBOs to operate infrastructure had become a global panacea of water service provision (Schouten et al., 2003); however, the great optimism ascribed to this approach (Narayan, 1995; Sara and Katz, 1997) was quickly challenged by a wide range of critical scholars (Schouten and Moriarty, 2003; Harvey and Reed, 2007; Lockwood and Smits, 2011). The criticism has focused primarily on the need for communities to be both willing and able to take over the management, administration and operation of the water infrastructure in such a way as to make end-user management sustainable. While this approach has thus yielded many benefits, "in most countries around the world it has by and large failed to achieve the ultimate goal of reliable and sustainable water supply at scale" (International Water and Sanitation Centre, 2009: 1). Recent evaluations show that

positive examples are only likely to materialise when communities are receiving external support, especially when technically complex systems prove difficult to manage on a volunteer basis (Lockwood and Smits, 2011; Chowns, 2015). Scholars therefore propose a more holistically supported version of community management; this is referred to as "community management plus" (Moriarty et al., 2013; Smits and Lockwood, 2015).

3.5 Transformative servicing – the pilot project in Ga-Moela

The current modus operandi as described above not only produces unsatisfactory services, it also focuses to a large extent on the provision of minimal services; it does not support a process of transformation that is aimed at achieving a more equitable post-apartheid South Africa. This focus is the result of the enormous pressure on local governments from higher levels of government and from communities themselves to provide services as promised and as constitutionally defined. In this environment, the number of toilets and water taps installed and the number of kilometres of road constructed have become the main evaluation criteria for assessing the development efforts of local politicians (Oranje and van Huyssteen, 2011). The resulting concentration of effort on the achievement of basic service delivery standards is reinforced by grants from the national treasury that can only be spent on infrastructure for basic service delivery.[99] This propensity does not challenge the existing power structures and tends to reinforce inequalities that were established during apartheid by filling in gaps (ibid). To overcome the growing divergence between servicing and transformation, the provision of basic services could better be conceived as an incremental step towards the common goal of transformation.

In an attempt to explore possibilities for creating such a transformative process of water service delivery, the team that is carrying out the project entitled *Operationalising Community-Driven MUS in South Africa* has developed an experimental approach; it focuses on strengthening end-user agency and creating a common vision for multiple water uses in a transformed reality. The main author of this paper formed part of the team that tested this approach in Ga-Moela, a rural village in a mountainous region of Sekhukhune District[100]; this author co-facilitated the described interactive planning process and followed the end-user-led construction as an observer. The lessons learned from this process form the basis of the following section.

The existing water infrastructure for this community of approximately 100 households comprised two communal boreholes; only one section of Ga-Moela, however, was served through a reticulation system that supplied street taps.[101] The unconnected households were getting water from shallow wells or from the tap points next to the borehole; this required the collection of water on foot, primarily by women, from a long distance. The

idea behind the novel approach being discussed was the collective formulation of a step by step vision of the desired future situation regarding water use; available project funds would then be used to take a first incremental step towards the goal, followed by the identification of opportunities for further steps. The experimental process as described below follows a sequence of participatory diagnostics which define the scope of the project, envision water use in a transformed reality, and then design and construct the desired infrastructure in an end-user-led process.

After introducing the project to the traditional leader/s and presenting it at a community meeting where a committee of representatives was nominated, the process began with a participatory diagnosis of the current situation. The diagnostic phase was, on the one hand, essential for the facilitator to get an understanding of the existing infrastructure and community organisation; on the other hand, it was a key step towards starting the mobilisation of local knowledge, existing ideas for solutions, and trust. Tools used in this phase were aimed at engaging and including as many community members as possible. Community mapping was used to create a common ground for discussion and to raise the interest of community members in participating.[102] A map of the village and its water sources was drawn on the ground and then copied onto paper, and follow-ups were provided through transect walks.[103] Before starting a discussion on the desired future situation, the scope of the project was set; this helped avoid the unrealistic expectations that are automatically created when outsiders engage a community in such analytical activities (Chambers, 2006). We tried to manage expectations by ensuring a wide understanding of the procedures and creating maximum transparency on the available financial means provided by the project. Since this was a donor-funded project, it was possible to communicate upfront the available budget for the infrastructure investment. This was done at a community meeting where a list of local market prices of all relevant material was also distributed in order to enable community members to take informed positions.

The formulation of the vision of future multiple water uses was conducted through a sequence of planning meetings with small groups that engaged all the potential beneficiaries. During this process we avoided referring to 'the community', since communities are diverse groups of stakeholders without a standardised definition. To perceive them as a homogenous group could have led to the paradoxical situation where participatory processes in fact disempower residents (Levine, 2017). The main task for facilitators during this phase was to avoid elite capture[104] and to ensure the inclusion of young people, women and other traditionally excluded groups. To create space for the latter groups to get involved and to articulate their opinions, it was key to hold separate meetings; once these previously excluded groups had been given the chance to voice their opinions in separate meetings, they also started to articulate their views at general

community meetings. During the diagnostic phase, the main tool used for developing the vision was large copies of maps developed with QGIS open source software, on which participants could directly place objects. This proved to be a very useful tool for fostering discussions since objects could be added, removed or moved around, and the large size of the prints enabled many individuals to take part. A key role was played by the facilitator who had to make sure that all community members got a chance to participate while, at the same time, facilitating neutral feedback on steps in the process and mobilising technical expertise from the NGO.

Once the common vision was completed and was accepted at a community meeting with the traditional leader, the facilitator added the objects that had been placed on the map to the QGIS image and handed over this plan to the engineer of the project. The engineer then charted the technical and financial constraints of the proposed intervention in such a way as to enable end users to take as many further incremental steps as possible. In the described example of the rural village in Sekhukhune District, the identified next step was the construction of a reticulation system with street taps connected to existing boreholes. The planning process showed that most community members understood the concepts of head loss and pressure; they were thus able, in a facilitated process, to develop a common plan for an intervention. This plan also included social aspects relevant to the local setting, such as putting the storage tanks in a location that would best enable security and reduced operation tasks. In order to reduce vandalism, street taps were also located in such a way as to ensure that they were shared among households belonging to the same family. The process also showed that the facilitator needs to have some water-related knowledge, since relevant issues like the possibility of groundwater depletion and the limitation of the strength of mechanised water pumps had to be explained. In the described example, the contribution of the engineer was limited to checking the feasibility and adding specifications for the materials needed.

Creating the ground for further incremental steps in this case meant that pumps and main pipelines had to be over dimensioned to the extent that the budget allowed. Reservoirs were constructed in locations that allowed for future extensions of the piped water network once additional funding was available; similarly, technical designs were made with a view to enabling a maximum number of households to connect to the system in the next step. Assessing similar systems in similar contexts has shown that users are very quick to either connect removable pipes to tap points or connect fixed household connections to the reticulation system. Working towards a vision thus meant that such initiatives had to be anticipated as part of the expansion of service delivery rather than being branded as illegal connections; this involved related design decisions such as the positioning of tap points and the size of reticulation pipelines; it also involved choosing pipe-connecting technology that reduced leakages more effectively than do conventional

connection methods. To ensure that community members benefitted equally, it was important to start discussing issues like water-sharing regimes, payments, and rules on system modifications early on in the planning.

The design proposal developed by the engineer was then presented, explained, and discussed with end users in such a way as to enable an optimal learning outcome and to create the ground for further extensions. Once the final design was determined, user-led construction started under the lead of the local NGO; this implied that as much as possible the construction work was performed by the end users under direct supervision and paid for by the NGO. For the few tasks for which additional skilled labourers had to be hired, contracts and scopes of work were made transparent to the committee of community representatives and they were directly included in supervising this work. This mode of construction strengthened end-user agency and allowed for capacity building among end users. An important part of this approach was its investment in building the community's capacity for identifying and developing future opportunities for infrastructure extension and problem solving, and to enhance the community's ability to effectively operate and maintain existing infrastructure.

Since this approach was tested in a real life context, with team members having different opinions and being affected by different pressures, certain compromises were made in carrying out the original plan. The NGO representative who was responsible for facilitating the election of the committee thus decided to follow a locally accepted method of nomination. Any community member present at the community meeting could raise their hand and nominate another person who was present; if no one objected and the nominated person accepted, they became a member of the committee. While gender balance was assured, this nomination method compromised the representation of certain sections and was the reason that the members of the committee were not assigned a special role during the planning phase. Due to rising pressure to produce results, the NGO started to show an increasing reluctance to spend additional time on public meetings during the later stages of implementation; this meant that towards the end of the project the financial transparency was scrutinised exclusively by the committee, and certain changes to the original plan were also only discussed within the committee.

These compromises indicate the challenges of creating buy-in, since all actors must adapt long-practised procedures. Moving towards a public water service delivery approach that strengthens end-user agency will not be a quick fix but will be a process of building awareness and capacity among all actors. The described experimental approach should therefore in no way be seen as a blueprint; it should rather be seen as an attempt to learn from testing methods of infrastructure implementation that have been adapted through

practice. In the next section, I discuss the effects of these adaptations as compared to the current modus operandi.

3.6 Discussion: counter-mechanisms increasing accountability and improving service delivery

Analysis of governmental practices has shown how the mechanisms of patronage and gatekeeping affect the implementation of policies, and how gatekeeping and patronage result in low levels of service delivery and reduced potential for contributing to societal transformation. In this section, I present the potential benefits of the experimental approach described above; I show how it could improve service delivery and contribute to a more transformative development. Figure 14 shows the current accountability relationships in black, and the new relationships created by the experimental approach in grey. Below I highlight four relevant aspects.

The figure shows how the new approach does not affect the long route of accountability (1); while departmental officials are highly accountable to the politicians who directly or indirectly appoint them, the link between politicians and communities is and remains weak. Patronage relations and state capture are difficult to check through electoral accountability alone since both mechanisms are about more than performance in public office. The weak ability of the electoral process to check on the performance of politicians was also pointed out by Theo Rauch[105] and Mark Oranje[106]; both identified this as the main reason for the limited influence of the IDP on the development of service delivery. While there are no effects on the long route of accountability, the new approach substantially strengthens the short route.

By assigning the end users a role in the oversight and approving of payments of consultants and contractors, the accountability of these private service providers to the end users is strengthened (2); it thus directly strengthens the agency of members of the end-user community. To tackle the risk of such processes being captured by local elites, all relevant information should be shared from the start with all end users and not only with a small selected group – the project steering committee – as is currently common in municipal infrastructure development projects. Transparency of project-relevant decisions and awarded contracts also contributes to a stronger accountability relationship between the departmental officials and future end users (3). Increasing the role of end users in both planning and construction of new infrastructure also creates many more interactions between end users and the departmental officials; this helps contribute to a more realistic view among officials of the current services delivered, and creates closer personal relationships; as Pape (2002: 185) describes it, it has the effect of, "enhance[ing]

solidarity between municipal workers and communities". The final but important effect of this strengthened role for communities in the planning and construction of infrastructure is that it becomes no longer possible to simply direct the blame for failures towards outsiders. The end users become, in a way, accountable themselves (4).

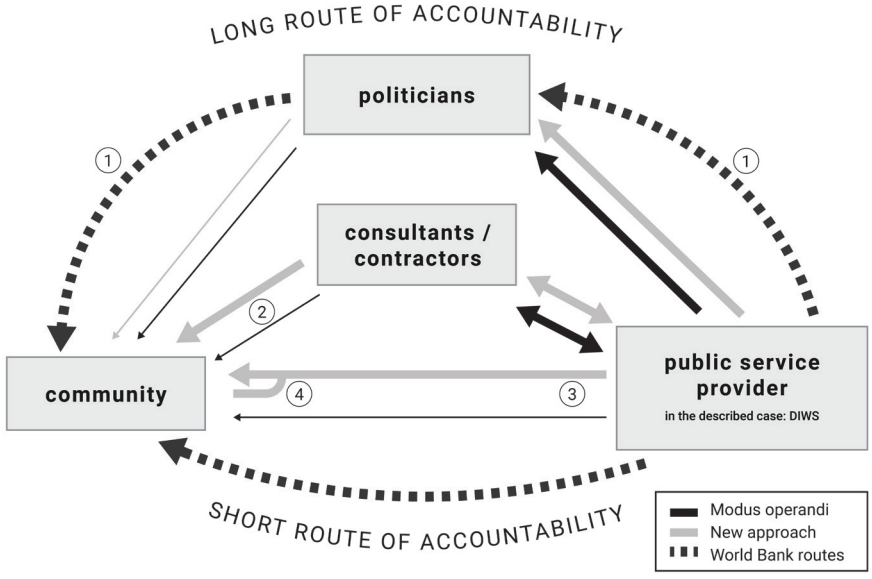

Figure 14. Accountability relations in the implementation of new infrastructure (own elaboration based on World Bank, 2003)

Note: Direction of the arrow means 'accountable to'. The notion of the long and short route of accountability is based on the accountability triangle presented in the World Development Report 2004 (World Bank, 2003). In this figure, I have adapted the World Bank framework by splitting the service provider into consultant/contractor and public provider; this was done in order to highlight the importance of strengthening the relationship between the communities and the public service provider to reduce the often-problematic role of contractors and consultants and to strengthen the inclusion of users in service delivery.

Construction that is led by end users also creates capacities within communities for initiating and implementing future extensions and improvements of water infrastructure. This capacity building can lead to a formal recognition of various forms of co-investment in, and co-ownership of, water infrastructure. With the functionality of a project and a process having been already proven on the ground, many rural households may feel confident investing their own resources into infrastructure, or they may decide to expand

or modify existing public infrastructure so that it will better provide the required services. This is further proof of how enhanced end-user capacity can allow for the exercising of agency in the realisation of a transformative agenda in water service delivery.

To include the end users in the planning and implementation of projects as described above is also a precondition to creating hydraulic property relations; these relations then become the basis for further collective action related to operation and maintenance (Coward, 1983 as cited in Boelens and Vos, 2014). Co-management – where the responsibilities for operation and maintenance are being shared between the municipality and the end users – can become a promising approach to reducing the time taken to respond to breakdowns. In 2015, in response to the service delivery protest and in order to tackle the susceptibility to patronage of the project identification, the Minister for Water and Sanitation launched new institutional forums for water and sanitation. These representative forums were supposed to assist with demand identification at all levels of government. Local officials were hopeful that this structure would ameliorate the situation, but since it has been implemented in a top-down fashion while facing a lack of funds, the benefit remains feeble in Sekhukhune District.

Other promising approaches have been developed which rely on similar mechanisms of transparency and the accountable delivery of services; these include competitive bidding with end-user developed proposals, benchmarking, and indirect investment. Competitive bidding, with proposals developed by end users, is an approach that the African Water Facility, which is managed by the African Development Bank, has implemented in a decentralisation-of-services project in Benin; project proposals are developed by end users and the best of these proposals is selected for funding by a technical committee. The experience collected in the course of this project has shown that communities develop not only capacities to plan projects; they also gain experience in mobilising funding (African Water Facility, 2012). Benchmarking, on the other hand, entails the comparison of local service delivery to a generically excellent model or to the performance of similar municipalities (Bovaird and Löffler, 2002). South Africa already has such incentive-based frameworks in place at the municipal level for drinking water quality and sanitation; according to this incentive-based approach, municipalities can work to achieve 'Blue Drop Status' for drinking water quality (DWAF, 2009) and 'Green Drop Status' for waste water treatment (Department of Water Affairs, 2011). Using such an approach to improving service levels within municipalities would enhance transparency and would therefore strengthen the long route of accountability for end users. Finally, indirect investment is an approach proposed by Coward (1986b) to create collective hydraulic property when supporting irrigation development; he recommends placing the allocation of funds in the hands of the future users and letting them – rather than external consultants and

contractors selected by outsiders – make the investment. The described experimental approach capitalises on this insight.

3.7 Conclusion

The analysis of the four phases of public water service delivery in Sekhukhune District shows how in several instances the quality and level of the services delivered has been compromised by rent-seeking and the lack of capacity both within the department and among the hired consultants and contractors. While improving access for end users can only occur by countering these two issues, I believe them primarily to be symptoms of the underlying mechanisms of patronage and gatekeeping.

I argue that the way to reduce rent-seeking is not by adding more procurement regulations, since willing officials will always be capable of undercutting them; nor do I believe it is only possible to improve capacity in municipalities only through state-financed initiatives such as the Municipal Infrastructure Support Agent (MISA) or the South African Local Government Association (SALGA). These programmes are important, but their effect will remain limited if municipal decision makers continue to rely on their neoliberal approach of outsourcing key planning activities and construction of communal water schemes to private service providers in order to create opportunities for gatekeeping and dispensing of patronage.

In terms of the three discourses explaining failed water services delivery, it may be clear that I agree to a large extent with the second discourse; this discourse emphasises the debilitating effects produced by forms of rent-seeking (gatekeeping and patronage). The way to counter it is by strengthening and changing accountability relations through increasing the agency of end users. This also taps into the first discourse, which explains failed service delivery as being rooted in a lack of capacity. I believe that an end-user-driven approach such as that presented here strengthens end-user capacity both technically and organisationally; I feel that this is a key precondition for increasing the accountability to end users of different actors in the water services delivery chain. The third school of thought singles out neoliberal policies and the process of commodification of water services as the root cause of failed water service delivery and rural transformation; I believe that this discourse may carry some validity with regard to explaining elite capture of water resources. I argue, on the other hand, that many forms of (indirect) co-investment in, and co-management by, end users of rural water infrastructure rely on certain forms of cost recovery, and that some forms of renumeration for water services supply are thus required. Since the present system of water service delivery in Sekhukhune is significantly undermined by public officials' misallocation of public funds to (incompetent) private

contractors, focusing on structural change through decommodification of rural water services is not likely to improve access; I argue, rather, that there is a need to engage in a process that moves towards a public service delivery approach which strengthens collective action and co-investment by end users through making them active contributors and co-owners of rural water infrastructure.

As I stated from the outset, I am not in favour of new policies to increase access to rural water services; rather, I call for new strategies to strengthen accountability relationships towards end users within the existing structure. Due to the compromising effect of both patronage and gatekeeping on financial and electoral accountability, I propose an approach that minimises such opportunities for diverting public resources through focusing on the strengthening of end-user agency. End users are the only actors who have an intrinsic interest in a functioning water infrastructure; strengthening their position in service delivery will thus improve results. Assigning end users a key role in the planning and implementation of water infrastructure, as explored in the approach I describe here, is the basis for defining new forms of collaboration in operation and maintenance. In the identification of projects, end users must be better represented; either the credibility of ward councils must be strengthened through defining a common procedure for their election, or there must be a strengthening of water forums.

4

CONVIVIALITY UNDER PRESSURE OF MARKET-MODERNIST EXPERTOCRACY:

THE CASE OF WATER COMMONS IN RURAL SWITZERLAND

4.1 Introduction[3]

Collective ownership and management of natural resources, especially water, has a long tradition in Switzerland. From 1250 onwards, a variety of collective organisations emerged on the territory of today's Switzerland, managing forests, pastures and water (Stuber and Wunderli, 2021). These collective forms of organisation became deeply rooted within Swiss society and took on more and more state functions during the 17th and the 18th century (Schläppi, 2019). Despite the reorganisation of the state and the creation of a central government based on principles of personal freedom during the French occupation at the end of the 18th century (Stuber and Wunderli, 2021), cooperative organisations remained important (Schläppi, 2019). This led to a situation characterised as municipal dualism which still exists today, with local cooperatives playing a key role next to other political structures (Reynard, 2005; Stuber and Wunderli, 2021). While for example the provision of water services within urbanised zones is the responsibility of the municipalities (Schweizer Bundesversammlung, 1979), in the Canton of Luzern this task is in most cases delegated to cooperatives, with the municipality fulfilling an oversight function. Yet, during the course of the 20th century the interest in common property organisations began to fade (Head-König, 2019) and as the Swiss minister of justice noted in a speech in 2011: cooperative forms of organisation that rely on collective action are in Switzerland on a retraction (Sommaruga, 2011).

This article contributes to a growing body of literature on Swiss commons (e.g. Aubriot, 2022; Flaminio and Reynard, 2023; Netting, 1974; Reynard, 2005; Stuber and Wunderli, 2021) by analysing collective water governance in a rural area where citizens are responsible for their own water supply. Especially in the mountainous regions, many small water cooperatives exist which, in comparison to the cooperatives within urbanised zones, are characterised by low levels of professionalisation and technological complexity and a high level of user involvement. Despite their independence these cooperatives are also under the influence of public institutions due to regulations and their dependence on public subsidies.

Within this context, I analyse the public support during four phases of water projects and a specific project that sought to interconnect three independent water schemes in a rural municipality in the foothills of the Alps in detail. My analysis, which is informed by a conviviality lens, shows how these phases were shaped by neoliberal governance ideas framed as New Public Management (NPM).

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3 This chapter is a slightly adapted version of the article that has been published as: Hofstetter, M.; Bolding, A. and Boelens, R. 2023. Conviviality Under Pressure of Market-Modernist Expertocracy: The Case of Water Commons in Rural Switzerland. International Journal of the Commons 17(1): 375–389.

My analysis shows how a growing expertocracy dominated by modernist ideas of development and progress fails to recognize the value of the commons and their forms of organisation and water governance. This lack of recognition undermines the functioning and sustainability of these organisations. The fieldwork for this article was conducted by the main author, who was first employed at the department for agriculture and forestry of the Canton (Landwirtschaft und Wald, LAWA) responsible for supporting rural water schemes (Feb. 2021 – June 2022) and then by the private engineering company planning the described project (since July 2022). Both were junior positions in which the author was supporting his superiors. These engagements allowed observations of daily operations and meetings, which was transparently agreed with the Canton department and company. It further created the opportunity for regular interactions with all relevant actors. These insights were enriched by in-depth, semi structured interviews with six government officials (four current and two former), five scheme officials, three engineers, two local politicians and one contractor. In addition, the historical and the newspaper archive of the Canton was consulted.

I first develop a conviviality lens and provide the historical context within which rural water commons in Switzerland emerged. I then apply this conviviality lens to scrutinize the public support during four phases of water projects and analyse one such project in detail before concluding my findings.

4.2 Conviviality and the commons

A wealth of commons literature has emerged since the publication of "The tragedy of the commons" (1968) in which Hardin described how rational, self-interested individuals would be incapable of collectively managing common resources without either coercion (imposed by the state) or economic rationality (imposed by the market). Authors as Netting (1974) and Ostrom (1990) countered this view by describing different forms of collective management, among them the collective management of alpine pastures in Swiss villages and identifying principles that support commons' success. They demonstrated that communities can manage commons in a coherent and sustainable way, a third way of governance besides private and public governance (Caffentzis and Federici, 2014; Dolenec and Žitko, 2016). More recent interpretations of the commons reject the idea of the commons as being an alternative form of economy and see the commons as an organisational alternative (De Angelis and Harvie, 2014; Dolenec and Žitko, 2016; Esteva, 2014;). Humans are no longer seen as rational individuals solely interested in their own benefit, but as subjects of omnipresent power relations (Nightingale, 2015) who through "other-than-capitalist" (García-López et al., 2021) collaborative forms of organisation and interactions among human and non-human actors shape the commons – an endeavour

called commoning (Boelens et al., 2022; Hoogesteger et al., 2023a, 2023b; Villamayor-Tomas and García-López, 2021). This most recent interpretation of the commons is at odds with older concepts such as social capital, since exchanges are no longer perceived as transactional. These commons in contrast describe an organisational alternative which builds on and strengthens communality, which I in this context understand to be "a feeling or spirit of cooperation and belonging arising from common interests and goals" or "the state or condition of being communal" (Collins Dictionary, 2023. cf. Hoogesteger et al., 2023a).

The key concept applied to describe commoning in this article is conviviality, which Illich (1973a) described as the opposite of industrial productivity. "Commons are either convivial or only a variant of globalised (and institutionalised) sameness" (Groenemeyer, 2015, p.4). A convivial society is one of creative and autonomous intercourse between people in which services and goods are created by members of society, or as Illich put it: "People need new tools to work with rather than tools that 'work' for them" (Illich, 1973b, p. 10). Tools in this context are not limited to simple hardware but include institutions that produce both tangible and intangible goods (e.g. knowledge, governance forms) (Illich, 1973a). Such tools are considered convivial, if they "can easily be used by anybody as often or as seldom as desired, for the accomplishment of a purpose chosen by the user" (Illich, 1973b, p. 21). Convivial tools therefore must be accessible, and their complexity and size must be limited to allow for a maximum number of possible operators. Convivial tools allow for the collective creation of societal goods and oppose the tendency to reduce the role of citizens to mere consumers. By creating tools that allow citizens to cater for their own needs, societies reduce societal injustice resulting from dependence on tools that can only be used by a few and reduce their reliance on commodity inputs. Convivial tools are labour intensive but not necessarily inefficient (Illich, 1973b). By creating the necessity to collaborate in socially beneficial activities, they address the desire of citizens for recognition (Convivialist International, 2020) and counter the meaninglessness of contemporary society (Illich, 1973b). Such a collaborative and non-profit mode of production provides a pathway for de-growth and challenges the neoliberal organisation of society (Büscher and Fletcher, 2019; Convivialist International, 2020). Neoliberalism in the public sector is primarily expressed by what Dean defined as "technologies of performance", viz. the establishment of "quasi-markets", the setting of performance indicators, benchmarking and "the corporatisation and privatisation of formerly public services, and the contracting-out of services" (Dean, 2010, p. 197). Conviviality further opposes ideas of modernist development and progress, which profoundly characterize expert knowledge in the water sector (Boelens, 2015). Rather than radically breaking with the past and moving linearly towards a better modernist future through technological innovation, conviviality "refers to a specific kind of lived togetherness that is shared between the human and non-human inhabitants of a specific place in time" (Vetter, 2018, p. 161. cf. Houart, 2023).

Convivial water governance tools build on grounded knowledge, rooted identities, hybrid organisational forms and multiscale complexities (see Hoogesteger, 2015; Sanchis-Ibor et al., 2017; Vos et al., 2020) and are therefore at odds with depoliticised expert interventions engrained in "state-bureaucratic and neoliberal water policies aim[ing] to construct 'equals'"(Boelens, 2015, p. 197).

Following from this, one-sided structural and teleological analyses or rational choice new-institutionalist approaches, in which actors are relatively uniform and predictable agents, miss the point. They fail to understand real-life actors' behaviours as embedded in actual social relationships (Duarte-Abadía, 2023; Dupuits, 2019; Owens et al., 2022; Zwarteveen et al., 2005). A convivial commons' analytical approach must allow for understanding how agents creatively manoeuvre within structural circumstances (e.g. Boelens and Gelles, 2005; Goldman et al., 2018; Mirhanoğlu et al., 2023). I therefore apply an actor-oriented approach as described by Long (2001). It builds on the conviction that agents and structures interact and co-constitute each other (Giddens, 1984). Similar structural circumstances can, depending on the agents involved, lead to different outcomes (Long, 2001). Empirically and conceptually, the messy worlds of water commons and hybrid water governance structures and practices provide many learnings for this (e.g. Dupuits et al., 2020; Flaminio et al., 2022; Hoogesteger et al., 2023c; Veldwisch et al., 2019; Venot et al., 2022; de Vos et al., 2006; Whaley, 2022).

4.3 The historical development of community owned water schemes

As outlined in the introduction, collective ownership and management has a long tradition in Switzerland (Schläppi, 2019) and still plays an important role in Swiss society (Stuber and Wunderli, 2021). Commons exist in Switzerland on different scales and sectors, with the two biggest supermarket chains (Benz, 2022), several large insurance companies and banks (Ideecooperative, 2023) and 5% of the housing sector (Rorato, 2018), but also regional cheese producers, alpine pastures, forests (Haller et al., 2021) and local water schemes being organised as cooperatives. It is important though not to fall into what Schweizer (2018) coined the "commons trap" by romanticising collective organisations as forms of organisation that inherently produce more equity and sustainable solutions. Some cooperatives are deeply embedded in capitalistic markets and collective organisations have historically served as a protection against the claims of others (Stuber and Wunderli, 2021). They further used to have a strong normalising effect since "troublesome members of the community could easily be expelled from political and economic communal life by labelling them as so-called "Übelhauser", which means "bad housekeeper"" (Schläppi, 2019, p. 27). Only with the subordination of commons organisation under public law in

the 20th century were they forced to adjust such socio-political positions (Stuber and Wunderli, 2021).

For farming households common water schemes were (and still are) in many cases the most feasible manner to improve water access. The national parliament therefore created already in 1884 the legal basis for supporting projects to improve water infrastructure for farming households in mountainous regions, subsidising these up to a maximum 40% of the project cost (Schweizer Bundesversammlung, 1884). Public subsidies supporting water access for farming households and animal husbandry formed part of a broader set of programs, summarised under the term soil improvements. To provide technical support, the Canton of Luzern created the position of a 'cultural engineer' (Regierungsrat des Kantons Luzern, 1905) and endorsed in 1908 its own, additional subsidies of 10-25% of the cost of planning, construction, and land acquisition of such projects (Der Grosse Rat des Kantons Luzern, 1908). The demand for soil improvement projects soon exceeded the available financial and personnel resources. The office of the cultural engineer kept growing and was turned into the department for Meliorations in 1945 (Regierungsrat des Kantons Luzern, 1945). In response to a growing water demand due to the intensification of agricultural production, the national government revised its policy in 1954 and made it a condition that the national subsidies cannot be higher than the subsidies from the Canton (Der Schweizerische Bundesrat, 1998). In response, the Canton raised its maximum subsidies to today's level of 30% through new legislation passed in 1957 (Der Grosse Rat des Kantons Luzern, 1957).

During the three decades that followed most of the water schemes existing today were built. These schemes serve domestic uses and livestock production since only exceptional and very minor irrigated production takes place in the area. It does therefore not surprise that the expansion of water schemes coincided with a drastic increase in livestock numbers in the Canton between 1956 and 1978 (LUSTAT, 2022). In the same period, the Canton extended its technical support and the department for meliorations grew from seven employees in 1957 (Regierungsrat des Kantons Luzern, 1957) to 14 employees in 1973 (Meliorationsamt Luzern, 1973). In the 1980s, the neoliberalisation of service provision according to the ideas of "wirkungsorientierte Verwaltung" (WOV) and New Public Management (NPM) rose to prominence and put pressure on this publicly funded technical support offered by the Canton.

The term New Public Management (NPM) emerged to describe administrative reforms in the United States, United Kingdom (McLaughlin and Osborne, 2005) and New Zealand (Boston, 1999). Under different names but with the same rules and strategies, NPM reforms worldwide promise to raise the efficiency and reduce the cost of public administration by introducing private sector principles such as customer orientation, performance

auditing and competition, while reducing the size of the state through outsourcing and privatisation (Boston, 1999; García-Mollá et al., 2020; Gruening, 2001). NPM takes a neoliberal perspective on public administration (Drechsler, 2005) and builds on ideas of neo-classical management and rational choice theories (Gruening, 2001). According to NPM principles the state should orient its practice on private service deliverers (Schedler, 2000a) and introduce a competitive market mechanism where possible, to provide services at the lowest cost possible (Rickenbacher, 1995). These schools of thought are based on the perception that societies are a conglomerate of rational individuals who seek to maximize self-interest (Duarte-Abadía et al., 2021; Espeland, 1998; Vos and Boelens, 2014, 2018). NPM reforms were adjusted to the Swiss circumstances and introduced under the term WOV which can be translated to "effect-oriented management". WOV aims to increase the efficiency of public activities by precisely formulating targets and the introduction of management structures and indicators to measure success (Schedler, 2000b. cf. Venot et al., 2022; Whaley, 2022; Zwarteveen et al., 2005).

Luzern became then in 1995 a pioneering Canton in Switzerland by starting a four year pilot to implement these ideas in two departments (Fellmann and Fässler, 1995). The positive evaluation of this pilot resulted in the revision of the legal framework, facilitating implementation of market mechanisms and outsourcing of services across all public departments (Der Grosse Rat des Kantons Luzern, 2001). In addition, the executive board of the Canton was reduced in 2001 from seven to five members through a popular initiative. These developments led to pressure on the agency providing technical support for water schemes to lower fixed costs and engage with private companies to provide support services (interviews with former employees, June/July, 2022). This strategy of outsourcing of responsibilities led to a reduction of public employees providing support to six, in 2005, and finally only three, in 2008.

This trend was reversed only after the onset of a severe drought in 2018/19, which led to rural water shortages in 60% of all municipalities (Department for Environment and Energy, 2019). Since then, officials of LAWA have noticed an increased interest in improving water access. In response, the Canton more than doubled the available funds for such projects in two steps (2021 and 2022) and in 2022 a fourth employee was hired to manage the rising number of projects. The LAWA further revised its support strategy for rural water schemes in 2022. In the future, the focus will be on building new collective water supply schemes and connecting or merging existing schemes.

4.4 The four phases of a project establishing water access

I situate my examination of state intervention with water commons' in four analytical project phases: identification and financing, planning, construction, and operation and maintenance (see Chapter 3).

4.4.1 Identification and financing

To initialize a project, one or several of the potential beneficiaries submit an application describing their issue to the municipality. These champions were and still are generally farmers who are affected more than their neighbours by water shortages or farmers who have the financial means to invest and need to ensure water availability. The municipality then forwards the application to the department for structural improvement which is part of the LAWA. This two-step approach was introduced in 1995 to create transparency and coordination in the allocation of the subsidies. Before, allocation was heavily dependent on personal relations, hence municipalities without the right contacts were less likely to get any projects (personal communication with former and current employees, June/July 2022).

4.4.2 Planning phase

If the LAWA considers the agricultural interest sufficient to warrant subsidy, the process of working out a feasibility study is started. Once a cooperative has decided which of the options presented in the feasibility study should be realised, they commission, under the lead of the project leader from the LAWA, an engineering consultancy firm for the detailed planning. The cooperatives must approve all decisions in this process and can raise their concerns, but the influence of the project leader who controls the allocation of the public subsidies is strong. One president of a cooperative described the relationship as: "The one who pays decides". Also, the engineer plays a major role in shaping possible project ideas since: "what the engineer does not propose, cannot be implemented" (personal communication with a project leader of the Canton, May 2022).

Before the introduction of NPM and the laying off of departmental staff, the Canton employed an engineer and technical drawers who were developing feasibility studies and planning water schemes in collaboration with the cooperatives. Since the department no longer has the manpower to perform these tasks internally, external expertise has to be commissioned. Outsourcing of governmental support services is premised on the lure of cost reduction due to proclaimed higher efficiency associated with competition in the private sector and the flexibility to only pay for someone when this person is needed (Girth et al., 2012; Kremic et al., 2006). Since the Canton has a fixed annual budget to support drinking water infrastructure for farming households (1.5 million USD), there is a constant spending pressure to initialise and plan new projects. The fact that these support

tasks are conducted by expensive external service providers (140-160 USD per hour for an engineer), means that while the fixed costs can be kept low, higher public subsidies are paid due to inflated project cost based on commercial rates. Outsourcing of annually recurring tasks therefore either results in reduced time availability for planning activities and consultation processes, or in higher planning costs. In addition, this development has led to a privatisation of planning know-how (brain-drain) which according to several interviewees would be very difficult (if not impossible) for the Canton to rebuild internally.

4.4.3 Construction

Once the cooperative approved the final design, the engineers initialize the tender process for contractors with the cooperative and the Canton having oversight over the process. The cooperative's steering committee usually follows the construction of new infrastructure very closely, meeting regularly with the engineer and deciding on any unforeseen issues cropping up. Depending on the nature of the project, members of the cooperative may also assist the contractor, for example, by transporting materials. At the end of the construction process, the steering committee is therefore often already familiar with their new infrastructure and only needs limited training by the engineers to start the operational phase.

4.4.4 Operation and maintenance

The cooperatives have full ownership over the constructed infrastructure and maintain and operate it independently.[107] All cooperatives have a steering committee responsible for coordination, which consists usually of five members. A regular general assembly, to which all members of the cooperative are invited, normally takes place once a year and is usually attended by many users.

While all schemes either have an agreed hourly rate or set a blanket amount for the work of their steering committee, these expenditures are significantly lower than common salaries for comparable work. The proximity of committee members to key infrastructure allows them to integrate monitoring tasks into daily routines. One president explained that he regularly checks the reservoir when collecting his cows and a master of the well who lives close to the wells made it a habit to regularly monitor their yield during droughts. These water schemes form part of people's daily lives and many of the small operation and management tasks are conducted on a voluntary basis. The interviews both with scheme representatives and current and former government officials showed that financial renumeration is not the driving factor to contribute. The most common motivational factor mentioned was that water access can only be maintained through collective action. This is also valid for roads and small cheese factories, which in the rural areas are commonly also organised as cooperatives. One steering committee member explained that "our society can sustain itself, only because we have a lot of people who are willing to contribute". This

engagement is acknowledged by others and several committee members expressed pride to be contributing to good quality water access. While interviewees mentioned that due to what could be described as increased individualism, it has become more challenging to find steering committee members, these rural schemes keep finding motivated members.

4.5 The unification of three schemes

To analyse the interaction and negotiation of actors within current structures and the effects this has on this form of water access creation, I will describe the initialisation and planning process of one specific project in detail. I selected this project since it attempts to improve water access through the inter-connection of existing schemes, which as explained above will be a key type of project to adapt to changing rainfall patterns.

4.5.1 The start: refurbishing one scheme leads to a proposed merger of three schemes

This project was initially limited to scheme S constructed in 1962, serving 14 households and one cheese factory. The cooperative owning the scheme has a very stable structure: the president having served for over two decades. He is proud of "his" scheme and is planning to hand it over to the next generation. Before doing so, he wants to ensure the renewal of the infrastructure. Scheme S has very good wells, which allow it to provide water to three other cooperatives. In 2018 it was decided that the bad state of the infrastructure warranted a complete overhaul; an engineering consultancy was commissioned to formulate a feasibility study. This project was stopped because the reconstruction cost was too high for the cooperative (despite subsidies) and the Canton received requests for subsidies from two neighbouring cooperatives.

The municipality decided in collaboration with the public home insurance company to commission a local engineering company to prepare a general water service plan. The intention of this plan is to analyse the state of water schemes in a predefined area and identify possible synergies. The procedure of this planning process was outlined at an initial meeting, to which the steering committees of the schemes in the area were invited. After this initial meeting, the consultancy firm gathered relevant information about the schemes. The main author joined the project at this point, assisting the project leader of the Canton and, in this capacity, joining all meetings and supporting the data gathering of the consultant.

I focus here on the three schemes for which a collective project was proposed. Scheme K is a small scheme built in 1967, serving 11 households. The yields of their springs are prone to high annual variability, hence the cooperative had sought to secure access to additional

water sources, unsuccessfully. During the drought of 2018/19 a water rationing system had been instituted, which led to a renewed search for an additional water source. In 2019 this resulted in a request for support from the Canton. Cooperative N also submitted a request for public subsidies in 2019. While the cooperative has very good wells, they urgently needed to renovate their two reservoirs. These reservoirs were constructed in 1970 and no longer met the minimum standard of the department of food security, that promptly issued an ultimatum forcing the cooperative to improve its infrastructure.

All three cooperatives emerged out of communal initiatives that had been supported by the Canton. Scheme N for example was initialised by a single farmer who did not have sufficient water to cover the increased demand related to domestic uses and growing livestock numbers. When he requested public support, he was told to start a collective scheme. He then called in a public meeting and managed to convince his neighbours to join his effort. According to him, the offer of public support was so good that no one could refuse it. While these cooperatives are all situated in the same municipality, their extent is defined by the topography and there has not been a need to collaborate in the past.

4.5.2 Development of infrastructural options

Early on, the project leader of the Canton developed the idea to connect schemes S and K. This could potentially reduce the investment cost for S and solve the water scarcity problem of K. Since the yields of the springs of cooperative S were significantly affected by the dry spell 2018/19, their president indicated that such a connection would only be feasible if cooperative N would also join. It was then agreed with the representatives of the municipality and the housing insurance, that the consultant would develop a plan for a shared reservoir for the Cooperatives S, K and N. Each of these schemes would in return give up one of their reservoirs (Figure 15). The consultant would additionally develop for each scheme a solution to solve their issue independently.

The feasibility study suggested that a connection of the schemes would solve the outstanding issues of three cooperatives in one go, ensuring safe and sustainable water access for many households. By merging the three schemes into one, the organisational structures could be simplified, while the increased complexity of the inter-connected infrastructure would warrant the outsourcing of its operation and maintenance to an external, professional operator. Both these developments would simplify the implementation of state interventions in case of bigger maintenance tasks and refurbishments, which was a key reason for the support of officials of the Canton for this merger. Professionalisation would further allow to keep up with the increasingly strict regulations and standards related to water quality, a scenario that both public officials and engineers kept repeating in public meetings. The consultant shared this view about professionalisation and preferred the connection option due to the technical advantages

he identified (one instead of three reservoirs and better water supply security). At this stage, these project ideas were not individually discussed with the steering committees of the affected cooperatives, to avoid a situation of imbalanced levels of information among the steering committees. Future organisation of the merged scheme was also internally not discussed, with both the project leader of the Canton and the consultant stating that questions of organisation and use could be clarified at a later stage in the project.

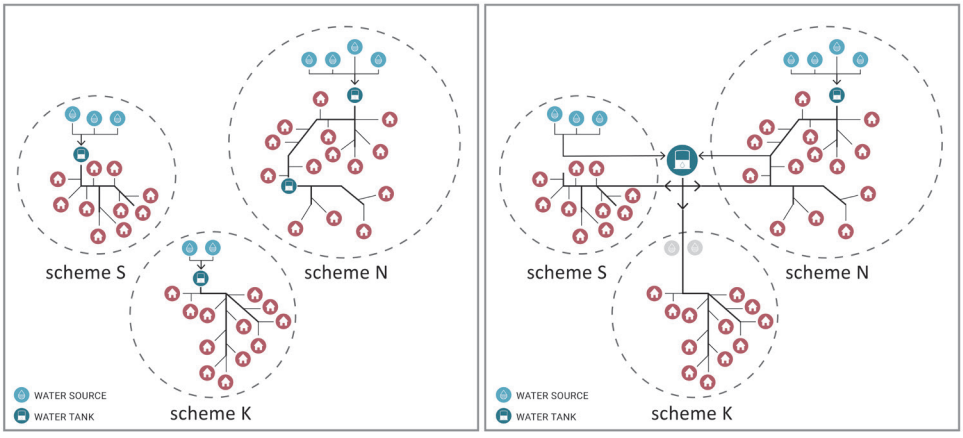

Figure 15. Current schemes (left) and inter-connected schemes (right) (source: own elaboration)

The assumption of both the project leader and engineer was, that it would be the cost of the different options that would be the decisive element. It was therefore assumed that the steering committees could be convinced through financial incentives. When dividing the cost of the collective solution among the three schemes, it became clear that the common solution would be financially interesting for scheme S and there was no feasible alternative to improve water availability for scheme K. For scheme N though, renovating their own two reservoirs would be cheaper than the inter-connection option. Since the inter-connection option, which the canton officials and the engineer considered to be the most efficient and sustainable option, could only be realised if cooperative N joined the project, the officials of the Canton decided that the independent refurbishment of the reservoirs of scheme N would not be allocated any federal subsidies. Without these subsidies, it would become too expensive for cooperative N to pursue the independent refurbishment of their own reservoirs and they would instead be forced to join the inter-connection option.

4.5.3 Developing a plan for management

Once the different options with cost estimates and possible subsidies were evaluated, the steering committees of the selected schemes were invited to a presentation. Several representatives of the schemes later stated that they felt overwhelmed at this meeting,

since it was the first time that they were hearing about the idea to connect the schemes. They raised many questions about what the organisation of such a connection option would look like, if it would be a necessity for the cooperatives to merge into one cooperative and what the running cost would be of the new scheme. No answers could be provided for these questions at that point. Other questions probed small inconsistencies in the plan, like the reservoir being situated too high to benefit from certain wells or a pipe that had been assigned to the wrong cooperative. It became clear to the main author that these inconsistencies could have been avoided through co-design and more active involvement of the steering committees in the planning.

Since the reception of the project was not as positive as anticipated, it was decided that the consultant together with the Canton representatives would discuss with the representatives of each scheme individually before meeting again. The president of Scheme N was then the first to be invited to such a discussion, which turned out to be highly disharmonious. The steering committee of Scheme N had in the meantime decided at an internal meeting, that they would under no circumstances agree to a merging of all cooperatives into one. During later informal discussions with members of scheme N they cited different reasons for this opposition. The main point raised was, that they did not see a reason to change and give out of hand a well-functioning scheme that delivers good water services. The cooperative owned good wells and there were young members who were willing to take responsibility. They also raised the fear of rising prices, since the water from their wells does not have to be pumped and they feared that this connection would force them in the future to contribute to pumping cost for the households of the other schemes. In addition, their scheme functions with a low level of technology and they do not see a reason to become part of a larger, modernised scheme. They further mentioned that they were proud of the way this scheme was started by their relatives and the good water quality that their own scheme ensured.

After the agitated meeting with the president, the department of structural improvements invited the whole steering committee of cooperative N to the Canton offices. To increase the pressure on the steering committee to consent, the Canton explained that it would not be possible to foresee when the (already reduced) subsidies for the refurbishment of the two reservoirs could be paid. The steering committee of Cooperative N then stated that they were willing to share water with the other schemes, but that they would only support a project that would allow them to stay independent. The Canton agreed to elaborate such a management option.

Shortly after the meeting, the possibility was discussed to renovate both reservoirs of scheme N for them to stay fully independent. Through a connection, schemes K and S could receive water from Scheme N. Such an approach could have solved the institutional

issue at an estimated additional cost of 8%. It was ruled out, since to renovate an almost 60-year-old reservoir in close proximity to a newly built reservoir was considered unsustainable. Allowing these schemes to stay independent would have to be achieved through a purely institutional solution, since Canton officials perceived the co-existence of these schemes only as an in-between step before they would realise the advantages of merging anyway. The opposition against the merging of the cooperatives was described as irrational. Moreover, it was argued that cooperatives needed to professionalise due to increasingly strict quality regulations, and only the larger ones would be able to do so.

The Canton then proposed as organisational solution the creation of an additional cooperative for the operation and maintenance of the shared reservoir, in which all cooperatives would be represented, financed through flat rate payments. This plan was then discussed with representatives of all steering committees individually and then again with all presidents in a collective meeting. They all agreed to present the project in this form at their general assemblies.

4.5.4 The issue of the 3rd chamber and the general assemblies

While the cooperative S directly called for a general assembly to take a decision on the project, the cooperatives K and N decided to first hold an information evening to inform their members. The general assembly of scheme S was very well attended, with only two households out of 14 absent. After some probing questions, the members endorsed the connection project. A general assembly is also a social event, which in the case of scheme S takes place in the restaurant within the perimeter of the scheme. After the meeting, all members are invited to a meal and a drink by the cooperative and most members stay also after the meal and socialise with the other members. For the information event of Scheme K, the members were invited to the house of the president. The event was also well attended and in this case, there were also drinks and snacks served. Some questions were asked, but none was explicitly against, and they endorsed the connection project at their general assembly two weeks later.

The president of Scheme N requested a preparation meeting for the information event. This was deemed necessary since the steering committee of cooperative N had decided that they would only present the project to their members if their independence would be reflected in the infrastructural design. This could be guaranteed through the construction of an additional, third chamber next to the planned two reservoir chambers (Figure 16: Option 2). This was rejected by the project leader of the Canton and the engineer. The engineer argued that "the State is paying for almost all costs of this project, so they should stop demanding things". He explained that the consultancy could keep adapting the project and test other options, but that this would inflate the cost, which in this case had to be paid for by the municipality. Based on this argumentation, also the suggestion by

leaders of scheme N for a physical separation of the schemes with two chambers (see option 3) was rejected.

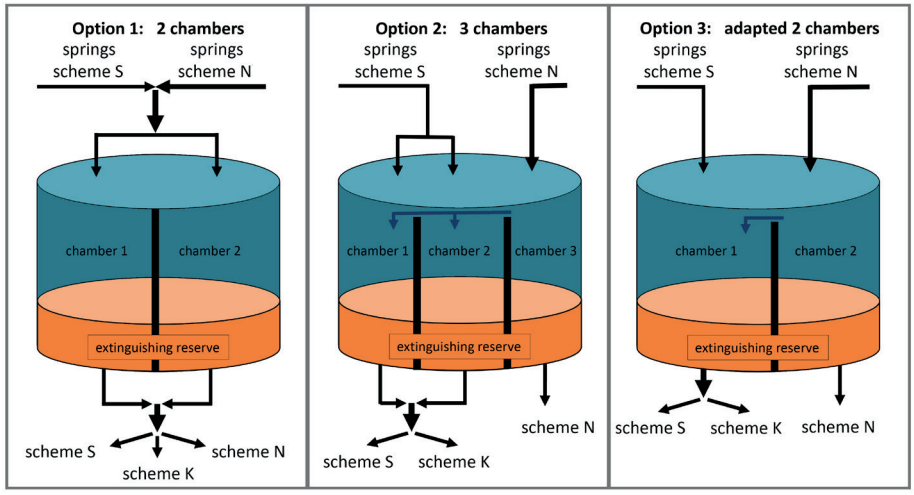

Figure 16. Different possible solutions for the new reservoir (source: own elaboration)

To clarify that no additional changes could be discussed, the department officials decided to attend the information event of scheme N, which was attended by more than 50% of all involved households, though not all. During the question session, one member asked representatives of the Canton if they would be sure that the federal government would not pay subsidies for an independent refurbishment of the reservoirs of Scheme N. He backed his question up with the legal text defining the conditions for support, which he had open on his phone. The officials explained that they had to efficiently spend the subsidies and therefore had the authority to decide this. Members of the steering committee later stated that while being aware of the decision power of the Canton, they were convinced that they could win, if they decided to challenge this decision in court. They explained though, that this would be expensive and time consuming and that it was not in their interest to engage in such a confrontation with the Canton.

No questions were raised regarding the setup of the reservoir. One member did express his fear that if the project would be constructed in the proposed manner, they would eventually lose their independence. After the meeting, while drinking a "Kafi Schnaps" (coffee with alcohol) which the cooperative traditionally offers its members, the steering committee explained that they purposely did not engage in a discussion with the Canton on the topic of the reservoir. The Canton representatives had communicated to them beforehand, that they did not want to discuss the issue of the reservoir and that they

were not willing to negotiate. The steering committee therefore decided that they would let the general assembly decide over this physical separation of the reservoir without involvement or agreement of the Canton. "They can then figure out how they want to do it, since the project does not work without us."

This general assembly of cooperative N took place three weeks after the information event, attended by slightly less than half of the members. When the planning of the connection project was discussed, many members were critical. The project leader of the Canton was again challenged to explain why there would not be any subsidies from the national government for an independent project. The answer that this was not considered a sustainable project, since it would mean substantial investments into two reservoirs that were already 60 years old with one of them being near the new collective reservoir of their neighbouring schemes, was challenged by a second member raising the same question again. Another member asked why the option of a direct connection between Scheme N and K, as projected at an earlier occasion, was not chosen despite its assumed lower cost. While the planners were aware of this option during the initial situation analysis, it was not further considered, since initial data had suggested that the water resources of Scheme N would not suffice to supply K during droughts. Based on better data that became available later, this option would have been a valid alternative, but since the focus of the planners had been fixed on the now presented option this was not reconsidered.

The steering committee refrained from raising the demand of a physical barrier to the other schemes through the design of the reservoir. They later stated that the majority of the steering committee members decided that they did not want to endanger the project. They felt that they already had a significant influence by preventing the merging of the schemes and they trusted that a good solution could be found ensuring their independence. Yet, the issue of a third chamber was raised by a member and sparked a fierce discussion. Several members believed a physical separation should be a pre-condition for scheme N to join the merger. The project leader of the Canton, the steering committee, and the consultant countered that this need not be decided now, since it was too detailed for the current state of planning and ensured that the independence could be secured without a physical manifestation. When it came down to the vote, the members decided with 14 to 4 votes to continue the planning of the connection option. Three of the four opposing voters afterwards informally stated that their main concern was that they would lose their independence eventually. They want to prevent this, since they see the scheme as a heritage of their grandparents, and they feared that the state wanted to take over what was historically grown and independent. They further disliked the way the state was bullying them in case they did not choose the project option the Canton prefers. However, they emphasised that they wanted to state their opinions, but would ultimately accept the majority decision.

4.6 Conclusion: conviviality and the threats of market-modernist forces

Caught within the NPM paradigm, both consultants and public officials promote "efficient" technologies, presenting enlarged managerial units and professionalisation of management as inevitable to adapt to increasingly strict water quality regulations and changing climatic conditions. Opposition to this expert driven normalisation is dismissed as representing forms of "naivety" or "lack of understanding". The simplistic expert view of these collective actions as conglomerates of self-interested and rational individuals therefore actively undermines the continued functioning of collective schemes.

Outsourcing further strengthens the development of an expert class, whose opinions are difficult to question since it is too expensive to do so (see García-Mollá et al., 2020). This mechanism is also at play in the described example, where users are only consulted once the engineer is proposing a solution and advantages and disadvantages of specific ideas raised by users are never fully elaborated. The engineer stated that testing further options would be possible, but that this would raise the cost of planning, which eventually would have to be paid for with public money. This dependence on external experts becomes difficult to keep in check when public institutions lack access the home-grown counter-expertise (see also Sanchis-Ibor et al., 2017).

In the described commons, efficiency is created through proximity and the integration of tasks into daily lives. This allows them to be efficient despite being labour-intensive. They create purposeful functions within society which are recognised by other users and members of the cooperatives are proud of the level and quality of services provided. While in all cooperatively organised schemes, some form of renumeration is used, all interviewees stated that their motivation is not financial but to help themselves and their neighbours. Still, steering committee members are not romanticising their contributions, but perceive them as an expression of civic duty, or as one steering committee member explained, "this is just how things work here in the countryside, everyone has to contribute, otherwise things break down". Owning these schemes makes the users more than mere consumers – with water commons user identities that deeply differ from obedient project 'water beneficiaries', State-law 'water recipients' or market-based 'clients'. Citizens actively interact, negotiate, and take collective decisions concerning the operation and maintenance, water pricing and future developments of their scheme, which strengthens social relationships in rural areas. Users value their schemes and oppose the pressure of normalisation and encroachment. The steering committee of cooperative N for example managed to block the merging of the three schemes into one. They further used their strategic position within the proposed scheme to repeatedly propose an alternative design of the reservoir.

The presented analysis suggests that the described schemes function based on "a feeling or spirit of cooperation and belonging arising from common interests and goals", or communality (Collins Dictionary, 2023). To enable the collective action that permits these other than capitalist interactions, it is key that the organisation and infrastructure of the commons is convivial, meaning that it allows members of the society to interact in an autonomous and creative manner to create goods and services. When expert-driven interventions aim to enlarge the management units and modernise infrastructure in the name of efficiency as was the case in the described example, the viability of these commons is negatively affected (cf. Owens et al., 2022; Wutich et al., 2022). Within the irrigation sector, this socio-technical dimension of interventions has long been recognised (Bolding et al., 1995; Coward, 1985; Shah and Boelens, 2021; Uphoff, 1986) and described for example in cases of irrigation modernisation where the introduction of expert designs has disrupted water common's social structures (e.g. Basel et al., 2022; Molle et al., 2009; Sanchis-Ibor et al., 2017). A failure to recognise the value of these commons for rural communities and their value as organisational alternatives from which we can learn will render their demise inevitable.

In the described water access schemes, users collaboratively organise and take responsibility for the use and maintenance of their hydraulic infrastructure. These commons are not functioning merely based on State endorsed, rational choice or market logics. Rather users are willing to contribute more than their neighbours in another than State-servant or capitalistic fashion motivated by the lived togetherness and collective engagement in purposeful actions. For the users to be able to do so, it is key that the institutions and the infrastructure are convivial. This means that they are accessible, legible and controllable for as many community members as possible. It also implies some form of carefully negotiated assistance to allow them to reach the desired outcome while not externally taking over the tasks.

The analysis shows that marketised experts, by focusing on the technically 'best' and 'most efficient' solution, and government officials, with their aim to simplify and 'equalize' realities, often may endanger these commons. Within the current planning environment dominated by neoliberal outsourcing, there is very limited recognition for the role of such self-governed schemes in maintaining healthy social relations and their value as alternative forms of social organisation. To create room for users to keep managing and co-creating their water access demands an open engagement with the realities of the users and a recognition that users are not simply self-interested, rational, or profit-maximising individuals. Improvements to well-functioning water commons must be co-created with user collectives at the steering wheel, and their development cannot be outsourced to all-knowing experts and then dictated by the state.

Modernist actors aim to render such commons to be a thing of the past, but convivial forms of interaction and co-creation can help address both societal and natural resource related problems of our time. Yet, for these organisational alternatives to thrive, their complexity, networked autonomy, and rooted notions of belonging need to be recognised.

5

ROOTED WATER COLLECTIVES IN A MODERNIST AND NEOLIBERAL IMAGINARY:

THREATS AND PERSPECTIVES FOR RURAL WATER COMMONS

5.1 Introduction[4]

Since time immemorial, humans have engaged in collective action to secure their water access. (Co-) ownership and management of water infrastructure is the reality of many around the world up to these days. Although such user-driven schemes have been described (Bolding et al., 1996; Boelens and Gelles, 2005) and promoted (Cremers et al., 2005) in the irrigation sector for a long time, interest in forms of (co-) investment and user ownership in the domestic/multiple water use sector is more recent (World Health Organization, 2017; Sutton and Butterworth, 2021). These schemes are suggested to be more sustainable due to (co-) ownership (Sutton and Butterworth, 2021; Olschewski et al., 2016, 2017; Maltha and Veldman, 2016) and the use of simpler and more affordable technology (Sutton and Butterworth, 2021; Maltha and Veldman, 2016) while being more accessible, adapted, and cheaper due to user investments (Sutton and Butterworth, 2021; André Olschewski et al., 2016; Butterworth et al., 2014; Sutton, 2018). The supposedly low-cost, resilient manner that so-called Self Supply systems offer to attain the sustainable development goals (SDGs) has led to its promotion by international organisations and development agencies (Shah et al., 2018; Gelhard, 2014; USAID, 2020; Andre Olschewski, 2016; Sutton et al., 2004). In several sub-Saharan countries, self-supply has been the object of newly piloted policies (Olschewski et al., 2016; Kyeyune et al., 2011; Sutton, 2004) or draft policy adjustment projects (Federal Democratic Republic of Ethiopia, 2012; Sierra Leone, 2013 cited in Gelhard, 2014). To successfully develop district-specific supply strategies that build on such user initiatives, it is important to "recognize the part that self-supply is already playing in bringing water to millions of households, and to understand the forces that drive it" (Sutton and Butterworth, 2021: 250). The self-supply discourse is thereby dominated by it being able to solve the rural water access problem through a combination of an enabling policy environment, NGO support, development of and training on low-cost technologies and creating access to technologies through the development of the private sector (Sutton and Butterworth, 2021; Butterworth et al., 2014; Kyeyune et al., 2011; Sutton, 2009). As many concepts before, self-supply becomes a manifestation of the belief that an issue like water access can be addressed isolated from other, structural aspects of unequal capitalist society. As such it represents an example of atomism and fits well in the imaginary of neoliberal development towards a modern utopia (Achterhuis et al., 2010; Duarte-Abadía, 2023). Within this imaginary, the definition of value is based on markets, and solutions are considered sustainable if they can reproduce themselves within them. Many actors in the development sector are still looking for governance or management models that can serve as panaceas and solve

4 This chapter is a slightly adapted version of the article that has been published as: Hofstetter, M.; Bolding, A. and Boelens, R. 2023. Rooted Water Collectives in a Modernist and Neoliberal Imaginary : Threats and Perspectives for Rural Water Commons. Water 15: 3736

all issues related to water access independent of the context. In this paper, I point at the limitations of such conceptions, which is in line with a growing body of literature that questions the usefulness of decontextualised concepts such as irrigation management transfer (Meinzen-Dick, 1997), permit systems (Tewari and Oumar, 2013), pre-paid water meters (Komakech et al., 2020) and main-streamed participation (Winters, 2010) as solutions for rural water access. While I reject the idea of self-supply as a panacea, I emphasize the potential benefits of focusing on forms of collective action. To capitalize on these benefits, it is though essential to recognize contextuality, unequal power relationships, and grass-rooted forms of interdependence and collaboration, and actively build on and work towards alternative, more convivial imaginaries.

I base my analysis on research findings in three case studies of local water commons. The first case study describes user initiated and constructed schemes situated in Tshakhuma, a rural-peri-urban village in Vhembe district in Limpopo province, South Africa. Users own, manage, and maintain these water schemes independently from public institutions. The second case study is situated in Ga-Moela, a small rural village in Sekhukhune district in Limpopo province, South Africa. It describes the co-management and co-maintenance by users and municipal officials of two reticulations that were constructed by users as part of an external intervention by an NGO. The third case study is situated in a rural municipality in the Kanton of Luzern, Switzerland and describes a water scheme that is owned and managed independently by a user collective. This collective is currently planning a refurbishment of the infrastructure which due to the high relevance of the scheme for agricultural production is subsidised by public institutions.

In this article, after explaining my conceptual framework in a second section and my methodology in the third, in the fourth section I outline the contextual factors and referential environments of the cases in South Africa and Switzerland. While there are similarities in terms of "consultification" of support services and the preference of officials to realise large and modern schemes, the contexts are entirely different. The intention of this paper is not to draw lessons from one context to implement them in the other – as is commonplace practice in the transfer of de-politicised and de-contextualised 'best practices' in mainstream and neoliberal 'good governance' approaches. Rather my analysis is driven by the curiosity to understand why 'rooted water collectives' (RWC, Vos et al., 2020), despite the differences in context, are struggling with similar issues and challenges. In the fifth section, I describe three such user owned water schemes. I outline how their rootedness – i.e. their embeddedness in context- and history-specific social, cultural, and ecological relations informs their responses to its political, technological, and economic challenges: what makes these collective schemes function? I show that these collectives create positions of purpose within societies and that what motivates people is to help themselves and contribute to the greater good of the community. In

the discussion section I outline, for the case study in Switzerland, how such user-owned schemes tend to be uprooted by modernist/neoliberal governmental approaches – a state of becoming unrooted, vulnerable, and unsteady to withstand the pressures of that same neoliberalising society. In the final section, I draw conclusions. Analysing these three schemes allows us to identify common threats to the celebrated user-owned water schemes which are promoted by modernist approaches and answer the posed research question: how are rooted water collectives affected by a modernist/neoliberal imaginary? This analysis will further allow us to argue for different, non-neoliberal imaginaries and hydro-social configurations.

5.2 Analytical and conceptual framework

5.2.1 Rooted water collectives

Rooted water collectives (RWC), as described by Vos et al. (2020), is an analytical concept to identify and examine the dimensions of collective action around communal management of water systems, of social movements defending and advocating for communal management of water systems, and the possible interaction among these two. It differentiates itself from other conceptual frameworks, such as the Institutional Development framework (IAD) and the Social-Ecological Systems framework (SES) (e.g., Ostrom, 2009; McGinnis, 2011), by highlighting the power and political dimensions of these collectives. The ontology of RWC departs from the justice and empowering effects of collective action. It includes scrutiny of internal politics and hierarchical relationships, intersectionality, as well as embeddedness in broader political strategies and power structures. The RWC framework rejects the application of rational choice theory and methodological individualism to investigate or comprehend such patterns and relationships. As Vos et al. explain, the framework also allows for the description of "the plurality of ontological understandings, epistemological perspectives, worldviews, and values, including the disputes among discourses and multiple languages of valuation" (Vos et al., 2020: 4).

The framework developed by Vos et al. (2020) builds on a detailed analysis of five contextual factors within which these collectives operate. These are "(1) the strength and involvement of the state bureaucracy…, (2) the strength of civil society and room for manoeuvre…, (3) the functioning of agricultural markets and the economic environment of the water sector…, (4) the academic and epistemological environment …, and (5) the techno- physical and agro-ecological environment" (Vos et al. 2020: 4). The collectives that emerge and reproduce themselves within these contextual environments are then described according to three dimensions: their (1) rootedness, their (2) internal structure and capacities and their (3) effectiveness of activities. Rootedness refers to the extent that

these collectives function on the basis of solidarity, belonging, motivation, identity, and awareness and build on vernacular water knowledge. The internal structure and capacities describe the different forms of capacities and the strength of democratic decision making and gender equality in the collective. The effectiveness of activities then refers to the cross-scalar alliance building, advocacy impact innovativeness and their effect on socio-environmental improvements (see Figure 17).

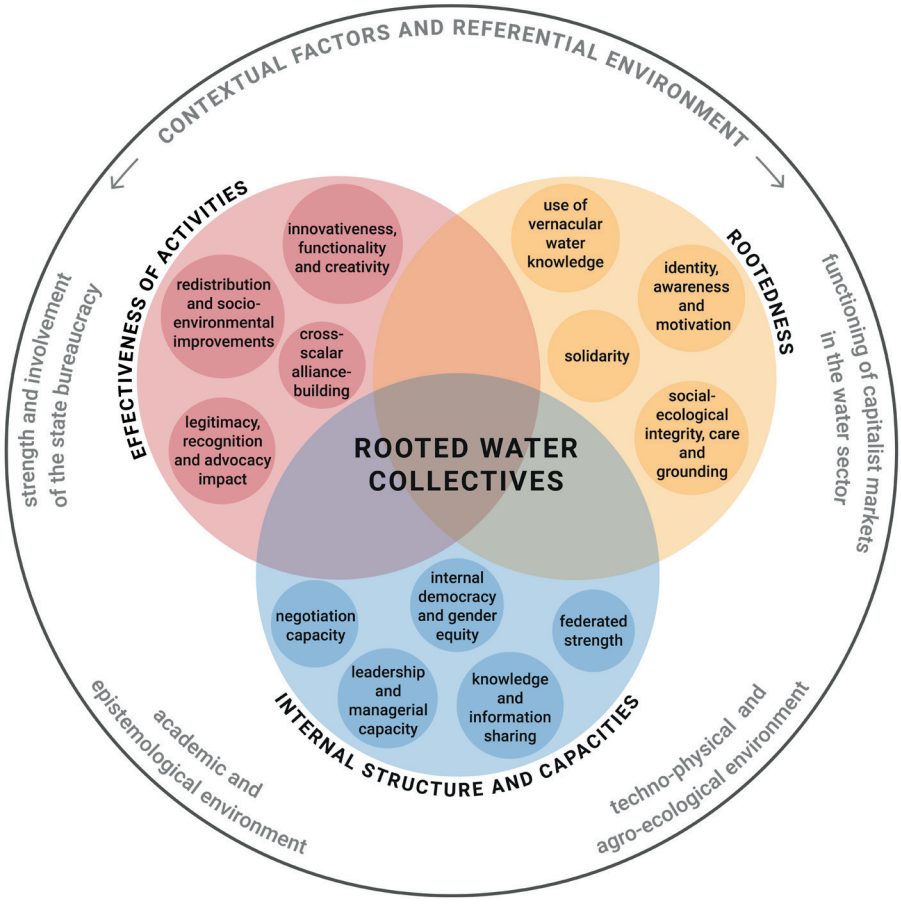

Figure 17. The three dimensions and four contextual factors and referential environments (source: adapted by author from Vos et al. 2020: 5)

The aim of this article is not to compare the three case studies on the nitty-gritty of the contextual factors affecting their functioning, but to identify common underlying dynamics and obstacles affecting the emergence and reproduction of water collectives

and the outcomes achieved by them in terms of water supply. The framework of rooted water collectives was chosen, since its detailed scrutiny of contextualisation in combination with its constructivist ontological lens allows to describe the situatedness of these collectives, while recognising common dynamics and obstacles.

5.2.2 Modernist and neoliberal paradigms

Modernism and neoliberalism and are two paradigmatic constructions that through their promotion in policies define our time's societies to a large extent. While the term modernism initially described the radical reshaping of societies after Enlightenment and the Industrial and French Revolutions (Wagner, 2014; Bendix, 1967), increasingly it came to stand for the core values of Development with a capital D (Illich and Cayley, 2005; Escobar, 1994). Scott (1998: 89) characterizes modernism as "a supreme self-confidence about continued linear progress, the development of scientific and technical knowledge, the expansion of production, the rational design of social order and the growing satisfaction of human needs". The idea of a development towards this modern utopia, which emerged in the 19th century "to ameliorate the perceived chaos caused by progress" (Cowen and Shenton, 1995: 30), was and still is guided by a positivist epistemology and consequently neglect of alternative and subaltern forms of knowledge. Only what can be measured within the realms of positivist science can be true and assigned a value.

In their discussion of hydro-territorial development, Boelens et al. (2019) outline some critical tenets of modernist paradigm(s). They entail the fundamental belief in, and societal-technological project of, humans' agency to pass from one development stage to the next improved one along a linear trajectory. For this, both traditional societies and nature are seen as disordered, in need of being conquered, colonised, and subjected to modern humanity's will and benefit. Its discourse and societal project "inherently entail an epistemological and ontological divide between society and nature … [Its project of] rational design of social, political, and cultural order, commensurate with the laws of natural science, entails standardising the subjects of development and eliminating attributes that are considered "situated", "deviant", and "contextual"…" (Boelens et al., 2019: 8). Core modernist notions are: "… 1). 'De-rooting' the past and ahistorical views that stress 'making a break' and discontinuity (in order to achieve development); 2). The deep-grounded notion of the plannability of socio-natural futures; 3). The need and possibility of reducing diverse cultural meanings, values, language, and knowledges to a single rubric to arrive at one common metric ('commensuration'); 4). The objectification of social values and relationships and the calculability of societal choices and preferences to derive socially engineered optimal outcomes; 5). The deployment of instrumentalist rationalities that enable a universalist water governance culture, and; 6). The commodification of nature and society to justify large-scale hydro-territorial development…." (see Boelens et al., 2019: 7-8; see also Latour, 1993; Blackbourn, 2006; Hommes and Boelens, 2018; Swyngedouw and Boelens, 2018; Flaminio et al., 2022).

This monopolisation over the creation of truth by positivist science paved the way for the dominance of mathematical principles in economics from neo-classical economics onwards. The use of formulas and graphs and the integration of terms from natural sciences like equilibrium and laws (imitating natural laws), created the idea that economics was no longer a contestable social science but a supposed exact science free from ideology (Christian Felber, 2019).

The term 'neoliberalism' emerged In the 1930s and describes the conviction that markets should be expanded and introduced where they do not existing (Connell, 2010). Harvey (1990: 2) defined neoliberalism as "a theory of political, economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterised by strong private property rights, free markets, and free trade". While this view was initially just a counter position to Keynesian economics that dominated the post-war period (Venugopal, 2015; Palley, 2004), it arrived in the mainstream through the adoption of its central principles by conservative parties in many countries in the 1970ies. The electoral success, particularly of Margaret Thatcher in the United Kingdom in 1979 and Ronald Reagan in the United States in 1980 (Connell, 2010), then solidified what later was coined "the neoliberal turn" (Harvey, 1990). This turn was characterised by a wave of welfare state withdrawal, privatisation, market deregulations (Venugopal, 2015), and public sector reforms. Under the term new public management, neoliberal policies encouraged public institutions to orient their structure and operation in line with private companies (Schedler, 2000b) and to introduce competitive markets where this was possible (Rickenbacher, 1995).

I consider modernisation and neoliberalism to be intertwined in our current epoque; in capitalist societies, modernisation is a precondition and foundation for neoliberalism. The reduction of public capacities and the privatisation in return creates entry points for modernist actors. I therefore choose to apply both these concepts in this article to describe underlying dynamics affecting water supply in both SA and Switzerland.

5.2.3 Commons, self-supply, water commoning

The meaning of the term commons has changed over time. Originally Hardin in 1968 introduced it in "the tragedy of the commons" arguing that so called rational humans would not be able to collectively manage common pool resources due to their self-interested nature (Hardin, 1968). Ostrom then in 1990 made use of the term to describe irrigator communities and show their ability to collectively manage a resource, without leading to ruin (Ostrom, 1990). Her approach has been described as a third way of governance besides public and private governance (Dolenec and Žitko, 2016; Esteva, 2014). In this article, I apply a more recent interpretation, where commons are no longer seen as just an

alternative form of economy, but as an alternative form of organising (Dolenec and Žitko, 2016; Esteva, 2014; de Angelis and Harvie, 2014). This recent interpretation deviates (just as the framework of RWC) from rational choice theory and methodological individualism to recognise that humans collaborate in "other-than-capitalist" manners (García-López et al., 2021) and are subjects of omnipresent power relations (Nightingale, 2015).

Though the notion of 'self-supply' in water governance has obvious associations with collective ownership and management, it cannot be equated to such notions as commons and commoning. As outlined above, the focus on user ownership in the drinking water, sanitation, and hygiene (WASH) sector and its conceptualisation as self-supply is a relatively new development, starting at the beginning of this century. Most comprehensively, self-supply has been defined "as the construction of, or incremental improvement to water supplies and sanitation by households and small groups, largely using their own means" (Sutton and Butterworth, 2021: 28). Conceptually-ideologically it is commonly embedded in public-private policy paradigms and assumptions, and strongly based on outsourcing, marketisation and sometimes the privatisation of public services, to support and align local collectives.

Water commoning processes are born of heterogeneous hydrosocial relations (Flaminio et al., 2022; Suhardiman et al., 2017; Villamayor-Tomas and García-López, 2021; Wutich et al., 2022), which provide a contrast to the de-localised water rules and universal forms of organising promoted by bureaucratic and market logics that fail to incorporate vernacular-cultural values and complexities. Boelens (2015: 133) defines water user commons as "a group of internally differentiated water users bound by mutual dependence to develop, use and manage their water sources, by a sense of collective (culture-space bound) hydraulic identity, and who are determined to realize their interdependence and materialize their collective and individual water rights by engaging in collective action strategies". Their water commoning experiences are messy and power-charged processes, and "include distributive and decision-making conflicts, such as over water access or fishing grounds, and over legitimate territorial rules and authority" (Boelens et al., 2023: 1132). Water commoning processes are struggles to shape collectivity from difference and divergence, ordered around a resource that, if to be managed by vulnerable groups, by nature requires shared action (Sanchis-Ibor et al., 2017; Aubriot, 2022; Hoogesteger, 2023; Veldwisch et al., 2013).

5.2.4 Actor-oriented approach and imaginaries

An actor-oriented approach evades the structure agency conundrum by recognising, that structures are co-created and recursively reproduced by actors (Long, 2001), who exert agency based on their resources, convictions, and motivations (Giddens, 1984). So, while circum-stances are "directly found, given and transmitted from the past" (Marx, 1978: 595) simply focusing on structural aspects is unsatisfactory (Long, 2001). An actor-oriented

approach allows to combine structuralist and agency approaches and analyses how driven by their own aspirations and epistemologies actors reproduce imaginaries and exert agency within them.

These imaginaries, then, are "societally and institutionally established visions about what is and what ought to be" (Hommes, 2022: 28). These visions not only describe a desirable future, but also the social order and forms of social life that should be lived. Several imaginaries can coexist within a society, "gaining traction through blatant exercise of power or sustained acts of coalition building" (Jasanof, 2015: 4) as they are propagated by a wide range of social actors, ranging from public institutions, political parties, and social movements, to corporations, media, think thanks and other professional societies. Imaginaries become performative, effective, and truthful not only based on their content, but also on how they are "promoted, contested and/or accepted by concerned actors through different forms of power" (Hommes, 2022: 26). For water control endeavours, Hommes et al (2022: 7) add that imaginaries are among the foundational elements of hydro-social territorialisation, "because they encompass the framework in which life, subjects, objects and their relations are understood and lived; and because they contain normative ideas about 'the right disposition of things' and how these should be achieved. When fixed in space and time through hydraulic infrastructure's designs and connected knowledges, institutions, and norms; the resultant set of new materialities brings changes to existing socio-territorial relations". This process is not just 'social' or 'cultural' but deeply material and political too. It relates to the creation of subjects and their ordering and self-understanding in socio-natural and techno-political environments (cf. Flaminio et al., 2022; Whaley, 2022; Mirhanoğlu et al., 2023).

5.3 Methodology

The description of the three case study RWC's and their contextual factors and referential environments is based on fieldwork conducted for three earlier studies (Chapters 2,3 and 4) and an additional field visit to South Africa in 2023. The main author was engaged with two RWCs in South Africa in the context of a research project of the Water Re-source Commission of South Africa, to which he contributed as a scientific consultant for the International Water Management Institute (IWMI) from April 2017 to June 2018. The fieldwork for the Swiss case study RWC was conducted first as a trainee at the responsible provincial department (February 2021 to June 2022) and then as an employee at a local engineering consultancy firm planning rural water infrastructure (July 2022 to present). The insights generated through these professional engagements were enriched with literature and archive study, and semi-structured interviews with 28 department and 12 scheme officials, nine engineering consultants, 12 politicians, three academics and 64 water users. The two co-authors have long-term academic and action research experience in the fields

of water commoning struggles in Europe, Africa, and Latin America, contributing with conceptual-analytical tools, insights, and collective/public debate sessions for this study. In trying to uncover the mechanism that makes collective actions around water successful, I deploy core notions from (micro) political ecology and use an actor-oriented approach . "Philosophically grounded in a social constructivist view of change" (Long, 2001: 2), this approach relies on the idea that similar structural circumstances can lead to different outcomes. I use this approach in this article since I am convinced that collective action is not simply the result of structures and policies but depends on informal arrangements among actors interacting with and within this structure.

5.4 Context of the three case study areas

Two of the three described rooted water collectives are located in South Africa and one in Switzerland. The two South African cases are located within the same province, and the contextual factors and referential environment, therefore are to a large extent similar. They are thus described in a common section. Differences occur primarily in the techno-physical and agro-ecological environment and will be highlighted.

5.4.1 Limpopo Province, South Africa

Strength and involvement of state bureaucracy

While the historical context in any case is important when describing the strength and involvement of state bureaucracy, in the case of South Africa, with its violent apartheid past and the sudden transition to democracy, this becomes pivotal. When the first democratically elected government of South Africa came to power in 1994, they faced enormous racial inequalities in access to water services. While in the "white" South Africa, water services were in the hands of the municipalities (Muller et al., 2017) and reached almost full coverage, only an estimated 43% of black South Africans had access to piped water (World Bank, 1994). While the national government was committed to extending services to the underserved former homelands, there were, at that point, no local governments in place that could lead these efforts. The approach chosen for the extension of water access, especially in rural areas, was to build on community-based organisations (CBOs). For implementation, the government collaborated with NGOs such as the Mvula Trust and was supported in these efforts by international donor agencies. With the development of the legal framework, building on the constitution of 1996, the role of these community-based organisations in water service delivery changed. Especially the Water Service Act (WSA) of 1997 and the Municipal Systems Act (MSA) of 2000 had a transformational effect on the role foreseen for communities in water service provision. Community-based initiatives from then on would have to be recognised as water service providers by local government. This was only possible if no government institution

could provide these services, and they would have to follow a process of public tendering designed for private service deliverers. This meant that after the establishment of today's municipalities and the first election in December 2000, the majority of CBO-supported forms of water supply became technically illegal (see Chapter 2). While local governments in rural and poorer districts took a more pragmatic approach and recognised community efforts (Sutton, 2004), these schemes are operating in a legal grey zone.[108]

Functioning of capitalist markets in the water sector

From the beginning, the post-apartheid extension of service delivery relied heavily on non-governmental actors. While these were initially NGOs, with the establishment of local governments, this shifted to consultants who plan and contractors who construct new infrastructure. At the time of fieldwork for an earlier study in 2018 in the district of Sekhukhune, all the steps of planning and construction of investments into water infrastructure were outsourced (see Chapter 3). This outsourcing can be seen as the result of what has been described as the failure of the national government to develop technical capacity at local levels to ensure the planning, construction, and operation of basic water and sanitation services (Koelble and Lipuma, 2010; Atkinson, 2007). Yet, the lack of local capacity is also a result of the pressure of government officials to outsource to create rent-seeking opportunities (see Chapter 3) and the global trend of outsourcing as a means to make public agencies 'more efficient' (see García-Mollá et al., 2020), as promoted by the new public management gospel. The planning and construction of rural water delivery infrastructure is today firmly integrated in the capitalist markets, whereby the dominant belief is that private sector involvement is good and efficient.

Academic and epistemological environment

The above-described push to regulate user initiatives came at a time when governmental agencies started to no longer see community-based organisations as temporary solutions (DWAF, 1994) but as valuable partners in rural settings (Republic of South Africa, 1998; DWAF, 2000b, a; c; d). The national planning commission called in 2011 again for the involvement of users in decisions about infrastructure, while acknowledging that "implementation has been slow" (National Planning Comission, 2011). This indicates that not all public officials supported the stifling new regulations for CBO's. Opinions about the new legal framework were ambivalent and highly diverse. I found concerns of union leaders about outsourcing to non-governmental actors[109]; a conviction of many officials that community organisations were a thing of the past[110]; and the "absence of political will to allow community organisations to exist parallel to the newly formed local governments"[111] (Hofstetter et al., 2021: 255). The conceptualisation of self-supply as a promising and sustainable approach to service expansion has been introduced in South Africa by an NGO in 2010 (Rosenfeld, 2010). While the rise of the new concept led to an international frenzy of reports and scientific publications, this concept was only recently

taken up in the national scientific discourse (van Koppen et al., 2020; Matlakala et al., 2023; Aina et al., 2023; Koppen et al., 2021; see also Chapter 2). Contesting this conventional and expert driven interpretation of self-supply, local activists and academics made use of the concept of self-supply to describe one of their strategies to claim the right to water access (in addition to litigation, engagement with the government, media advocacy and protest) (SERI, 2020; Masiangoako et al., 2022; Scheba, 2022).

Techno-physical and agro-ecological environment

Here the two settings differ. Tshakhuma is a rural-peri-urban village inhabited by over 4,000 households and is located along a humid mountain ridge in the Vhembe district in Limpopo province. Owing to the relatively high annual rainfall averaging at 854 mm between 2009-2018 (FAO, 2018), several perennial streams allow water abstraction up-stream of the village. Its proximity to the district capital and many plantations in the region provide employment opportunities. This results in a relatively high living standard for a rural South African setting. A wealth assessment survey conducted among 250 households by IWMI in 2017 found that 70% of the inhabitants live in houses made of cement bricks with roofing either made of tiles or corrugated iron. Moreover, 25% of the households participating in the survey owned a car (van Koppen, 2017).

Ga-Moela on the other hand is a small rural community situated on top of a mountain ridge, which is only accessible over an unpaved road. The village comprises around 100 households, which are dispersed over a large area. Apart from the primary school, there are no formal employment opportunities in and around the community. Households generally either rely on cash transfers from migrant workers or government grants.[112] In the wealth assessment survey of IMWI conducted in the village in 2017 among 65 households, 48% indicated that at least one household member had migrated to study or work and 83% of all households were receiving some form of government grants. The limited water availability makes farming difficult, and yet a small number of community members manage to produce vegetables and market them locally.

5.4.2 Kanton Luzern, Switzerland

Strength and involvement of state bureaucracy

Households outside the built-up zone of the Kanton of Luzern are responsible for establishing and maintaining their water access (Schweizer Bundesversammlung, 1979). This traditionally affects farming households and has led to various collectively organised water schemes especially in the mountainous regions of the Kanton. These collectives are usually organised as co-operatives and own and operate water infrastructure collectively. Water demand is driven by animal husbandry and domestic uses, while irrigation is very unusual.

Due to the dependence of agricultural production on a reliable water supply and the high investment cost per household, the state already started in 1884 to subsidize initiatives to improve the water supply to farmers covering up to 40% of the project cost (Schweizer Bundesversammlung, 1884). During the 20th century, the state built up public support services that assisted with the planning of new investments, and in 1957, the maximum level of subsidies from the federal and the cantonal government was raised to 60% of the construction cost (Der Grosse Rat des Kantons Luzern, 1957). Most of the schemes operational today were constructed during the following three decades. This expansion co-occurred with a rapid intensification in animal husbandry (LUSTAT, 2022). To meet the demand, the number of employed public servants providing technical support was increased from seven to fourteen between 1957 (Regierungsrat des Kantons Luzern, 1957) and 1973 (Meliorationsamt Luzern, 1973). This trend was turned around with the introduction of neoliberal management ideas in public service delivery starting in the 1980s. During the 1990s, the Kanton of Luzern became a pioneer in Switzerland to introduce the principles of "new public management," which led to a reduction of the public technical support staff from 14 to just three employees by 2008. While public subsidies remained at the level of 1957, infrastructure investments were no longer planned in-house, but outsourced to private service deliverers (see Chapter 4).

While the role of government officials is reduced to overseeing projects, their control over the allocation of public subsidies secures them significant influence on all project-related decisions.[113]

Functioning of capitalist markets in the water sector

While the construction of water schemes was always conducted by private companies, the outsourcing of the planning of water schemes was only introduced after the endorsement of neoliberal policies. Today all steps of planning, from compiling feasibility studies to overseeing the construction of new infrastructure, are conducted by private service providers. This has led to a deep integration of the water sector into capitalist markets with private companies tendering for planning and construction tasks. While this privatisation of know-how has created a dependence on private service deliverers, it is still widely perceived as being efficient since it keeps the number of public employees low. Yet, this view is flawed, since the demand for water related projects remains high and the department experiences spending pressure to make use of the annually recurring public subsidies. Ironically, as I explain in Chapter 4, this results in engineering consultants with much higher hourly rates than public servants either having less time available to plan or inflicting higher costs.[114]

Academic and epistemological environment

Despite the focus of self-supply on "developing" the global South, such schemes in western countries are also described under this term, normalising the idea of users owning water infrastructure. Within the Swiss context, state officials and consultants perceive these user owned schemes as single purpose institutions, which are inter-changeable with any other form of service delivery. Their multi-functionality within social structures, such as the creation of points of social interaction and positions of purpose is not recognised within the dominant discourse. In chapter 4 I show, how among government officials and engineering consultancies these structures are seen as relicts from the past which will have to grow and professionalise in the future anyway to adapt to climate and regulatory change.

Techno-physical and agro-ecological environment

The rural municipality of the studied water collective is situated in the foothills of the Alps and the economic activity within its rural area is dominated by dairy farming. In the Kanton of Luzern there are currently six collectively owned water schemes serving households outside the built-up zone and all of them are relying on natural springs. While these springs do not respond directly to a lack of rainfall, the yield of many is sensitive to longer dry spells as occurred in 2018 and 2020. Climate change is predicted to increase such summer droughts, while annual rainfall is expected to remain at around 1400mm (Kanton Luzern, 2022) with heavy rainfall events becoming more frequent (Regierungsrat des Kantons Luzern, 2021).

5.5 Results: the three rooted water collectives

Below I present the results of this inquiry. By applying the rooted water collectives framework developed by Vos et al. (2020) I describe each of the selected collectives in detail. This allows us in the discussion and conclusion to analyse the common underlying mechanisms that enable these collectives to reproduce themselves and keep functioning.

5.5.1 Tshakhuma

The case study scheme is one of 13 collective schemes that emerged in Tshakhuma between 2004 and 2016. These schemes were built in response to the dwindling service provided by the public water scheme, originally constructed by the homeland government in 1990 (van Koppen, 2017), during the decade after the end of apartheid. In addition, the perimeter of the village had grown beyond the reach of the then existing public infra-structure. After having lobbied the local government unsuccessfully to extend the reach of the scheme and rehabilitate the aging infrastructure, two independent groups of community members of the Muhovhoya section started to look for an alternative to

the time-consuming trips to a public tap at the top of the section or buying of water from water vendors. At that time there were already examples within other sections of the village of such self-constructed water schemes, abstracting water from springs or small rivers upstream of the village and distributing water through gravity-fed polyethylene pipes to households (see Figure 18). Muhovhoya uses, like most schemes, plastic tanks to store water during night-time.

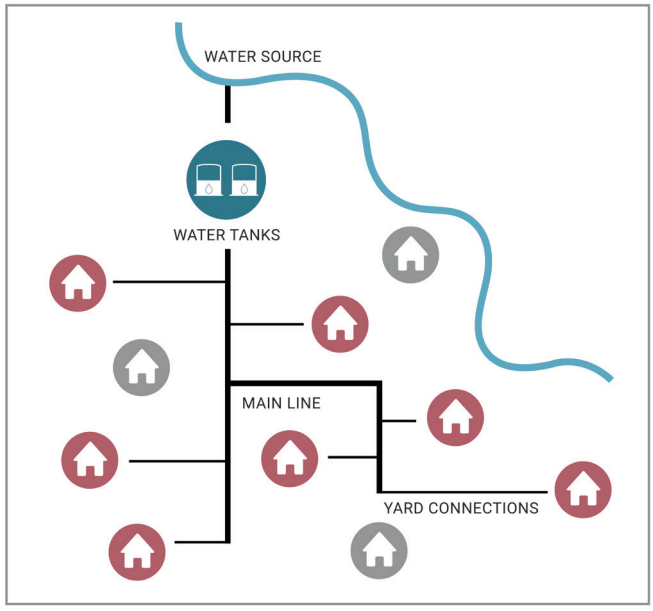

Figure 18. Sketch of the Water scheme in Muhovhoya (source: own elaboration)

Rootedness

During the search for a water source, both initial groups approached the traditional leader, since he is the custodian of the water resources within his jurisdiction. He not only initialised the merger of the two initiatives and organised the first community meeting on the topic, but he also advised them on where on his land to find a good spring that could sustain the section. As outlined, the scheme was started by community members with the intrinsic motivation to improve their own water access through an intervention with a few neighbouring households. Once the first community meeting was held, it became clear, that the interest among the rest of the community was significant and ultimately 113 households committed to join the scheme. The five initial members were tasked to develop the plans and coordinate the construction, a period that one of them described as being very stressful. Suddenly they were not only doing something for themselves, but a large part of their community was relying on their success. They spent many

evenings planning the new scheme and its construction since they wanted to do it well for their community. It was decided that each household that joins the scheme would have to pay the same initial contribution, irrespective of their location within the scheme. Each household further had to provide one person to help on the earmarked days of construction. Households who were not able to dedicate a member to construction activities could also hire someone to contribute for them or as-sist with catering for the constructing members.

This process of collective construction has created collective awareness among the users about where their water comes from and how the scheme functions. The initial members tasked with the planning created a strong bond among them and while later other users have taken on responsibilities, they are all still involved in the management of the scheme. For example, the present operator was part of this initial group. He initially offered to voluntarily perform the operation of the scheme, but it was decided by the members of the scheme, that everyone should pay a monthly contribution, to finance a small stipend for him. He says that he does not consider this to be a salary, but more a thank you. He is motivated by the fact that he can do something for his community and feels that while the other members are not saying thank you every day, they are grateful. Whenever larger maintenance tasks or problems must be tack-led, it is easy for him to find members willing to help. The finances of the scheme are also still managed by the same female leader that initially was acting as a sort of chairperson during the emergence. As a retired schoolteacher, this position within the scheme has allowed her to keep playing an essential role within the community.

All community members willing and able to make the investment in a project with unknown success could join the scheme. Once the construction was finished, it was decided that since the infrastructure could not sustain more members, no more households would be allowed to join. A second scheme then emerged within the same perimeter, but its management is a lot weaker, and the service level provided is much more erratic.

Internal structure and capacities

The structure of the collective has never been formalised. The group of five initiators, or "big five" as they refer to themselves, has been functioning as a committee. While they had developed leadership qualities during their professional careers, they only had very limited technical knowledge. The female leader acting as a chairperson had to deal with the prejudice, that she as a woman would not be able to develop a functioning plan. She says though that this only made her work harder to ensure that they succeed. From the beginning it was also ensured that all relevant decisions were taken at meetings which all members could join.

At the behest of the now late chief, a forum was installed within which the leaders of the different schemes in the village would regularly meet and exchange their experiences and assist each other with problems. After the passing on of the chief and due to the covid pandemic, these meetings stopped.

Effectiveness of activities

As mentioned, this collective is operating in a legal grey zone. The municipality is aware of their existence and tolerates this, but the scheme has not been assigned any legal status. Yet, there is a growing awareness within the South African state of user contributions to water access and the chairperson of the scheme has now already several times been invited to policy dialogues and governmental meetings to present their scheme. The collective is characterised by a high effectiveness of activities, with funds being well accounted for and responses to breakdowns organised swiftly. Users reported that in case of issues with the supply, the operator would immediately after being notified attend to the problem and in case of larger tasks they would assist him. User satisfaction is also reflected in the high paying morale of its users.

5.5.2 Ga-Moela

This collective emerged because of an outside intervention. The village was select-ed in 2017 by the district authorities as one of six schemes for a project to pilot an approach to create multiple-use water schemes (combining productive and WASH uses).[115] The water infrastructure in the village at the beginning of the project consisted of one borehole with a public street tap and a second borehole that was supplying a piped scheme to one section of the village. The households without access to this borehole water were collecting water from shallow wells (see Chapter 3). The aim of the project was to use a predefined budget to realise an improvement in water access through a process of participatory diagnosis and planning. The in-depth approach extended over six months, consisting of six community meetings and seven planning meetings with an elected committee and focus groups. Additionally, the main author as project representative was staying in the village during 46 days in this period, which offered the opportunity for many informal discussions. After receiving training, the community members then built the scheme under supervision of the local NGO, with only tasks demanding skilled labour being contracted to local artisans. Users that contributed only received a small stipend, but not a salary as compensation for their contributions.[116]

The infrastructure established by the project consisted of two reticulations supplying street taps in the two previously unserved sections. These reticulations were supplied by the already existing boreholes. Once finalised, this infrastructure was handed over to the municipality. However, since it was developed through an external intervention and constructed by users who sustained a sense of ownership over the scheme, the responsibilities for operation and maintenance of the schemes remained insufficiently

defined. The municipality has extended the responsibilities of the two voluntary borehole operators to also pump water to the storage tanks of the new reticulations, but no clarity exists concerning the responsibility for the operation of the valves and the maintenance of the reticulation. In both sections the users became active. Below I describe the two collectives that emerged in sections A and B (see Figure 19).

Rootedness

The originally installed borehole pump in section A was not sufficiently powerful to pump water to the location of the new storage tanks, so an additional electrical pressure pump had to be installed as part of the project. The original collective A with a committee with representatives from all village subsections was initially established around the task to collect funds to buy prepaid electricity for the pressure pump. With the installation of a new submersible water pump on the borehole by the municipality, which was strong enough to pump water to the storage tanks and for which the municipality paid the electricity, this committee lost its main purpose. Since at the same time, two key members of the committee left the village for work elsewhere, the committee became dysfunctional. This became a problem since the high pressure of the new pump caused an increased frequency of leakages in the pipe. Three and a half years after completion (2019) the users still attended to repair the leakages collectively, yet old inter-sub-sectional conflicts started to flare up. While there is a clear lack of leadership, there are many community members with the capacity to attend to breakdowns and they do so in changing coalitions. The primary motivation mentioned by users to do so is their own dependence on the water provided.

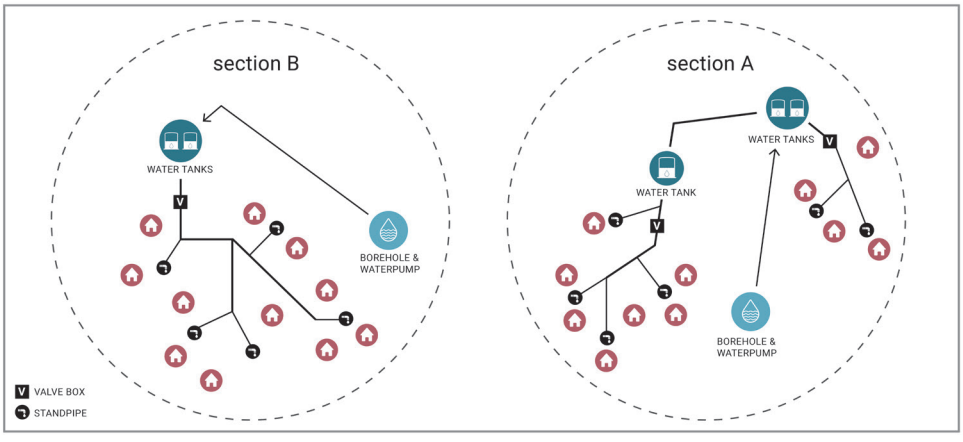

Figure 19. Section B and Section A (source: own elaboration)

In section B, the collective action around the scheme has never been clearly organised and is much more focused on one specific female community member. The collective action emanates from her. If there are leaks in the pipe, which is also a regular occurrence in this section, the users confirm that she organises the response. Since she is one of the few small farmers producing for local markets, she is depending on the water and is most of the time present in the village. She says that when she is in need, it is easy for her to find community members to help attending to leakages in the pipes.

Leakages in the pipe leading from the pump to the storage occur in both sections regularly. The organisation of the response to such breakdowns and the operation of these schemes is the result of a collaboration between these rural collectives and municipal volunteers. Due to budget constraints hiring unpaid volunteers has become the common solution to operate public boreholes in rural areas in the district. In 2023 there were 20 volunteers in the villages around Ga-Moela with some already volunteering for as many as 14 years. These volunteers stay in contact with the municipality and report breakdowns. The volunteer of scheme A expressed frustration with the municipality. She stopped reporting faults since the municipality did not respond to earlier reports. The manager of the local depot of the district authority confirmed that her staff level is insufficient to cope with all maintenance demands, but that community members could report breakdowns and collect materials from their depot. However, last year this material arrived late which meant that for several months they could only sporadically assist communities. The fact that volunteers are not selected by the community but by the ward councillor weakens their accountability relationship to the community. This upward accountability (and downward neglect) is rendered even more problematic since volunteers are left with the hope that they might eventually get hired by the municipality. Both volunteer operators have expressed frustration about the fact that they are still not receiving a salary. While the volunteer in section A only refrains from quitting, since she still hopes to get an employment contract, the volunteer in section B sees added value in her task. She has been volunteering for seven years and says that this enabled her to contribute to her community and that people turned to her when they had issues with their supply.

While the rootedness of these collectives results in great solidarity among users when breakdowns need to be attended, it also means that these collectives reproduce local power imbalances. This is manifested in the adaptation of the "participatory" plan during the construction process. The placing of the tap points next to the chiefs house upstream of the valve for the rest of the sub-section is an example of preferential treatment. This allows him to abstract water also when the taps of others run dry. Another example is the shortening of the lines to tail-end households, due to budget constraints.

The traditional wells are protected by wooden branches from intruding livestock and are taken care of by the elderly community members. It is believed these wells are home to mythical creatures and the tales around them form the rules of their use. Villagers consider it to be unthinkable to abstract water during the night, which allows collective control, and children do not play close to the wells. Only elderly villagers, who no longer are planning to have children are allowed to clean and maintain these wells, which ensures that only people who have been depending on these water sources all their life interfere with them. However, since the modern scheme relies on borehole water it is exempt from this vernacular water knowledge and its conscriptions.

Internal structure and capacities

As mentioned above, the structures of these collectives are not formalised. They rely heavily on the initiative of one person (collective B) or functions in changing collaborations among users due to a lack of leadership (collective A). While collective B is fortunate to have this leading figure who is a small-scale commercial farmer and therefore bound to the village, collective A had to deal with a loss of three leading figures who left for employment elsewhere. This has weakened the structure significantly. Technical capacities on the other hand are widely available among the users, with many of them able to do repairs on the pipes since they helped constructing the scheme. Until now, the issues they faced have not reached an extent that would require them to negotiate with outside partners for assistance.

Effectiveness of activities

The tasks of these collectives are unclear, as they share their sphere of action with volunteers accountable to public institutions. One might say that since there are no legally recognised structures in place these collectives do not even exist formally. At the same time, both these schemes would not be operating anymore if there was no continuous collective action and vernacular rule enforcement in response to recurring breakdowns. So, while these collectives might be relatively weak and continuously changing (section A) or heavily dependent on a single person (section B), they are effective in maintaining water access.

5.5.3 Entlebuch

The initiative for this scheme came from a group of local citizens, whose private wells were no longer able to meet their increasing water demand due to rising living standards and augmented livestock numbers. After identifying suitable wells, they constructed the scheme in 1962 with technical and financial support from the department of meliorations of the Kanton. This support was provided since the majority of the 12 households served at the time were farms (i.e. agricultural use) and the scheme also created reliable water access for their collective cheese production facility. Besides the installation of connections

to three neighbouring schemes to share the excess water and the connection of 2 more households, the scheme remained unchanged. At the time of the research, it still consisted of four springs, whose water was being collected and then pumped into a reservoir above the households from where it was being delivered to the users.

In 2017, after facing regular breakdowns, it was decided to replace the aging infrastructure. From the start, it was clear that due to the high project cost which could only be shared among 14 households, such a project would only be feasible with public subsidies. With the financial support of the cantonal department for agriculture and forestry, the cooperative commissioned an engineering consultancy to compile a feasibility study. Once the feasibility study was finalised, the cantonal department informed the scheme officials that since other, neighbouring water schemes also had issues with their water access, the proposed renovation would have to become part of a larger project connecting several schemes (see Figure 20). The initial plan for this larger project was developed by a local engineering consultancy in collaboration with the cantonal department. While it was technically feasible and addressed several issues related to changing climatic conditions, it ignored all organisational implications for the three schemes that were to be connected. During the process, both consultants and government officials expressed that these small user-based structures only complicated modern functionality and merging them into one large cooperative would be simply in line with the time. Moreover, the prospected implementation of stricter regulations on water quality would render the implementation of new technologies necessary. The designers dismissed opposition from the cooperatives to this normalisation of organisational forms and the modernisation of technical aspects as a lack of understanding of future challenges. Dialogue on these aspects was only initialised after the threat of one of the co-operatives to step out of the project.

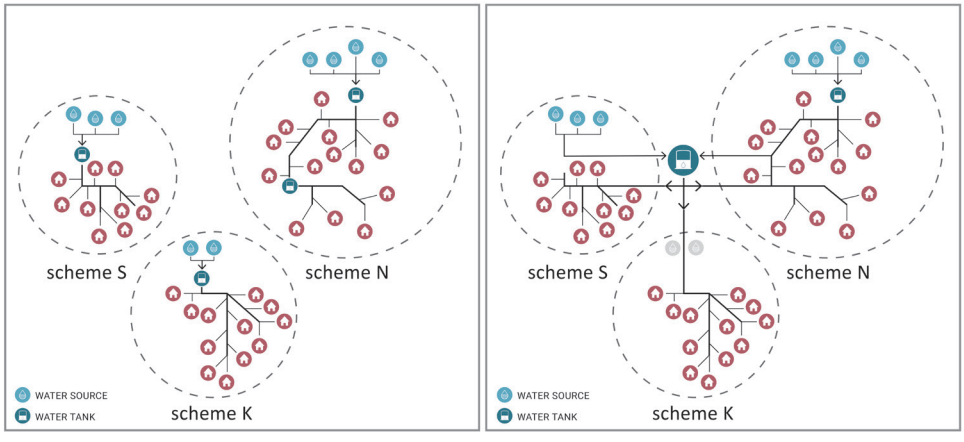

Figure 20. Current schemes (left) and connected schemes (right), scheme S is the one described in detail in this article (source: own elaboration)

Rootedness

While the committee members are receiving a small stipend for their work, all interviewed committee members stated that this was not a key element for their motivation to contribute. Two out of the three committee members that took on the most responsibility in managing the scheme during the past years are direct descendants of members of the initial group. Their primary motivation is related to solidarity and the need to respond to mutual reliance on a shared resource among neighbours, or as they would express it, "one of us has to do it". They further expressed that other users recognize their contribution and are grateful as they are aware of their dependence on the scheme's functioning. The president of the scheme, who has served in the steering committee for more than 20 years, explained that he finds it important to take responsibility within the community and to contribute to the common good. The cashier who was a long-serving member of the committee decided to retire on account of her advanced age. Yet replacement was easy to find, despite the worries of fellow committee members about securing community members willing to contribute. This is an experience that other schemes in the region shared. While competitive elections for positions in schemes are rare, the social contractual reciprocity (cf. Manosalvas et al., 2021; Abadía et al., 2019) among users is strong enough that when a new committee member is needed, someone will volunteer.

Since the technology of the scheme has only been updated slightly since the construction of the scheme, it is possible for an amateur operator, or master of the well as he/she is called in the local context, to operate the scheme. The operator and the president also take care of smaller maintenance tasks, while they receive support from a local plumber when this is needed. The father of this plumber was the one doing the plumbing works during the original construction in the 1960s. In case of emergency also other users come and help, depending on their availability. These long-standing relationships have resulted in a vast number of shared anecdotes and friendships.

Internal structure and capacities

The rooted collective managing this scheme resembles the management of most such collectives in the region and is governed by a committee and structured as a cooperative. The general assembly, which consists of all members of the cooperative, elects the committee members, negotiates, and takes collective decisions on the operation and maintenance, financial issues, and future investments. These meetings take place once a year in the restaurant located in the vicinity of the scheme, and after the meeting, the members eat and drink together. When during the above-described project the intention to merge the cooperatives became clear, it was the opposition of another steering committee that blocked this from happening. This resistance was shared by the members of the described scheme, with the president stating: "This is something that the next generation can discuss".

The composition of the committee is very stable, with many long-serving members. The developed capacity to operate and maintain the scheme tends to be handed on to the following generation. For instance, the cashier who retired introduced her successor to the tasks and remained available to assist in case of any questions cropping up. While it is not unusual for women to take care of administrative tasks, they usually do so in the background, and it is their husbands take a seat on the committee. This was also the case with the cashier of the described collective, until she decided that she did not just want to do the work but sit on the committee herself. Her proposal to join the committee was accepted without opposition.

Effectiveness of activities

This collective is a vernacular institution within which the know-how is handed from one generation to the next. The president stated that they would very well know how to ensure a high quality of water and that they had their internal procedures to react in case of a water quality health threat. Committee members therefore express very little understanding for the increasingly strict regulations and mandatory procedures from the government in this regard. He expressed the feeling that new regulations are primarily in place to keep government officials busy, but that they had no other way than to obey.

There is no advocacy group representing the interest of such schemes even though they are increasingly under pressure by the dominant neoliberal/modernist discourse of officials and engineers who regard them as single-purposed and outdated. The latter aim to improve these schemes to the state of the art defined by bureaucrats (see chapter 4), which results in upgraded water schemes relying on high-tech infrastructure and forming larger units of management. Such schemes dissolve the close connection that users have to their scheme and render the management of schemes by vernacular knowledge holders increasingly difficult. Such a development results ultimately in professionalisation or in other words outsourcing of the management to commercial parties and turning users into consumers (see also Sanchis-Ibor et al., 2017; García-Mollá et al., 2020; Dupuits et al., 2020; Dupuits, 2019).

5.6 Discussion

In all described cases it can be observed that it is not the state or the market that provide water services, but it is people who actively collaborate to create water access. It is not my intention to romanticize or essentialize these collectives, but I aim to show the rationale according to which they operate and describe their role within societies and the underlying dynamics that counter or sustain them. The three collectives described in this

article differ significantly not only considering their context but also in how they emerged and are organised.

In the case of Tshakhuma, the described collective emerged independently, merely without outside support, exploiting the availability of perennial water streams upstream of the village and a population with the economic means to invest. While the initial motivation of the initiators was to create water access for themselves, their motivation shifted during the project to 'doing something for the community'. This is an aspect that comes back in the other examples. The motivation to work for these collectives is not based on a calculated transactional relationship among self-interested, so-called rational individuals, but the result of solidarity and livelihood-insisted and context-urged 'contractual reciprocity' among community members. These collectives create points of social interaction and positions of purpose within communities and through that, create identity. However, the emergence of this collective also indicates their potential to reinforce social inequalities and exclusion. Only those willing and able to contribute to a project with unknown success chances could join the scheme. As explained above, the remaining households formed a second collective but enjoyed more erratic, inferior service.

The case of Ga-Moela shows two examples of collectives that were introduced through an outside intervention based on an elaborate process of participative diagnosis and planning and user-led construction. By applying such an approach, capacity, awareness, and identification were built among community members, which serve as motivational and enabling factors to organize around operating and maintaining the scheme. This differs significantly from the neoliberal approach in public-private partnership projects, where private service providers marginalize tedious and expansive community participation to reduce costs (see Chapter 3). The rootedness of these collectives is a core pillar and fundament but may also constitute their Achilles heel. One such challenge in the described case is the emigration of key community members due to the lack of economic opportunities in the village. Another is the reproduction of local power structures, which led to the adaptation of the construction plan to move the tap point of the chief upstream of the valve for the rest of the section. Since the Ga-Moela collectives operate in the same space as the municipality, they are negatively affected by the unclear assignment of responsibilities and the lack of accountability from the voluntary operators towards them. The described examples further indicate that to deal with conflicts and tackle issues beyond local financial and technical capacity, these collectives need to receive some form of continuous outside support, which again increases their dependency and vulnerability.

The rooted collective in Switzerland concerns a collective that has already existed for 60 years and operates as a structure highly independent from the state. With the described

project to rehabilitate the aging infrastructure and the connected dependence on state subsidies, the collective is forced to interact again with outside actors – also conceptualised as 'shotgun marriage' or 'forced engagement' among state and commons institutions; they need each other in mutual recognition and resource exchange, to remain credible, operational, and not lose legitimacy (Boelens, 2013; Boelens and Seemann, 2014). The small size, the low level of technology, and the particular forms of organisation of these schemes mean that they do not fit into the normalising rationale of modernising public servants and private engineers and are seen as a complicating factor for interventions. These actors tend to take a positivist approach within which social aspects like the creation of positions of purpose and points of social interaction are considered irrelevant. The lack of understanding regarding the core logic of these collectives as alternative forms of social organisation results in interventions planned by government officials and consultants undermining their continued existence. The increased complexity related to growing perimeters and modern technology further reduces the capacity of laypeople rooted within local communities to manage and operate these schemes. This results in the operation of schemes being professionalised and users being detached from water access creation. The simplistic expert view of these collective actions as conglomerates of self-interested and rational individuals and the promotion of "efficient" and "safe" technologies, therefore, actively undermines the viability of these rooted collectives and will (if unchallenged) lead to a reduction in the variety and number of such collectives.

Governance issues related to a lack of recognition of the heterogeneity and complexity of collective arrangements and unequal power relations in participatory processes have also been described by other scholars. Höhl et al. show for example, how technical and measurable knowledge is imposed during indigenous consultation processes in hydropower projects (Höhl et al., 2021) and Wessels et al. describe how the reduction of water management issues to technical problems allows powerful actors to obscure the political nature of water access inequalities (Wessels et al., 2019). Seeman analyses how ignoring the contested character and complexity of rights frameworks and geopolitical spaces leads to a misrecognition of marginalised people (Seemann, 2016). Hoogendam (2019: 143) stresses that issues of rural water justice need to be tackled through a thorough investigation since rural areas are "not homogeneous but consists of diverse, complex and dynamic realities.". De Vos et al. further highlight that the recognition of diverse local water management arrangements is not only crucial to improve rural livelihoods but also for the "building of self-respect, identity, capacity, power, and collective action" (de Vos et al., 2006: 45).

Dupuits et al. (2023: 367) therefore call for "a reflection on the necessary mechanisms for ensuring water knowledge co-creation processes that would benefit water conservation

for all, instead of designing and implementing partial solutions and spaces that reproduce power inequalities among actors".

5.7 Conclusion

The presented cases demonstrate that rooted collectives are more than just a form of instrumentalist water access creation. The need for collective management and ownership forces community members to interact to make decisions and create positions of purpose within society. The three described collectives exemplify three critical lessons about such schemes. Firstly, the example of Tshakhuma indicates that such collectives can emerge spontaneously if favourable conditions exist. Secondly, the collectives in Ga-Moela suggest that if the value of such collectives is recognised and interventions are not guided solely by market-rationalistic or state-institutionalist principles, such collectives can be introduced or strengthened with targeted outside interventions. Lastly, the collective in the Swiss context demonstrates how interventions guided by a neoliberal and modernist imaginary reduce the viability of such schemes. Each of these three examples provides us with a part of the answer to the research question: how are rooted water collectives affected by the dominant neoliberal imaginary? The motivation of members to contribute is in all three schemes, not functionalist-transactional and void of local morals and meaning but based on co-dependence, reciprocity, and solidarity. Since these collectives operate in this other-than-capitalistic manner, I consider them to both form part and depend on an alternative imaginary in line with recent understandings of the commons.

I align with a diversity of political ecology, empowerment, and critical action-oriented approaches that side with the intentions and strategies of self-supply communities to create low-tech and locally owned and governed water schemes as inspiring and liveable institutions for rural water supply. I am convinced that such collectives cannot proliferate in a neoliberal/modernist or state-bureaucratic imaginary. To make this a viable form of organisation, the imaginary of the modernist and neoliberal commensurate association of individual and functionalistic agents must make room for a power-critical and context-specific imaginary of rooted commons.

I refrain from romanticising or glorifying these collectives since the evidence I have discussed also shows how local commons always operate in and constitute messy, conflict-ridden arenas, including local power imbalances and complex forms of exclusion. However, considering their potential to expand collective water control and access that is inclusive of vulnerable groups otherwise marginalised, and which builds (on) forms of conviviality, I argue for the need to create room for, foster, and learn from such collectives.


6

DISCUSSION AND CONCLUSION

As outlined in the introduction, this thesis is the product of a social, political and academic journey that I have navigated in the past seven years. Each of the four previous chapters builds on the state of personal, scientific and societal learning, consciousness, and political positioning I found myself in when doing fieldwork, writing and reviewing the articles. This is most evident when one looks at the conceptual frameworks developed and applied in the different chapters. I start this discussion therefore by looking critically at the conceptual journey this thesis takes. I then answer my two sub-research questions in detail in a discussion on rural water collectives, before reflecting on my positionality and how it affected my research.

6.1 A critical look at my conceptual journey

As outlined above, I conducted the fieldwork for the first two papers as a consultant to an international research institute in South Africa. I have started off by describing user initiatives that provide water to citizens as collectively owned self-supply of water. I showed in this chapter examples of user initiatives that spark collective actions which (re-)create sustainable water access. Users take responsibility and contribute to ensuring the functioning of their scheme largely independently from state actors. While self-supply serves well to analyse such schemes and their context, I only later realised the danger of the conceptualisation of such rooted collectives in this way. The concept of self-supply, which is itself a product of the "development complex", allows to integrate autonomous collective action "into the politics of expert knowledge and Western science in general" (Escobar, 1994, p. 45). This process, which Escobar coined as professionalisation, is led by academics, development professionals and practitioners and is deeply entangled with our knowledge, how we learn and how we prescribe. It aims to turn collective action into reproducible development projects which in turn create a demand for expert advice and contribute to the reproduction of Development with a capital D (Lewis, 2019).

Chambers, who is considered to be one of the forefathers of participatory development in the 1980s, observed already in 1997 that "more than ever before, power is concentrated in the cores of the North, including power to determine national policies in the South" (Chambers, 1997, p. 4). These days, I would add, this power has dissipated, multiplied, and become ingrained in myriad institutes and offices in the global South too, reproducing the same logic and patterns of expertocracy. When formulating new approaches such as self-supply, one has to keep asking "whose reality counts?" (Chambers, 1997). Otherwhise we might just be formulating the next panacea which will bear little positive influence on the target population. Thus self-supply as recently being pimped by institutions like the World Bank may be serving primarily as a justification of current access inequalities by portraying a (perfunctory) willingness to address rural water supply. In addition, as

Galvin (2015) has shown in the sanitation sector, there is a danger that approaches which "empower" users in a neoliberal, pull back the State, mode of ordering become a vehicle to abscond (constitutional) obligations.

The third chapter scrutinizes the policy environment around public rural water service delivery in Sekhukhune District, South Africa. The conceptual framework for this chapter is based on the accountability triangle defined by the World Bank. While this analysis is still both institutionally and intellectually firmly situated within the development complex, I start to question in this chapter the possibility of addressing global inequalities through the very mindset and tools of "development". Lack of capacity and rent-seeking, both within public institutions and recruited private service providers, were identified as the main causes for the looming problem of substandard and/or incomplete infrastructure projects. In my analysis, I show that these two factors are primarily symptoms of the underlying patronage and gatekeeping practices. New regulations and policies will, in the context of a state-of-the-art policy environment and procurement regulations, not significantly change the situation. The chapter concludes that instead of providing policy advice and suggesting innovative approaches, the focus should be on strengthening user agency through the enactment of a new modus operandi within the existing structure. Developing such an alternative modus operandi requires a new mode of understanding, working, and engaging with and among the community actors involved. Only end-users have an intrinsic motivation to improve and maintain rural water access, but to harness this potential there needs to be a change in how development and public service delivery are conducted.

While chapters 2 and 3 were framed from the perspective of a willing development agent, who wants to improve the outcomes of projects that seek to enhance rural water supply access and delivery, in the subsequent chapters 4 and 5 my perspective changed to that of a critical researcher questioning the developmental framing of rural water service access and delivery. I did so by introducing the concepts of commoning and the commons, which allowed for greater attention to questions of values, justice, equity and power (Agrawal et al., 2023; Boelens et al., 2023; De Castro et al., 2016; De Castro, 2020) and allowed for the analysis of the way that these collectives are imagined and motivated. By also introducing the concepts of modernism, neoliberalism and conviviality, I described the influence that market-modernist actors (both public and private) exert on these organisational alternatives (e.g. Dupuits et al., 2020). With this conceptual lens, I studied a public project for the unification of three rural water collectives and the interactions among actors that this intervention sparked. I show how the narrow value definition of the market-modernist experts, which focuses exclusively on efficiency and pricing, fails to recognise the rooted values of these schemes and the position they take within rural communities.

To bring the three cases together, in Chapter 5, I introduced the concepts of Rooted Water Collectives and imaginaries. The Rooted Water Collectives framework (Vos et al., 2020) allowed me not only to scrutinise internal politics, intersectionality, and hierarchical relationships, but it also permits to study the power structures and political strategies that contextualise collectives. Analysing water collectives using the RWC framework allows, in the spirit of Lazar (2012), to set the three cases alongside one another and to analyse the observable similarities and differences. This also allowed for analytical "cross-pollination" (Hommes, 2022). By recognising the justice and empowering effects of collective action going beyond rational choice theory and a value definition based on neo-classical economics, the RWC framework allows for the description of the multitude of realities, resulting from diverse languages of valuation, world views and ways of understanding (Vos et al., 2020, p. 4). It permits to study how co-existing imaginaries interact and become productive. Rejecting rational choice as the only way of understanding human behaviour and recognising the existence of a multitude of realities increases the complexity of the analysis significantly. When studying complex socio-technical systems, clear-cut answers are rare (Wals & Rodela, 2014). At the same time, this shift creates a new freedom since we are alleviated from the burden of finding that one best practice approach to solve our problems.

Recognising diversity allows for creativity since it allows for considering other forms of knowledge and (collective) ways to respond to societal issues (Dupuits et al., 2023). To analyse this diversity, I introduced the concept of imaginaries, which I understand as established and evolving visions of how things are and how they ought to be in the future (Hommes, 2022). The study of these three diverse examples of rooted water collectives helps to see the fundamental differences between the imaginaries guiding rooted water collectives and the market-modernist imaginary of public and private experts. Users in all three collectives are motivated to contribute, based on their own need for water and the desire to contribute to their community. In contrast to the market-modernist imaginary, which sees these schemes on a path of progress and professionalisation driven by a neoliberal understanding of efficiency, these schemes in the described rooted imaginaries are perceived as part of the social fabric. Recognising the power of these imaginaries to shape realities helps not only to understand why things are the way they are, but also opens the door to shaping different futures.

6.2 Reflection on rural water supply collectives

The provision of water access in rural areas remains an enormous challenge. Low housing density and/or a remote setting pose complex problems and high costs across all four phases of public service delivery (identification, planning, construction, and operation

and maintenance). While the focus in countries of the global South still is on an extension and improving the quality of the services to the underserved, Western countries mainly struggle with the high cost related to the maintenance and refurbishment of ageing infrastructure and meeting ever-changing water quality norms.

How are the water collectives studied in South Africa and Switzerland organised, motivated and imagined and how do they relate to external actors?

I have studied in this thesis three water collectives at different infrastructural moments and in different contexts. The collective action in Ga-Moela has been based on personal relations and the widely available capacity to repair breakdowns which was achieved through the involvement of the community in the construction process. While in one section of the village, it was primarily one woman who organised the response, in the other section it was a changing alliance of users attending to breakdowns. Neither of the two collectives has had a clearly formalised or explicitly organised structure. They differed in that sense from the collectives described both in Tshakhuma and Entlebuch. While the collectives in Tshakhuma were non-formal, most of them relied on a structure of a steering committee and one or several operators. I described the great differences in how stable and effective these structures were and how this resulted in a variety of approaches to organising and financing responses to breakdowns. While some collectives collected monthly contributions and met regularly, others only became active once there was an issue with the scheme that needed to be addressed. The collectives in Switzerland were formalised as cooperatives, an organisational form common in rural areas also for cheese factories, roads and alpine pastures. They were all led by a steering committee and had selected an assigned operator, called the master of the well. While the frequency of the meetings of the steering committee differed based on the state of affairs, the members came together at least once per year to confirm the bookkeeping and to decide on future projects, water prices and their leadership.

While water collectives in Switzerland were commonly seen by policymakers and engineers as a remnant of the past (see Chapter 4), there is a broad agreement within the development complex that in the global South, user participation and collective action are key for sustainable and affordable rural water services (Schouten and Moriarty, 2003; Sutton and Butterworth, 2021). The above-presented analysis of three rooted water collectives suggests that we should reject both the market-modernist imaginary within which user collectives are perceived as a relic from premodern time and the development imaginary seeing these collectives as a cheap way to reach our sustainable development goals. Instead, we should recognise that these collectives are more than simply instrumentalist forms of creating access to water. They function based on another

logic than just a capitalistic rationale, which I referred to in this thesis as "rootedness". In chapter 5 I outlined how the three collectives are rooted. Thereto, I followed the definition of Vos et al., who see rootedness as the extent to which collectives «are 'grounded' and aim at addressing issues while attaching to place-connected notions of identity, awareness, motivation and belonging; solidarity; social-ecological integrity; and use of vernacular water knowledge» (Vos et al., 2020, p. 4). The involved actors were not motivated by an interest to maximise their own benefit but by their own need for water and by the desire to contribute something meaningful to their community. Because all described collectives operated vernacular, low-tech schemes that they themselves (co)conceived and (co)constructed, the capacity to interact with the water infrastructure and to govern water access was high.

While I had to be careful not to romanticise these collectives, the three described cases show how these convivial infrastructures allowed users to autonomously create water access through a creative intercourse. The resulting collective action created points of social interaction and relations of recognition that are essential for rural societies (though not exclusively for them).

How is the viability of existing rural water collectives and the potential to successfully engender user-owned schemes affected by the dominant market-modernist imaginary?

Within the above-described rooted imaginaries, these water commons were understood as part of the social fabric. Through the creation of points of social interaction and positions of purpose within communities, they created forms of value, that the dominant market-modernist imaginary does not or only insufficiently recognises.

The market-modernist imaginary in water control, which I found operational in all three cases, is to be understood as a perception of the world which builds on a conviction that technical progress and extension of market-oriented forms of production is inevitable. I describe for example in the Swiss case, how newly endorsed and predicted water quality standards are used as key legitimation for proposed mergers and refurbishments of water schemes. Markets are in this imaginary portrayed as neutral structures, efficiently allocating water and providing services (Hefetz and Warner, 2012; Howe et al., 1986) supposedly maximising the benefit for all. It is guided by the urge to measure and quantify reality based on a positivist view of science. The evaluation of interventions based on market-modernist efficiency is premised on simplifications of realities which are based on countless assumptions about human and nonhuman agents and a value definition rooted in the market-based framing of a willingness to pay (Dolderer et al., 2021). The three described cases show how the value of these water collectives as a part of the social fabric

and allowing for convivial collaboration is neglected in a market-modernist perception. In chapter 4 I showed how the opposition of collectives to market-modernist interventions is perceived by public officials and consultants as a form of naivety or lack of understanding. I also show how interventions that embrace such a market-modernist imaginary, actively undermine the mechanisms which keep the rooted water collectives functional.

I have identified three key motivations for implementing expert-driven interventions in line with such an imaginary: the personal convictions of involved professionals, the incentive structure within neoliberal service provision, and the modernist urge to normalise and order perceived disorder. The involved professionals were conditioned, viz. educated, trained and socialised within a modernist paradigm. If that paradigm's narrow value perception remains unquestioned, as I have evidenced both in the South African and in the Swiss context, the logical choice is to modernise these schemes. As my cases profoundly show, the neoliberal incentive scheme in place supports this modernisation, evaluating public officials on their ability to assign the available budget to projects (spending pressure) and renumerating private planning engineers based on the total project cost. The third reason is the normalising force of modernism. By reducing the existing diversity of these collectives and professionalising their operation and maintenance, these schemes become easier to govern. In the described cases, this is expressed by the urge to professionalise service delivery and merge independent schemes. This normalisation is driven by a commensuration of water services according to a market-modernist imaginary, resulting in a neglect of rooted values of these schemes.

The level of influence that this imaginary had in the described cases differs. The collectives in Tshakhuma show how users within a good socio-economical and physical context imagine, plan, construct, operate and maintain water infrastructure independent from public actors. The case of Ga-Moela shows how such collectives can be introduced through interventions which are not guided solely by the market-modernist imaginary. The Swiss example finally shows how interventions guided by the market-modernist imaginary can actively reduce the viability of such established rural water commons. I showed in all three cases, that despite the multiple forms of modernity and neoliberalism being ingrained in service delivery realities, their convivial mechanisms and values are not passively victimised. Water users actively took initiative and mobilized based on a convivial rationale to create and maintain water access and were willing to oppose external modernising forces.

6.3 Future research

The Rooted Water Collectives framework applied in chapter 5 allows us to study and learn from collectives in different contexts. Further research efforts should focus on sharpening the capacity of the RWC framework to study different forms of conviviality and the imaginaries expressed, but also on the way such a conception of rural water schemes can contribute to more equality in water access. This raises a series of possible research questions, of which I list here but a few: How would the RWCs meet the challenges set by increasingly stringent water quality conditions? How can collectives fruitfully resist the market modernist imaginary? How can we better understand what makes these RWCs tick, and how do they foster and fit a convivialist modus operandi? How would these RWCs deal with constitutional obligations for providing safe and affordable water, as is required in South Africa? How can we get the self-help collectives out of a legal grey zone? Pilot projects applying lessons learned from such studies could then assist in testing necessary changes in the structure of government and possible policies to create room for the formation of rural water collectives through public efforts.

6.4 Reflection on positionality

I have conducted this research project as an external PhD student. This meant that the university provided supervision and paid for courses, but that I had to work to finance my project. While this included working on construction (October 2018 – February 2019), for a political campaign (June 2019 – October 2019) and as a teaching assistant at WUR (April 2019 – December 2020), it also included the professional experience I have based this thesis on. The first-hand insights gained during my role as consultant to an international, development bank-financed, research project (April 2017 – Sep 2018) mirrored a lot of the critiques of development that I was familiar with from the classroom. Working then in the Swiss context both for a public institution (February 2021 – June 2022) and as a consultant commissioned by it (July 2022 – January 2024) allowed me to better understand the workings of the market-modernist imaginary.

Both during the interviews for my analysis of public water service delivery in Sekhukhune, but also while I worked myself for a public department in Switzerland, I got to see the effects of neoliberal governmental reforms on public capacity and commons' feasibility. The outsourcing of key planning activities has led to a privatisation of know-how. This has created a dependency on engineering consultants, for which public projects have become a continuous funding stream. During my fieldwork, I became myself part of this system. During my time as an engineering consultant in Switzerland, I worked primarily on publicly funded projects benefiting from the high fees charged by consultancy firms which exceed

the salary scale of an ordinary civil servant. While I, as an employee of a consultancy, only received a fraction of these payments as salary, it was the system I criticise in this thesis that allowed me to work flexibly and part-time to finish this PhD. At times this created some personal and professional unease, but it also shaped the modalities of this research opportunity. It is in the fissures and ambivalences of the market-modernist imaginary that not just the water collectives but also everyone else, including myself and my own research, had to navigate and shape room for manoeuvre.

While my personal conceptual and political focus and intellectual look-out changed over the last seven years, my motivation remained to try to understand how I could do something about inequality, however small yet meaningful. This thesis allowed me to observe, describe and analyse different forms of collective operation of convivial systems and tools (both institutional and physical). I showed how these interactions strengthen social bonds based on recognition and the creation of a sense of belonging. I, therefore, came to the personal conclusion that to address challenges of rural water supply, it is fundamental to collectively form new imaginaries that include all relevant actors. Or as Wals et al. argued, imagining different futures is necessary "in order to break through the tendency to see the continuation of present manifestations of global systemic dysfunction" (2016, p. 22).

Challenging the market-modernist imaginary in this way is, though, not only necessary due to its force to define realities, but also for its inconsistency. This inconsistency is expressed through its urge for efficiency leading to the introduction of new and complex technology replacing functioning modes of operation that rely on existing social relations. The focus on technological progress weakens the capacity of users to convivially create water access and increases their dependency on specialised experts. One might argue that - by externalising basic water supply functions to specialised agencies (however expensive, normalised and meaningless) life becomes easier, but this functional perception of water schemes excludes and undermines the multitudes of values that such convivial forms of collective action have for rural societies. A market-modernist imaginary is turning autonomously collaborating individuals into consumers of industrially produced services, concentrating the economic benefits of modernisation in the hands of the few who develop, implement, finance, and operate complex systems. A market-modernist imaginary not only undermines convivial forms of collective action, but it increasingly also becomes clear that the majority of people will be left behind on their journey of progress towards a market-modernist utopia.

I showed in this thesis, that conviviality is well suited to describe the alternative imaginaries for a positive future that includes all of us. I believe that it is our collective responsibility to draw up such positive and convivial imaginaries to counter the dominant market-

modernist imaginary serving only the few. If we fail to do so, "those left behind" will keep flocking to the alternative imaginaries of radical political currents that build on identity and the blaming of scapegoats.

6.5 Conclusion

I conclude this thesis by answering my main research question:

> **How are rural water collectives in the studied South African and Swiss context areas constituted and motivated, and how are these modes of collective water control affected by the dominant market-modernist imaginary?**

The studied collectives differ greatly in their context and the infrastructural moments they are in, which is reflected in their organisation and varied forms of governance. While the described collectives in Ga-Moela were frequently changing alliances of users that came together to address technical, operational and governance issues, collectives in Tshakhuma tended to have a fixed structure of a steering committee and one or several operators. The collectives described in Tshakhuma differ greatly in their effectiveness and are all informal, operating in a legal grey zone. The described collectives in Switzerland are formalised in the shape of established cooperatives. For their outward (re)presentation, they had a fixed structure of a steering committee with an operator called master of the well and an annual member meeting, even when inwardly each collective had its own, vernacular and dynamic in-house rules to cope with stubborn and harsh, ever-changing realities.

I outlined in this thesis, that despite these differences, these collectives all functioned within an other-than-market based imaginary. Users who contributed are motivated by their own livelihood needs for water and the norms and desire to support their communities in meaningful and life-engendering ways. While contributions, at least in the more structured collectives, were renumerated, this remuneration was limited and in all cases seen more as a sign of recognition by the other users than as a salary for the work done. Based on these similarities, I referred to the imaginaries of the users in the described collectives as rooted imaginaries. Within this imaginary water schemes are a part of the social fabric of rural society and are valued for their creation of social relations and positions of purpose.

All these rooted imaginaries coexist with a market-modernist imaginary of rural water supply. Since the perception of this opposing market-modernist imaginary of rural water

collectives depends on the context, the impact on the collectives differed. Within a (so-called) developing context, rural water collectives are perceived as instruments for the provision of sustainable and affordable rural water services. They can be initiated through outside interventions, and are "allowed" mostly only after the construction is completed, to operate and (assist to) maintain infrastructure. Self-supply goes one step further by introducing the idea of (co)ownership of water infrastructure by users. Through support services and an enabling policy environment users are encouraged to take responsibility themselves.

I showed in this thesis that despite the interest of development agents to empower users, their market-modernist approach is not compatible with the rooted imaginary that allows collective actions to proliferate. It takes commitment, time and a willingness to co-design and share actual decision-making power with users, to foster the emergence of rooted water collectives, not patronised by the very 'participative' interventions. Hired water engineering consultants 'operating in' and 'limited by' a market-modernist imaginary are unable and/or unwilling to spend enough time within communities to allow for a collective based on a rooted imaginary to grow. Water committees and user associations created in this way usually remain empty vessels that fail to be active after the termination of 'the project'. In the Swiss context, the market-modernist perception of rural water collectives is different. Here the collectives were seen as relicts of the past that will eventually have to be modernised and professionalised for them to be able to adapt to climate and regulatory changes. Opposition to this modernisation based on a rooted imaginary was most often seen as "naivety" or "lack of understanding".

Based on this analysis, I conclude that the creation of rooted water collectives based on a market-modernist imaginary is a mission set to fail and interventions guided by such an imaginary have the potential to negatively affect the viability of existing water collectives. After all, it is not at all surprising that, from South Africa to Switzerland, just as in other water commons and commoning arenas across the world, user families are fighting against the commensuration and neoliberalisation of their most intimate collectively built and shared environments.

7

SUMMARY

The provision of water services in rural areas poses a significant challenge for governments in both Western nations and countries in the Global South. The construction, maintenance, and operation of rural water schemes is complex and expensive due to the characteristically low housing density. Western nations are primarily challenged by the high cost to sustain and refurbish ageing infrastructure while developing countries are focusing on extending support to those still in need. Despite a series of ever-new concepts and approaches that promise a sustainable proliferation of water services in the global South, there are few success stories. At the same time longstanding rural water collectives in Switzerland are under increasing pressure to modernise and adapt to an efficiency rational dominated by neoliberal principles. This thesis takes a political ecology approach to understand the current situation of rural water service delivery both in South Africa and Switzerland. By analysing diverse cases, I aim to lay bare the underlying trends affecting collective schemes in both settings. The main research question I aim to answer is: "How are rural water collectives in the studied South African and Swiss context areas constituted and motivated, and how are these modes of collective water control affected by the dominant market-modernist imaginary?"

This thesis is the result of a seven-year journey. It starts with the premise that even though development has not yet led to the promised progress, it can be improved to help reduce global and more local forms of inequality. The first two empirical chapters were written in this context, aiming to learn both from the public service delivery environment in South Africa and communal water schemes in Limpopo province to contribute to better development. I conducted the fieldwork for these chapters as a consultant to an international research institute in South Africa and both chapters explore the "role" of communities in service delivery. In the second chapter, six user initiatives to supply water in Tshakhuma are described. Tshakhuma is a peri-urban village situated along a mountain ridge in Vhembe district in Limpopo province, receiving relatively high annual rainfalls and citizens have access to several perennial streams that flow through the village. Since the public water scheme was increasingly affected by breakdowns and because the village had grown beyond the perimeter of that public scheme, users collaborated to plan, construct and operate their own water infrastructure as collectives. The described collectives show how users are willing to invest time and financial resources to collectively improve and sustain their water access. However, these examples indicate also the danger of members being excluded since users are requested to make an initial investment. Such collectives also tend to strengthen existing power structures by relying on traditional leaders for conflict resolution. Nevertheless, I show in this chapter how user initiatives applying low-cost technologies can create reliable water services.

The third chapter studies public service delivery in South Africa based on the example of Ga-Moela, a small rural village in Sekhukhune district in Limpopo Province. In this chapter,

I engage with the debate on the reasons for the failure of rural water services and show how in the studied case the sub-standard service delivery can primarily be attributed to the weak capacity of both public and hired private actors. This lack of capacity is explained by apparent rent-seeking and gatekeeping behaviour, which is in turn enabled by the outsourcing of key planning and construction activities according to neoliberal principles. While I conducted this fieldwork as a well-intended consultant in an international action research project, I humbly concluded that the failure to reach the rural population was not the result of a lack of (Western) expert advice. This experience has profoundly altered my perspective on the capability of the development sector to fulfil its promise of providing incrementally enhanced services for the marginalised. This idea of development is based on the implementation of modern technology coupled with a rationally designed social structure that adheres to the principles of economic efficiency. The insights gained sparked my interest in the underlying dynamics that define how we think about and conduct development.

In the fourth chapter, I describe the process of publicly subsidised rehabilitation and unification of three existing user-owned water schemes in the mountainous region of Entlebuch in Switzerland. Since their establishment in the 1960s these three schemes abstract water from perennial springs and provide water to farming households, covering both domestic and productive uses. Already their establishment in the 1960s was publicly subsidised. I analyse the positions of and dynamics between the different actors involved in this intervention. I use the concept of conviviality to describe how market modernist interventions endanger these water commons. In the fifth chapter I return to all three case studies. I do so by applying the rooted water collectives framework to all cases. This approach allows me to describe similarities in terms of what position water collectives take in these rural areas, but also how their performance is affected by the market modernist imaginary.

In the discussion of this thesis I return to the change of perspective throughout this thesis and discuss how this was influenced by and had influence on my positionality. My perspective changed from looking for ways to contribute to better development to trying to understand why development is not bearing the promised fruits and studying the underlying factors causing that. I discuss this change based on the conceptual approaches I chose. In chapters two and three, I make use of the concepts of accountability, self-supply, patronage and rent-seeking, which are concepts commonly used in the development sector. In the fourth and fifth chapters, I introduce the concepts of conviviality, the commons and rooted water collectives, which all reject rational choice approaches and recognise the plurality of ontological understandings, values and worldviews. This change in conceptual approach was the result of a changing personal perception of inequalities and how to address them.

I conclude this thesis by answering my main research question. The studied collectives differ greatly in their contexts and the infrastructural moments they are in, which is reflected in their organisation. While the described collectives in Ga-Moela are changing alliances of users that come together to address issues as they arise, collectives in Tshakhuma tend to have a fixed structure of a steering committee and one or several operators. The described collectives in Switzerland are formalised and established cooperatives. I outline in this thesis, that despite these differences, these collectives all function within an other-than-market modernist imaginary. I refer to such imaginaries, within which users are motivated to contribute by their own need for water and the wish to contribute something to their communities, as rooted imaginaries. Within such imaginaries, water schemes are a part of the social fabric and are valued for their creation of social relations and positions of purpose.

All these rooted imaginaries coexist and interact with a market modernist imaginary of rural water supply. Since the perception of this opposing market modernist imaginary of rural water collectives depends on the context, the effects on the collectives differ. Within a (so-called) developing context, rural water collectives are perceived as instruments for the provision of sustainable and affordable rural water services in the global south. Collectives in that perception can be initiated through outside interventions, which is mostly only done after the construction is completed to operate and (assist to) maintain infrastructure. Self-supply goes one step further by introducing the idea of (co)ownership of water infrastructure by users. Through the provision of support services and the implementation of enabling policy environments, users are encouraged to assume responsibility for their water services. This thesis demonstrates that, despite the motivation of development agents to empower users, their market modernist approach is incompatible with the rooted imagining that permits collective actions to flourish. It necessitates a level of commitment, time, and a willingness to relinquish actual decision-making authority to users in order to foster rooted water collectives through interventions. Water engineering consultants 'operating within' and 'limited by' a market modernist imaginary are unable and/or unwilling to spend enough time within communities to allow for a collective based on a rooted imaginary to grow. Water committees and user associations created in this way usually remain empty vessels that fail to be active after the termination of the project. The market-modernist view of rural water cooperatives is different in Switzerland. Here they are seen as relicts of the past that will eventually have to be modernised and professionalised for them to be able to adapt to climate and regulatory changes. Opposition to this modernisation based on a rooted imaginary is seen as "naivety" or "lack of understanding".

This examination has led me to conclude that the establishment of rooted water collectives based on a market-modernist imagining is doomed to fail, and interventions influenced by such an imaginary have the potential to adversely impact the viability of existing water collectives.


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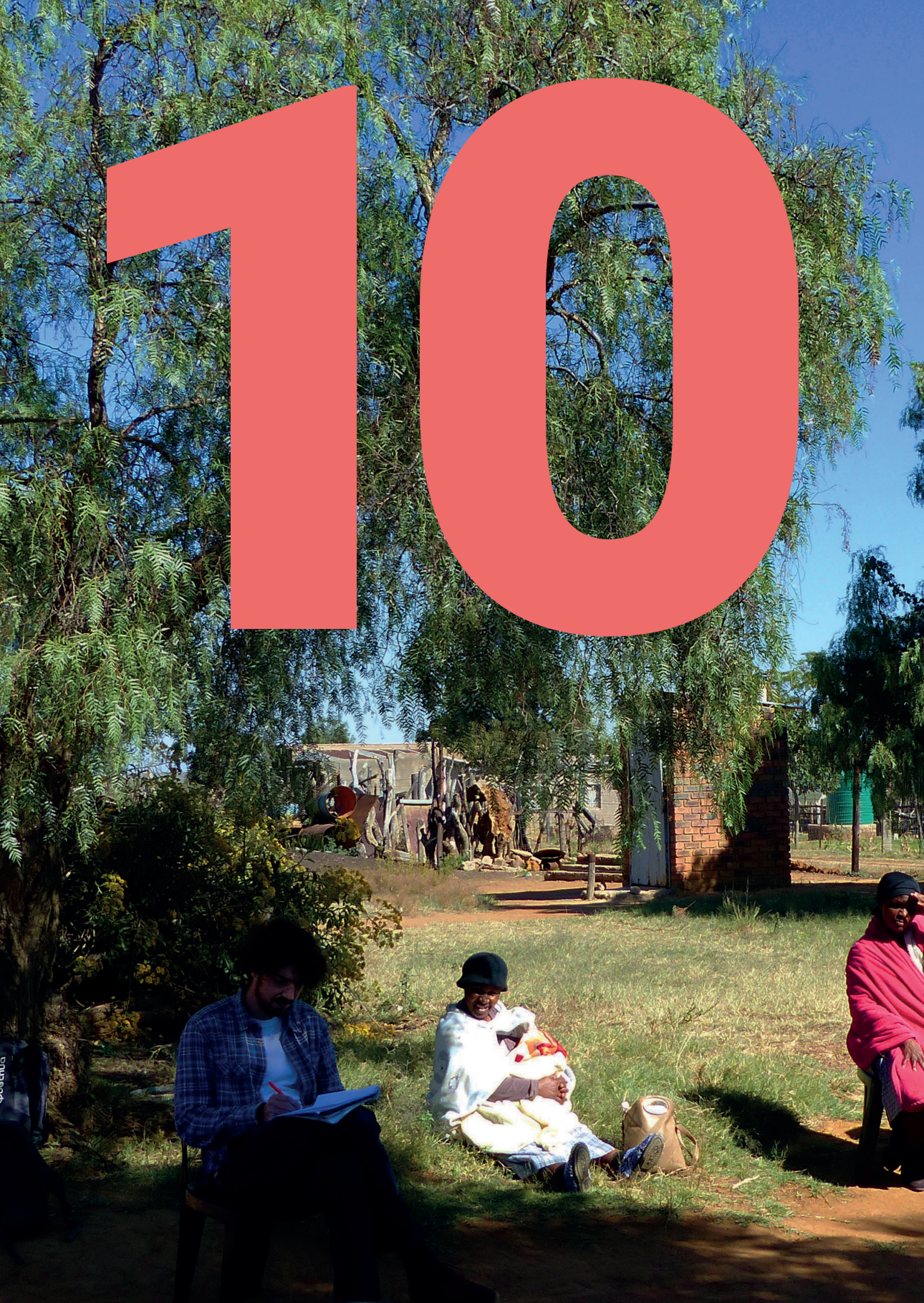
10

NOTES

1. Interviews with two former high-ranking officials of DWAF 19.5.18/20.5.18 and an experienced water sector consultant 10.5.18
2. 'Water- services authority means any municipality, including a district or rural council as defined in the Local Government Transition Act, 1993 (Act No. 209 of 1993) responsible for ensuring access to water services' (Republic of South Africa, 1997, p. 10)
3. 'water services provider means any person who provides water services to consumers or to another water services institution, but does not include a water services intermediary' (Republic of South Africa, 1997, p. 10)
4. Discussion with a high-ranking official of the Municipal infrastructure Grant (MIG) 21.3.18
5. Interviews with two former high-ranking officials of the Department for Water Affairs and Forestry, that were involved in the negotiations of the new policies: 20.5.18/19.5.18
6. Interviews with two former high-ranking officials of the DWAF 20.5.18/28.9.18, an experienced water sector consultant 26.3.18/ Water Research Commission (2021)
7. Interviews with two planning engineers of a (rural) district municipality in Limpopo province 19.9.18/21.9.18, the director of the water service department of a (rural) local municipality 11.12.17
8. Interviews with the mayor of a (rural) district municipality in Limpopo province 20.9.18, a high-ranking official of the Department of Water and Sanitation (DWS) Limpopo 20.9.18, a high ranking official of the extended public works program Limpopo 27.9.18,
9. Interviews with the municipal manager of a (rural) district municipality in Limpopo province 21.9.18, the head of the project implementation unit of a (rural) district municipality in Limpopo province 21.9.18
10. IDP's assist with the need identification and budget allocation prior to the actual act of service delivery. Earlier studies showed that IDP's only have a limited influence on the budget allocation (Todes, 2004; Oranje and van Huyssteen, 2011; van der Waldt, 2014; see also chaper 3).
11. Interviews with two water project managers of a (rural) district municipality in Limpopo province 19.9.18/20.9.18, the deputy director of the department of water supply in a (rural) district municipality in Limpopo province 21.9.18, a leading engineer of a (rural) district municipality in Limpopo province 5.12.17
12. It is generally unclear, if uses to create an income can also be considered as such so called Schedule One uses (van Koppen and Jha, 2005) and there have been calls to clarify the definition of Schedule One uses and to include such small scale productive uses (Schreiner and van Koppen 2002).
13. Discussions with a high-ranking official of the Municipal infrastructure Grant (MIG) 21.3.18, an experienced water sector consultant 26.3.18, a high-ranking official at the Water Resource Commission WRC 28.3.18
14. According to section 102(2) of the municipal systems act (Republic of South Africa, 2000), the municipality is not allowed to collect depth from any citizen in case there is a dispute over the specific amount.

15. 'Operationalising community-driven multiple use water services (MUS) in South Africa', a project of the Water Resource Commission (WRC) of South Africa. Tshakhuma was included as case in the project on the request of a government official due to the lack of an official approach on how to interact with such self-supply initiatives.
16. Interviews with a headman 9.4.18 / committee member: 9.4.18
17. van Koppen, 2017, Interview with a committee member 4.4.18 and observation of the first author.
18. While in the described case all traditional leaders were male, there are also female traditional leaders in Vhembe (Tshitangoni and Francis, 2016)
19. Interviews with a headman: 6.4.18, a close advisor and family member of the headman 2.4.18, committee members: 29.3.18/2.4.18/4.4.18/9.4.18, water users: 4.4.18a)/4.4.18b)/5.4.18/7.4.18
20. Interview with the scheme manager: 8.4.18
21. Interviews with a committee member: 2.4.18., a user: 16.4.18
22. Interviews with a committee member: 8.4.18, a traditional leader: 6.4.18
23. Interviews with a water user: 2.4.18, two committee members: 2.4.18./5.4.18, a traditional leader: 9.4.18
24. Interviews with two committee members: 29.3.18/8.4.18
25. Interviews with two committee members: 4.4.18/15.4.18
26. Interview with a committee member: 8.4.18
27. Interviews with water users: 29.3.18/30.3.18/2.4.18/4.4.18/5.4.18/7.4.18/2.4.18, committee members: 2.4.18/4.4.18/9.4.18, a headman: 9.4.18
28. Interviews with water users: 28.3.18/29.3.18a)/30.3.18/2.4.18a)/2.4.18b)/2.4.18c)/2.4.18d)/4.4.18/5.4.18a)/5.4.18b)/5.4.18c)/ 5.4.18d)/6.4.18
29. Interviews with water users: 28.3.18a)/28.3.18b)/ 29.3.18/ 5.4.18
30. Interviews with water users: 28.3.18/29.3.18/6.4.18
31. Interviews with water users: 28.3.18/31.3.18/4.4.18 a)/4.4.18b)/4.4.18c)/ 5.4.18a)/5.4.18b)/6.4.18
32. Interviews with water users: 30.3.18a)/30.3.18b), a committee member: 4.4.18
33. Interviews with water users: 4.4.18/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b), an operator: 5.4.18, a committee member: 5.4.18
34. Interviews with two committee members: 29.3.18/2.4.18
35. Interviews with operator: 5.4.18, committee member: 5.4.18
36. Interviews with an operator: 5.4.18, committee member: 5.4.18, written agreement seen by author: 5.4.18
37. nterviews with water users: 29.3.18/2.4.18a)/2.4.18b)/3.4.18/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b), an operator: 5.4.18, committee members: 4.4.18/5.4.18
38. Interviews with water users: 29.3.18/30.3.18, a committee member: 4.4.18
39. Interviews with water users: 2.4.18/3.4.18, a committee member: 5.4.18, an operator: 5.4.18
40. Interview with water users: 4.4.18/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b)
41. Interview with a headman: 9.4.18, a committee member 9.4.18,
42. Interviews with water users: 30.3.18a)/30.3.18b), a committee member: 2.4.18

43. Interviews with water users: 4.4.18/5.4.18/6.4.18a)/6.4.18b)/7.4.18/
44. Interviews with an operator: 5.4.18, a committee member: 5.4.18, written agreement seen by author: 5.4.18
45. Interviews with water users: 5.4.18/6.4.18, a headman: 6.4.18, a committee member: 30.3.18
46. Interviews with committee members: 5.4.18/ 4.4.18, an operator: 5.4.18, a scheme manager: 8.4.18
47. Interviews with operators: 2.4.18/5.4.18/7.4.18
48. Interviews with water users: 30.3.18a)/30.3.18b)/4.4.18/5.4.18/6.4.18a)/6.4.18b)/7.4.18/
49. Interviews with water users: 31.3.18/4.4.18a)/4.4.18b)/4.4.18c)/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b)/ 6.4.18c)/7.4.18
50. Interviews with a headman: 6.4.18, a close advisor and family member of the headman 2.4.18, two committee members:29.3.18/2.4.18/4.4.18/9.4.18, water users: 4.4.18a)/4.4.18b)/5.4.18/7.4.18
51. Interviews with water users: 5.4.18/7.4.18, a committee member: 2.4.18
52. Interviews with a traditional leader: 9.4.18, observations of the leading author
53. Interviews with a community member: 2.4.18/ committee members: 4.4.18/5.4.18/7.4.18, a Traditional leader: 9.4.18
54. Interviews with operator: community members:2.4.18/3.4.18, committee member: 5.4.18, operator: 5.4.18
55. Interviews with community members: 29.3.18/30.3.18, committee member: 8.4.18
56. Operator committee member: 5.4.18, committee members: 5.4.18, the leading author also saw the written rules and regulations that they agreed on.
57. Interviews with community members: 30.3.18/31.3.18/7.4.18a)/7.4.18b)/9.4.18, operator: 2.4.18
58. Interviews with water users: 4.4.18/5.4.18/7.4.18, committee member: 2.4.18
59. Interviews with water users: 30.3.18a)/30.3.18b)/4.4.18a)/4.4.18b)/5.4.18a)/5.4.18b), former users: 5.4.18 a)/5.4.18b)/6.4.18/
60. Interview with water users: 29.3.18/30.3.18a)/30.3.18b)/5.4.18, committee members: 2.4.18/ 4.4.18/7.4.18 traditional leaders: 9.4.18
61. Interviews with water users: 28.3.18/4.4.18 a)/4.4.18 b)/5.4.18/6.4.18 a)/6.4.18b)/6.4.18c)
62. Interview with an advisor to the traditional leader: 8.4.18
63. Interview with water users: 4.4.18/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b)/6.4.18c)
64. Interviews with water users:2.4.18/3.4.18a)/3.4.18b)/ 4.4.18a)/4.4.18b)/5.4.18a)/5.4.18b) One scheme decided not to have new members to ensure services for the initial users: water users: 30.3.18a)/30.3.18b) committee member: 2.4.18/4.4.18
65. Interviews with water users: 31.3.18/4.4.18a)/4.4.18b)/4.4.18c)/5.4.18a)/5.4.18b)/6.4.18a)/6.4.18b)
66. Discussions with a high-ranking official of the Municipal infrastructure Grant (MIG) 21.3.18, an experienced water sector consultant 26.3.18, high-ranking official at the Water Resource Commission WRC 28.3.18
67. This project was funded by the African Development Bank (AfDB) and implemented by the Water Research Commission (WRC) of South Africa in collaboration with the International

Water Management Institute (IWMI) and an NGO. This paper's lead author undertook project implementation and facilitation on behalf of IWMI.

68. Interviewees here included a community member on 15 November 2017, one current ward committee members on 7 June 2017, one former ward member on 16 November 2017, two ward councillors on 19 August 2017 and 13 August 2018; there was also a focus group discussion on 15 May 2017.
69. Interviewees included a leading official of the district IDP coordination of Sekhukhune District on 8 July 2018, a leading district-level official of the DIWS on 5 December 2017, a local official of the DIWS on 17 November 2017, and a leading official of the institutional social development unit of Sekhukhune on 5 April 2018).
70. Interviewees included two community members on 23 July 2017 and 10 December 2017, and two former ward committee members on 15 November 2017 and 16 November 2017.
71. Interviewees included four local officials of the DIWS, one on 17 November 2017, two on 29 November 2017, and one on 11 December 2017.
72. Interviewees included one current ward committee member on 7 June 2017, one former ward committee member on 16 November 2017, two ward councillors on 19 August 2017 and 13 August 20 18), two local officials of the DIWS on 17 November 2017 and 29 November 2017), two district-level officials of the DIWS on 29 November 2017 and 16 August 2018.
73. Interviewees included four local officials of the DIWS: two on 29 November 2017, one on 11 December 2017, and one on 16 August 2018.
74. Interview with a district-level official of the DIWS on 5 December 2017.
75. Interview with a district-level official of the DIWS on 12 December 2017.
76. Municipal Infrastructure Grant funding is coordinated by the Department of Cooperative Governance (DCoG); every municipality gets assigned a certain budget in accordance with a formula that has been developed by the national treasury. These funds must then be spent according to priorities approved by DCoG, with the technical support of the relevant national-level department. Water Services Infrastructure Grant (WSIG) funding on the other hand is fully under the supervision of the Department of Water and Sanitation (DWS) and funds are allocated for specific projects which must be approved by the DWS. The Regional Bulk Infrastructure Grant (RBIG) is a third funding source for water projects but can only be used for bulk infrastructure (Republic of South Africa, 2017).
77. Interviewees included ten officials from different levels of the DIWS; interviews were conducted on 17 November 2017, 22 November 2017, 29 November 2017, 12 December 2017, 16 August 2018, 19 September 2018 (two), 20 September 2018, 21 September 2018, and 22 September 2018.
78. Interviews with two engineers of the DIWS on 19 September 2018 and on 14 September 2018.
79. Interview with a district-level official of the DIWS on 14 September 2018.
80. Interview with a high-ranking municipal official on 21 September 2018 and with a leading engineer of the DIWS on 19 September 2018.

81. Interviewees included five officials from different levels of the DIWS, two on 19 September 2018, one on 20 September 2018, one on 21 September 2018, and one on 22 September 2018.
82. Interviewees included a high-ranking municipal official on 21 September 2018 and a leading politician on 20 September 2018.
83. Interview with an engineer of the DIWS on 14 September 2018.
84. Interview with a leading official of the project implementation unit on 20 September 2018.
85. Interview with an engineer of the DIWS on 19 September 2018.
86. Interview with a director of the Regional Bulk Infrastructure Grant (RBIG) and Water Services Infrastructure Grant (WSIG) funding bodies at the national Department of Water and Sanitation (DWS) on 26 September 2018.
87. Interview with a member of the directorate for Water Services Macro Planning at the national DWS on 26 September 2018.
88. Interviewees included district-level officials of the DIWS on 22 November 2017, 29 November 2017 (two), 5 December 2017, 7 December 2017, 12 December 2017, 19 September 2018, and 21 September 2018.
89. Interviewees included a leading official of the DIWS on 5 December 2017, a project manager of the DIWS on 29 November 2017, and a local official of the DIWS on 22 November 2017.
90. Interviewees included three district-level officials of the DIWS on 29 November 2017, 5 December 2017, and 12 December 2017.
91. Interviewees included a leading district-level official of the DIWS on 21 September 2018, four district-level officials of the DIWS on 19 September 2018, 21 September 2019, 12 December 2017, and 14 September 2018.
92. Interviewees included a district-level official of the DIWS on 19 September 2018 and 21 September 2019, an engineer of the DIWS on 19 September 2018, a district-level politician on 21 September 2018, a leading official of the DWS Limpopo on 20 September 2018, and a leading official of the district municipality on 21 September 2018.
93. Interviewees included a water sector consultant on 22 September 2018, and three district-level officials of the DIWS on 12 December 2017, 14 September 2018, and 20 September 2018.
94. Interviewees included two local-level officials of the DIWS on 29 November 2017 and 17 November 2017, and two district-level DIWS officials 5 December 2017 and 11 December 2017.
95. Interviewees included two local-level DIWS officials on 29 November 2017 and 17 November 2017, and a district-level DIWS official on 29 November 2017.
96. Interviewees included two local DIWS officials on 29 November 2017 and 11 December 2017.
97. Interview with local-level official of the DIWS on 17 November 2017.
98. Interview with local-level DIWS official from Sekhukhune District on 17 November 2017.
99. The possible uses of these grants are described in the division of revenue bill (Republic of South Africa, 2017).
100. A short series of videos produced as part of the project can give an overview of the setting and the process. See http://stories.iwmi.org/voicing-water-visions/mus-south-africa/.

101. In addition to this section, there was a compound of three households of a religious congregation which had a yard connection from one of the boreholes.
102. See available manuals for community mapping (IFAD, 2009) and case studies (IIED, 2006).
103. See available manuals for transect walks by Bouris (2006) and Rufina (2006).
104. "Local elites are locally based individuals with disproportionate access to social, political or economic power; the term elite capture refers to the process by which these individuals dominate and corrupt community-level planning and governance" (Beard and Dasgupta, 2006, p. 230).
105. The interviewee was a professor at the Institute of Geographical Sciences at the Freie Universität Berlin; the interview took place on 24 October 2018. In his earlier position at GIZ he was one of the leading facilitators of the creation of the IDP framework.
106. The interviewee was a professor at the Department of Town and Regional Planning at the University of Pretoria; the interview took place on 25 September 2018.
107. Cooperatives are obliged to keep their infrastructure functional (Schweizer Bundesversammlung, 2022) and conduct water quality tests to meet national standards (Eidgenössisches Departement des Inneren, 2021).
108. For a more detailed account of this history, see chapter 2.
109. Interviews with two former high-ranking officials of the Department for Water Affairs and Forestry, that were involved in the negotiations of the new policies: 20.5.18/19.5.18.
110. Discussion with a high-ranking official of the Municipal infrastructure Grant (MIG) 26.3.18.
111. Interviews with two former high-ranking officials of the DWAF 20.5.18/28.9.18, an experienced water sector consultant 26.3.18 and discussion with a high-ranking official of the Municipal infrastructure Grant (MIG) 21.3.18.
112. The dominant national grants are pension payments and child support
113. For an example of such a planning process, see chapter 2.
114. For a detailed account of the effects of the privatisation of the water supply planning process on "efficiency", see Hofsetter et al., 2023. See also (Owens et al., 2022; Duarte-Abadía et al., 2021)
115. This project was funded by the African Development Bank (AfDB) and implemented by the Water Research Commission (WRC) of South Africa in collaboration with the International Water Management Institute (IWMI) and a local NGO.
116. For a more detailed description of this process and the project, see chapter 3.

Moritz Hofstetter
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
A1 Managing a research project			
WASS Introduction Course	WASS	2022	1
'The role of communities in rural water service delivery'	Sekhukhune District Authority - provincial conference, Burgersfort, South Africa,	2018	1
Project proposal writing	WRM – WUR	2020	6
Reading Club	WRM – WUR	2023	3
A2 Integrating research in the corresponding discipline			
Advanced social theory, RSO58306	WUR	2020	6
Summer school: Authoritarian Natures? Political ecologies of post-truth, the state and social ruptures	WASS	2021	3
Summer school: The Natures of life and death: political ecologies of collapse, transformation and revival	WASS	2023	4
B) General research related competences			
B1 Placing research in a broader scientific context			
Analysing Discourse, CPT56306	WUR	2020	6
Stikstofproblematiek, waterkwaliteit en broeikasgasemissies in de landbouw	WUR Academy	2023	0.5
Nutrient and Pollution management	ESA, WUR	2024	2
B2 Placing research in a societal context			
Making Impact: Increasing the relevance of research through science-society interaction	WGS	2023	1
Ethics for Social Sciences Research	WGS	2022	0.5
C) Career related competences/personal development			
C1 Employing transferable skills in different domains/careers			
Communication with the Media and the General Public	WGS	2023	1
Total			**35**

*One credit according to ECTS is on average equivalent to 28 hours of study load

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