The political ecology of hydraulic infrastructure in Kenya

Claim-making and contestations in hydrosocial spaces

Dissertation
zur
Erlangung des Doktorgrades (Dr. rer. nat.)
der
Mathematisch-Naturwissenschaftlichen Fakultät
der
Rheinischen Friedrich-Wilhelms-Universität Bonn

vorgelegt von
Arne Lennard Rieber
aus
Herrenberg

Bonn 2025

Angefertigt mit Genehmigung der Mathematisch-Naturwissenschaftlichen Fakultät
der Rheinischen Friedrich-Wilhelms-Universität Bonn

Gutachter/Betreuer: Prof. Dr. Detlef Müller-Mahn
Gutachterin: Prof. Dr. Britta Klagge
Tag der Promotion: 30.06.2025
Erscheinungsjahr: 2025

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List of abbreviations

ASAL	Arid- and Semi-Arid Lands
CRC	Collaborative Research Centre
CSO	Civil Society Organization
DFG	Deutsche Forschungsgemeinschaft (German Research Foundation)
HGF	High Grand Falls Dam
STS	Science and Technology Studies
UN	United Nations
WCD	World Commission on Dams
WP	Work Package

Abstract

Hydropower and multi-purpose dams are experiencing a resurgence in global infrastructure planning, often framed as solutions to pressing challenges such as climate change, water insecurity, and energy demand. In Kenya, dams have re-emerged on the political agenda, with previously shelved projects being revived within broader development visions. This dissertation examines the impact of large-scale infrastructure, not only during construction but also when it exists primarily as a political promise. By analysing dam projects at different stages of their lifecycle it explores the effects of promises, expectations, and contestations around infrastructure. Conceptually, this research advances debates in the political ecology of infrastructure by integrating a temporal perspective with a focus on both material and immaterial dimensions of dam development. Drawing on political ecology, science and technology studies (STS), and critical infrastructure studies, the dissertation develops the notion of future-faking – a performative strategy in which infrastructure developers and politicians sustain visions of progress despite chronic delays, cost overruns, or failed implementation. This complements existing work on the economy of anticipation and imagined futures by showing how infrastructural promises, rather than only mobilizing public support or investment necessary for its implementation, can actively mislead affected people. Furthermore, by reviving and expanding conceptual thoughts around political arenas, this study situates infrastructure projects as contested spaces of future-making, where strategic alliances, competing claims, and power relations shape hydrosocial transformations, well before infrastructure materialises. Empirically, the research takes a longitudinal perspective and qualitative approach to the study of multiple dam projects in Kenya, using archival research, semi-structured interviews and participatory visual methods. Ultimately, this dissertation contributes to a broader understanding of infrastructure as a political and temporal phenomenon, challenging dominant narratives of linear development and exposing the violence embedded in speculative infrastructure planning. At the same time, this dissertation grounds the temporal approach to infrastructure in political ecology on an analytically tangible level by linking it to the immediate effects of infrastructure politics.

Zusammenfassung

Staudämme und Wasserkraftwerke erleben ein Comeback in der internationalen Infrastrukturplanung, oftmals als Antwort auf drängende Herausforderungen wie Klimawandel, Wasserverknappung und Energiebedarf. In Kenia sind Staudämme wieder zentraler Bestandteil der politischen Agenda. Vorübergehend ausgesetzte Projekte werden im Rahmen umfassenderer Entwicklungsvisionen wiederbelebt. In dieser Dissertation werden die Auswirkungen großer Infrastrukturprojekte untersucht, sowohl während ihres Baus, als auch dann, wenn sie lediglich ein politisches Versprechen darstellen. Durch die Analyse von Staudammprojekten in verschiedenen Stadien ihres Lebenszyklus werden die Auswirkungen von Versprechen, Erwartungen und Auseinandersetzungen im Zusammenhang mit Infrastrukturen untersucht. Konzeptionell trägt diese Untersuchung zu Debatten in der Politischen Ökologie von Infrastrukturen bei, indem sie eine zeitliche Perspektive mit einem Fokus auf materielle und immaterielle Dimensionen der Staudammentwicklung einbezieht. Auf der Grundlage der Politischen Ökologie, der *Science and Technology Studies* (STS) und der Critical Infrastructure Studies entwickelt diese Dissertation den Begriff des *Future-Faking* – eine performative Strategie, bei der Infrastrukturentwickler*innen und Politiker*innen trotz Verzögerungen, Kostenüberschreitungen oder gescheiterter Umsetzung Visionen des Fortschritts aufrechterhalten. Dies ergänzt bestehende Arbeiten zu *Economies of Anticipation* und *Imagined Futures*, indem gezeigt wird, wie infrastrukturelle Versprechungen, nicht nur öffentliche Unterstützung oder notwendige Investitionen mobilisieren, sondern die betroffenen Menschen auch aktiv in die Irre führen können. Durch die Neubelebung und Ausweitung konzeptioneller Überlegungen zu *Political Arenas* verortet diese Studie Infrastrukturprojekte als umkämpfte Räume der Zukunftsgestaltung, in denen strategische Allianzen, konkurrierende Ansprüche und Machtverhältnisse hydrosoziale Transformationen prägen, lange bevor die Infrastruktur realisiert wird. Empirisch verfolgt die Forschung einen qualitativen temporalen Ansatz zur Untersuchung mehrerer Staudammprojekte in Kenia, wobei Archivrecherchen, semistrukturierte Interviews und partizipative visuelle Methoden zum Einsatz kommen. Im Ergebnis trägt diese Dissertation zu einem umfassenderen Verständnis von Infrastruktur als politisches und zeitliches Phänomen bei, indem sie die vorherrschenden Narrative einer linearen Entwicklung in Frage stellt und die in die spekulative Infrastrukturplanung eingebettete Gewalt aufzeigt. Gleichzeitig bringt die Dissertation den zeitbezogenen Zugang für Infrastruktur in der Politischen Ökologie auf eine analytisch fassbare Ebene, indem sie ihn mit den unmittelbaren Auswirkungen von Infrastrukturpolitik verknüpft.

Acknowledgements

As I emphasise in this dissertation, nothing over the last three years has been done without the immense support of colleagues, partners, collaborators, friends and family. A dissertation is where you, as a doctoral student, demonstrate that you are capable of pursuing an independent academic career. And while I acknowledge this, my work is, and hopefully always will be, a team effort.

I would like to begin by thanking **Prof Detlef Müller-Mahn** for creating the collaborative space in which I have worked over the past few years. Without him, the dozens of people I've had the pleasure of working with would probably never have come together under the framework, structures and funding of the Collaborative Research Centre *Future Rural Africa*. I would like to thank Prof Müller-Mahn for putting together an extremely strong team in our sub-project C03, in which all individuals made each other stronger. I am deeply grateful for the supervision over the years and the immediate trust given to me to follow an independent path when I needed it, but full support when I asked for that. Always having my back and sharing the stage with me at numerous events, I now have the opportunity to build on a very successful PhD period in my future career.

Next, an immense thank you goes to the second Principal Investigator on my project, **Dr Eric Kioko**. Even before I arrived in Kenya for my fieldwork, Eric's presence and support provided me with immense comfort. His confidence in my abilities also gave me the right balance of humility and self-assurance as I entered the field. I truly enjoyed the time we spent together, and it was a great learning experience to observe someone so experienced at work.

For the next person to be named here, **Dr Theo Aalders**, I would probably need a whole page to put into words how much his presence and company have meant to me from day one. Anyone who has met Theo and had the pleasure of working with him knows how much of a pillar he is to those around him. For me, he is a mentor, a friend, a colleague, a gym partner, a gaming buddy and the first person I turn to in moments of hardship and distress. His approach to academia is a true inspiration, his dedication to teaching is honourable and an example to us all, and he proves that unconditional dedication to your values and ideals is not an obstacle to pursuing an academic career.

I would like to thank our academic partners in Tanzania, **Dr Lucy Massoy** and **Prof Theobald Theodory** of Mzumbe University and **Dr Max Chuhila** of the University of Dar es Salaam for the years of great academic partnership and exciting workshops. I am truly grateful to **Dr Boniface Kiteme** and the team at CETRAD for granting me an affiliation and extending their network in Northern Kenya to me.

Benson Nyaga has played a pivotal role as an unofficial project partner, bringing his expertise and network to the benefit of my work and that of my colleagues. But more than that, as someone who has already partnered with me on my Master's project in 2018, he is a great friend and the one who knows me as a researcher in the field better than anyone else. It has been a great pleasure to grow together over the years and to

keep finding ways to work together. Thanks to him, Embu feels like my base whenever I arrive in Kenya, somehow familiar, even in such an unfamiliar environment.
I am also deeply indebted to **Mercy Mueni**, **Kenn Munene** and **Sebio Jackson**, who worked alongside me on the various dam projects across the country. Without their dedication, this research would not have progressed as far as it did. It was a great boost to have such reliable people by my side, often more disciplined than I was, when the question arose as to whether we could gather more data or put in an extra day's work.
Without being able to name individuals, my work is based on the hundreds of people in Kenya who were willing to support my research by giving their time to our project. I have had the pleasure of conducting interviews in Nairobi and the relevant county capitals, but also around the dam sites and adjacent areas with water resource users. These experiences are always special, often unpredictable and without any academic pretentiousness, often a moment of great learning. I sincerely hope that my academic work contributes, directly or indirectly, to the betterment of society and infrastructure development, and that no one ever felt that their time was not well spent.
Additional thanks go to everyone who has, in one way or another, been in the same boat, building, office, or field with me, sharing the challenge of balancing the panic and joy of doing a PhD. A very special thank you to **Emma Minja** for being a quiet genius, an inspiration with her work ethic, a fantastic team member, and a wonderful office mate. Huge thanks to the Lunch Bunch – **Zainab, Johannes, Frankline, Matiwos, Douwe, Inès, Nyi, Valentine, Valentina, Akwesi, Annapia, Ravn, and Manuel** – for making our breaks a joy and our walks to Mensa Campo something to look forward to each day. Beyond office hours, the Lunch Bunch were a constant source of support, and the friendships we built are ones I truly hope are just the beginning. We shared amazing moments together, shared our deepest fears and hopes and formed a bond that remained strong no matter what happened around us. I will cherish that forever.
I would like to extend my thanks to all the members of the CRC and everyone who has contributed to the many collaborations over the past years. I am especially grateful to our speakers, **Prof Britta Klagge** and **Prof Michael Bollig**, as well as to our scientific coordinator, **Matian van Soest**. My appreciation also goes to all those in the administration who organise the regular meetings, summer schools, and events that foster exchange and community. A special thank you to **Valerie McCool** and **Monika Faller** for patiently guiding me through the intricacies of travel expense reports and other organisational masterclasses, essential skills for any member of the University of Bonn.
I am deeply appreciative of the **University of Bonn** and the **Department of Geography** for hosting this project and creating opportunities for so many of us, as well as to the **German Research Foundation (DFG)** for their support in funding.
I want to acknowledge **Irene Johannsen** and **Martin Gref** for creating the maps used in this dissertation and the associated articles of this cumulative work.

Finally, in the academic field, I cannot forget those who guided, trained, and supported me on my path to becoming a PhD student. I would like to especially acknowledge **Prof Theo Rauch** for igniting my passion for development research and development geography. I am also grateful to **Prof Hermann Kreutzmann** and **Dr Stefan Schütte** for designing an inspiring Master's program at Freie Universität Berlin. Immense gratitude goes to all the wonderful people at the **Institute for Development and Peace** in Duisburg for giving me the opportunity to discover true joy in academic work during my time there, an experience that ultimately led me to pursue a PhD.
I would like to end the acknowledgments with thanks to my parents, **Inge** and **Eckhard** and my brother **Philipp** for their unconditional support over the years, no matter what decisions I made. I am eternally grateful for that and no written words could ever do it justice. I am deeply grateful to **Anni** for celebrating the many small successes over the last years leading up to this dissertation, especially when I failed to recognize or allow myself to celebrate them.

I dedicate this dissertation to the late **John Mwangi**, who would have soon followed with a dissertation of his own. His sudden passing left an unfillable void in the lives of his loved ones and all who knew him. I am deeply grateful for the time we shared.

Figure 1: Gitaru Dam on the Seven Forks dam cascade, Tana River (source author)

1 Introduction

In the 2001 update of Patrick McCully's major critique of dams, entitled 'Silenced Rivers', the author asserts, with a certain sense of relief: 'These gigaprojects are aberrations. There is little doubt that the heyday of dam building has passed' (2001, p. lxiv). Some 20 years later, in October 2022, the newly elected Kenyan President William Ruto declared in his inaugural speech on Mashujaa Day: 'Irrigation is the ultimate solution in guaranteeing food security. We are working [...] to construct at least 100 dams' (Murimi, 2022). With this statement, the Kenyan president signalled that his term would continue a renaissance of dam development in the country, one that has emerged in recent years globally[1]. McCully's assessment of dam development was written shortly after the formation of the World Commission on Dams (WCD). The WCD was an UN-level commission set up in response to growing global criticism and concern about dam development, which had come at immense social and environmental cost, particularly since the middle of the 20th century. The WCD was formed by high-level politicians around the chair, South Africa's Minister of Water Affairs and Forestry, Kader Asmal. At the time, McCully hoped that the WCD's report on dams and the guidelines it set out (World Commission on Dams, 2000) would mark a turning point in global dam development, leading to greater accountability and a shift towards smaller, more sustainable projects. But that's not what happened. While the WCD report received significant global attention, only a handful of countries adopted it as a binding strategy (Schulz & Adams, 2019). It would be wrong to call it a paper tiger, as it has been a highly relevant collection of research on dams and has contributed to understanding the far-reaching impacts of dams. However, major players in global dam development have reignited a 'dam fever' (Meehan, Mirumachi, Loftus, & Akhter, 2023) in the search for cheap electricity, irrigation systems and flood control, while carrying the negative social and environmental impacts of dams into the 21st century. Particularly in the global West, the image of dam development has been restored in times of climate change. This is actually what McCully predicted, only that he underestimated how strong the 'green futures' narratives would become.

> Faced with a funding crisis, the industry is desperately looking for justifications for public subsidies. The great hope for the industry is that global warming will come to its rescue - that hydropower will be recognized as a ‘climate-friendly’ technology (2001, p. xvii).

'Dams are back' (Dye, 2022) and they came back under the label of green electricity and adaptation to the pressing climate issues (Atkins & Hope, 2021). Current estimates of planned dam projects suggest that the number of dams built in the 21st century will

[1] President Ruto later refined the statement, formulating the goal of '[...] 100 mega-dams we are going to construct. We are going to do another 1,000 micro dams, and another 3,800 pans of water, because water harvesting, water storage is a very important component of unlocking our ability to be able to grow enough food, create food security [...]." (KTN News Kenya, 2023)

far exceed the previous one (Zarfl, Lumsdon, Berlekamp, Tydecks, & Tockner, 2015), putting dams back on research agendas for critical analysis.

Historically, large dam developments have been central to large political agendas and prominent promises of national development, and that has arguably not changed between the 20th and 21st century. Dams are portrayed as economic drivers, transformative infrastructure projects, and solutions to water and energy challenges in times of climate crisis (Moore, Dore, & Gyawali, 2010; Schulz & Adams, 2019). Moreover, they have often symbolized progress and modernization (Meehan et al., 2023). Dams have been key endeavours in nation-state building (Mohamud & Verhoeven, 2016), situated at the heart of high-modernist agendas (Dye, 2022), and employed as political tools in geopolitics (Ahlers, Budds, Joshi, Merme, & Zwarteveen, 2015).

Unlike some other types of infrastructure, e.g. embedded infrastructure, which can be described as only becoming visible when they break (Star, 1999), dams are highly visible both physically and symbolically. Proponents and developers actively emphasize this visibility, making dams a focal point of their narratives. The visions and promises tied to dams often cast long shadows, projecting influence well before the projects themselves materialize. This creates an environment where dams become the focal point for political debates, negotiations, contestations and for future-making (Appadurai, 2013). Dam developments are 'reflexive points where the present state and future possibilities of government and society are held up for public assessment' (Larkin, 2018, p. 177). It reflects what has been discussed in infrastructure studies, wherein infrastructure shapes the social, and in turn, society influences (the development of) infrastructure (Graham & Marvin, 2001). However, infrastructure projects, including dams, often fail to materialize as planned. Unfulfilled plans, delayed promises, and halted visions are the norm rather than the exception (Carse & Kneas, 2019). This interplay raises a critical question in this context: If infrastructure and society are in constant mutual influence, how do planned, incomplete, or unrealized projects affect social issues such as livelihoods affected by them? Conversely, how does the social respond to, reshape, contest, and renegotiate these incomplete visions?

These questions formed the starting point for this dissertation project. The research was driven by the idea of exploring *ghost projects* (Aalders, 2020; Müller-Mahn, Aalders, & Kioko, 2025) and their impacts on the regions they haunt or entertain, when considering the less ominous metaphorical ghosts. This approach sought to investigate the socio-political dimensions of infrastructure, specifically dam infrastructures, beyond their materiality, using a political ecology approach. As this dissertation and the articles at its core[2] demonstrate, this perspective enabled a focus on future making processes, examining how different options for the future are weighed, negotiated, contested, and, at times, violently or oppressively pursued. With this approach, the

[2] The publication in section 7.5. is a book chapter, and part of a proposal for an edited volume submitted to Brill. In order not to complicate my writing here, I will refer to all five publications as articles throughout this dissertation.

research conducted within the project 'Green Futures', part of the Collaborative Research Centre (CRC) 'Future Rural Africa', extended beyond ghost projects to explore the socio-political dimensions of dams apart from their materiality but also across all stages of their infrastructural life cycle. Two research questions were identified to address these aspects:

> **Q1: How does the anticipation of dams shape the political arenas around them?**
>
> **Q2: How does infrastructure politics unfold in hydrosocial spaces around the construction and operation of dams?**

This dissertation is structured around four articles that were published in 2024 and 2025 and a book chapter that is part of a proposed edited volume with the publisher Brill. The first article understands proposed large infrastructure projects as political arenas of future-making and investigates the relations between the social and infrastructure at a meso-level by developing three distinct categories as a research heuristic for infrastructure development – temporality, spatiality and performativity – informed by an engagement with Bourdieu's field theory. This first article lays the foundation for subsequent publications that explore the co-production of infrastructure and society at the local and regional levels, analysing the socio-political dynamics at different stages of infrastructure development. The micro and regional perspectives are primarily supported by two strands of literature: hydrosocial spaces and the temporality of infrastructure, and further enriched by insights from future studies. By integrating these perspectives, this dissertation advances the understanding of both the material and immaterial impacts of infrastructure development and, based on the empirical cases presented, argues that forms of infrastructural violence (Rodgers & O'Neill, 2012) are inherent in the development of large-scale infrastructure.

Figure 1 provides an overview of both the empirical case studies and the above mentioned conceptual engagements, in their infrastructural temporality of past, present and futures. The socio-political phenomena examined here are understood in the context of hydraulic infrastructures, which are in constant interplay with the hydrosocial spaces in which they are planned, constructed or operated.

The figure also illustrates that the analytical engagement with operating dams (Masinga Dam) tends to focus on past developments, while those with planned dams (High Grand Falls Dam (HGF) and Thwake Dam) are strongly future-oriented. Only ghost projects, such as the Crocodile Jaw Dam, exist in a continuous interplay between these temporal categories, characterised by past anticipations, broken promises and the lingering threat or hope of eventual materialisation.

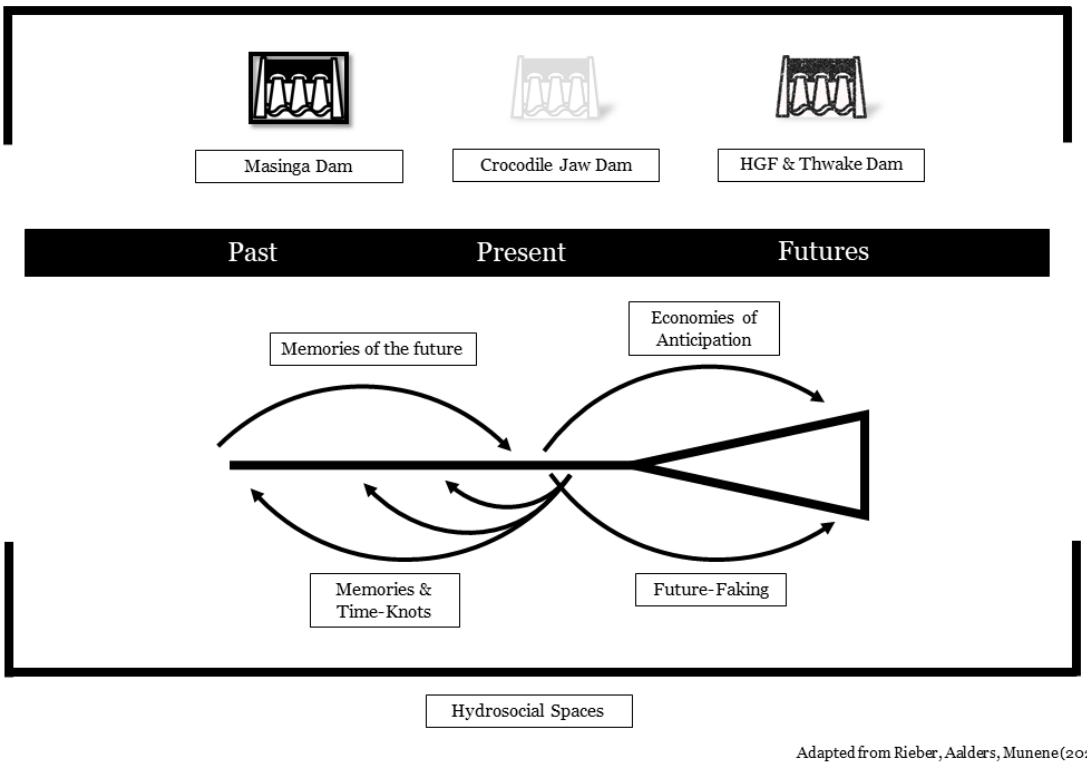

Figure 2: Overview of the conceptual and empricial contributions of the dissertation

This dissertation is structured as follows: Section 2 provides the background and context of this research within the context of the Collaborative Research Centre (CRC) 'Future Rural Africa', hosted by the Universities of Bonn and Cologne. Section 3 situates the study within its academic framework by engaging with political ecology, highlighting the researcher's understanding of his role in studying land use change and socio-ecological transformations within development geography. Section 4 explores the theoretical and conceptual underpinnings of this work, while section 5 outlines the research design, study sites and methodologies employed and adds a discussion on the ethics and positionality of the researcher and the research team. Section 6 provides an overview of the four articles and the book chapter, followed by Section 7, which comprises the core articles of this cumulative dissertation. In the conclusion, I aim to synthesise how the individual articles address the research questions, reflect on the broader findings from them collectively, discuss their limitations, and identify areas for future research in this area.

2 Research objectives and project background

Before responding to the questions raised, it should be noted that while a doctoral dissertation is always about demonstrating one's qualifications for an independent academic career, the work presented here cannot be separated from the project in which it was initiated and situated. The work presented here is the result of a researcher position in the Collaborative Research Centre *Future Rural Africa*, funded by the German Research Foundation (DFG). Initially launched in 2018 and extended for a second funding phase from 2022 until the end of 2025, the research centre addresses the question of how African futures are *made* in rural areas by examining land-use change and socio-ecological transformations from an interdisciplinary perspective. The research centre is structured into several sub-projects, with the work here being an outcome of project C03 'Green Futures'. In the first funding phase from 2018-2022, the project investigated narratives of green growth in Kenya and Tanzania and additionally in Namibia by affiliated project members. In the second phase, C03 built on the findings of the first funding phase and productively narrowed its perspective on infrastructure-oriented models of green futures, shifting the empirical focus to hydro-infrastructure development. The renaissance of dams in East Africa, many of the dams being planned as multi-purpose projects, provides an illustrative example of how shifting global narratives – in this instance of combating climate change and food insecurity – are being mobilised to implement infrastructure that was in the pipeline long before these issues reached the global agenda. This context set the ground for a temporal perspective which would allow for conceptual engagements with future-making (Appadurai, 2013) and infrastructural promises, contestations around the ambivalences of infrastructure, as well as the temporality of infrastructure.

Project C03 frames its research design in the second phase conceptually in two ways. First, it draws on the work of Rottenburg (2009), Behrends et al. (2014) and Hornidge et al. (2020), on *travelling models* and *epistemic mobilities*, to show how ideas about hydro-infrastructure development emerge in international discourses and are transferred to local contexts through translation processes that reflect the visions and interests of dominant actors. Second, the project explores hydro-infrastructure developments as arenas of future-making, where different actors and groups come together to negotiate, contest, and challenge dominant visions of the future. This concept builds on earlier works by Bierschenk et al. (Bierschenk, 1988; Bierschenk, Elwert, & Kohnert, 1993), who analysed the formation of strategic groups around development projects in West Africa.

Empirically, the project continues to focus on Tanzania and Kenya in the second phase. The project is conducted by the core team at the University of Bonn, with project partners at the University of Dar es Salaam, and Mzumbe University in Tanzania and the Centre for Training and Integrated Research in ASAL Development (CETRAD)

based in Nanyuki, Kenya. The overall research question for the project was formulated as follows: **How do travelling models and local arenas of hydro-development influence future-making and social-ecological transformation in Kenya and Tanzania?**

Within the project, six work packages were identified and distributed among the project members: WP1 Global models of hydro-development and their transfer to Africa, WP2 National hydro-politics in Kenya and Tanzania, WP3 Arenas, WP4 Actors, WP5 Struggles, WP6 Conceptual synthesis. As already foreseen in the project proposal, my role was tied to the work packages 3-5: 'The PhD student (social anthropology, development geography) will focus on a local arena of hydro-development in Kenya (WP 3-5), and spend approximately 8 months in the study area'[3].

In brief, these work packages involved investigating planned and ongoing dam developments as arenas of future-making at the local and meso-levels, identifying and mapping active and passive actors and the alliances they seek from the local to the national level, and analysing the power plays and struggles among local actors and affected communities. The latter also aimed to examine the strategies and performances used by different groups to be heard, organize, and gain influence in the arena.

Both the overarching question, as well as the work packages are reflected in the articles in section 7 as highlighted by the table below. Evidently, these contributions are often overlapping.

	WP3 Arenas	*WP4 Actors*	*WP5 Struggles*
Article 7.1	✓	✓	✓
Article 7.2		✓	✓
Article 7.3			✓
Article 7.4		✓	✓
Article 7.5	✓		✓

Table 1: Contributions to the project working packages

[3] Cited from the unpublished project proposal, CRC228/2 C03 'Green Futures'.

3 The political ecology of dams

In order to answer the research questions formulated in the introduction and to meet the research objectives of the project as outlined in section 2, the dissertation is broadly situated in political ecology. A framing such as 'applying a political ecology lens' is deliberately avoided, as the meaning of this is vague at best. Political ecology has struggled with a clear identity since its inception, and probably still has not clarified – at least there is no consensus – whether it emphasises the 'political' (Paulson, Gezon, & Watts, 2003) or the 'ecology' (Vayda & Walters, 1999). However, what has remained, since its early days (Blaikie & Brookfield, 2015 [1987]) is that it is 'an explicitly normative intellectual project, which has from its beginning highlighted the struggles, interests, and plight of marginalized populations' (Perreault, Bridge, & McCarthy, 2020, p. 8). With its normative, theoretically grounded, yet empirically rich engagement with those active in the struggles mentioned above, I see Political Ecology as a continuation of my training and work in development geography. I believe the interdisciplinarity of the two disciplines, development geography and political ecology, enables the research results to engage with a broad and expanding academic discourse. Moreover, conducting and presenting research under the framework of political ecology facilitates concept testing and concept development that is applicable or adaptable wherever 'a rejection of positivist approaches to social relations and environmental science' (Perreault et al., 2020, p. 7) is relevant.

My political ecology inspired approach to studying infrastructure began in my dissertation project with an examination of the socio-political dynamics of infrastructure development, including how infrastructure shapes and becomes central to the process of future-making. The next step was to analyse how future-making around infrastructure affects marginalised or peripheralised communities in rural areas, alongside the wider socio-economic impacts of infrastructure development on these groups.

The political ecology of infrastructure, as a relatively young field, remains strongly influenced by earlier works published under different conceptual frameworks, which have significantly contributed to its emergence. It examines how power and inequality are exercised through infrastructure (Scott, 1998), how capital is accumulated via infrastructure (Harvey, 1981), how infrastructure shapes access and exclusion in resource distribution (Swyngedouw, 2004), and the socio-environmental impacts of large-scale systems (Blaikie & Brookfield, 2015). More recently, within the political ecology of infrastructure, a growing discourse has drawn on anthropological and sociological perspectives to explore the temporality of infrastructure (Appel, Anand, & Gupta, 2018; Braun, 2020; Guma, 2022; Howe et al., 2016). This approach moves beyond analyses that focus solely on the spatial configurations of infrastructure to understand it as continually shaped and reshaped by social, material and temporal dynamics (Appel et al., 2018; Carse & Kneas, 2019). Infrastructure, infrastructural plans and infrastructure systems are deeply rooted in (a colonial) history, affecting

contemporary plans and systems (Aalders, 2021; Anand, 2017; Enns & Bersaglio, 2020). But infrastructure is also a key feature of future-making as infrastructures are 'projections and gestures towards the future; their development both closes down and opens up possibilities, in ways that maybe both unpredictable and contested' (Barry, 2020, p. 104). This intersects with Political Ecology, where the processual nature of infrastructure consequently influences environmental and social transformations in temporal ways and can lead to generational struggles and conflicts. It becomes particularly evident around claims and promises (Anand, Gupta, & Appel, 2018; Kovač & Ramella, 2023) about development and progress which often exclude or adversely impact marginalized groups, revealing power dynamics in future-making.

The invisibility of infrastructure in everyday life is a recurring theme in social science research, with Star's observation (1999, p. 382) that infrastructure only 'becomes visible upon breakdown'. A quote that is often taken out of context, as Star herself emphasised the relational nature of infrastructure and focused primarily on embedded infrastructure. Even discussions of Star's quote that take it out of context and risk strawman arguments often contain an important insight: for infrastructure to be perceived as invisible, people would have to be accustomed to infrastructures simply being there and functioning all the time, or at least most of the time, which is of course not universally the case. Additionally, depending on one's perspective and position, even fully operational infrastructure remains highly visible, particularly when it does not work for oneself and instead of being 'built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space' (Larkin, 2013, p. 328), it becomes an obstacle or threat. This emphasis of the visibility has been advanced by prominent authors (Carse, 2012; Larkin, 2013), who note that infrastructure can become so visible that it finds its way into national identities. Infrastructure is deeply political, and at times 'new infrastructures [...] threaten to alter or eradicate existing ways of life' (Carse, 2012, p. 544). The visibility of infrastructure, as a showcase, as a means of transforming lives and social relations, and as a political tool, creates dualities, ambivalences, and ultimately winners and losers, making it a central theme in political ecology. These dynamics are particularly evident in the study of dam infrastructure, as it merges the political ecology of infrastructure with the political ecology of water, centring on one of the most significant infrastructural interventions in ecological and social systems.

> Large hydropower dams are the epitome of an object of concern in political ecology given that they are major human artefacts that disrupt biophysical processes, rupture nature-society relations, enclose commons, redistribute (or dispossess people of) access to resources and their related benefits, and exist within political economic processes and power relations that almost always privilege elite interests (Middleton, 2022, p. 251).

Figure 3: Construction site of the Thwake Dam in 2024 (source: author)

The political ecology of dams focuses on key questions raised by the literature on the hydrosocial cycle (Linton & Budds, 2014; Swyngedouw, 2009), an approach that scrutinises the production of water flows: where water flows and to whom it is scarce or abundant. The hydrosocial perspective challenges the notion of water as merely a natural entity running unimpeded from upstream to downstream. Instead, it exposes water as a commodity (Swyngedouw, 2004), with its scarcity often produced (Linton & Budds, 2014; Swyngedouw, 2014) and obscured by deeper economic mechanisms and water narratives. Unlike the often less obvious mechanisms that shape water distribution, dams make their impact on rivers and water flows highly visible. As symbols of humanity's attempt to dominate nature, dams manifest power relations at the intersection of the social, political, and ecological (Meehan et al., 2023).

This manifestation of power has a very material aspect in dam developments, with the sheer size of the dam structure and the even more sizable dam reservoir that can cover whole regions. What emerges is a hydrosocial space, where water is materially and discursively produced, 'within specific moments, contexts and relations' (Budds, Linton, & McDonnell, 2014, p. 168). I will discuss the territorialisation of the hydrosocial space (Boelens et al., 2022) in the next section. Before moving on, I would like to discuss both the material and immaterial aspects of dams and dam development, which are addressed in the published articles of this dissertation, but which I explore in more detail in this framework text. Even though dams are impressive

structures and symbols of techno-economic power states (Bromber, Féaux De La Croix, & Lange, 2014), a broad range of socio-economic/-cultural/-ecological and -political dynamics happen far away from the material artefact of the dam. It does not take a dam for a dam to be impactful, and sometimes, it is not the dam that is the problem but the societal and political dynamics that come with it. A political ecology approach operates at the intersection of the material and immaterial impacts of dam development by analysing the unequal distribution of the benefits and risks associated with dams and by uncovering the power relations that shape these distributions. Coupled with critical infrastructure studies and a temporal perspective on infrastructure development, this approach enables an examination of the materiality of dams. This linkage strongly informs the publications that form the core of this dissertation.

In four case studies, I focus on both the material and immaterial effects of dam development within infrastructure biographies, with a particular emphasis on the socio-political dynamics that emerge alongside material impacts. We observe socio-political dynamics alongside the materialisation of dam projects that are directed towards and shaped by the materiality of the dam. While these dynamics themselves are immaterial, they have both material and immaterial effects on those affected by the project.

In other words, dams and reservoirs have consequences, often negative ones. That is inherent to their materiality, to their physical structure. But there are also negative effects related to the immaterial political game that unfolds around dams. As I show, sometimes it is not the dam itself that causes the negative effects as affected people actually show (or expect themselves) a very strong navigational capacity to adapt to the material changes of dams (Rieber, Aalders, & Munene, 2025; Rieber & Nyaga, 2025). Instead, the more serious problem in these cases are the misrepresentation of dam-affected populations and the misuse of political promises and expectations around dams. If project timelines, project benefits and the future vision of a dam project as a whole are treated as a mere fictional image in order to attract the necessary public and financial support, those affected or actively engaged in that future will be constantly and repeatedly misled, with potentially ruinous consequences.

These investigations of the material and immaterial began with the Crocodile Jaw Dam in northern Kenya, a ghost project planned for decades, where the immateriality of exclusion in planning and future-benefits, alongside the materiality of questioned downstream water supply, led to fierce contestations. It was followed by the study of a dam with a very similar history, the High Grand Falls Dam on the Tana River, which has recently been financially secured and is currently in the planning stage. There, anticipations and uncertainties shaped the immaterial aspects, while material questions around the land market and speculative investments became prominent. In our research around Thwake Dam, which is at the time of writing being built at the confluence of the Thwake and Athi Rivers, we reveal the immateriality of political deception and future-faking, while the construction site, with its immense impact on

adjacent communities, is leaving material traces. Finally, two operating dams, the Masinga and Kiambere dams on the Tana River, served as a case study to explore claim-making in hydrosocial spaces, decades after their construction. Ongoing attempts to materially dispossess residents from areas around the dam reservoirs lead to an immaterial disconnect from state power and a material resistance to it.

3 The political ecology of dams

4 Dimensions of dam infrastructures

In the previous section, I established material and immaterial effects as a core distinction in the study of the political ecology of dams. Detlef Müller-Mahn and I have developed an additional distinction that helps to conceptualise dam developments as arenas of future making (Rieber & Müller-Mahn, 2024). We approach dam development through three dimensions: spatiality, temporality and performativity. These dimensions serve as a heuristic in the study of dam development, especially when these have not materialized, and underpin our conceptualisation of the political arena of infrastructure development. I want to use the three dimensions at this point, not to repeat the arguments already made, but to adopt them for a deeper engagement with materiality and immateriality of dams:

1. **Spatiality**
2. **Temporality**
3. **Performativity**

I will build on the engagement with these categories for a concluding argument in which I want to problematise two aspects, one directed at the way infrastructure is planned in democratic systems of governance, and the other at the academic discourse after the infrastructural turn, which tends to emphasise the immaterial aspect of infrastructure when discussing its temporality, which I believe is often, but not always, useful when adopting this perspective in political ecology research.
I will explore hydrosocial territories as **spatiality**, infrastructure **temporalities** in the investigation of dam lifecycles and future-faking as a form of **performativity**. The latter concept draws from a body of literature that is rooted in economic and technical studies of infrastructure development. I argue that engaging with this perspective offers valuable insights into how infrastructure promises are constructed and how they feed into the first two dimensions. These three conceptual categories form the basis of this dissertation, as political ecology serves as an overarching approach rather than a distinct theoretical framework. By understanding hydraulic infrastructures as deeply temporal interventions that reshape hydrosocial spaces, I bridge two conceptual strands: temporality of infrastructure and hydrosocial spaces. This integration, in turn, allows me to reveal the performativity not only of those who develop infrastructure, but also of those who contest or seek to renegotiate its implementation.

4.1 Spatiality: Hydrosocial spaces around dam developments

The scholarship on the hydrosocial cycle emerged as a critique to the hydrologic cycle, claiming that the hydrologic cycle reduces water to a technical aspect and misses the political nature of water and its distribution (Linton & Budds, 2014). Linton & Budds define the 'hydrosocial cycle' as a 'socio-natural process by which water and society make and remake each other over space and time' (2014, p. 170). Using this approach

as a heuristic for studying the material and immaterial dimensions of dam developments, I focus on the *cycle* in hydrosocial cycle. As Linton & Budds elaborate, the cycle represents the dialectical relationship between water and society, an ongoing process deeply rooted in historical and social contexts. Interventions of any scale reshape these relationships, but a dam in particular represents a significant disruption to this cycle and is rooted in a 'particular kind of social structure' (Linton & Budds, 2014, p. 175) and power geometries (Swyngedouw, 2009). It reconfigures existing social relations with water, producing new social relations that in turn lead to further alterations in how water is managed or manipulated (Linton & Budds, 2014). Recent studies on hydrosocial spaces have further developed this perspective, expanding the investigation into the specific types of social relations produced through the hydrosocial cycle. One prominent strand of this literature focuses on sociospatial relations to water and the territorialization of water bodies and water resources (Boelens, Hoogesteger, Swyngedouw, Vos, & Wester, 2016; Hommes, Boelens, & Maat, 2016; Hommes, Hoogesteger, & Boelens, 2022; Liao & Schmidt, 2023). Once built, dams retain immense amounts of water, creating reservoirs that often change the banks of rivers dozens of kilometres upstream. These changes in land use are often accompanied by legal changes in the ownership of the affected land. Water governance institutions, charged with protecting the functioning of the dam, need to secure some form of control over the reservoir and adjacent lands. In the Kenyan context, and arguably in many contexts around the world where different legal regimes over land exist, this results in an extension of state power (see Ahlers, 2020) into regions where its presence and legal power over land has generally been limited.

Dam reservoirs are deeply 'humanized waters' (Boelens et al., 2016) and the resulting change in land and water use creates a hydrosocial territory, or rather many overlapping hydrosocial territories, held by different individuals and actors, each with 'diverging ideas about what hydrosocial relations should look like, each trying to materialize their respective ideas and interests in spatial-material as well as political-institutional arrangement that people imaginatively shape' (Hommes, 2022, p. 23).

Within these overlapping imaginaries, questions of the right or wrong of resource use and allocation emerge and are materialised over time. The resulting spatial and often legal restructuring, as a consequence of the power and agency of an actor's imagination of the hydrosocial territory, materialises change but does not always remove or negate existing claims to land and water. This results in the contested nature of dams and dam reservoirs. Contestations that are deeply embedded 'in the context of their historical, cultural and political settings' (Boelens et al., 2016, p. 3). The notion of territory allows us to focus on the very material changes that result from overlapping imaginaries and claims around water, shaped by power relations and the materiality of the dam and its reservoir (Drapier, Germaine, & Lespez, 2024). In the article 'Claim-making in hydrosocial spaces' (Rieber & Nyaga, 2025) that is part of this dissertation I analyse together with my co-author how the contestations of the hydrosocial territory are rooted in temporalities and overlapping timelines. Therefore, to not duplicate the

investigation, I approach this topic with an additional lens by examining the necessity of a material structure for the emergence of a hydrosocial territory.

Figure 4: Territory making: Trenches to securing investor property near the Kiambere Dam reservoir (source: author)

Before infrastructure materialises, plans, visions and goals of the project are based on sociotechnical imaginaries (Jasanoff & Kim, 2015), which often go through a process of negotiation and contestation. Imaginaries of large-scale hydraulic infrastructures are often normative and prescriptive (Miller, 2020), with the power to shape lifeworlds and social order (Hommes et al., 2022) transforming both the everyday realities of affected people and the broader structures of social organization. It is the process of negotiation and contestation, often characterized by 'strategic alliances' (Rieber & Müller-Mahn, 2024) and how these are able to mobilize the necessary political and financial capital or 'coercive forms of power' (Hoogesteger, Boelens, & Baud, 2016), that determine if and how a project materialises. Within this process, the territorialisation already takes place, with differing visions foreseeing different spatial visions, fixes and land-use changes. Through economies of anticipation (Cross, 2015a; Elliott, 2016; Greiner, 2016) these do have material effects, and the hydrosocial territory materialises already in the planning phase. Infrastructure imaginaries have the capacity to sever connections between the present and the past by reshaping the environment, significantly transforming people's ties to their territory, history, and cultural heritage (Hommes et al., 2016). Even when infrastructure projects fail to materialize, their impacts can still leave lasting traces. Since the immateriality of

infrastructure imaginaries and the territorialisation of these imaginaries can have very material effects, the argument for hydrosocial territories emerging before infrastructure materialization is intellectually compelling. However, such an expansive conceptualization might diminish its utility as an analytical tool. Instead, I propose that analysing the hydrosocial territory through the lens of the dam's temporality offers a more productive framework for understanding these complex transformations.

4.2 Temporality: The infrastructural lifecycle

> Ghosts define the spaces in-between, living in and arising from broken things, the cracks: between past, present and future; between here and there, between material and imaginary (Aalders, 2020).

The initial point of departure for this dissertation project was an engagement with ghost projects; projects that have been in planning for decades, looming over regions in an indefinite state of vision and abandonment, but ultimately never materialising. As the above quote suggests, working on ghost projects is inherently an engagement with the temporality of infrastructure. It disrupts notions of linear infrastructure development that seamlessly moves from vision to plan, from plan to construction, and from construction to operation, where it will remain for all eternity.

Over the last 20 years or so, scholars from critical infrastructure studies, STS and related sub-disciplines have broadened our understanding of infrastructure (as briefly outlined in section 2). I draw heavily on this strand of literature in this dissertation and in the articles that form the core of this dissertation. The notions developed in the broader literature on infrastructure temporalities are immensely helpful in analysing the hidden aspects of infrastructure politics and the impacts that are unseen, or made unseen, by those who develop, finance, construct or benefit from infrastructure. However, when working with infrastructural temporalities in political ecology, a normative approach to the study of power, inequalities and marginalisation, I am convinced that the intellectual effort to disrupt our thinking of time around infrastructures and detach the study of infrastructure from the infrastructural lifecycle can dilute concrete analysis and even become an obstacle (see Rieber, Kioko, & Aalders, 2025). In this subsection, I would therefore like to briefly explore the fine line between the linearity and fluidity of time in the context of infrastructure development. I believe this approach is not a critique but a refinement of the argument for specific cases.

When Appel et al. (2018) in their pivotal work on infrastructure temporalities and the promise of infrastructure investigate 'both across and even within the different phases of infrastructure's life span—design, financing, construction, completion, maintenance, repair, breakdown, obsolescence, ruin— [...] the operation of multiple temporalities and trajectories', they emphasise a protean nature of infrastructure and highlight that not all infrastructure development goes as planned. This is no point for contention when the starting point for research is a ghost project. They go on to discuss how once a project is completed, it is always changing, maintained, decaying or

repurposed (see also Greven, 2023; Ramakrishnan, O'Reilly, & Budds, 2021). I believe this is a perspective that can help to research infrastructure from a lifecycle perspective, it is a perspective that we apply most easily after something has happened, after infrastructure has not materialized, broken, decayed etc. However, when we focus on the anticipation of infrastructure or projects in their early stages, such as ghost projects, dams in planning or dams under construction, the protean perspective can blur important distinctions between lifecycles. This is particularly evident in the case of dam developments. In the planning stages, displacement is often a contentious issue, with those facing potential resettlement bearing the greatest negative impacts of the project. However, once construction begins (a moment that is often difficult to pinpoint) the dynamics shift significantly. The groups contesting and negotiating the project, and those bearing the burden of construction, are changing completely, complicating our understanding of who is affected and how. Therefore, while a lifecycle perspective on infrastructure is useful, researchers must be careful not to overlook the different impacts and shifts that occur at different stages of development. This is particularly important when studying infrastructure in the early stages of development, where the material impacts and affected communities may change dramatically as the project progresses.

Determining the precise moment when a project shifts from planning to construction is extremely difficult, and perhaps not particularly relevant. These stages are often blurred and overlapping, but from a broader perspective there remains a significant period of time when not only researchers but, more importantly, those affected or involved in the project perceive the phase as singular and not as something that overlaps or constantly connects to other stages. Unless our focus is specifically on the transition between design and construction, a more pragmatic approach seems appropriate.

This raises a broader question, often controversial in academia: should we adopt the categories set by practitioners, developers and politicians, or should we challenge them explicitly? In the context of dam development, where dominant actors commonly use categories such as planning, construction and operation, do we as researchers follow these distinctions or do we critique and redefine them? I argue that the object of our research should ultimately determine the categories used to study it. Larkin's (2013) 'poetics of infrastructure' highlights that it is not just about what infrastructure does or will do, but also what future it portrays. In researching the promise of infrastructure at the time it is promised, it is crucial to work with the categories set by developers, financiers and politicians, as some promises are not only about the completed project but specifically about the construction phase, particularly when having to secure support from those most affected to get the construction under way. Exploring the deliberate misuse of political promises requires an examination of what has been promised for what stage. By engaging with the linearity of the infrastructural promise, focused on linear phases of infrastructure development, we have shown how the linear infrastructural promise is trapped in the temporality of infrastructure, and how it

crumbles when linearity begins to stutter (e.g. halted construction works). In this dissertation, my engagement with the temporality of infrastructure operates as a tuned limbo between the protean nature and its imposed linearity. What is particularly striking is that, for developers and politicians, irregularities in infrastructure development are not something to be openly acknowledged. Instead, infrastructural promises are upheld within a 'logic of improvement' (Braun, 2020), even when their fragility is easily exposed to onlookers and affected communities. This performative dimension can be understood as *future-faking* in *future-making*.

4.3. Performativity: Future-faking and the promise of infrastructure

In the first article of this cumulative dissertation, *Political arenas of infrastructure development*, Detlef Müller-Mahn and I examine how strategic alliances, particularly those challenging dominant actors, employ performative tactics to make their voices heard in the political arena. By overstating their position and assertively making claims, these actors engage in forms of contentious politics (Lind, Okenwa, & Scoones, 2020; Tilly, 2008) that shape infrastructure contestation during its planning stages. However, performativity in dam development is not limited to opposition groups. Developers and governments also engage in strategic exaggeration, projecting grand narratives about the future in order to secure public support. This performative practice of faking the future highlights the often inherently deceptive dimensions of infrastructure development. By exaggerating promises of prosperity and progress, actors tend to create dreamscapes of modernity (Jasanoff & Kim, 2015; Müller-Mahn, 2020; Müller-Mahn, Mkutu, & Kioko, 2021), reinforcing the political and affective dimensions of material infrastructures. While this is a common practice and often even necessary to get a project going, it runs the risk of causing immense harm at a later stage.

Future-faking is a term used in popular psychology[4] to describe narcissistic manipulation, where a person makes big promises about the future in order to gain trust and control from another person (Greenberg, 2021). It is a commonly discussed behaviour of people in the early stages of dating or relationships. These promises are often about shared plans and a shared future, creating a sense of security and hope in the other person. However, the key feature of future-faking is that these promises rarely, if ever, come true. The future-faker uses them as a tool to manipulate emotions, maintain power in relationships or avoid accountability. At first glance, this may seem unrelated to infrastructure. However, unpacking the political performances in infrastructural politics reveals striking similarities, inherent to infrastructure development. In the following, I describe the narcissistic nature of infrastructure

[4] While this behaviour is studied in academic psychology under different terms, I will refrain from citing specific academic literature, as a full understanding of the field is beyond my training. In this section, I use the popular term future-faking because its terminology parallels future-making.

development and how a toxic relationship has been normalised over decades of building large infrastructure around the world.

As we know from research on infrastructure built in the 20th and 21st centuries, large projects around the world tend to overrun in cost and time, while underperforming in what was originally planned (Flyvbjerg & Gardner, 2023; Flyvbjerg, Skamris Holm, & Buhl, 2003). Hydropower dams are particularly prone to this, with an average cost overrun of 70.6% and time overrun of 63.7%, or in other words, typically taking more than 3.5 years longer than what was planned (or promised) (Sovacool, Gilbert, & Nugent, 2014). The key question is this: if cost and time overruns on major infrastructure projects have been a persistent problem for decades, why do we continue to underestimate them in the 21st century? High-profile examples such as China's Three Gorges Dam, Germany's Berlin Brandenburg Airport and California's unfinished high-speed rail project are merely prominent examples of a wider ongoing problem. While poor management (Adam, Josephson, & Lindahl, 2017; Asiedu & Adaku, 2019) is often cited as explanations, the fundamental problem lies in the incentives of project developers and politicians. There is little motivation to fully account for potential overruns because lower initial cost estimates increase the likelihood that a project will be approved (Flyvbjerg, Holm, & Buhl, 2002).

> Cost underestimation and benefit overestimation are used strategically to make projects appear less expensive and more beneficial than they really are in order to gain approval from decision-makers to build them. Such behaviour best explains why inaccuracy is so consistent over time (Flyvbjerg, 2008, pp. 130–131)

Consequently, in democratic systems, where public tenders are usually awarded to the lowest bidder, the contract is often awarded to the bidder who underestimates costs the most, making overruns almost inevitable. After solid data of almost 100 years of large-infrastructure constructions and their overruns in 9 out of 10 cases (Flyvbjerg et al., 2003; Sovacool et al., 2014), we can safely conclude that this is a performative practice that has been normalised and one that is not penalized. A culture of prioritizing project initiation, often justified as necessary to 'get things moving', has contributed to a pattern where infrastructure projects advance to a point where cancellation is no longer a viable option. Legally, this approach may raise few objections, but democratically, it undermines public trust in institutions. From an ethical perspective, and particularly within a political ecology framework that examines social and environmental costs rather than perceived collective benefits, this practice needs to be actively challenged to ensure greater transparency, accountability and equity in infrastructure decision-making.

To put this in the context of performativity and future-faking: Infrastructure developers promise a future that they know will almost never happen. But as long as the other side buys into that future - in our case, the general public (sometimes those affected by the project have a constitutional right to object and therefore need to be convinced) - this seems like a negligible problem. Once the facts have been established

on the ground in large projects, it is almost impossible to turn back when cost overruns become more and more apparent. This form of faking the future can be a deeply violent one. Promising to complete a project in a certain time and within a certain budget, only to waste taxpayers' money and expose whole regions to the burden of living near a dam construction site, has very material consequences for lives and livelihoods. Furthermore, people are actively engaged in the future that was promised before the project, investing and planning for that future. The deliberate misinformation of those who, in the case of dams, are already very likely to be on the side of those who bear the burden of a (once again promised) social good, is a clear form of infrastructural violence (Rodgers & O'Neill, 2012) that is more or less repeated with every large-scale project.

In this aspect of future-faking, I would argue that we can uncover another layer of material and immaterial effects that only run parallel to the immaterial and material effects of the dam itself. While many affected people are equipped, or claim to be equipped in the interviews we conducted, to deal with the material and immaterial effects of the dam, I would argue that it is difficult for anyone to anticipate the effects of future-faking. A key component of future-faking in infrastructure is for developers to keep the promise and deny for as long as possible that the promise will not be fulfilled. Not only is the future faked at the outset, but any changes to project implementation schedules, for example, are repeatedly denied until the last second. Time extensions are then underestimated, faked as it were, only to be overrun again. The chaos this causes in the lives of those affected by or involved in the project is therefore not caused by the infrastructure artefact, but by the inherent deception of infrastructure politics. This deception through future-faking has a direct impact on the hydrosocial territory and territory-making. While the hydrosocial territory begins to form through visions, imaginaries and anticipations even before infrastructure materialises, future-faking adds another layer of complexity by introducing deliberately misleading visions of spatial transformation. At the same time, developers continuously attempt to maintain the illusion of linear progress in the implementation process, even as projects face delays and complications. This staged linearity serves to obscure the actual protean nature of infrastructure development that emerges in practice.

Therefore, the three dimensions - spatiality (hydrosocial territories), temporality (infrastructure lifecycles) and performativity (future-faking) - fundamentally inform and relate to each other in ways that deepen our understanding of infrastructure materialities and immaterialities.

5 Methodology, positionality and research sites

In this section, I outline my field sites, research design and methods. My empirical approach is grounded in political ecology, drawing on critical realism while incorporating insights from social constructivism. Building on approaches to material hybridity such as Swyngedouw (1999) or Ingold (2011), I understand the material conditions and generative mechanisms of infrastructure that shape social interaction with its environment, while adding an understanding of the social meaning of infrastructure as rooted in power relations and discourse.

This has in a way become a struggle but also a philosophy for me that is reflected in both this framework to my dissertation as well as in the articles at the core of this cumulative work. With a certain amount of frustration and puzzlement, I fought my way through a strand of literature that saw infrastructure as everything but its actual material structure. And through the struggle with these ideas around the infrastructural turn, through the frustration, and only after analysing my own data, I realised how much I myself had been drawing from this discussion. A discussion that I perceive today as critical and fruitful. Yet I still believe that if we understand political ecology not only as an academic and intellectual practice, but also as a normative struggle for justice, we cannot detach our writing entirely or too far from the primarily very material consequences of infrastructure and its material presence and from the way infrastructure is perceived by those we work with and those we critique.

While political arenas are conceptualized by Detlef Müller-Mahn and myself (2024) as socially constructed spaces of contestation, we emphasize that the project has (material) effects on the ground, even when that infrastructure exists only as a future possibility. Moreover, my engagement with futures studies and future-making approaches – conceptualizing the future as open and shaped by what is perceived as desirable, possible, and probable – highlights the importance of material power as a key determinant, given that its consequences are or can become imminent. This is again reflected in the conceptual engagement with hydrosocial territories, encompassing both discursive as well as material and spatial perspectives (Rieber & Nyaga, 2025). It is within the overarching framework of the Collaborative Research Centre that these ideas converge. Our work engages with the making of the future (Appadurai, 2013), viewing many of our empirical cases as large developmental promises or 'dreamscapes of modernity' (Jasanoff & Kim, 2015), driven by imagined futures (Beckert, 2016). This connection between the socially constructed and the material is further illustrated by showing how imagined futures lead to anticipatory actions (see also Cross, 2015a on the economy of anticipation).

5.1. Field Sites

The selected field sites are located in semi-arid areas near the geographical centre of Kenya. While my fieldwork spanned three different river basins, the dams are all situated within a radius of less than 150 km. With the exception of the Crocodile Jaw Dam, they share comparable agro-ecological characteristics and livelihood systems around their sites.

Figure 5: Location of the case study dams

1) Crocodile Jaw Dam in the Ewaso Ng'iro Basin

The Crocodile Jaw Dam project was chosen as a prime example of a ghost project, as it remains a rough vision, never moving beyond the planning stage for decades. Initial ideas for the dam date back to the colonial administration (Gibb, 1949). The site is located at the Crocodile Jaw rock formation, north-west from Mount Kenya, on the border between Laikipia and Isiolo Counties in the Upper Ewaso Ng'iro Basin, just before the semi-arid area changes to arid lands. The region is characterised by a large number of public and private conservancies, as well as a number of different pastoralist groups that inhabit the land and depend on the river or its tributaries for their livelihoods.

2) High Grand Falls Dam on Tana River

The proposed site for the High Grand Falls Dam is located at Kibuuka Falls, on the border of Tharaka-Nithi and Kitui Counties, in a semi-arid area east of Mount Kenya.

The project was included in the study because, like the Crocodile Jaw Dam, it has been in the planning stages for decades without materializing. However, this project is a top priority in the infrastructure politics of the current government. Just as our research project began data collection in Kenya and Tanzania, the Kenyan government secured a financing deal for the dam. This created an opportunistic moment to connect our conceptual engagement around ghost projects to the dam's imminent construction. The case provided an opportunity to examine the long history of the project, while also observing contemporary hydropolitics in Kenya, the promises associated with the project, its role within broader development visions, and how affected communities are preparing for displacement.

3) Masinga Dam and Kiambere Dam on Tana River

The High Grand Falls Dam is a proposed extension of the Seven Forks Dam cascade, which was built on Tana River – Kenya's longest and largest river – between the 1960s and 1980s. The two largest of the five operating dams are Masinga Dam, the first in the cascade, and Kiambere Dam, the last in the cascade to date. These dams are located approximately 50 km and 25 km upstream, respectively, from the proposed High Grand Falls Dam.

As part of a longitudinal perspective to a qualitative approach to researching the High Grand Falls Dam, we sought to understand past developments along the Tana River to explore how historical experiences in the region shape current anticipations surrounding the project, which led to the inclusion of the two dams into the research design. While this objective was certainly achieved, the research also revealed that the developments around Masinga and Kiambere Dams were not merely historical events but remain sites of active contestation even 30 to 40 years after their construction. These findings were incorporated into the publication in section 7.4 of this dissertation and contributed to a broader dam lifecycle perspective when combining the findings of the field sites together.

4) Thwake Dam on Athi River

To contribute to a lifecycle perspective, the research design incorporated Thwake Dam. Thwake Dam has been under construction by the Chinese Gezhouba Group since 2018 but has faced multiple delays. It is being built just after the confluence of the Thwake and Athi Rivers in the Athi River Basin, on the border of Machakos and Kitui Counties. This dam was also included because like the High Grand Falls Dam, carries a wide-ranging infrastructural promise and is intended as a multi-purpose dam. The Thwake Dam is the envisaged water provider for the development of the planned Konza Technopolis, the proclaimed *Silicon Savannah*,

an IT and start-up hub south of Nairobi, about 75 kilometres west of the Thwake Dam.

5.2. Research design and methods

Leaning on the project proposal in Section 2 and the initial research on ghost projects, the methodology needed to be both explorative – as *hunting ghosts* is rarely found in human geography method handbooks – and embedded in a longitudinal approach. After an initial *travelling workshop* with the project team I started my research in the county capitals around the Crocodile Jaw Dam. There, I realized quickly that while expert interviews provided some information, ghosts remain elusive and leave minimal tangible research data that can easily be produced in government offices or by simply scanning media and development reports.

Temporality

A more successful approach emerged by stepping back and examining the dam's extensive planning history. Conducting three weeks of archival research in the National Archives of Kenya and online repositories, I thoroughly scanned planning files and government reports from the colonial period to the 1970s. With my training as a geographer, this became an incredibly fun endeavor of trial and error, though it left me wondering how much more historians might have uncovered. The ultimately relevant sources were limited, but their quality and insights proved invaluable, not just for the first empirical case, but for understanding hydropolitics and infrastructure politics during the colonial and post-colonial eras.

This archival research significantly contributed to three of the five core articles in this cumulative dissertation. The second aim for a longitudinal approach was by including oral history in open interviews with elders in locations directly adjacent to the proposed site of the Crocodile Jaw Dam. This admittedly was extremely important for a broader understanding of the area and historic dynamics related to land-use and livelihood systems change but only to a limited extent relating to the ghost project itself. While almost all respondents were aware of the project, for many its presence as a dominating vision over the area was rather young.

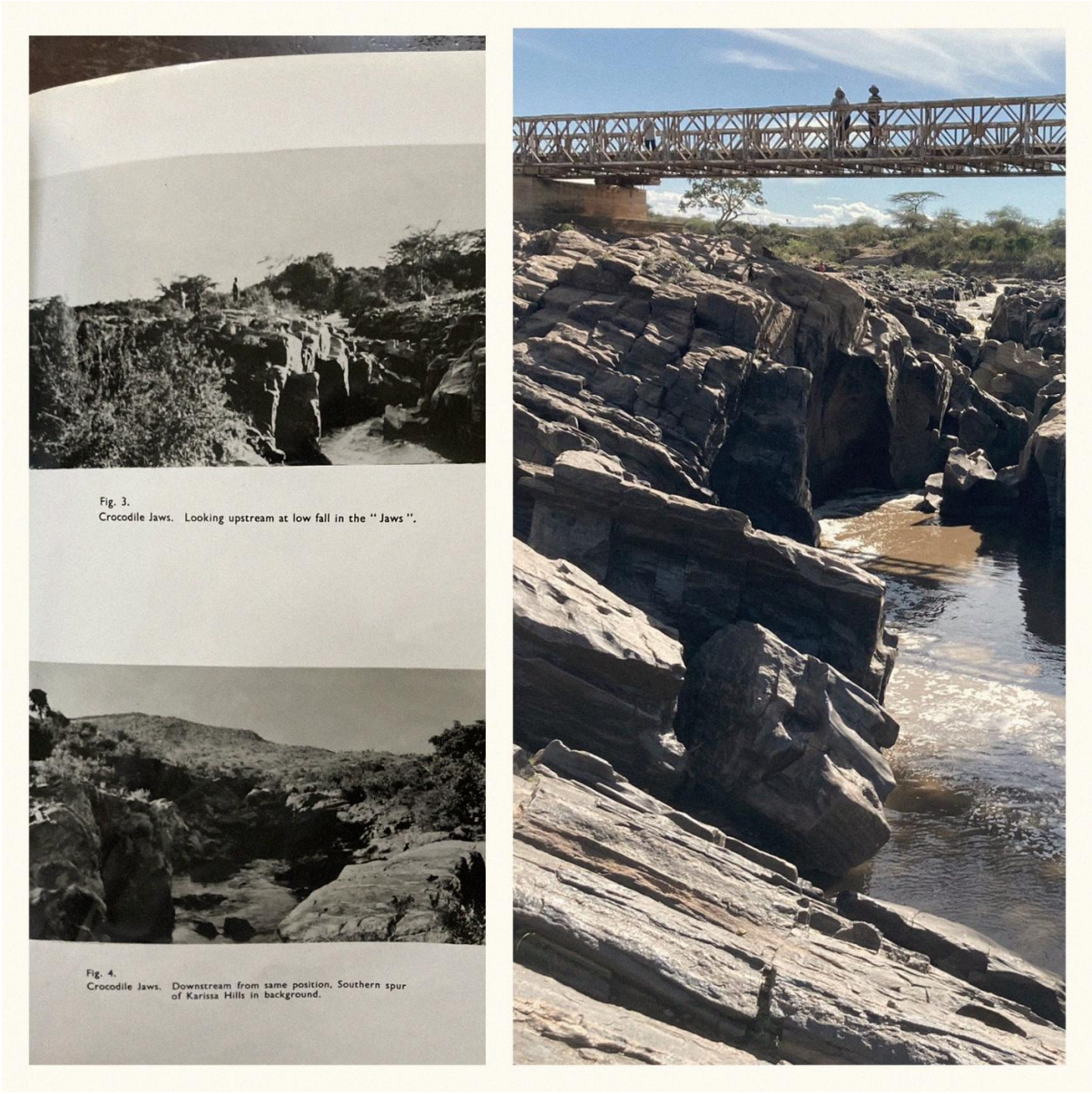

Figure 6: The Crocodile Jaw rock formation in an archival file (left) (Gibb 1949) and today (right) (source: author)

Spatiality

The research approach shifted from exploring the *ghost* nature of dams to focusing on the visions and anticipations surrounding the dam project. As many felt that the dam had lost its topicality, the interviews aimed to understand retrospectively the anticipations that were prevalent during the period of intense contestation, some 5-10 years prior to the 2022-2023 data collection. As the contestation of the project emerged well beyond the actual proposed construction site, a 'travelling-the-river' approach (see Barnes, 2014) was developed and conducted, starting with semi-structured interviews of river resource users upstream of the dam, all the way downstream before the next major tributary would meet the river. This would cover the area most affected by damming the river.

This overall approach using a temporal qualitative methodology was also applied to the High Grand Falls Dam case study. However, the 'travelling the river' approach focused

more on the upstream areas, up to the Masinga Dam, rather than the downstream areas, which consist for a long part of Meru and Kora National Parks.

Temporality, Spatiality and Performativity

Together with my colleague and project member Theo Aalders, we also incorporated participatory visual methods (Aalders, Moraa, Oluoch-Olunya, & Muli, 2020; McNally, 2024) to explore the future and the anticipations of people in areas affected by potential displacement. This approach, in which participants visualise both the current situation and their aspirations for the future, aims to better integrate local knowledge (Johansson & Isgren, 2017), understand the values held by the people, and identify priorities, concerns and positive perceptions for the future.

Figure 7: Photographs of collaborative landscape paintings of the present and future HGF (Artwork by Patrick Mukabi)

In the workshops, we as organisers would at some point condition the future as one with a dam. This helped structure discussions that were often elusive and vague.

Through collaborative art, we established a foundation for shared dialogue. The group discussions, in turn, generated transcripts, and thus data, that could be analysed, capturing perspectives of participants on a highly sensitive and emotional topic: displacement.

All of the above and the many semi-structured interviews (Hammett, Twyman, & Graham, 2014) with those affected by dam developments was coupled with interviews with public officials, CSO representatives, private sector experts and politicians on local and sub-county levels as well as in the county capitals in Nanyuki, Isiolo, Embu, Wote and Kenya's capital Nairobi. A total of **126 interviews** and two focus group discussions (with the additional two focus groups during the art workshops) were conducted across all field sites.

The majority of interviews were recorded and transcribed, with the exception of about 25 interviews conducted during my early fieldwork at the Crocodile Jaw Dam, where the cost of compensating qualified translators for both transcription and translation from Maa and Samburu into English would have exceeded the available budget (and a reasonable cost/benefit ratio). For the analysis of these interviews, field notes were used. All notes and transcripts were inductively and deductively coded (Saldaña, 2013), using MaxQDA, and the dataset was subsequently enriched with archival material, government reports, and media reports.

5.3. Ethics, positionality and the etic perspective

Since 2018, I have visited Kenya five times and conducted over a year of fieldwork across three projects, mostly in the wider Mt. Kenya region. Despite this, I have never felt remotely close to adopting an emic perspective. There is considerable debate about the precise meaning of emic and etic perspectives (Headland, Pike, & Harris, 1990; Markee, 2012) and whether they should refer to objectivity/subjectivity, internal/external or themes around language. Here, I use etic to describe a perspective that does not seek to adopt an insider's view on social and cultural dynamics. I do not attempt to become part of what I study, although I acknowledge that my presence inevitably influences the research context. The perceived distance between me and the hundreds of people I have interviewed – who were of different roles, genders, professions, economic and social statuses, or belonged to different age groups in Kenyan society – has almost always felt too great for me to adopt any kind of insider position, regardless of the interview locations – sometimes in high-end hotels, sometimes standing in the sun on the side of the road.

From the very beginning, already during the first weeks of my Master's project and my first extended experience of fieldwork, I realised that I would never feel comfortable aiming for an insider's perspective. At the same time, I felt that the people I interviewed understood the interview situation as a structured and planned exchange with an external expert – not necessarily someone who already had expertise, but someone who wanted to develop it. When I introduced myself as an undergraduate or, more

recently, a PhD student, I was often met with surprise, as students in Kenya tend to be much younger, and my age was often estimated higher than it already was. My limited knowledge of Kiembu and my very basic knowledge of Kiswahili certainly contributed to this perception, but they were not the only factors.

Through continued exchange with my research environment, I came to focus on developing and embracing an etic perspective while maintaining ongoing dialogue and reflection with emic viewpoints. I now see this as both a strength and a necessity in cross-cultural research. For me, this means working at all times with research partners who are familiar with the context. Not only would my research take significantly longer without them, since research partners often serve as gatekeepers who use their networks to connect the researcher with interviewees, but they also translate much more than just language. Particularly in the social sciences, where we analyse not only what is said but also how it is said and in what context, including the metaphors used or the parallels drawn by respondents, a reflexive process following interviews or field observations is crucial. In my research process, hypotheses or initial conclusions often emerged between interviews or during travel to and from interview locations rather than during the interviews themselves. Conversations with research partners often provided crucial context that enriched the findings.

This approach meant that my work had limited independence and was largely a collaborative effort in the field. This was particularly true during my fieldwork in Laikipia and Isiolo counties, where trust between me and my research partners became increasingly important. At the time, the region was experiencing food insecurity, armed conflict, banditry and security operations by the Kenyan armed forces – operations that were sometimes as dangerous as the threats they were trying to counter. I came to realise, however, that trust was crucial not only for the logistical aspects of fieldwork, but also for creating the basis for intellectual exchange and reflection within the research team. In cases where I struggled to develop strong working relationships with research assistants, I tended to look for alternative research sites, feeling that the lack of trust compromised the quality of the research itself.

Reflecting on my research process over the past three years inevitably raises questions about coloniality and power imbalances within an academic system dominated by northern institutions and their staff (Guma, Akello, & Ndlovu-Gatsheni, 2023). I often asked myself why I was doing this kind of research in rural Kenya when I had rarely, if ever, seen Kenyan students doing research in rural Germany (or I myself not having any experience of doing research in my own country). I have never found a fully satisfactory answer to this question, except to conclude (and in a way escape the dilemma) that in a fairer world more researchers from the South would be studying socio-political phenomena in the North.

Being part of a Collaborative Research Centre that focuses on African contexts addresses these imbalances to some extent by providing opportunities for researchers from the African continent, enabling exchange between students, offering translocal learning opportunities and thus fostering institutional links between the German

academic system and its counterparts in partner countries. However, given the way research is funded in the Global North, such initiatives ultimately cannot address the deeper structural issues at play (Guma et al., 2023).

In addition to the broader reflections on the research context, my research touched on ethical issues in two ways, namely researching the anticipation of a traumatic experience (i.e. displacement) and changing the anticipation of the future through our sole presence. In particular, but not exclusively, the research at the three field sites along the Tana River placed me and my colleagues in ethical challenges and our interviewees in potentially emotionally distressing situations. When we approached the proposed High Grand Falls project, we did so primarily to explore how people would anticipate their own displacement. With our methods and research design, this would automatically mean running through different, potentially distressing scenarios with our research participants in interviews as well as in our collaborative art workshops. As with many things, there are no bulletproof strategies for approaching sensitive issues, but as interviewers we have a great responsibility to adapt to the respondent (see Pascoe Leahy, 2022). We justify the possibility of emotional distress on the part of respondents by the fact that we are working towards a bigger picture, and this needs to be communicated to individuals (*ibid*.). However, it is also the interviewer's responsibility to balance the bigger picture with the emotions expressed by respondents. In our research, individuals reacted in very different ways, with many understanding displacement as a distant possibility, which made the research setting easier from an ethical point of view. However, in individual cases and during the collaborative art workshops, it could be felt that visualising a possible future could also make certain scenarios much more real.

The fact that we were changing the situation by our mere presence was not something that could be mitigated by the research team, but rather an important effort to take into account. By the time we arrived at the proposed High Grand Falls Dam site, the dam project had been in the news, but no construction company or anything related to it had been seen in the area. Now that we were foreigners in the area, and apparently visiting the proposed site itself, people not only noticed the media reports, but also that outsiders were coming. This spread the word that the first people were doing preparatory work around the site and interviewing people. Of course, our role as researchers with no connection to the dam developers was not clear to people who had not been directly involved with us. However, this increased the need for us to clarify our roles wherever we were in direct exchange with people in the region.

As Eriksson Baaz and Utas (2019) so unsparingly put it, even after a great deal of reflection on positionality, it is still the researcher from the North (in this case me) who is at the centre of the research process at the end of it (in this case my dissertation). And yet, without the labour of brokers, the research would not only be of significantly lower quality (even if the broker did not contribute a single written word to the final product), but in many cases would not have taken place at all. As they and others argue, we need to move beyond the systematic silencing of assistants (Turner, 2010) and the

outdated image of the Northern researcher as a 'lone-gun' (Bloor, Fincham, & Sampson, 2010) navigating foreign research contexts on his/her own.

At the risk of concluding the positionality section by putting my own role in a more favourable light, I would like to emphasise and make transparent the importance of teamwork and active collaboration. I do not believe that this in any way diminishes my academic credentials. A dissertation, in my very personal view is not of higher quality because the research was carried out alone or collaboratively. For me personally, no fieldwork in my academic has been taken entirely on my own. All of my research projects have been, to varying degrees, team efforts, both in terms of preparing for and carrying out fieldwork. I have always tried to use the limited funding provided by the host institutions (or, in the case of my Masters project, by a German NGO) to establish long-term collaborations and affiliations with academic institutions in Kenya. While this has not always been fully successful, I have been able to co-author academic outputs with those most closely involved in my data collection efforts and am aware of opportunities that arose elsewhere for members of my research projects. These collaborations, in one case dating back to 2018, have enriched my career development and have shaped work that is presented in this cumulative dissertation. It also connects and contributes to a very controversial issue in social science research: dissemination and travelling back to disseminate findings. In a context where the work is a collaborative effort of researchers with an etic and an emic perspective, 'experts', I would argue, do not need to travel back to disseminate, but dissemination can come from within.

6 Overview of the articles of this cumulative dissertation

The four articles and the book chapter presented in section 7 of this dissertation are linked in a number of ways. First, they all contribute to at least one of the work packages outlined in the project proposal of the C03 project of the CRC Future Rural Africa. They are conceptually connected in that they all work closely with a temporality perspective on infrastructure and follow a normative approach: all of them, some to a greater extent, some to a lesser extent, expose power dynamics and forms of marginalisation at the expense of those directly affected by dam development. This normative approach, however, is not strongly rooted in an activist idea of research, but merely aims to expose the abuse of power or the irresponsible use of power.

Furthermore, this dissertation follows dam projects in relatively close geographical proximity through their lifecycles. While the projects are not comparable, they do allow for an examination of how Kenyan hydropolitics unfolds around the dams in their various stages of infrastructure development at this moment in time, and the visions and promises that surround them. The three field sites on the Tana River also revealed how some of these projects at different stages are linked and how they inform the contestation and negotiations around them.

Conceptually, the publications aimed at concept building or concept testing, with all of them having a strong empirical grounding, as shown in the table below. The categorisations are certainly open to contestation, as all the articles aimed to some degree of concept building or testing.

	Concept-building	*Concept-testing*	*Empirical*
Article 7.1	✓		✓
Article 7.2		✓	✓
Article 7.3	✓		✓
Article 7.4		✓	✓
Article 7.5		✓	✓

Table 2: Article types in the dissertation

In brief, the first article 7.1. on political arenas of infrastructure development (Rieber & Müller-Mahn, 2024) is a conceptual contribution that aims to reinvigorate the arena concept (Bierschenk, 1988; Bierschenk et al., 1993) as already foreseen in the projects' initial proposal. The article develops the concept of political arenas as sites of future-making in the context of large-scale infrastructure projects. It also engages with concepts of contentious politics and performativity (Lind et al., 2020; Tilly, 2008) by showing how the key stakeholders in the arena make claims that not necessarily reflect the individual positions of those they represent. This claim-making strategy aims to

have a strong negotiating position in order to be heard and to achieve a minimum outcome.

Article 7.2., 'Displaced Futures or Futures in Displacement' (Rieber, Aalders, et al., 2025) extends the engagement with dam projects that have been in the planning for decades. By researching the anticipation of displacement, we investigate infrastructure temporalities and show how the current dynamics around the project, both in the preparation for displacement and in the land market – a key issue in displacement – are shaped by the past, present and future. In this article, we engage directly with the CRC's key concept of future-making by drawing on Appadurai's (2004, 2013) work on the capacity to aspire and Cross' economy of anticipation (2015a). By adapting the term to a *capacity to anticipate*, we introduce a category into infrastructure studies to assess how people are able to anticipate the *big blow* of being negatively affected by displacement. This category further highlights a difficulty in future studies and studies of anticipation. In the context of infrastructure – with its tradition to not always materialise as planned or promised – translating anticipation into action might not always be the most rationale choice for those affected.

Article 7.3., 'Non-economy of anticipation' (Rieber, Kioko, et al., 2025) and 7.4. 'Claim-making in hydrosocial spaces' (Rieber & Nyaga, 2025) both deal with the negative effects of dam developments partly apart from their actual materiality. In 7.3., we show how, at the time of construction, the initially grand promises of what the dam would bring crumble, and those affected and those who bought into these promises are driven into a state of apathy. With no credible political response and a future suddenly filled not with prosperous infrastructure but with uncertainty, action and investment in the future are halted. In 7.4., we re-engage with the long temporality of displacement, this time not in anticipation, but decades after its occurrence. It is a case where through the connection to its initial planning and construction we understand the case as part of researching *infrastructuring*, the 'attending to activities of organizing, managing, and knowing heterogeneous relations, at once natural and cultural, material and social, and scientific and political' (Blok, Nakazora, & Winthereik, 2016, p. 3), even where infrastructure has been operational for decades.

The article demonstrates how people have adapted their lives to the dam and its reservoir, while also revealing how political elites exploit the displacement process to strip communities of their rights to the land and water they inhabit and use. By working with the concept of time-knots (Carse & Kneas, 2019), we illustrate how claims to land and water are rooted in different historical phases or moments and how elites selectively interpret these historical developments to justify denying rights to certain groups.

Finally, the book chapter in 7.5. 'Conditional futures of infrastructure' is a strong empirical engagement with the anticipations (once held) around the Crocodile Jaw Dam and in the downstream areas. By developing the notion of 'conditional futures', the chapter shows that affected people often do not reject large-scale infrastructure problems outright, but – regardless of whether this is sought by the developers – make

their consent conditional, e.g. on the provision of water or other ancillary infrastructure (see Greiner & Klagge, 2024). The chapter aims to contribute to the discourses on contentious politics (Lind et al., 2020), by showing how individual responses sometimes diverge sharply from the political representation of interest groups, and the chapter aims to contribute to work discussing how community consent to large projects can be achieved in a more equitable way.

7 Publications

7.1 Political arenas of infrastructure development – the case of a dam project in Kenya

Arne Rieber & Detlef Müller-Mahn
Published in *Review of Regional Research* in 2024

Journal Citation:
Rieber, A., Müller-Mahn, D. Political arenas of infrastructure development—the case of a dam project in Kenya. *Rev Reg Res* (2024). https://doi.org/10.1007/s10037-024-00219-7

The co-author and supervisor has given permission to this work being used as part of my cumulative dissertation project.

The article is open access and can be viewed in the typeset version using the link above. I contributed approximately 50% of the work that led to the production of the article. The citation style is adapted to the guidelines of the journal, so that the version directly reflects the published version. The reference list of the subsection refers only to citations within the publication.

Political arenas of infrastructure development—the case of a dam project in Kenya

Arne Rieber, Detlef Müller-Mahn

Abstract
State-led infrastructure development plays an increasingly important role in social transformation, especially in the Global South, which is also pushing the topic on research agendas in the social sciences in general and in development geography in particular. However, large infrastructure projects are often not completed as originally planned, and they may even end before implementation. This raises the question of how infrastructure and social transformation are related, especially if plans do not materialize. The paper presents an empirical approach to capturing the co-evolution of these two spheres of change in terms of a 'political arena of infrastructure development'. The arena is defined as a socially constructed space of contestation and strategic collaboration at an intermediate scale, characterized by a specific composition of temporality, spatiality, and performativity. Its focal point is the infrastructure development project, which characterizes the arena as a site of future-making. By conceptualizing the co-evolution of infrastructure and society in terms of a political arena, we highlight the contestation and strategic alliances of infrastructural futures. The concept offers insights into the contentious politics of infrastructure development, resource conflicts and land-use interventions from a political ecology perspective. We apply the concept to the case of the Crocodile Jaw Dam project in Kenya, which was repeatedly proposed in development plans, but has never materialized to date. Serving as a heuristic, the concept of political arenas of infrastructure development guides the research process, helping to identify key topics and dynamics within the socio-political landscape of infrastructure projects.

Keywords: Political Arena, Dams, Political Ecology, Strategic Alliances, Infrastructure

Zusammenfassung
Staatlich gelenkter Ausbau von Infrastrukturen spielt eine zunehmend wichtige Rolle in der gesellschaftlichen Transformation, insbesondere im Globalen Süden, was das Thema in den Fokus der Sozialwissenschaften und speziell auch der Entwicklungsgeographie rückt. Große Infrastrukturprojekte werden vielfach nicht wie ursprünglich geplant umgesetzt oder schon vor der Fertigstellung aufgegeben. Dies wirft die Frage auf, wie Infrastruktur und sozialer Wandel zusammenhängen, insbesondere wenn Pläne nicht realisiert werden. Der Beitrag entwirft einen empirischen Ansatz zur Erfassung der Ko-Evolution dieser beiden Sphären des Wandels im Sinne einer „politischen Arena der Infrastrukturentwicklung". Wir verstehen die Arena als einen sozial konstruierte Raum der Auseinandersetzung und

der strategischen Zusammenarbeit auf einer intermediären Ebene. Kennzeichnend für eine Arena ist eine spezifische Komposition von Zeitlichkeit, Räumlichkeit und Performativität. Im Mittelpunkt steht jeweils ein konkretes Infrastrukturentwicklungsprojekt, das die Arena als einen Ort der Zukunftsbildung charakterisiert. Das Konzept der politischen Arena verknüpft gesellschaftliche und infrastrukturelle Transformationsprozesse in Hinsicht auf infrastrukturelle Zukünfte. Es betont einerseits den Aspekt der Auseinandersetzung und des Streits, andererseits die Bildung strategischer Allianzen. Es adressiert die politische Auseinandersetzung im Kontext von Infrastrukturentwicklung, Ressourcenkonflikten und Landnutzungsinterventionen aus der Perspektive der politischen Ökologie. Wir wenden das Konzept auf das Beispiel des Crocodile Jaw Dammprojekts in Kenia an, das bereits mehrfach Gegen- stand von Entwicklungsplänen war, aber bis heute nicht realisiert werden konnte. Das Konzept der politischen Arenen der Infrastrukturentwicklung dient als Heuristik und leitet den Forschungsprozess, um Schlüsselthemen und Dynamiken innerhalb der sozio-politischen Landschaft von Infrastrukturprojekten zu identifizieren.

Introduction

This article presents a heuristic approach to investigating the political struggles around large infrastructure projects and their contribution to shaping the future. The co-evolution of technology, infrastructure and society has long been at the center of science and technology studies, more recently also with a focus on 'future objects' (Esguerra 2019), 'imagined futures' (Verschraegen 2017), 'dreamscapes of modernity' (Jasanoff and Kim 2015), 'infrastructuring environments' (Blok et al. 2016) and 'future-making' (Appadurai 2013). Yet what happens when the planned infrastructure does *not* materialize has so far attracted little attention. This is astonishing in so far as it is not uncommon that infrastructure projects are delayed or cancelled, so that dreamscapes remain dreams, and futures do not unfold as promised (Müller- Mahn 2020). In this article we argue that future-making nevertheless takes place, i.e., even if projects deviate from what was originally imagined, or are abandoned altogether. As an example, we present the case of a dam project in Northern Kenya, which has been on the political agenda for decades without ever reaching implementation. After more than half a century of planning and contestation, there is little to be seen at the proposed dam site. Nevertheless, the controversies over the dam have had an impact on the adjacent communities. To investigate this complex situation, we propose the concept of a 'political arena', which views infrastructure projects as focal points of contestation between competing groups, leading to the co- evolution of infrastructure and society. The article consists of three main parts after this introduction. First, we conceptualize 'political arena' in terms of temporality, spatiality, and performativity. We argue that the complex phenomenon of the arena becomes empirically accessible through these three dimensions. In a second step, we apply these dimensions to the case of the Crocodile Jaw Dam project in Kenya to illustrate the building of a political arena as a socio-political phenomenon without any physical construction works. In the third step, we draw conclusions from the case study to demonstrate the applicability and limitations of the arena concept as a heuristic tool.

We believe that a better understanding of the political arena of infrastructure development is a timely contribution to the political ecology of land-use change, because infrastructural interventions are high on the agenda of state-led development policies (Apostolopoulou 2021; Enns and Bersaglio 2020; Schindler and Kanai 2021). Particularly important in this context is the comeback of one of the most contested infrastructural artefacts of the last century: 'Dams are back' (Dye 2022, p. 232). The construction of big dams has long been contested because of a number of reasons, including the fact that dam mega-projects are highly susceptible to cost overrun and failure (Flyvbjerg and Gardner 2023). Nevertheless, dams have always been, and continue to be, conspicuous instruments of future-making, because their construction leads to fundamental changes in the hydrology of river basins and the livelihoods of the people living there. Their impact may have long-lasting consequences, possibly for many generations to come (Swyngedouw 2014). They severely interfere with land

rights, environmental justice, and the hydro-social cycle (Linton and Budds 2014; Loftus 2015). But despite these potentially harmful consequences, dams have recently been positively reframed, from problematic obstacles impacting the flow of rivers and people to essential instruments for climate change adaptation and carbon-free electricity production (Cole et al. 2014). The 2030s may well become the decade with the highest number of dams ever built (Zarfl et al. 2015).

This article investigates how large infrastructure projects, even when they remain unrealized, shape social and political relationships. The core research question guiding this study is: How do infrastructure projects that exist primarily on paper influence social transformation and political dynamics? To address this, we explore three sub-questions: (1) Which actors and strategic alliances dominate project planning? (2) How does contestation around infrastructure development influence social transformation at the local level and contest the dominating actors? (3) How are infrastructure development and future-making practices related?

We illustrate the applicability of the concept with the example of the long-planned but unbuilt Crocodile Jaw Dam in Kenya, a project characterised by its long temporality. This project has been the subject of intense public debate, driven by the fierce and performative contestation of strategic groups (performativity) from different regions and across multiple scales (spatiality).

Conceptualizing the political arena of infrastructure development

Even though widely used in academic debates, the metaphor of an arena carries a descriptive and not an analytical meaning. We want to contribute to this by conceptualising political arenas with a broader theoretical underpinning in the context of infrastructure and social change, and with a distinct geographical notion. We define the political arena of infrastructure development as a field of contestation and strategic collaboration at an intermediate scale constituted by (a) an infrastructure project as the object of contestation, (b) a set of actors trying to get hold of the object, (c) strategic alliances between these actors, and (d) the resources and practices they mobilize in the struggle.

Our main initial reference is Bourdieu's theory of practice (Bourdieu 1985; Bourdieu and Wacquant 1992), which inspired geographical research especially through its concepts of 'social space' and 'field' (Dörfler et al. 2003). 'Social space' designates a space constituted by the relations between individual actors or groups. Bourdieu describes social space as a 'space of relationships that is as real as a geographical space, where movements are paid for in work, in efforts and above all in time' (Bourdieu 1985, p. 725). Our conceptualization of the political arena starts from the use of arena metaphors in the social sciences, beginning with social-anthropological studies of rural development in West Africa in the late 1980s (Bierschenk 1988; Bierschenk et al. 1993). The studies explicitly use the term *arena* to denote the power struggles instigated by

development projects among local populations. In these struggles, specific interest groups emerge which skilfully forge new alliances in the competition for the expected project benefits (Bierschenk et al. 1993). Bier- schenk (1988, p. 146) highlights the temporal and purposeful character of these newly formed alliances by calling them 'strategic groups'. Bourdieu's concept of the field was later adopted by Fligstein and McAdam (2011, 2012), who put the focus on strategic action and its impact on society. They define a strategic action field as 'a meso-level social order where actors (who can be individual or collective) interact with knowledge of one another under a set of common understandings about the purposes of the field, the relationships in the field (including who has power and why), and the field's rules' (Fligstein and McAdam, 2011, p. 3). Strategic action fields are, in other words, characterized by a set of actors and their common cause or interest, the rules of the game, and a shared 'interpretive frame that individual and collective strategic actors bring to make sense of what others are doing' (Fligstein and McAdam 2011, pp. 4–5). The dynamic of social transformation, i.e., everything that happens within the field, is largely determined by the power relations and coalitions between actors. Fligstein and McAdam call this practice of target-oriented collaboration 'strategic action', defined as 'the attempt by social actors to create and maintain stable social worlds by securing the cooperation of others' (Fligstein and McAdam 2011, p. 7).

In our approach, we draw from the above-cited authors by acknowledging the relevance of social order and strategic action for the constitution of the field of contestation. We also share the understanding of strategic action fields as socially produced entities shaped by the practices of future-making and social transformation, yet we would argue from the perspective of human geography that the material and spatial aspects are not sufficiently recognized in the sociological definition of strategic action fields. These spatial aspects are, as we suppose, particularly relevant in the context of infrastructure development. That is why we prefer the concept of the political arena to that of the field, because it embraces not only the social relations as in the concept of the field, but also the material aspects and the spatial dimension of infrastructure.

We believe that the concept of the political arena, with its focus on contestations and alliances between actors, is appropriate to capture the socio-political dynamics at the meso-level. The meso-level is particularly suited to examining the broader effects of infrastructure projects—beyond their materiality or materialisation—on the region where they are implemented. In addition, the focus on the political arena scrutinizes how contestation over infrastructure affects both local and national contexts, even when projects remain unrealised. It further shows how meso-level dynamics influence the outcome of the political arena, although ultimately it cannot fully ex- plain why a project is abandoned or implemented. To address these macro-level dynamics, we have to turn to political economy approaches.

Our conceptual approach addresses the articulation between three meso-level dimensions, a temporal, a spatial, and a performative. The temporality, spatiality, and

performativity of infrastructure development jointly constitute a political arena by connecting all actors in the struggle over a specific project of infrastructure development. The arena is filled with life by a specific set of actors, i.e., the players or combatants in the center of the arena, and the spectators. The relationship between the spatial and the performance of the spectacle determines which actors are drawn into the center of contestation, and which remain marginal in the role of spectators. The spatiality and performativity of the spectacle create a distinction between the players within the arena, and the spectators surrounding it. The former are actively engaged in the spectacle, and the latter are watching. However, the spectators are not necessarily passive onlookers, but rather addressees of the performative action within the arena. They are emotionally engaged, supporting their team, and they may even escalate the contest by entering the arena to become actively involved.

Temporality: establishing an arena

The spectacle within the political arena is a temporal phenomenon in so far as its duration is limited, with a beginning and an end. Yet, the duration may be rather blurred and fuzzy. Establishing an arena does not necessarily start with a concrete date, but may also happen through a diffuse process, more in the sense of a gradual evolution, or '… an ambiguous process of becoming' (Lundborg, 2012, p. 3). This process of becoming reaches out into the past and the future, as Lundborg (2012) points out, and it has therefore to be distinguished from an 'historical event' defined by temporal borders that separate the 'before' and 'after' (2012, p. 5).

A second aspect of temporality concerns the way in which infrastructure development creates linkages between the present and the future through extended planning processes, but also through promises that are made and expectations raised among local populations. These linkages are reflected in anticipatory politics, which com- bine contemporary visions and future infrastructural needs (Gupta 2020). In view of all this, infrastructure development can be considered as a tool of future-making aiming at a concrete object like a road or a dam (Appadurai 2013). A political arena emerges when the actors involved in infrastructure projects do not share the same imaginations of 'desirable futures', and disagree over the way forward due to incompatible technocratic visions, development blueprints, local aspirations, and national expectations.

A third aspect of the temporal evolution of arenas is related to the specific role of actors in this process. The evolution and accordingly the dissolution of a political arena are accompanied by the appearance and disappearance of actors on the scene. Actors do not necessarily enter the political arena all at the same time; they may ap- pear and disappear gradually. Information asymmetries and informal networks allow some actors to better prepare for contestation at the center of the arena than others who remain marginal. When actors' priorities shift, implementation may be delayed. When public interest in a proposed project wanes, the arena itself may become void, get

abandoned, or re-emerge over time. The attractiveness of particular pieces of infrastructure may change over time. This is because the 'enchantment' of infrastructure (Harvey and Knox 2012), its role in providing 'beacons of hope' (Müller-Mahn et al. 2021), and its 'logic of improvement' (Braun 2020) serve particular political interests. The arena of infrastructure development may simply fade away when the project comes to an end, i.e., when it ceases to be an object of contention. When financing is secured, resettlement completed, and political support sufficiently guaranteed, some of the leading actors gradually withdraw from the contestation, while others still carry on with protests, sabotage, or forms of 'slow resistance' (Fung and Lamb 2023).

A fourth aspect addresses a political arena that fades as developers withdraw from the scene and the materialization of the project becomes increasingly unrealistic, effectively removing the object of contention. This links back to Lundborg's (2012) concept of becoming, which stretches into both the past and future. A political arena is always shaped by previous contestations, and as it fades—along with its struggles and conflicts—it continues to inform future debates and the formation of new arenas. Therefore, it is worth investigating which futures are undone during the contestation within the arena, and how these contestations affect the likelihood of a project ever materializing. In this context, sustainability becomes important in shaping not only the immediate outcomes of contestation but also the long-term socio-economic and environmental consequences of whether a project materializes or is abandoned.

Spatiality: making place for the arena

The spatial dimension of political arenas of infrastructure development becomes visible in the expansion of the area affected by infrastructure projects, i.e., how the arena is inscribed in space. It is reflected in a socio-spatial order built around an object of contestation at its center, which has a clear geographical location, and a territory around it. This order determines how actors position themselves in the arena, who is attracted towards it, how some of them gain influence, and to what extent others are marginalized or excluded. It is evident that this space is continually reworked, challenged and shaped by the interaction of the actors within and around the arena. Drawing from Massey (2005) and Lefebvre (1991), the 'political arena' can be understood as a relational and socially constructed space where power struggles take place. In this space, the material aspects of infrastructure projects be- come deeply interconnected with social relations. The object of contestation serves as the focal point for interactions, power dynamics, and conflicts. The dynamics of these struggles are largely determined by the differentiation between the players in regard to their interests, position and power resources. For example, government agencies and parastatals may have different objectives when competing for man- dates or dealing with overlapping responsibilities. The analysis of a political arena requires therefore a context-specific focus on power asymmetries between actors and a distinction between

those who are playing an active role in the center, and those challenging them from outside. Fligstein and McAdam (2012) call these two categories the 'incumbent' and 'challenger' actors. They point out that the struggle between the 'incumbent' and the 'challenger' actors largely drives the power dynamics and therefore determines the transformation of the arena. They explain that '[i]ncumbents are those actors who wield disproportionate influence within a field and whose interests and views tend to be heavily reflected in the dominant organization of the strategic action field' (Fligstein and McAdam 2012, p. 13). In contrast, the challenger actors 'occupy less privileged niches within the field and ordinarily wield little influence over its operation' (ibid.). Incumbent actors are usually the ones who establish the arena, while the challengers raise their voices to get a bigger share.

The differentiation of actors in the political arena has to consider the role of government agencies. In general, governments have a tendency to support incumbent actors to the disadvantage of challenger actors. However, one may often find both incumbents and challengers within government structures, which explains their competition over the allocation of resources and political priorities of infrastructure development. Within the government apparatus itself, there are incumbents and those who challenge the rules of the game, as we will see later in our case study. '[S]tates are made up of myriad social orders whose dynamics are nearly indistinguishable from other fields' (Fligstein and McAdam 2011, p. 19). Nevertheless, the agency or authority which is dominating the process of launching a proposal for a large- scale infrastructure project will have the power of an incumbent actor (Jasper 2021). Being the first on stage creates advantages in being prepared for potential contestation, as well as financial and political power. The power asymmetries within a large infrastructure project do not only unfold at the local or national level. This type of project is a prime example of a 'travelling model' (Behrends et al. 2014) and the relationship between power and space (Massey 2009).

In our conceptualization of the political arena, we emphasize the spatiality of the political arena, which encompasses both horizontal and vertical dimensions, providing a heuristic for the practical research of planned infrastructure. The horizontal dimension refers to the geographical spread and the socio-spatial order surrounding the contested infrastructure project. This perspective allows researchers to identify the actors and stakeholders involved in or drawn towards the political arena. Infrastructure as focal points lead to debates and contestations spreading horizontally along the infrastructure (e.g., roads, corridors, transmission lines) or decreasing in intensity as they move away from it. The spatiality of the infrastructure and the extent to which attention to the project spreads indicate who is drawn into the polit- ical arena. Applying this perspective to dams shows that it is not enough to engage only with actors around the dam site. It is necessary to take a broad view of who is affected within the river basin. The vertical dimension addresses the cross-scalar relationships that link local actors with regional, national and even international en- tities, creating a complex web of influence and contestation that transcends scalar boundaries.

Performativity: filling the arena with life

The arena evolves around an outstanding unique object at its center, something that one may call a 'spectacle', i.e., an exceptional event or project that has the potential to mobilize the masses. The performative character of the spectacle is essential for holding the arena together, because it creates a connection between the players, both the incumbents and challengers, in the central 'place of fighting', and the spectators in the audience. Performativity may therefore also be understood as 'techniques of futuring' (Oomen et al. 2022) in so far as it translates hope, expectations, and visions into 'imagined futures' (Beckert 2016) or 'dreamscapes of modernity' (Jasanoff and Kim 2015).

The forms of participation and performativity in the political arena follow the (discursive) 'power resources' (Svarstad et al. 2018) and modes of operation of an actor group and their respective worldviews (Bierschenk 1988). Communication in the political arena, even the language in which actor groups communicate, is highly diverse, including press releases, academic reports, local forums, protests, town-hall meetings, visualizations of the future, marketing clips, etc. What some actors see as a promise of future prosperity may appear as the horror of infrastructure for others. The struggle to control the arena is also a struggle over its meaning. It goes along with the formation of *strategic alliances*. These alliances are strategic in so far as they create coalitions between actors who have otherwise little in common, for the sole purpose of supporting each other for one common goal or shared interest in regard to the infrastructure development project.

In economics, strategic alliances are defined as 'voluntary arrangements between firms involving exchange, sharing, or co-development of products, technologies or services. They can occur as a result of a wide range of motives and goals, take a variety of forms, and occur across vertical and horizontal boundaries' (Gulati 1998, p. 293). The definition, even though originating in a very different context, also applies to our understanding of alliances in the political arena of infrastructure development. What makes strategic alliances so special in the context of infrastructure development is their capacity to create affiliations between actors who have little in common besides a shared goal in regard to the infrastructure project, leading to alliances even between highly unlikely partners (Grossman 2017; Harrington and Cantor 2024). This understanding of 'unlikely alliances' may divert from the theory of fields (Fligstein and McAdam 2012), which conceives of political coalitions as 'rooted in a combination of shared interests and a common collective identity' (2012, p. 15). However, challenges may arise when such unlikely alliances are formed un- intentionally and involve actors whose positions are perceived unfavourably or are not aligned with the own values. Strategic alliances, as we show in the empirical study of the Crocodile Jaw Dam, are in some cases not overt, but can be silent, unlikely and unintentional.

Strategic alliances aim to maximize bargaining power and influence within the arena. They often do so through ties between local and national or even global actors, thereby

creating connections between scales. We inherently see inter-scalar collaborations between different actors pushing for the development of the project, since large-scale infrastructure, especially in the Global South, attracts international construction consortiums, financial institutions, and development banks. However, challenger actors also form alliances in dam developments to apply forms of contestation between scales, aimed at different targets and with adapted strategies of action (McCormick 2010). Since large-scale dam developments involve international actors, through both construction and financing, these actors become part of the political arena. Challenger actors may leverage multi-scalar cooperation to apply pressure on these actors also at the international level, potentially achieving more resistance to the project than through actions on the local or national stage. This highlights the significance of cross-border alliances in influencing the outcome of contested infrastructure projects.

The political arena of the Crocodile Jaw Dam project

In the following, we take the case of a dam project in Kenya to demonstrate how we apply the arena concept in empirical research. The idea to build a dam at a place called Crocodile Jaw has been on the agenda for more than eighty years, dating back to British colonial rule. However, there is nothing to see at the proposed dam site but the impressive rocks of a narrow geological formation shaped like the jaw of a crocodile, through which the Ewaso Ng'iro river flows. The place has repeatedly intrigued planners and politicians as an ideal location for a dam. Earlier plans focussed on irrigation, while a more recent initiative aims at building a luxury tourist 'Isiolo Resort City' with a corresponding need for a secure water supply as part of the Lamu Port-Southern Sudan-Ethiopia Transport (LAPSSET) Corridor. What makes these ambitious plans so remarkable is the fact that the runoff from the Ewaso Ng'iro river has always been limited, with great fluctuations between seasons and years. Climate change is expected to further aggravate these conditions, and already now, there is hardly enough water to cover the needs of the people living along the river. Given these precarious conditions, it is not surprising that the pastoralists further downstream who depend on seasonal flooding of the river plains were alarmed when they heard of the construction plans.

The Ewaso Ng'iro river originates from the Aberdare Range and Mount Kenya, flows in a wide circle through the arid and semi-arid lands of Laikipia and Isiolo County, before it disappears in the Lorian Swamp (see map, Fig. 1). The river supplies some pockets of intensive agriculture in its upper parts, while further down- stream it serves as a lifeline for local pastoralists and their livestock. It can dry up for several weeks every year, putting pressure on the livelihoods of local populations and raising conflicts between upstream and downstream users.

To investigate the arena of the dam project, we used a mixed-methods approach, combining archival work, media analysis, expert interviews, and ethnographic methods. The fieldwork, which took place over five weeks in late 2022 and an

additional shorter visit in early 2023, was based on a transect approach, following the river from the upper reaches through the areas directly affected by the proposed dam site to the downstream parts around Archers Post.

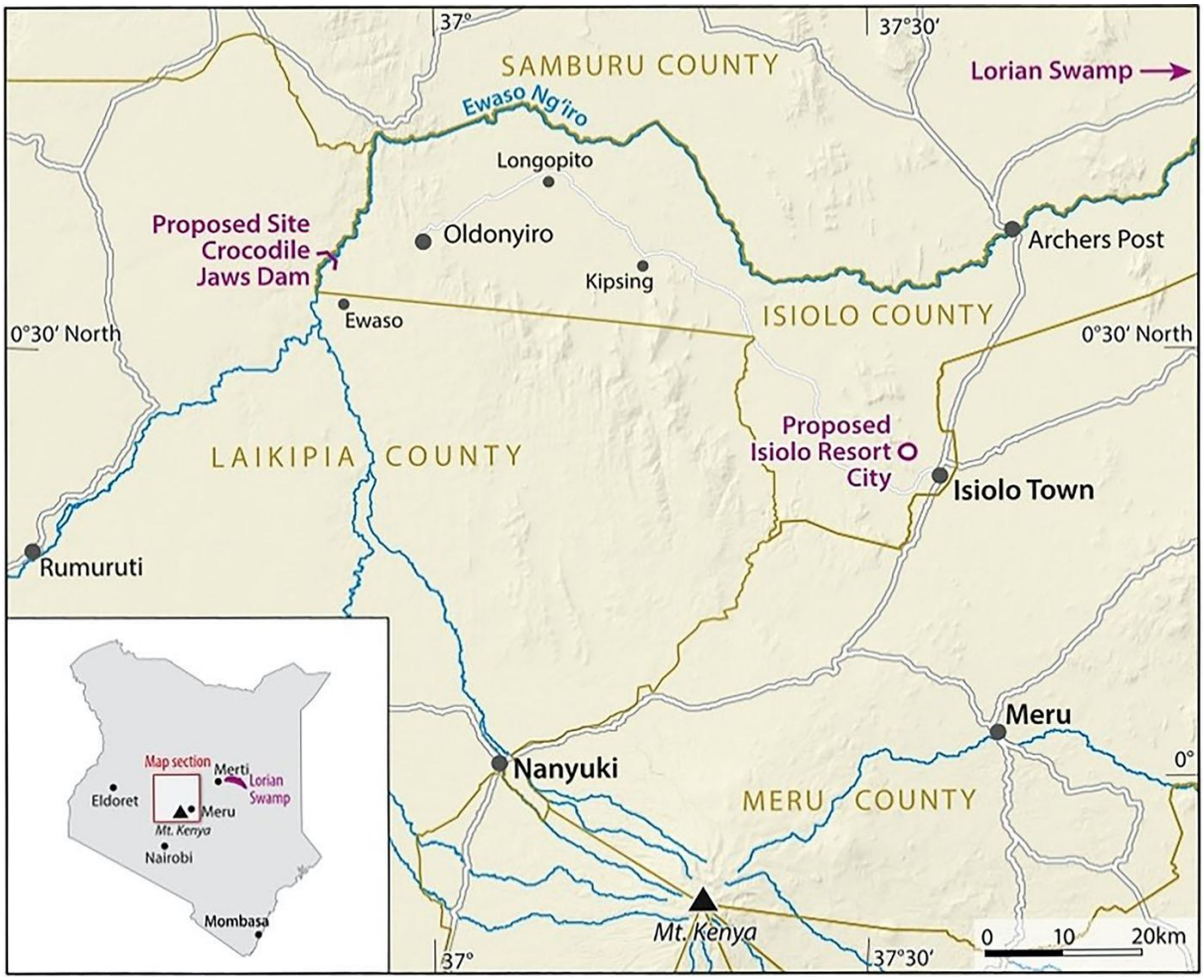

Fig. 8 *The study area and proposed dam site on the Ewaso Ng'iro river*

Thirty-six individuals and representatives of the potentially affected communities were interviewed. The vast majority were pastoralists whose livelihoods depend on the Ewaso Ng'iro river or one of its tributaries. The interviews in Archers Post were exclusively held with young men involved in sand harvesting. In addition, two focus-group discussions were held—one with male elders and another with a women's savings and loans group. While the transect approach addressed primarily the horizontal aspects of the arena, we also investigated the vertical contestations between actors at different spatial levels by conducting thirteen interviews with government officials, advocacy groups and other stakeholders in Nairobi, Nanyuki and Isiolo Town. The interviews helped to shed light on internal power relations, the formation of strategic alliances across scales, and the dynamics of decision-making. Our research revealed how actors work across scales and seek to forge strategic alliances to gain support and public attention. This became particularly evident in participatory research during two stakeholder workshops hosted by civil-society groups in late 2022. Additionally, media reports, development plans, government and scientific

publications were analysed (Aalders 2020; Aalders et al. 2021; Enns 2019; Mkutu 2021; Mkutu and Halakhe 2019).

Temporality: evolution and dissolution of the dam project

The history of the Crocodile Jaw Dam project is a story of non-materialization, reaching back to the middle of the 20th century. In 1949, the colonial government contracted a British consulting company to identify a site for water storage in the Upper Ewaso Ng'iro basin. The consultants came up with a report that was in some way symptomatic of the 'modernist' water-management policy of that time. They advocated against the prevalent policy to allow at least a minimal water flow to downstream areas, and urged instead for an intensification of water use further upstream in the 'white highlands', without any concerns for the downstream riparians. Their report culminated in a clear recommendation: 'We do not [...] recommend that any storage projects be prepared [...]' (Gibb 1949, p. 18). This recommendation willingly accepted increased livelihood risks for the pastoralists further downstream to allow the (white) farmers in the highlands to use water 'profitably' (Gibb 1949, p. 10). The report of the colonial consultancy mission reveals a bias that still prevails in Kenyan land-use politics, based on the diagnosis of 'over-grazed' (Gibb 1949, p. 18) pastoral areas, and the belief in the profitability of irrigated agriculture and 'modern' water-resource management. The Gibb consultancy report also reveals why the Crocodile Jaw Dam remained unbuilt at that time—simply because the 'profitable' land lay upstream of the proposed dam site. Already then, the modernist visions of profitable water use clashed with technical feasibility and the economics of infrastructure.

Government sources distinguish three phases in the debates and plans for building a dam at the Crocodile Jaw site: colonial times; the 1970s/80s; and a contemporary phase in the context of LAPSSET. Public debates during the first two phases are difficult to reconstruct, given the limited archival material and the oral history and memories of local informants. It seems that the initial idea of a dam never became sufficiently concrete. To what extent the first two planning phases led to the emergence of a vibrant political arena is therefore hard to say. This only became obvious in the last, contemporary phase, when the dam project actually instigated public debates and local resistance.

The idea of building a dam at the Crocodile Jaw site was reinvigorated by the LAPSSET Corridor Development Authority (LCDA) as part of the plans to establish the LAPSSET transport and development corridor. The LAPSSET corridor is a key pillar of Kenya's development blueprint Vision 2030. In this context, the dam project became prominent again as the water source for a planned luxury tourist resort. The Isiolo Resort City was promoted in a highly performative manner, featuring Las Vegas-style images. However, the Crocodile Jaw Dam failed to be seen as a 'dreamscape of modernity' (Müller-Mahn 2020). This perception gap arose be- cause the dam's

ultimate purpose—to serve the Isiolo Resort City—seemed vague, more a political spectacle (Lesutis 2022) than future reality, and of limited relevance to the development of other components of the transport corridor. The project thus became emblematic of the contrasting visions for the future of the country's arid lands held by the Kenyan government and the local inhabitants and land users.

The emergence of the Crocodile Jaw Dam arena had a clear starting point with the publication of the Environmental Impact Assessment. The end of political contestation is more difficult to pinpoint. At the time of our research, we still observed debates among government officials about the right location of a dam, and whether it should be shifted to another branch of the Ewaso Ngiro river so that the project would be fully under control of Isiolo County. Local NGOs no longer direct their activities against dam developments, but their activities carry on with a focus on water supply and water governance. This is not to say that plans for the dam are off the table, but if the project was renewed in the future, it would probably involve new actors and players. Whether this will reinvigorate the slowly vanishing political arena, or rather constitute a new one, remains to be seen.

Spatiality: placing the arena of the Crocodile Jaw Dam project

Plans to build the Crocodile Jaw Dam as a prerequisite for the Isiolo Resort City instigated the unfolding of a political arena by drawing various actors into the field of contestation. Placing the arena involved three major aspects. First, dam planning happened shortly after the devolution of the Kenyan government system ceded more power to the county governments (Chome 2020a). The Crocodile Jaw Dam was to be built on the border between Laikipia and Isiolo counties, and would have affected more communities further downstream in Samburu County. Samburu's veto power was limited, but without Laikipia's support, the dam was unlikely to materialize. What the planners did not sufficiently anticipate was the sharing of benefits between the counties. There was little in the proposed plans for the Laikipia County government to gain. The resettlement of households and the reduction of grazing land would only have affected communities in Laikipia County, while the proposed irrigation schemes and the main beneficiaries, Isiolo Resort City and Isiolo Town, are located in Isiolo County. Second, opposition also came from local representatives in the Isiolo county assembly, who saw the livelihoods of their communities at risk as they expected a reduction in the flow of water in general and a reduction in the flooding necessary for the ecosystem around the Lorian Swamp. The Lorian Swamp ecosystem is a lifeline for dry-season grazing in the eastern part of Isiolo County. Quite understandably, the inhabitants of that area and their political representatives resisted the dam construction. Thirdly, the project's development vision even failed to win the support of the communities living close to the dam site and sparked fierce opposition from advocacy groups. At this point, we can already see that the arena had actors on different sides of the field within the devolved government structures.

Figure 2 offers an—admittedly messy—overview of the actors and groups we identified using the arena concept. This is not an exhaustive list, nor does it capture the full complexity of the issue. However, it illustrates our practical application of the arena concept as this has been drafted during the time of data collection. The actors are grouped by their institutional background, but this does not imply that they collaborated on the project.

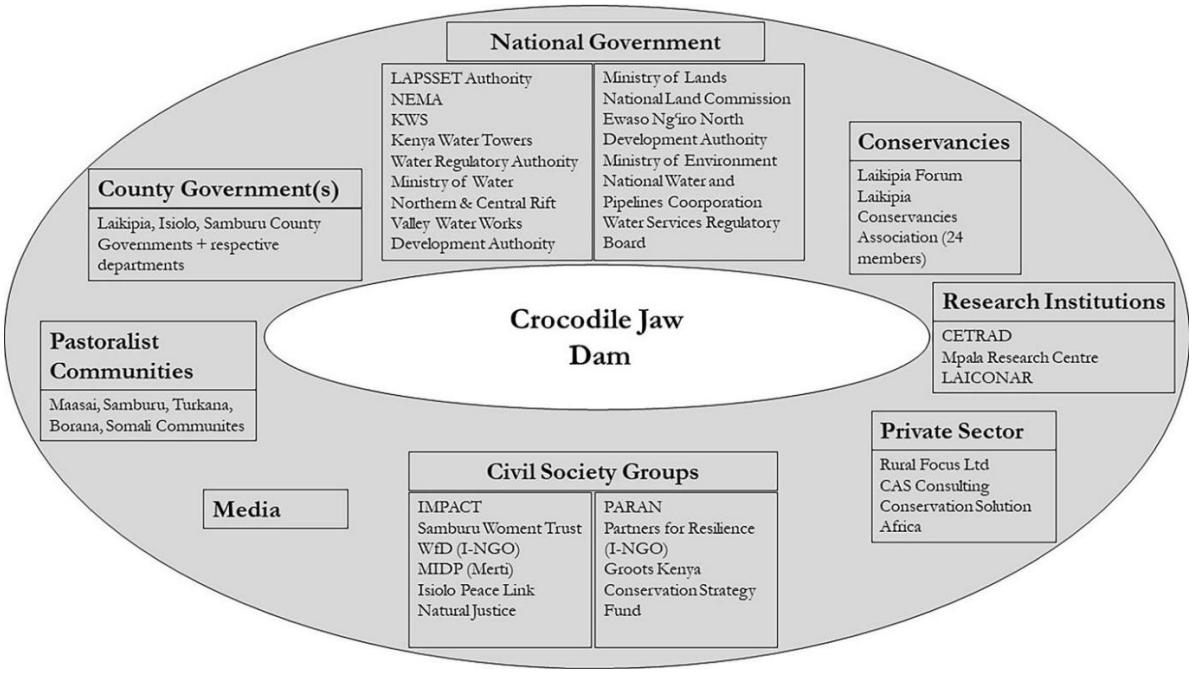

Fig. 9 *Political Arena of the Crocodile Jaw Dam*

During the contestations over the dam and its location, the president's office and the national government remained conspicuously silent. This absence of the most powerful actors in the nitty-gritty struggles in the political arena can only be interpreted as strategic action, or rather, strategic non-action. While the project was often referred to as a contribution to Kenya's development agenda Vision 2030, it was not specifically mentioned in any public documents. While the LCDA and the National Water Conservation and Pipeline Corporation were committed to implementing the project, other government bodies did not publicly position themselves.

The communities living along the Ewaso Ng'iro River, historically marginalized groups in Kenya, have been largely excluded from direct participation in the political arena of LAPSSET (Carrier and Kochore 2014; Mkutu et al. 2021), just as they were excluded from the arena around the Crocodile Jaw project. Political representatives and advocacy groups negotiate on behalf of these communities. Indigenous- rights activists and organizations, mainly based in Nanyuki and Isiolo, have been particularly active. Through community sensitization, lobbying, networking events, publications, and a protest march, they have drawn national and international attention to the project.

This activism has garnered media coverage, putting strong pressure on other actors in the arena and provoking them to take a stand.

Our interviews with members of affected Maasai communities in Laikipia County and Samburu communities in Isiolo and Samburu Counties in the Upper Ewaso Ng'iro Basin confirm some observations that have already been mentioned in the literature. For instance, individuals have varied views on the impacts of large infra- structure projects (Lind et al. 2020, p. 27), with local residents reacting to projects with a mix of hopes and fears. Their engagement with projects also varies greatly between social groups, triggering different responses (Chome 2020b; Hall et al. 2015). We were able to identify distinct tendencies based on the spatial relation of individuals to the dam project. Upstream of the dam, people generally also per- ceived potential benefits, such as ancillary infrastructure development, job creation, and business opportunities. In contrast, further downstream, these visions tended to become much more negative due to fears of being cut off from water supply, as it was expected that the dam could block and divert water to the Isiolo Resort City.

The contestation within the arena was in constant exchange with the affected river users, but in our context, this exchange was fragmented, incomplete, and heavily reliant on the dissemination of information within the community. In cases relatively opaque to the 'spectators in the stands' of the arena, the opinion of the spectators is strongly shaped by the most active communicator towards the stands. The range of attitudes towards the dam, from opposition to optimism, was influenced by several factors, including the location of households along the river and livelihood challenges at the time of the research. Additionally, the source of information about the dam played a significant role—individuals were more likely to be supportive if they had heard about the project from politicians and engineers rather than from CSO representatives.

At first sight, the performative actions by the CSOs seem incompatible with the recognition that community members have different visions of the future and the role of large-scale infrastructure development. Our interviews have shown that many formulate a conditioned view of the project. Individuals insist that they do not generally oppose any project that may potentially be beneficial for themselves or their community or even the country at large. A very common example of when people will not oppose the dam project is if their community expects improved and safe access to water as a direct benefit from the storage of water. Also the notion of 'opening up' the area and being better connected to the nation's transport and trade networks, as well as having better access to markets, schools and clinics, is not just a political mantra but resonates with many regional inhabitants. However, the advocacy groups play an important role in incorporating a minimum level of local interest in the political arena by applying performative forms of contentious politics:

> […] the various ways of seeing investments in Africa's drylands has set off a wave of contentious politics, created a range of claim-making factions and performances aimed at negotiating more favourable terms of incorporation

> into investment projects. As groups mobilise to make claims, particular modes of collective action are deployed, even though the interests of local actors differ. (Lind et al. 2020)

Performativity: strategic alliances around the dam project

Establishing the political arena around the dam project went along with performative action at various levels, aiming at mobilizing support among local populations, politicians, and wider society in Kenya and even internationally. One of the purposes of people taking part in the heated public debates was to get support and form strategic alliances, either in favour of or against the dam construction. In our empirical case, we observed the emergence of two strategic alliances which took almost opposite positions, and which both may be considered as rather 'unlikely alliances' (Harrington and Cantor 2024). On the one hand, there were the owners of large conservancies in the region who took the side of the dam developers, while on the other hand civil-society and advocacy groups joined hands with a government institution. In the first case, the position of the conservationists may appear surprising, because one would rather expect them to resist development interventions in the dryland part of the river basin, which has remained unaltered by large-scale interventions. In fact, the private conservancies and their umbrella organization, the Northern Rangeland Trust, are highly influential actors in the counties of northern Kenya, especially when it comes to land-use policy and land governance (Bersaglio and Cleaver 2018). However, they seemingly took an opportunistic position towards the dam project, expecting to benefit from higher tourism revenues and better access to water for wildlife and livestock. Consequently, the regional conservation organizations gave political support to the dam developers.

The second strategic alliance emerged as a coalition between regional and national advocacy groups and the Ewaso Ng'iro North Development Authority (ENNDA). ENNDA is a government agency responsible for the coordination of regional development in the river basin. However, it was not given the mandate to manage the dam project, and therefore found itself in a rather weak position in the emerging political arena. Without the backing of the national government for its own infrastructural visions, ENNDA remained in the shadows of the emerging arena, while other regional bodies started to position themselves in the struggle to gain influence on the project plans. It was only when debates about the dam and its location began to consider an alternative dam site further downstream from the Crocodile Jaw rocks that ENNDA returned to the centre of the arena, apparently in an attempt to enhance its own position as the leading agency for water infrastructure development, and from then on formed a strategic alliance with the advocacy groups opposing the Crocodile Jaw Dam plans.

One of the activities of the groups resisting the construction plans was the organization of awareness-raising campaigns among the communities living along the Ewaso Ng'iro river. Since 2014, the activists have organized an annual march of protesters with camels, support trucks, and informational material. The Camel Caravan initiative aims

to connect different water users of the Ewaso Ng'iro basin, civil society organizations and advocacy groups. In this campaign, several parties take off from different parts of the basin and march towards the small town of Archer's Post. The key idea of this symbolic performance of the annual Camel Caravan is to raise awareness for the connectivity and complexity of the basin's ecosystem. Over time, it has become a platform for stakeholder engagement with local communities (see also Enns 2019) and has actually contributed to a number of positive changes in terms of ecosystem restoration and peacebuilding between groups in the basin (Tafere et al. 2023). While the initial intention of the caravan was not to oppose the development of the Crocodile Jaw Dam, it was soon perceived as a form of protest in the political arena. Media reports and the images of the camel trek contributed to the significant public attention towards the project. In order to implement its own vision of sustainable and equitable water storage and gain the necessary support from local communities, participation in the Camel Caravan was seen as a key opportunity to position ENNDA in the political arena. The Camel Caravan signifies both the performativity as well as the spatiality of the political arena of infrastructure, which is not only metaphorical, but also has a concrete geographical focus. Due to the Camel Caravan and its repercussions with local communities and stakeholders, contestation over the Crocodile Jaw Dam project did not only take place in the political sphere between the county capitals and Nairobi, but took also shape in a place-based struggle around the dam site and the wider river basin. The rather successful performativity has two implications: First, local communities often do not speak with one voice, as members diverge in their personal aspirations and opinions on future infrastructure development based on individual aspirations. Through performative acts, a common position can be formed to be heard in the political arena and gain influence, even if it does not represent everyone. Secondly, however, the very fundamental rules of the field were upheld by the incumbent actors in the arena. Different epistemologies of the river and the resources of the river basin were excluded from the negotiations between actors of the arena. Representatives of the local communities levelled with the technical language and ideals of the developers but never vice versa. Within the political arena, culturally embedded and historically rooted relations of the adjacent communities with the Ewaso Ng'iro were neglected. The contestation focused on the livelihood effects, which do have social and cultural meaning, but are an issue that is accepted in the language of the incumbent actors. Concerns that the dam could pose a serious threat to people living downstream in the event of an overflow or the collapse of the dam were not taken up by other stakeholders. Similarly, the cultural significance of Ewaso Ng'iro and sacred trees in the riverbed, used by both Maasai and Samburu communities in the Upper Basin for their initiation rituals and offerings, has not been adequately addressed or found notable interest within the political arena. While challenger actors were able to gain relevant influence in the political arena, the rules, order and language of the incumbent actors were never removed.

Conclusion

How does the concept of the political arena help us to shed light on the Crocodile Jaw Dam project, and what can we learn from the case study regarding the applicability of the concept in empirical research? Taking it as a heuristic approach means that we expect the concept to guide the research process, but not necessarily to provide a comprehensive explanation of the complex processes we observed in the field. The arena is built around a spatial and temporal focal point, a central object of attraction and contention. Framing the empirical object as a political arena structures the research process by identifying specific topics that need to be addressed. This framework for empirical research targets the meso level of infrastructure development, including the intricate relationship between different actors, the power dynamics among their strategic alliances, and the ensuing socio-spatial transformation. With this focus on the meso level and its intermediate space of negotiation, the micro and macro levels are not at the center of the immediate empirical research, without denying their relevance. The empirical prioritization of the meso level political arena explains why our case study cannot answer the question why the Crocodile Jaw Dam was never built, despite seven decades of planning and negotiation. While the research gathered stakeholder views on the reasons for this, we can only speculate as to whether they lie in economic and technical feasibility, funding or political preferences for other projects and regions. In view of these limitations of the heuristic approach, the arena concept can be seen as a research tool that has to be embedded in a broader political ecology framework of water resources governance and infrastructure development.

Another point that has to be highlighted in regard to the case study concerns the relevance, or rather the irrelevance, of the materialization of the infrastructure at stake. From the perspective of infrastructure development, the case of the Crocodile Jaw Dam project may appear rather paradox, because the dam itself was never built, even after decades of planning and political debates. In a way, it is a case of infrastructure development without infrastructure. Yet, what makes this project so interesting for our conceptual reflections is the observation that it led to the emergence of a political arena with vibrant repercussions among local populations. This observation supports two of our initial hypotheses concerning the building of a political arena, i.e., co-evolution of infrastructural technologies and societal change, and the relevance of infrastructure beyond the material dimension. In this case, the dam project has long been an object of conflicting interests, it led to the formation of strategic alliances, and it even caused civil unrest. The effects of this project have been quite substantial, but they are not visible in the landscape, and they have little to do with what was originally intended.

In defining the arena, we made a point to take the metaphoric meaning of the term more serious and to look into the spatiality, temporality and performativity of the processes that play out at center stage in the ‘place of combat’. In our example, the dam site, the river basin, and the upstream and downstream relationships clearly circumscribe a spatial delineation of the potentially affected area. Other spatial

relations such as the administrative boundaries of the counties have been discussed in relevance but also the constituencies of powerful politicians or the territorial interests of investors and pastoralists alike. The temporality of the observed phenomena plays a role in so far as the plans for the dam have gone through phases, of which the first two never got much beyond the stage of feasibility studies, while only the last phase actually arrived at a degree of intensity that involved a wider public and led to conflicts. The performativity of the arena became obvious only in this latter phase of negotiations and competition, which included local resistance and the involvement of advocacy groups. Performativity in our case refers to the promises of development, the enchantment of infrastructure, and the big expectations raised among local populations. It also involves the fears and rejections of development interventions, the threat of displacement and land grabbing, and very specifically in our case, the fears of downstream populations to lose their water sources. We emphasise the role of the (construction) site as a tempo-spatial focal point. We show how political contestation over infrastructure development finds a metaphorical but also geographical spatial centre from which the effects of political negotiations travel horizontally from the object and vertically across scales.

Contestation over future infrastructures has implications for the here and now, through altering individual visions and aspirations, and through economies of anticipation. We argue for a persistent, intricate understanding of the roles that different actors play in positioning themselves in relation to future projects and in seeking to influence project design to align with their interests. Positioning the role of strategic alliances at the centre of the arena, we aim to avoid premature conclusions and simplistic analyses in infrastructure studies, of who is opposing or actively promoting infrastructure implementation. Strategic alliances are formed between heterogeneous actors temporarily for the very specific purpose of gaining power within the arena. However, in cases the alliances are less overt and even unintentional and uncoordinated.

We deliberately refrain from claiming that our concept applies to other stages of the infrastructure lifecycle, as we aim to be explicit about its specific strengths and limitations. Nevertheless, we acknowledge that the concept can be useful whenever infrastructure becomes the focal point of contestation5. While this article focuses on a rural setting, we see no inherent limitation in applying our approach to urban infrastructure developments. However, further empirical studies are necessary to test its applicability in these contexts.

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5 A good example of this can be found in the discourse surrounding dam removal (see for example Harrington and Cantor 2024; Hommes 2022).

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7.2 Displaced Futures or Futures in Displacement? Anticipations around the proposed High Grand Falls Dam in Kenya

Arne Rieber, Theo Aalders, Kenn Munene

Published in *Futures* in 2025

Journal Citation:
Rieber, A., Aalders, T., Munene, K. (2025). Displaced futures or futures in displacement? Anticipations around the proposed High Grand Falls Dam in Kenya. *Futures,* 166, 103530. https://doi.org/10.1016/j.futures.2024.103530

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Displaced futures or futures in displacement? Anticipations around the proposed High Grand Falls Dam in Kenya

Arne Rieber, Theo Aalders, Kenn Munene

Abstract

At COP27, the Kenyan and UK governments signed a climate finance agreement to accelerate the implementation of the High Grand Falls mega-dam on Tana River. Communities living near the dam site have been anticipating the dam construction since the post-independence era. The plans have been revived in the context of Kenya's Vision 2030. In this article, we contribute to the literature on imagined futures and economies of anticipation by examining how potentially affected households navigate the state of uncertainty that is formed by threating images of displacement. The analysis highlights concerns about (non-)compensation and the vulnerability of households with insecure tenure arrangements in the context of infrastructure developments. We outline how the capacity to anticipate is a decisive factor in preparing for a future in displacement and how economies of anticipation emerge most notably around the land market. The article contributes to the concept of future-making in infrastructure studies. By presenting displacement as a multi-temporal process, we show how anticipated infrastructures have shaped and continue to shape the socio-economic developments of affected regions.

Keywords: Dams, Compensation, Infrastructure, Land Tenure, Economy of Anticipation, Future-making

Introduction

The World Commission on Dams estimated around 40–80 million people were displaced through dam projects in the 20th century (World Commission on Dams, 2000). For the 21st century, this figure is likely to be exceeded well before the end of the first half of the century. The 2030 s could become the decade with the most dams ever built (Zarfl et al., 2015). Thus, more people find themselves affected by actual or anticipated dam developments in times of a global hydropower renaissance (Gutierrez et al., 2019). In 2022, during the 27th Conference of Parties in Sharm El-Sheik, Egypt, Kenyan President William S. Ruto made a push to put his name in the history of Kenya's mega-infrastructure development, by agreeing to a 'climate-finance' deal with the UK government, which is to support the implementation of the High Grand Falls (HGF) multipurpose dam. The project, designed (or at least presented) as a response to the challenges of climate change, aims to provide electricity and to introduce large-scale irrigation systems in the arid and semi-arid regions of the Tana River basin to increase agricultural productivity. Not everyone, however, is enthusiastic about this modernist vision of a green future. The promise of the HGF Dam has been around since the early post-independence years, leading to long-standing fears of displacement among the residents along Tana River. Consequently, repeated promises of the project cause anxiety and insecurity among the affected, rather than creating a shared vision of a prosperous future. The dam, even as constructions have not yet begun, thus has a long presence in the area around its intended location, both as a promise but also as a threat.

In this article, we are looking at the (recurrent) anticipation of involuntary resettlement in dam projects. We explore the long history of anticipation, examining how affected individuals expect to be compensated, plan their resettlement efforts, and envision their future homes and livelihoods. The article therefore continues an important development in the critical scholarship on infra- structure that emphasises the active role of affected people in shaping infrastructured futures (Aalders et al., 2021; Greiner, 2016). This study provides insights into how local communities, politicians, government officials and a range of organisations and institutions make futures by negotiating different anticipations of displacement around the HGF dam. We argue that these anticipations can be best understood as an active practice oriented not only towards expectations of the future, but also towards memories of the past and experiences of the present. Fig. 1 illustrates this article's argument: People anticipate possible futures, which influence economies of anticipation in the present. These anticipations are rooted in memories of how past instances of displacement were anticipated - a phenomenon we conceptualise as 'memories of the future' (Giuliani, 2020) in Section 5.

We conclude that, given the current legal and political dynamics as well as learning from the unjust displacement that occurred in previous dam developments on the Tana River from the 1960s to 1980s, fair compensation for all land-users seems unlikely.

Furthermore, marginalized community members without land titles may face issues of non-compensation in the proposed 'fast- tracked' project, repeating historical injustices along Tana River. We argue that current legal frameworks that will be used in upcoming Social Impact Assessments (Tilt et al., 2009) are incompatible with local, rural realities and the desired futures articulated by affected people. Consequently, we call for a revision of the application of western legal systems to compulsory land acquisition in the context of dam development, especially when driven by private actors. People do not only encounter displacement as something that has happened to them as passive expellees, but also as something that can be actively anticipated, thus informing both decisions in the present and ambitions for the future.

The High Grand Falls Dam - a history of delayed futures

All four post-independence presidents before William Ruto had attempted, but ultimately failed, to implement the HGF Dam on Tana River, a dam project that would be one of the largest on the continent. In the years following Kenya's independence, politicians, government planners and media reporters often believed that construction would commence in the near future. Archival records show the five dams that were built by the post-independence government were not intended to be the last (Government of Kenya, 1965). Downstream of the Kiambere Dam, four sites were identified as suitable solutions for water storage and irrigation development, though their economic viability varied. Grand Falls was identified as the most feasible, followed by Mutonga and Koreh, and Korokora downstream of Garissa town. Grand Falls and Mutonga were considered more favourable as both sites would capture major tributaries of the Tana River coming from the south-eastern side of Mount Kenya. Since Mutonga is upstream of Grand Falls, the proposed HGF combines the two potential dam sites into one mega-dam (JICA Nippon Koei Co., Ltd, 2013).

Geopolitical shifts, lack of funding and legal disputes over tenders repeatedly halted the implementation process for the dam. Although five dams were built upstream of the proposed HGF dam site between the 1960s and 1980s, further expansion of the dam cascade ended in 1988 in a time when dam projects became increasingly controversial on the global stage. The project gained traction once more in the context of Kenya's Vision 2030, which was launched in 2008, and more recently with the climate finance agreement at COP27 in 2022 between the UK and Kenyan governments. The British side has particularly emphasised its intention to 'fast-track' the 'new, clean and green investments' (British High Commission Nairobi, 2022). Since a feasibility study in 2012 (JICA Nippon Koei Co., Ltd, 2013), a restructuring of the project's implementation design and legal issues surrounding the tender have caused delays. Despite some interviewed experts stating that the legal issues around the tender awarded to the British consortium GBM remained unresolved by the end of 2022, the UK and Kenya governments proceeded with the climate finance agreement.

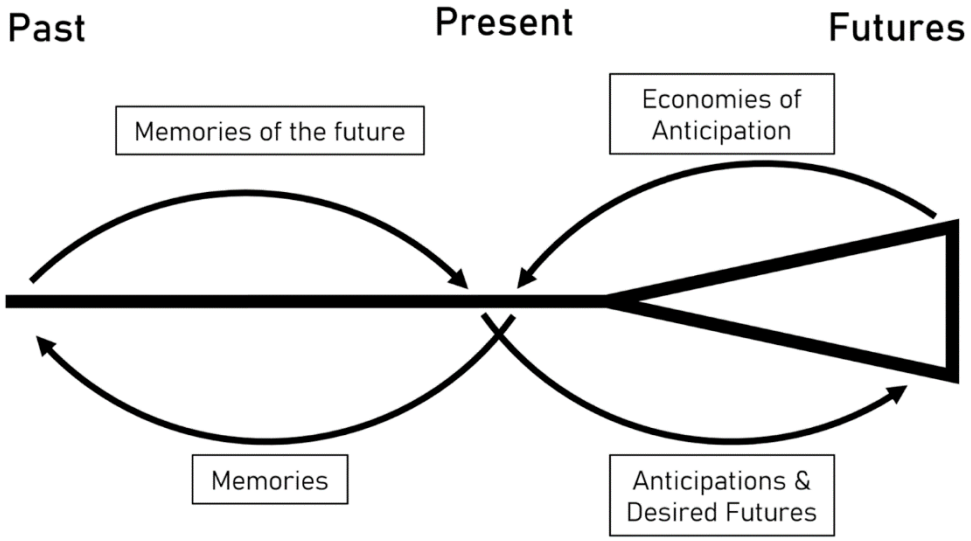

Figure 10. A visual scheme illustrating the recursive multi-temporality of displacement.

The biggest component of the deal is the dam, where the UK government will secure private funding for the 425 billion Kenyan shilling public-private partnership (British High Commission Nairobi, 2022).

This makes the HGF dam a prime example for a so-called 'ghost project', which exist 'in an obscure state between the real and the unreal' (Aalders, 2020, p. xii–xiii). Although - or perhaps because - the dam has a long history of being postponed to an undefined future, it is very present. Especially on the local level, the people of the Tharaka region of Kenya have been anticipating the HGF Dam for at least three generations. No child goes through primary school without being shown plans and maps of the dam's reservoir, which stretches 40 kilometres across Tharaka-Nithi, Kitui and Embu counties. Every election cycle, the dam becomes a highly debated issue, with political candidates at the rallies either promising its realisation or expressing doubts about its construction. Against this backdrop, the case of HGF is a 'present absence' (Powell, 2018), where the vision of a future that might come leaves traces in the here and now and shapes imaginations, visions and anticipations.

In the subsequent section we summarise the literature on the effects of displacement through infrastructure projects as well as the particular framework of displacement and compensation in Kenya.

The multi-temporality of displacement

The issue of displacement caused by infrastructure projects in general and dam developments in particular has been extensively studied worldwide for many years. Notable contributions include Cernea (1997), who introduced the risks and reconstruction model, Scudder (2006) and his longitudinal studies on the socio-economic impacts of displacement, and more recent analyses by Terminski (2015) on development-induced displacement and resettlement. These works highlight the importance of comprehensive social and environmental impact assessments (e.g., Tilt et al., 2009; E ́gr ́e & Sen ́ecal, 2003) in understanding the multi-faceted impacts of

such projects. Most studies focus on the consequences of dam constructions after completion. This approach has been crucial for gaining knowledge and finding ways to reduce the negative social and ecological impacts caused by dams over the years. However, it is equally important to focus on the planning stage of dam development (Kirchherr et al., 2016). As Hay et al. (2019, p. 5) point out, resettlement is not a singular event but triggers 'a multi-decadal process' for the affected, which is deeply rooted in present social differentiation and past experiences. Reactions to dam development are therefore heterogeneous, and individuals' starting points differ significantly, both materially and emotionally (ibid.).The findings from numerous studies about how displacement around infrastructure projects happened in the past consistently point to three conclusions. Firstly, marginalized population groups are particularly affected by dam developments (World Commission on Dams, 2000: xxxi). They bear a disproportionate burden compared to other groups (Munzer, 2019). Secondly, the overall population groups affected by dam developments experience economic losses (Hay et al., 2019). These losses include the loss of land (Singto et al., 2022) and the loss of livelihood opportunities (Hausermann, 2018). Thirdly, the process of displacement resulting from dam developments engenders a range of more hidden distortions, including the erosion of social and cultural ties within affected communities (Scudder, 2020; World Commission on Dams, 2000). Based on recommendations by the World Commission on Dams, a number of development banks and supranational organizations have developed guidelines and policies to safeguard the rights of displaced households (Museleku, 2021). However, in an era where dam development is driven by private sector actors and bilateral agreements to secure private financing for dam projects (Ahlers et al., 2015), these policies are not usually applicable. With the challenges outlined, resettlement processes continue to affect the displaced long after the actual relocation has taken place, and livelihood adaptations (in some cases with positive outcomes) can take decades to unfold (Hay et al., 2019). This underscores the need for a temporal lens on resettlement processes, which can be integrated into scholarship on dam development at all stages, and strongly influences the perspective of this article.

In the context of Kenya, the compulsory acquisition of privately registered land is governed by the Constitution of Kenya and the Land Act 2012. Land is to be compensated at market value with a 15 % top up for resettlement cost (Wanyonyi et al., 2017). Even though comprehensive assessment of market value is crucial for fair land compensation (Museleku, 2021), the existing system is flawed as it externalises costs and overlooks the long-term security that comes with land ownership (Hay et al., 2019; Shaojun, 2018). Additionally, in 2016, the Kenyan government partially dismantled this system by amending the Land Act to establish a legal framework for overriding the valuation process in an effort to address delays and cost overruns in large infrastructure projects (K'Akumu and Olima, 2018). According to the 2016 amendment, the government (the buyer) will determine the compensation for the

acquired land based on a land value index calculated by the government itself (K'Akumu and Olima, 2018: 350).

The proposed HGF Dam is a so-called flagship project of LAPSSET and one of the pillars of the Kenyan development blueprint Vision 2030 (Republic of Kenya, 2022). While parts of the LAPSSET corridor have already been constructed and especially in Lamu people have already been forcefully evicted (Lesutis, 2023), it too largely exists as an absent-present 'promise' (Appel et al., 2018) 'ghost' (Aalders, 2020), or 'Damocles' project (Kirchherr et al., 2016). Nevertheless, recent studies from developments along the LAPSSET corridor show that affected populations are being forced to proactively challenge non-compensation and exclusion from the benefits of such projects, even before the project is implemented (Aalders et al., 2021; Chome, 2020; Elliott, 2020).

In this study we build on this body of work and explicitly marry it to the established importance of anticipation and future-making around large-scale infrastructure projects. The central argument of this literature is that recurring promises of infrastructure devel- opment and their impact on visions of desirable futures have implications for the present and influence anticipatory behaviour. Processes of anticipation shape, for example, the economy through fictional expectations and imagined futures (Beckert, 2016). Anticipation of infrastructure leads to land speculation through 'economies of speculation' (Chome, 2020, p. 317), the 'economy of anticipation' (Cross, 2015; Elliott, 2016; Greiner, 2016) and 'structural speculation', where elites exploit information asymmetries (Kinuthia et al., 2021, p. 3).

Additionally, based on the existing literature on dam-induced resettlement, the temporal perspective can be reversed. Studies of the long-term effects of displacement and resettlement provide empirical examples that a future in displacement is not always dire. While acknowledging differences among the resettled, Sunardi et al. (2013) observe improved livelihood patterns 25 years after the con- struction of the Saguling Dam in Indonesia. According to Ty (2023), community members displaced by the Binh Dien hydropower dam in Vietnam took 12 years to surpass their pre-resettlement income levels, demonstrating that well-designed resettlement schemes can lead to positive livelihood changes. Nonetheless, it is imperative to note that research examining the long-term consequences of displacement is inherently limited in its capacity to account for the potential futures that were unmade due to the construction of large projects. As Scudder finds, in the majority of cases of large-scale dam developments '[…] was to worsen the living standards of the majority not just economically but socially and culturally as well' (Scudder, 2012).

Through this analysis, it becomes apparent that both large-scale infrastructure such as hydropower dams, as well as the displacement they might cause need to be understood as phenomena of multiple temporalities (Hay et al., 2019). Displacement exists as a memory of past injustices, of an embodied reality in the present, and as anticipations of possible futures. This multi-temporal framing of displacement imposes special demands on the methodology to be sensitive to all these dimensions. In the following

sec- tion we briefly summarise how we approached this challenge in the specific context of our study.

Methodology

Apart from the sensitivity to multiple temporalities of anticipation, the topic of displacement itself contains a multitude of social, affective, and cultural aspects. Apart from appreciating the multi-temporality of anticipations, our methodological challenge was thus to do justice to all these dimensions of displacement. For this purpose, we developed a multipronged methodology containing four distinct but related approaches.

Document analysis and archival work

In order to better understand the wider historical background of dam development along the Tana River, [Author 1] conducted an analysis of files and historic documents in early 2023. These consisted of government reports, donor reports and a government commissioned academic report. Though limited in number, the files contributed to the understanding of the post-independence economic cooperation and a lack of social and environmental impact assessments at the time. Despite this archival work, technical information, e.g. the exact size of the dam reservoir is unknown or rather outdated, as the feasibility study for HGF Dam from 2012 was never made public. To be able to identify affected households, we therefore geo-referenced maps provided in older feasibility studies (Government of Kenya, 1965; see Fig. 2) about the Grand Falls project, so as to get a rough understanding on what areas are very likely to be affected if the dam is constructed, and to help with the sampling of households for methods 3 (interviews with affected people) and 4 (collaborative visual methods). This has been strongly supported by the work of van Beukering et al. (2015), who developed a cost-benefit analysis of the High Grand Falls Dam in the wider context of LAPSSET, and by Clelland (2021), who analysed the visions and promises of the Masinga Dam reservoir on the Tana River.

Expert interviews

Expert interviews were conducted in early 2023 on all administrative levels, from local chiefs and deputy chiefs, to members of the county assembly. As representatives of their respective districts, interviews with local authorities were meant to gain insights into the sentiments within the affected communities, vis-a`-vis the HGF project. Among the experts interviewed were four representatives of the Tana and Athi Rivers Development Authority (TARDA), including the Managing Director. At the time of the research, TARDA was considered to be one of the potential implementing agencies.[6] In addition, an operations manager from the Kenya Electricity Generating Company PLC, which operates the existing dams in the dam cascade was interviewed. Finally, the two main political representatives of the Tharaka region in Nairobi, Senator Gataya and Member of Parliament Hon. Murugara, shared their views on the

[6] In late 2023, the Kenyan government announced that the National Irrigation Authority would commission the feasibility study and lead first steps towards implementation.

proposed project. In total, 17 key informant interviews were conducted in Nairobi, Embu and Tharaka-Nithi.

Interviews with potentially affected people

To engage with the central question of our research around economies of anticipation, land tenure and desired futures, semi- structured and unstructured interviews were conducted with individuals and households in the affected areas and some of the neighbouring communities in Embu County, Kitui County and Tharaka-Nithi County and has contributed most to the analysis pre- sented in this study. A strong focus was placed on the Tharaka communities, as they represented the majority of households facing displacement. A travelling-the-river approach was used to select several sites along the existing dam cascade, locations where the proposed dam's reservoir would extend. Additionally, sites immediately downstream of the proposed dam were selected. Within these sites, purposive and snowball sampling targeted individuals affected by past displacement or likely to be impacted by future displacement.

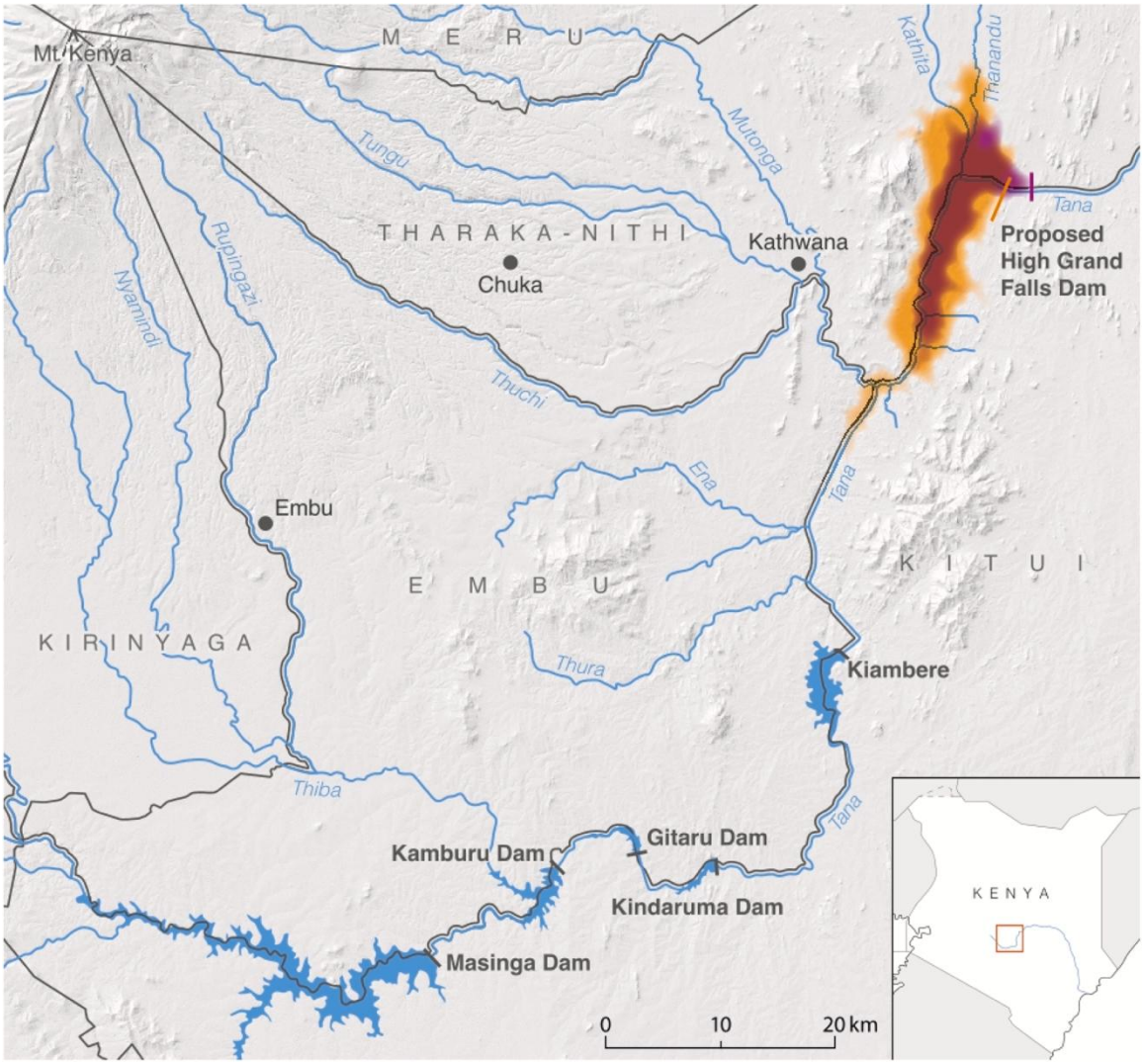

Figure 11. The proposed High Grand Falls Dam on Tana River.

Between February and March 2023, a total of 38 interviews were conducted. These interviews were later transcribed and, where necessary, translated by [author 3] and together with the expert interviews subsequently analysed using MaxQDA and open coding. The majority of interviews with affected people were conducted in Kitharaka, the language most commonly spoken in the area. [Author 3] translated and mediated between interview partners and the other members of the research team.
Differentiated positionalities of the researchers had a significant impact on the study design. [Author 3]'s intimate familiarity of the research area and the people inhabiting it by virtue of having grown up close to the proposed site of the dam was an enormous boon to the research process. On the flipside, being among the so-called 'affected population' himself, may have shaped the interpretation of the shared perspectives (Borchgrevink, 2007). The results of this study are a combination by [author 1&2]'s etic perspective as outsiders, and [author 3]'s emic perspective as an insider to the specific research context.

Collaborative visual methods

As part of this research, we produced several landscape paintings showing the present and possible futures of the area around the HGF dam in collaboration with people who live either within the expected area of the reservoir lake, or close enough to be directly affected by it.
Together with a Nairobi-based artist, three workshops with members of the local communities were held in Marimanti and another location closer to the estimated extent of the reservoir lake. Each workshop was divided into several phases, each focusing on an- ticipations of futures, desired outcomes, and conditioned scenarios to engage with temporalities in a co-produced approach (Johansson & Isgren, 2017). The conditioned scenarios involved imagining futures in which the dam had been built at Grand Falls (locally known as *Kibuuka* Falls). This allowed gaining insight into the participants' perceptions and expectations of the likely outcome if the dam were to become a reality. In a next step, the Nairobi-based artist compiled the different perceptions of the present situation and visions of futures into several landscape paintings. These professional paintings constitute a deviation from the original visions expressed in the individual 'landscapes of anticipation' (Aalders, 2020, p. 59 et seqq.), and need to be interpreted vis-a`-vis the drawing produced by workshop participants. The artistic interpretation of these sketches by a professional artist helps to compile multiple visions into a single visualisation, and constitutes a useful tool for communicating research results. In a further workshop conducted in early 2024, the paintings were shown to previous workshop participants and other community members. This step was not only meant to communicate research results, but also to gain further information on affective responses to different future scenarios.

Past: memories of the future

When asking people who have a negative attitude towards the current dam construction, a common theme in their reasoning unsurprisingly refers to examples from similar projects in the past. More specifically, those who are worried about the HGF damn often refer to how issues with resettlement and compensation had been anticipated in the past. Gaia Giuliani (2020) introduces the term 'memories of the future' for this phenomenon in the context of her study of Western imaginaries of catastrophe in popular culture. In her work, Giuliani establishes a feminist and post-colonial approach to understanding how future anticipations are deeply embedded in colonial violence and the violence of the Anthropocene. These learned anticipations of what is to come are shaped by both past and present experiences:

> Just as memories of the past are the result of processes of selection and reassessment mediated by social and individual factors, so too symbolic material, perceptions, fears and fantasies of the future mediated by understandings of the present and its imminent threats recombine to form 'memories of the future' (2020, p. 15)

We adopt the concept of 'memories of the future' to the context of infrastructure studies, to show how the developmental promise of the construction of the HGF quickly becomes a threat to the people living along the Tana River, remembering that every developmental intervention on the river in the past has been a form of oppression. Memories of past futures also shape current anticipations by an elderly women living in the area that would need to be evacuated for the reservoir lake. In an interview with Author 2 and Author 3 she said that she wasn't confident about receiving fair compensation because of bad experiences in the past:

> 'During the KARI (Kenya Agricultural Research Institute)[7] construction, I was old enough, as people were being relocated, nobody was compensated. You would meet someone on the road with their goats [because they lost their homestead]. They weren't given anything, not even a single payment did they receive, everyone was to look for somewhere to settle on their own. (Interview, Feb. 2023, translated from Kitharaka)

Even though the KARI has little to do with the National Irrigation Authority or any other potential implementing agency, many people see no fundamental difference between different arms of the government—perhaps rightly so, as the legal foundation concerning land-dispossession does not vary much from case to case. In order to better understand the general scepticism that many people have towards past, and subsequently towards future resettlement and compensation schemes, it is necessary to give a brief historic overview of the legal situation regarding the issue of land rights in Kenya. We supplement this general overview with the perspective of people living in the area to illustrate how the complicated history of land tenure systems and laws that

[7] In the early 1990s, the Kenyan government evicted several households for the construction of a public research institute.

often only exist on paper touch down in specific contexts and what lessons people draw from them.

In addition to this example, which unfolded in the very location where displacement might take place in the context of the HGF, there are several other historical examples in the wider region of unfair and inadequate compensation that shape local memories of the future. Both the World Bank completion reports and interviews with households living near the Kiambere and Masinga dams - two dams upstream of the potential site of the HGF - reveal persistent claims of inadequate compensation during the resettlement process (World Bank, 1993) and the impacts of that are still felt today (Clelland, 2021). As K'Akumu and Olima describe, the compensation payments around Kiambere Dam in the 1980s were arbitrary and negotiated without representatives of the affected households (2018). Interviews conducted by the authors with affected households have shown that some recall promised compensation payments so little, they did not make the effort to travel to the responsible offices in Embu Town to collect the money. Others named fraud and misuse of already meagre payments as additional factor for unjust compensation payments. In the post-completion report, the World Bank - one of the financiers of Kiambere Dam - acknowledged that TARDA paid KSh31 million in compensation, but failed to follow World Bank guidelines for resettlement. The guidelines required that affected people be involved and that their welfare is not to be negatively affected. The absence of a resettlement plan in the loan agreement and appraisal report was a concern to the World Bank (1993), p. 8), but ultimately never stopped the project. The World Bank's survey on Kiambere Dam resettlement found significant losses for displaced communities, including reduced land and livestock (ibid.) and insufficient cash compensation.

According to the Land Act 2012, just compensation is to 'be paid promptly in full to all persons whose interests in the land have been determined' (Republic of Kenya, 2012, p. 83). In reality, those with pre-determined interests are the titleholders, that is, the person who was head of the household at the time the land rights were formalised, unless formally updated since then. Land use and land tenure are much more complex, and just compensation from a human rights perspective will require more than merely compensation to title holders.

Land adjudication in the region began in the 1970s, to move from a customary tenure system to private land ownership (Hunt, 2005). Together with customary committees, land was transferred from clan control to individuals. The process was completed in the 1990s with only a few outstanding cases (Hunt, 2005). The formalisation of individual land rights between the 1970s and 1990s led to significant imbalances in land holdings. Survey data shows that land ownership has been skewed from the start, with some people owning no land at all. During our field visits to the border of Tharaka-Nithi and Embu counties, we found areas where exclusion from formal land ownership continues to fuel conflict today. As one County Government official expressed:

> ‘It is like a silent conflict. It only erupts when a Mbeerian, for example, sells that land, because he has a title, sells it to a person. At the time of going now to see the land, that is when the conflict erupts.’ (Interview in Embu County, March 2023, County Government Official)

In particular, in the Mbeere North District of Embu County, households have been denied land ownership based on their ethnicity. The problem arises from the transfer of communal land to individuals by traditional authorities at the time. Clans tended to allocate land to their members without considering the actual use of the land by members of other communities. Through mediation and informal agreements on land-use rights the conflicts between Mbeere and Tharaka households have largely quieted but remain highly sensitive. Any external intervention that touches land-related issues is affecting the fragile peace in the communities. Wherever current tenure arrangements are handled in a more informal manner, flexibility will vanish once compensation payments are tied to land ownership (Bainton et al., 2022).

Regardless of ethnicity, landlessness is the most obvious reason for non-compensation. Landlessness takes different forms and is a consequence of migration, social exclusion, the inheritance system and the patrilineal system of land tenure in the region. In the vast majority of cases, land is owned by men. Women’s access to land is therefore linked to marrying into a household with access to land or land ownership. This inevitably puts women at extreme risk of landlessness in the event of divorce, separation and widowhood. In- formants in this study stated that social structures rarely abandon affected women and single mothers in such cases, and that land is allocated to them. However, they will not be able to exercise any rights over the land they occupy. If left out of the compensation scheme, the gendered effects of displacement would be further exacerbated (Asthana, 2012; Kusakabe et al., 2015). The legal basis for compulsory land acquisition does not give any rights to land users without titles. Consequently, if the social responsibility plan of a dam project does not compensate these individuals, it will lead to impoverishment by design.

Distribution of compensation within a household is problematic even beyond the gender dimension. In the region, there is a culturally embedded practice of dividing land ownership from fathers to sons as they reach adulthood, while in most cases the title to the land remains in the name of the elders until their death. Consequently, if only the titleholder receives compensation, a significant number of households would not receive direct compensation. Instead, it would be up to the titleholder to decide how much, if any, of the compensation sum to distribute to other family members. While government officials argued that cultural practices could address issues of abuse of the compensation system, the majority of respondents in this study expressed concerns about potential conflict and unfair distribution of funds. In addition, many are concerned about the impact of one-off payments of seemingly large amounts of compensation, which may lead individuals to misuse the funds rather than seeking

land and productive investment. Respondents therefore called for a process in which the compensation is paid directly to the households, not only the title-holder.

Interviews with high-level politicians and officials at the national and county levels revealed a very mixed picture when it comes to concerns of non-compensation. For some, the issues raised seem small in number and therefore negligible, while others call for a renewed social and environmental impact assessment and new land surveys before implementation of the dam can begin. Social impact assessments are critical in understanding and mitigating the consequences of large-scale infrastructure projects on local communities (Égré & Senécal, 2003). One government official stated that she believed that past experiences with land-compensation proved that the existing procedures were sufficient:

> 'I would imagine if it is done the way it's supposed to be done, that shouldn't be a problem, because the government has been able even to do the expressway and there was a lot of, you know, resettlements and compensations, same with the SGR, so it can be done in an amicable way.'
> (Interview in Nairobi, March 2023)

These examples are interesting insofar as it would be possible to draw very different lessons from the mentioned cases. The con- struction of the Nairobi Expressway, for example, forcibly evicted 18,988 households from the Mukuru kwa Njenga slum who were, according to Amnesty International, not resettled (Amnesty International, 2023, p. 221). Human rights abuses during the demolition and forced eviction were taken up by the international press (Ram, 2021), and eventually forced then-president Uhuru Kenyatta to publicly apologise. The case of the SGR railway construction, too, came with several legal cases around supposedly unlawful compensation payments (Lesutis, 2022). This illustrates how different interpretations of past experiences with resettlement and compensation shape anticipations of similar processes in the future, and how these interpretations vary across actors and scales.

For interviewed local officials, renewed land surveys and updated titles are paramount to mitigating the expected displacement. With the dam project seemingly on the horizon, chiefs and assistant chiefs (appointed local government officials) have been urging community members to ensure that their land titles are up to date. While many households claim to have titles, updating them, especially in cases where the titleholder has died, is seen as a tedious, expensive and overly bureaucratic task. People often find it difficult to cover the distances to government offices, and the associated costs can be a burden for many households in the region.

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a burden for many households in the region. Furthermore, conflicts over boundaries or overlapping claims have not been resolved in recent decades, mainly due to the lack of capacity of the relevant authorities and the (at some times) expected facilitation payments.

Present: the capacity to anticipate and economies of anticipation

The main argument of Arjun Appadurai's seminal work is that one does not have to look far ahead to find the future, for it is actively made as a 'cultural fact' in the present. These cultural facts are characterised by a mutual relationship between the present and the future: futures are made through the material and ideational labour of imagination, anticipation, and aspiration; at the same time futures act on the present as an object of hope or 'as a trauma inflicted on the present' (Appadurai, 2013: 299). In this chapter we explore this mutual relationship between the present and futures with a particular focus on economies of anticipation, that is, the clash of different visions of desirable futures that determine present and future economic domination. In this context, we adapt Arjun Appadurai's concept of 'the capacity to aspire' (Appadurai, 2004), to shed light on the related 'capacity to anticipate'. With particular reference to anticipatory land acquisitions, we show how futures are very present in the economies of anticipation around the planned HGF project.

It is hard to imagine a body of water with the power and size to submerge areas that were never considered to be near the Tana River. It is hard to imagine a dam structure capable of pushing the water of the Tana River off its banks, 40 kilometres from its actual location. Imagining a mega-dam is difficult, but anticipating a dam, especially one that has been a vague promise for decades, can even seem irrational. The idea of homes, communities, schools and churches being submerged for what might be eternity makes community members uncomfortable. This discomfort is exacerbated by every new development around the dam. Media reports, visits by gov- ernment officials, engineers and researchers remind people of what might be coming.

Based on our fieldwork, we suggest to categorise the anticipatory actions of the majority of people in the affected Tharaka regions under three labels: denial, uncertainty and proactive anticipation. The three categories exemplify the wide range of very different anticipatory visions and (in-)actions towards the HGF Dam.

Denial in its original sense seems to have a negative connotation, but it is not meant as such in this context. If someone had made investments in anticipation of the Grand Falls Dam in the 1970s, from today's perspective it could be argued that they were misguided. As one interviewee noted regarding the construction of houses in an area that would be submerged by the dam:

> 'If you go round like now you can hear someone is building. There's someone building a stone house, you passed through there. Now, this dam was proposed in 1952, my mother was a young lady, from then we have

> been mentioning them. Let me ask you a question, if someone by then would have said now, 'I'm not going to build a house because a dam is coming,' how would he be living? (Interview, February 2023, Marimanti)

Many people, especially elders, have given up anticipating the realisation of the HGF dam, as they have been told too many times by radio, newspapers, government officials and politicians from Nairobi to prepare for it. For this group, the media reports after the COP27 conference in 2022, with no action being taken in months to follow, even confirm the perception of the dam never materi- alizing. Denial is also a way to cope with the emotional toll that is connected with envisioning the displacement from the ancestral land and the loss of social and cultural ties. One elderly women, for example, told us that even mentioning it made her anxious:

> 'We have only heard of the dam, and it has been discussed for some time now. … Anytime we hear about it we get worried. We keep asking ourselves where we are heading as a people?' (Interview, February 2023, translated from Kitharaka)

The anticipation of infrastructure can lead regions into apathy, where in the economy of anticipation investments are halted, as they do not seem to pay out in case resettlement starts (Kirchherr et al., 2016). This anticipatory inaction can contribute to economic deprivation for households long before displacement (Cernea, 1997). The anticipation of infrastructure results in regional underin- vestment, when too many people don't expect their investments to amortise before demolitions begin, and when the expected compensation won't make up for those losses. The reasoning is used by local government entities in Tharaka-Nithi to halt de- velopments and services, arguing the dam will submerge public investments.

The vast majority of respondents to our study could be described as being in a state of uncertainty, waiting for more information before taking proactive, anticipatory action. Lack of transparency in Kenyan infrastructure planning are common (Plummer, 2019) and prohibit protest and resistance movements to form. Vague plans leave room for positive visions and images of the future, and allow government officials to ask for patience before resisting to a project. For affected households along the river, the lack of transparency makes it difficult to prepare for displacement in any way, especially where anticipatory capacity is low.

We refer to this as the 'capacity to anticipate', which has a lot in common with Appadurai's 'capacity to aspire', warranting a brief summary of his conceptualisation. First, the capacity to aspire 'takes its force within local systems of value, meaning, communication, and dissent. Its form is recognizably universal, but its force is distinctly local […]' (Appadurai, 2013, p. 290). Second, the capacity to aspire is not evenly distributed and heavily favours the better off who have experience in navigating towards wants and needs (Appadurai, 2004, p. 69). This unequal distribution of the capacity to aspire is thus both a repercussion of material inequality, and worsens related injustices.

In the context of the HGF dam, a focus on unequally distributed capacities to anticipate offers important insights into how the project threatens to exacerbate material inequality in the region. The capacity to anticipate, we argue, is a fundamental precondition for success in economies of anticipation. Our study's participants residing in the potentially impacted areas possess a relatively clear understanding of their envisioned displacement scenarios. However, few can actively pursue anticipatory action to safeguard these aspirations and wishes for their future around the dam. In this context, Appadurai's notion of research as a human right becomes particularly relevant. He describes it as the ability to 'gain strategic knowledge' necessary for informed citizenship and democratic participation, emphasizing that research should be understood as an inherent human capacity, essential for everyone and not limited to academic circles (Appadurai, 2013).

An example of the capacity to anticipate is evident in the land market of the Tharaka region, where we observed two forms of anticipation: protective activity for individual risk aversion and land speculation. The first form involves individuals and households living near the Tana or Kathita rivers who may face displacement. Some have used their capacity to anticipate and financial resources to purchase land outside the areas at risk in anticipation of the dam. Historically, land prices in the region have been low, as population density has only recently become a significant factor in the land market. As a result, individuals who have acquired 'replacement-land' in recent years have been able to purchase it at a comparatively low price and in a comparable size to their current land holdings. Acquired land is in these cases usually left undeveloped or uncultivated, and is held only as a means of escape in the event of eviction. This practice also anticipates a possible land rush once the affected households in the region receive monetary compensation, which is believed to cause land prices in the Thraka constituency to skyrocket.

Many fear this particular scenario, but it offers opportunities for local and national elites, i.e. the individuals with the highest capacity to anticipate. As mentioned earlier, *economies of anticipation* in infrastructure development has been observed to lead to land speculation and land price inflation (Elliott, 2022). Lead investors can be drivers of increases in anticipatory investment as others follow their perceived expertise and, in our case, political elites who invest themselves can be seen as having inside information about future developments. This is particularly problematic, when there is uneven information about the exact areas that will be evicted, if the project is built. Fig. 2 illustrates this situation of uncertainty.

As recent studies on the extent of the dam's reservoir have not been made public by government institutions, we have geo- referenced two very different sources to get a very basic idea of which areas in Tharaka-Nithi, Embu and Kitui counties will be affected. The first is the historical files of the National Archives. In 1965 a report was published outlining plans for the Grand Falls and the Mutonga Dam (just upstream) (see purple/inner reservoir). A more recent source is a map that has been widely shared among community members on social media in recent years (yellow reservoir). The

source is unknown, but it is an example of the power of maps, as discussions began to revolve around the image, impacting future anticipations. The image is based on plans for today's larger HGF, which will combine Grand Falls and Mutonga Dam into one mega-dam.

Investors will seek to convince others that their perspective is the right one, as it will benefit their own investments (Beckert, 2016). These 'fictional expectations' used to justify investments influence the events from which they seek to profit (ibid.). Once powerful actors invest in anticipation of the HGF Dam, they have a vested interest in the realisation of the project and the resettlement plan and may use their power to guarantee that the dam project will happen. The investments in land will be most profitable if the majority of the 6000 or so households move to the areas where the investments have been made. This has led to various plans circulating in recent years proposing different models of resettlement to downstream areas in Tharaka and Kitui counties. For the time being, however, the position of Tharaka's political representatives is clearly against any plans for resettlement schemes. Affected households should be compensated according to the Land Act, while considering social and cultural costs of relocation.

All of the dynamics discussed in this section have one thing in common: as people negotiate and navigate futures, associated power dynamics play out in the present. Appreciating or depreciating land prices have a real effect on today's land market, whether or not the anticipations on which these investments are based come to fruition or not. Conversely, investments by powerful actors today might turn into self-fulfilling prophecies tomorrow as they leverage their power to make their anticipations come true. Lastly, unequal distributions of the capacity to aspire are rooted in present material inequalities, which may in turn lead to worsening inequalities in the future when big investors syphon off money from displaced people who are forced to spend their compensation money on inflated land prices. We found that studying the capacity to anticipate as a distinct feature of the capacity to aspire helps to reveal how inequality can be exacerbated even when people have a relatively high capacity to aspire, and how an understanding of contemporary power inequalities is essential to these dynamics.

Future: desired futures at the High Grand Falls Dam

It may seem contradictory to discuss desired futures in the context of involuntary resettlement. In the case of the HGF, it can be concluded that a number of potentially affected people in this study are not opposed to the dam development in general, even though the personal hardship connected with displacement is a pressing concern. Rather, individuals formulate conditioned futures in which they are ambivalent towards the project and cautiously cooperative as long as the compensation plan adequately compensates for losses and the monetary amount of compensation is sufficient to purchase land that will support a livelihood comparable to the current one. Especially during the collaborative art workshops, many participants started

imagining potential positive scenarios, mostly connected to a general notion of improved development in the area, but also on a personal level. One workshop participant, for example, envisioned being able to build rental houses on his plot to make a living from housing construction workers coming to the area.

The preconditions for these more positive futures are, however, compensations that adequately address losses. Looking at this process in detail, one realizes that expectations of affected individuals differ from the legal framework. The Land Act 2012 provides for land compensation at market value with a small addition to cover resettlement costs. Interviewees stressed that market price compensation will not allow them to buy land elsewhere in the Tharaka region, as the land to be inundated in the lower part of Tharaka is less productive and therefore trades at much lower prices. If residents are only compensated at market value, resettlement within Tharaka District will be difficult. Resettlement in urban areas is unattractive to the vast majority, and moving to other counties is, as presented above, for many hard to imagine for fear of political marginalisation and due to experiences of ethnic conflicts in the past. Buying only small plots of land in the upper areas of Tharaka-Nithi County would require a change in livelihood systems.

Apart from imaginations around access to land, desired futures around the dam include participation in implementation of the project and lasting benefit sharing. Coupling benefit-sharing with compensation has been found to be crucial to not only replace lost assets but give affected people a chance to at least maintain their economic status (Dombrowsky et al., 2014). However, compensation and benefit-sharing are two distinct features in infrastructure projects with benefit-sharing not being a legal requirement in most parts of the world (Schulz & Skinner, 2022). In addition, benefit-sharing is a longer-term mechanism that seeks additional and positive development impacts (Schulz & Skinner, 2022). Benefit-sharing can comprise of monetary and non-monetary mechanisms. When funded from the operating income of the dam, lasting benefits can be guaranteed to affected communities, not only households that were affected by displacement (see Dombrowsky et al., 2014).

The desired futures for benefit-sharing articulated by informants in this study were quite modest compared to what has been discussed as ethical in the academic literature (see Schulz & Skinner, 2022). The expected benefits of the dam project aren't usually formulated as demands but focus on potential outcomes of the construction such as employment, increased water supply, extended roads and improved electrification of the area. Especially the construction phase is seen as an important indirect benefit, providing employment opportunities, particularly for local youths. Businesses such as short-term rentals, hotels, restaurants and bars are ex- pected to flourish during the construction period. In the long term, the operation of the dam could create well-paid and skilled jobs for the local community and the stored water could be used to meet the urgent need for drinking water and irrigation in the semi-arid region.

The discussions in this section have shown that even though the HGF Dam appears as a 'Damocles project' (Kirchherr et al., 2016) to many residents in the area, and

threatens to ‘empty the future’ (Groves, 2017; Tups & Dannenberg, 2021), people in the area nevertheless articulate desired futures in relation to it. The reaction to this is an ‘entanglement’ (Aalders et al., 2021) of individual futures to the project, not drawn up by planners and implementers but by the affected themselves. Instead of leaving only one centrally planned vision of development, people in the affected area insist on their own ambitions for a dammed future. The future, then, does not only appear as a potential ‘trauma inflicted on the present’ (Appadurai, 2013, p. 299), but also as a dreamscape, unto which locals project dreams, desires, and hope. This hope, Appadurai argues, ‘is the political counterpart to the work of imagination’ (ibid., p. 293). The perseverance of residents near the proposed HGF development to not only anticipate the future but also establish desired futures ought to be comprehended as a political action. It creates a vision where individuals may be displaced from their land but still maintain a home in the future. This resonates with the field of displacement studies, where resettlement is not just seen as a policy issue but also as a potential future for displaced populations. By using collaborative visual methods, participants in this study were able to share their visions of the temporal frames of displaced futures or futures of displacement. These exercises revealed that even relatively margin- alized groups can envision a role for themselves in political processes that might otherwise be designed at their expense.

Conclusion

In this article, we have demonstrated the multi-temporality of displacement around the HGF multipurpose dam, that is, in inter- related past memories, present negotiations, and future anticipations. Anticipating possible future eviction is rooted in memories of past anticipations of previous construction projects in the study area and along the cascade of dams upstream of the study area - a phenomenon for which we adopt Gaia Giuliani’s (2020) term ‘memories of the future’. Future evictions are negotiated in the present, in a political arena (Rieber & Müller-Mahn, 2024) characterised by an unequal distribution of capacities to anticipate, which are prerequisite to economies of anticipation. Lastly, these anticipations are also rooted in the future, which appears as a threat, but onto which people in the study region nevertheless project their hopes and desires.

People living in the vicinity of the proposed HGF dam have to navigate this complex, multi-temporal arena of memories, and anticipations; fears and hopes; the past, present, and futures. Eviction from an ancestral place threatens one’s existence on all temporal levels: it is a looming possibility in the future that casts a long shadow on present conditions, affecting people’s decisions whether or not they should invest in their current homes, develop their land or pursue business opportunities. The looming dam affects people’s attachment to their ancestral homeland, their burial sites, places of worship, and traditional livelihoods. In short, collective memories are imperilled by future anticipations. Yet, many of the potentially affected entangle their own hopes and

desires into the landscape of futures created by the HGF dam; they resist a displaced future and instead insist on their place in futures in displacement.

We have found the capacity to anticipate being a useful sub-category of Appadurai's work on the capacity to aspire. The capacity to anticipate emphasizes access to information as a critical capacity determining access in economies of anticipation. We argue, however, that it is not enough to inform affected communities transparently about what will happen, but that implementing agencies must also take into account the specific needs and aspirations of affected people in their plans for the HGF project, if it is not to end up as one of many examples of injustices around dam development. Addressing the incomplete process of (un)formalised tenure would be the very first step towards a more ethical process of displacement and compensation. However, unless systems are developed that include compensation mechanisms for current land users and livelihood losses for landless residents, the gendered impacts of displacement would exacerbate existing inequalities. This will constitute a time-intensive process that is impossible to implement in a 'fast-tracked' timeline, as currently envisioned by the UK and Kenyan governments. In these master plans, residents appear mostly as an obstacle to be overcome to make space for the future. In order to guarantee a place in futures in displacement, to make sure that a dammed future is not merely a trauma inflicted on the present but an opening for hope and local agency, people demand a place at the table where these futures are negotiated. As one research participant succinctly put it:

> 'This is why we are asking the government, can you come in— I mean we need to sit you down. Let us talk and agree, harmoniously … and you know, you have to compensate me, not to take me down, but to take me up.'
> (Interview, Marimanti, February 2023)

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7.3 Non-economy of anticipation: Socio-Political Dynamics in the Construction Phase of Large Dams

Arne Rieber, Eric Kioko, Theo Aalders
Published in *Journal of Political Ecology* in 2025

Journal Citation:
Rieber, A., Kioko, E. M., & Aalders, T. (2025). The non-economy of anticipation in the construction phase of large dams. *Journal of Political Ecology*, *32*(1), 6117. https://doi.org/10.2458/jpe.6117

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The non-economy of anticipation in the construction phase of large dams

Arne Rieber, Eric M. Kioko, Theo Aalders

Abstract
Large-scale infrastructure projects often include government promises and visions designed to win the approval and support of affected populations and to attract much-needed funding for implementation. The promise of infrastructure leads to changes in the visions and aspirations of affected communities, and fuels anticipatory and speculative investment to tie one's future to the perceived benefits of the project. In this article, we explore the process of translating promises into materiality. The construction phase of megaprojects has received comparatively limited scholarly attention, yet it is critical for understanding the socio-technical and socio-political relations of infrastructure. Using the construction phase of the Thwake Dam in Kenya as a case study, we show how the stagnation, uncertainty, and irregularities that characterize the implementation of large dams lead to a decline in initially dynamic anticipatory investment, resulting in what we call the "non-economy of anticipation." We argue that the misuse of infrastructural promises and the opacity of project implementation lead to infrastructural violence long before the actual realization and apart from the materiality of the dam.
Keywords: dams, political ecology, economy of anticipation, infrastructure, Kenya

Résumé
Les projets de développement de grandes infrastructures sont souvent accompagnés de promesses gouvernementales destinées à gagner l”approbation et le soutien des populations concernées et à attirer les fonds nécessaires à leur mise en œuvre. La promesse d'une infrastructure entraîne des changements dans les visions et les aspirations des communautés concernées, et alimente des investissement anticipatif et spéculatif de leur part, dans l'espoir de lier leur avenir aux avantages perçus du projet. Dans cet article, nous explorons le processus de matérialisation de ces promesses. La phase de construction des mégaprojets a été relativement peu étudiée par les chercheurs, alors qu'elle joue un rôle crucial pour la compréhension des relations sociotechniques et sociopolitiques des grandes infrastructures. À travers l'étude de cas de la phase de construction du barrage de Thwake au Kenya, nous montrons comment la stagnation, l'incertitude et les irrégularités qui caractérisent la mise en œuvre des grands barrages conduisent à un déclin de ces investissements d'anticipation initialement dynamique, résultant en ce que nous appelons la “non-économie de l”anticipation”. Nous soutenons que l'abus de promesses liées à ces infrastructures, et

l'opacité de la mise en œuvre du projet conduisent à des violences infrastructurelles bien avant la réalisation effective et en dehors de la matérialité du barrage.
Mots-clés: Barrages, écologie politique, économie d'anticipation, infrastructure, Kenya

Muhtasari

Miradi ya miundombinu mikubwa mara nyingi ina sifa za ahadi na maono ya serikali yaliyojengwa ili kupata kibali na kuungwa mkono na jamii zilizo athirika, ili kuvutia ufadhili unaohitajika kwa ajili ya utekelezaji. Ahadi za miundombinu hiyo hupelekea mabadiliko ya maono na matarajio ya jamii zilizoathirika, na kupelekea uwekezaji wa kutarajia na kubahatisha katika jitihada za kufunganisha matarajio ya mtu ya baadae na kutambuliwa faida ya mradi huo. Katika makala haya tunachunguza mchakato wa kuzibadilisha ahadi kuwa katika uelekeo wenye maana. Awamu ya ujenzi ya miradi mikubwa imepokea kwa ulinganishi umakini wa kielimu, hata hivyo ni muhimu kuelewa majibu ya kiufundi-jamii na kisiasa-jamii yahusuyo miundombinu. Kwa kutumia hatua za awali za ujenzi wa Bwawa la Twake likilopo nchini Kenya kama uchunguzi kifani, tunaonesha namna ambavyo mkwamo, kutokuwa na uhakika na makosa vinavyoutanabaisha utekelezaji wa utengenezaji wa Mabwawa makubwa unavyopelekea kupungua kwa matarajio ya uwekezaji wa awali, na kupelekea kile tunachokiita "yasiyo ya uchumi tarajia" tunatoa hoja ya kwamba, matumizi mabaya ya ahadi za miundombinu na uwazi katika utekelezaji wa miradi yanapelekea vurugu za miundombinu kabla ya utambuzi halisi kando na kufanikiwa kwa Mabwawa hayo.
Maneno muhimu: Mabwawa, Siasa za Ikolojia, Uchumi tarajiwa, Miundombinu, Kenya

1. Introduction

The financing landscape for infrastructure projects has undergone significant transformations, driven by a push to address climate change adaptation, water scarcity, food insecurity, and increasing energy demand through large-scale infrastructure solutions. Governments in the Global South are seizing on this momentum, framing multi-purpose dams as optimal solutions to address resource challenges while also promising economic development (Ahlers, 2020). As a result, the Global South is experiencing something of a renaissance in the construction of mega-dam projects (Atkins & Hope, 2021), with hydropower projects projected to increase significantly in the coming years (Zarfl *et al.*, 2015). The entry of Chinese multinationals (Siciliano *et al.,* 2019) and private sector investors (Ahlers *et al.*, 2015) is emblematic of the increasing globalization of infrastructure finance. Various actors, including the World Bank Group, have highlighted the importance of addressing a "global deficit in infrastructure" (Rodríguez *et al.,* 2021). Therefore, as funding becomes available, infrastructure visions and promises are being adapted to global agendas, even though the plans for the project may be decades old and predate current global funding trends.

In this article, we want to focus on the construction phase of large-scale infrastructure projects, often referred to as megaprojects, to examine the translation of initially formulated promises and the socio-political dynamics and conflicts they cause. Megaprojects, such as large multi-purpose dams, are characterized by their ambitious scale & significant investment and are driven by "politics of aspiration" (Müller-Mahn, Mkutu, & Kioko, 2021). The politics of aspiration refers to the framing of infrastructure projects as promises of desirable futures, inspiring optimism about the future and aligning stakeholders to justify investments. However, this framing often obscures the practical challenges, risks, and inequalities involved (Müller-Mahn, Mkutu, & Kioko, 2021). We use the construction of large dams to show how, over time, projects of this magnitude raise expectations far beyond their actual scope, while at the same time, put increasing pressure on the promises originally made. While existing literature has extensively discussed the planning and operation phases of infrastructure projects, the socio-political dynamics of the construction phase have received relatively little scholarly attention as a distinct phase for analysis. This article seeks to address this gap by investigating how anticipatory actions, investments, and expectations around large-scale infrastructure projects shift as these projects move into the construction phase, and how these shifts shape the lived realities of affected residents during this period.

We investigate the construction phase of the Thwake Dam, a multi-purpose climate finance project in Kenya, to explore how socio-political and economic factors turn the economy of anticipation associated with the project into what we call the "non-economy of anticipation." Thwake Dam is part of the global renaissance in dam developments offering an opportunity to assess what has changed, or remained the same, compared to the initial wave of dam projects, which faced intense criticism. The

criticism around dam developments in the 20th century led to the formation of the World Commission on Dams (WCD) in 1997. The Commission published a comprehensive report, aiming to set out best-practices (World Commission on Dams, 2000). The WCD gained large attraction from governments and development institutions globally (Schulz & Adams, 2019), however, only few adopted it as a binding strategy in dam developments (Moore, Dore, & Gyawali, 2010). Twenty years later, it became apparent that the boom for dams in the Global South is not following the recommendations set by the WCD and the very same conflicts - such as the clash between economic benefits highlighted by engineers and politicians, and displacement and environmental degradation highlighted by activists and scientists, have resurfaced (Schulz & Adams, 2019). In addition, while today's aspirations may focus on creating "climate-proofed waterscapes," profit-driven operational practices perpetuate harmful infrastructural impacts in addition to the physical structure of dams, which inherently negatively affect residents in their vicinity (Käkönen & Nygren, 2023).

Scholars within the field of political ecology have studied the socio-political impacts of water infrastructure, such as dams for decades,[8] particularly in terms of displacement, resettlement, and resistance (Del Bene, Scheidel, & Temper, 2018; Scudder, 2012), disproportionate burdens on marginalized groups (Munzer, 2019), and development promises (McCully, 2001). Interestingly, political ecology research on development promises shows that dam projects are often characterized by strategic overpromises and depoliticization at the same time. For example, Atkins and Hope (2021) as well as Huber and Joshi (2015) discuss how through a "green" repackaging of the developmental promise of dams, the projects are deemed apolitical, presenting them as the only possible future while ignoring their immense ecological and social impacts. Dye (2022) finds that in Rwanda and Tanzania, dam projects are strategically deployed within a high modernist framework that depoliticizes their negative impacts by emphasizing economic progress and technical benefits. Puerta Silva and Carmona Castillo (2020) show how Environmental Impact Assessments (EIAs) in dam projects function as governmental tools that use technical framing to legitimize infrastructure development, depoliticize negative social and environmental impacts, and obscure exclusionary practices. Braun (2020, p. 855) highlights the strategic use of proclaimed future benefits of dams as a way to contain local discontent and dissent while maintaining hopes of a better future through a "logic of improvement." With this focus on promises as well as the temporality of dam developments (Braun, 2020; Bromber, Féaux De La Croix, & Lange, 2014), we aim to contribute to the political ecology of dams and to the debate on economies of anticipation in infrastructure studies. We argue that the intentional misuse of infrastructural promises and the false imaginaries created by developers and governments create non-economies of anticipation, which we believe constitute a form of infrastructural violence (Rodgers & O'Neill, 2012),

[8] See Meehan *et al.*, (2023), Chapter 6 for an introduction to the political ecology of dams and Middleton (2022) for a review of the broader literature.

regardless of the material outcomes of the project and in part regardless of the materiality of the dam itself. Infrastructural violence already unfolds during construction long before the project is completed. By this, we highlight an underexplored phase in the life cycle of mega-dams. We examine how the stalled construction of the Thwake Dam is fueling a unique "landscape of anticipation" characterized by crumbling promises. Our analysis shows that the socio-political and economic hardships for affected residents are not only caused by pre-construction displacement or the impacts of completed infrastructure but are also deeply embedded in the often-indefinite construction phase. This study highlights the need and opportunity to continually revisit (mega-) infrastructure projects through a political ecology lens, analyzing their impacts in all stages of their development and decay.

In the following, we will focus our analysis on three distinct development phases of the Thwake, which are not uncommon for similar mega-projects (Ansar *et al.,* 2014): imagining, building, and stalling. We find that imaginations about the materiality of the dam create expectations and anticipations, bringing together actors and strategic groups across scales. However, during the construction phase, these highly charged expectations and anticipatory investments fade quickly, and the everyday practices once driven by eager anticipation turn into apathy.

2. Phases of infrastructure development

There is an interesting tension in the growing literature on the temporality of infrastructural promises (see for example, Anand, Gupta, & Appel, 2018; Kovač & Ramella, 2023). On the one hand, authors argue for a processual perspective that takes into consideration "the different phases of infrastructure's life span—design, financing, construction, completion, maintenance, repair, breakdown, obsolescence, ruin, and how these imply different temporalities in turn" (Appel, Anand, & Gupta, 2018). On the other hand, the same authors diagnose this processual view of infrastructure with a "protean" nature, referring to the shape-shifting god of the Greek pantheon, Proteus, who knows past, present, and future but famously refuses to give straight answers unless seized and held down. This leaves us with an epistemological conundrum: how are we to find out about the significance of different phases in infrastructure development, if these phases are ever shifting and hardly ever distinguishable?

Existing approaches deal with this riddle in different ways. In the same volume as Appel *et al.* Gupta (2018) makes an epistemological case for a perspective in which projects do not simply begin with planning and end with completion, and that "a dynamic view of infrastructure enables us to replace the social death of a project marked by its completion with a focus on movement and process, on the constant struggle between renewal and ruination" (p. 73). Similarly, Carse and Kneas (2019, p. 11) describe the "dialectical relations" from which infrastructural temporalities emerge, leaving the "time-knots" of infrastructural temporalities entangled. More

recently, Dawney (2021) draws attention to "the multiple temporalities of infrastructure, and their shifting ontologies."
This empirically grounded article on the Thwake Dam in Kenya builds on these approaches but argues that, under certain analytical circumstances, it is essential to maintain distinctions between different phases of infrastructure project development. This approach helps untangle the "time-knots," pin down the "protean" nature of such projects, and preserve ontological distinctions despite the constantly shifting foundations on which they rest. This insistence on analyzing distinct phases of infrastructure development has several reasons. Most importantly, we will show that affected individuals themselves refer to a clear break between the prolonged planning phase and the eventual start of construction. Secondly, this relates to the fact that the planners themselves structure the project along distinct phases, which are communicated to and experienced by affected residents. The common use of the terms "planning," "construction," and "completion" in political communication and discourse on infrastructure cannot be excluded from critical analysis. Thirdly, precisely because of the multiple, entangled temporalities of infrastructure development, we see the need for analytical clarity from an epistemological point, even at the cost of potential simplification.

Imagining: The planning phase and economies of anticipation

The planning stage of infrastructure development is relatively well-researched, and several studies have focused in particular on the sociotechnical imaginaries (Jasanoff & Kim, 2015) that are negotiated and contested before the beginning of construction. At this stage, actors and strategic alliances of actor groups try to influence the design of the project in their interests or argue against its implementation. The contestation can be understood as a component of the political arenas of infrastructure development (Rieber & Müller-Mahn, 2024), in which 'challenger' actors take on the implementing stakeholders to secure project inclusion for otherwise marginalized groups. At this stage, the object of contention is fictional. All actions within the political arena are based on the anticipation of what will or might happen during and after the materialization of the project. This anticipation can be very different between actors and stakeholders, exposing epistemological differences in approaching the object of contention and leading to incoherence in the language of negotiation. In some cases, this results in the marginalization of the interests of less powerful groups, communities or individuals. To overcome alternative anticipations and secure both public and financial support for the implementation of the project, developers mobilize visions of growth, prosperity, and improvement (Müller-Mahn, Mkutu, & Kioko, 2021). Alternatively, threat scenarios are mobilized to warn of possible consequences of the non-implementation of the project. Bromber *et al.* (2014, p. 290) describe this as the politics of temporality, in which transformations are promised, with dams as the driver of change and the solution to multiple problems, such as "control of sweet water,

energy provisions, regional influence and modernization of state and citizens" (Bromber *et al.,* 2014).
These promises and visions of the future alter the present and trigger effects well before the project is underway. To "anticipate is not simply to expect; it is to realize that something is about to happen and, importantly, to act on that premonition" (Weszkalnys, 2014, p. 212). Acting on anticipation triggers anticipatory investments, anticipatory practices (Enslev, Mirsal, & Winthereik, 2018), and fictional expectations (Beckert, 2016), ultimately culminating in economies of anticipation (Braun, 2020; Cross, 2015; Greiner, 2016). Economies of anticipation revolve around "dream zones" (Cross, 2015, p. 425), where new regions, driven by the construction of infrastructure, become attractive for the financial flow of capital. What emerges through research is a perspective on "diverse ways in which people orient themselves toward the future" (Cross, 2015, p. 426), acknowledging that these processes are not only driven "by a singular logic of accumulation or rule" (Cross, 2015, p. 427), but in complex social processes by the affected people themselves. In practice, these are subtle changes in people's aspirations and actions, but also drivers in land markets and investments.

Building: Infrastructure under construction

The transition from planning to construction marks a significant shift in the "landscapes of anticipation" (Aalders, 2020) around infrastructure projects. First, the political arena of infrastructure planning vanishes and makes room for a new arena of infrastructure under construction. As it commences, a project's alignment towards the future takes a paradoxical form. On the one hand, it enters a stage where decisions become more difficult to reverse, and therefore facts are created on the ground, leaving less room to challenge the very existence of the project and its wider design (Hudon & Floricel, 2023). On the other hand, the construction itself creates concrete targets for striking workers or acts of sabotage where before there was only form, and placeless visions (Zhu & Aalders, 2023). As projects of such magnitude attract expectations for inclusion during construction as well as inclusion in the benefits of the project, new actors emerge on the scene. Negotiations in the political arena of construction focus on who is to benefit from the construction work and, at a later stage, who will benefit from the project's ultimate purpose, and how? In the case of hydroelectric or irrigation schemes as well as multi-purpose dams, these claims to inclusion extend far beyond the actual construction site and unfold at various scales (Hommes, Boelens, & Maat, 2016; Lord, Drew, & Gergan, 2020).
Secondly, before the construction leads to a new future of whatever outcome, it undoes futures that were held in the spaces that the project will now occupy. While multiple, even contradictory futures can coexist during the planning of an infrastructure project—think of concerns for social and environmental justice clashing with the requirement of fast implementation and cost-recovery (Wasimi, 2010)—the spectrum of possible future pathways is eventually narrowed down to just one during construction. When dams are built in populated regions, they require the relocation of

whole regions. Through this process, any future lives that individuals have developed is nullified, forcing them to start from scratch. Those who are just outside the technically defined boundary of who is to be compensated and displaced, now find themselves in a future conditioned by a dam. Instead of sharing their neighborhood with other community members along a river, they will soon be bordering a large reservoir lake and sometimes a habitat for wildlife. Once living within a community, they are now the periphery. In addition to the trauma of resettlement and the breaking of community ties, communities near the construction site are exposed to the effects of dam construction for years to come. These commonly include trucks passing through residential areas, explosions, dust, and the effects of a temporary influx of workers. They are the trade-offs that people living near dams are expected to endure throughout the construction phase for a greater, dispersed, and often weakly-defined good. In the absence of benefit-sharing mechanisms, the future marginalization of those most affected (Fan *et al.*, 2022) manifests itself during the construction phase, or, as in the case of forced displacement, in its immediate preparation.

Stalling: Building the non-economy of anticipation

Large projects are often subject to delays, cost overruns, and persistent financing problems that are almost inherent in infrastructure development. Over-optimistic project timelines and cost underestimates are often deliberate, due to tendering procedures that favor the lowest bid (Flyvbjerg, 2007; Flyvbjerg *et al.*, 2002), which leads to significant deficiencies later in implementation. This section explores these issues in detail, highlighting how they contribute to the development of a "non-economy of anticipation" and "infrastructural violence." It is worth noting that the contemporary wave of dam developments involves new actors not captured by earlier megaproject research. Käkönen (2023) highlights that in Cambodian dam projects, the host government and developers adopt "no strings attached" approaches with regulatory exemptions and limited oversight, leading to faster timelines and fewer delays—typical of Chinese overseas infrastructure investments. Thus, our conceptualization is more relevant to cases with stricter funder regulations, such as those by regional development banks and the World Bank.

Within these stricter models for tendering and project planning, one can assume that the project with the most unrealistic goals and the most optimistic cost and time estimations is chosen for implementation (Flyvbjerg, 2007). This strategic overestimation can lead to additional financial demands and timeline extensions as projects progress. When rising costs exceed the capacity of financiers like private investors, development banks, or governments, delays or even project stalling can result. These processes are visible to the public and any delay in the completion of a new (mega) project attracts media attention. It is impossible for developers and financiers to hide cost overruns and delays, and yet the original promises made (and possibly required to get the project off the ground in the first place) are usually not adjusted or revised, but maintained until proven otherwise.

This is what Braun (2020, p. 855) calls the "logic of improvement," which is about renewing hope in the promised prosperity of the project and dismissing complaints until the final benefits are realized. However, for the people who once bought into or consented to a project on the basis of the promises initially made, this phase marks a time of increasing recognition and understanding that not all promises may be kept, especially not within the expected time frame. As the project progresses, affected residents may enter a phase of disillusionment and uncertainty, and are faced with the hardship of being in the vicinity of a megaproject for longer than originally planned. With increasingly fluid timelines and delayed goals, it becomes difficult to rationalize actions towards anticipated future benefits of the project.

This disillusionment leads to what we call a "non-economy of anticipation." The realization that initial promises will not be fulfilled leads to a reduction in actions towards the promised future, as the credibility of these promises weakens. While a savvy investor may buy land to build accommodations for the anticipated influx of construction workers, she may cut her losses and sell the land and abandon her investment as she realizes that these workers may never arrive. A non-economy of anticipation is characterized by the stagnation of entire regions for an indefinite period. This phase has a profoundly negative impact on people's livelihoods and contributes to a growing sense of exclusion and a loss of confidence in the initial prosperous future. We propose this term as an addition to the existing academic discourse introduced above on the "economy of anticipation" (Braun, 2020; Chome *et al.,* 2020; Cross, 2015; Greiner, 2016) and "fictional expectations" (Beckert, 2016). In economies of anticipation, people align present economic activities with the future defined by an anticipated infrastructure project: "To speak of an economy of anticipation is to focus our attention on the diverse ways in which people orient themselves toward the future and the ways that expected or promised futures conflict or converge" (Cross, 2015, p. 426). Braun (2020, p. 855) argues that the above-mentioned "logic of improvement" is what constitutes an economy of anticipation, and in the case of large dam projects, is what keeps it alive. Our proposal to reverse the term into a non-economy of anticipation is an attempt to allow for a pessimistic understanding of this phase of megaproject implementation, especially when the "logic of improvement" is not (any longer) able to convince all the people it targets. At the risk of writing a fatalistic argument, it describes the socio-political status quo when the bubble of the political promise bursts.

The non-economy of anticipation is one where infrastructural violence unfolds before the project is operational. The skepticism about the infrastructure promise reveals, "how [...] relationships of power and hierarchy translate into palpable forms of physical and emotional harm" (Rodgers & O'Neill, 2012, p. 402). By including a perspective from the sociology of expectation, we can see that infrastructural violence is deeply embedded in the processes through which large-scale infrastructure is developed, promoted, and constructed. Borup *et al.* (2006, p. 290) argue that "Expectations usually have a temporal patterning over time. This is often manifested in alternating

cycles of hype and disappointment. This phenomenon of early promise/later disappointment suggests that while expectations are essential to mobilizing effective interest, an early surge in hype is necessary in order to get a hearing. [...] Thus disappointment seems to be almost built into the way expectations operate in science and technology."

This observation is in line with Flyvbjerg's (2014) work on megaprojects and infrastructure projects which, by design, overestimate benefits. However, these actions and expectations by developers result in emotional and material consequences for those affected by the project. When working in areas with high poverty rates and making promises that impact livelihoods, developers can secure consent by fostering commitment to the idea of a better future. However, this often leads people to overcommit and invest their limited resources in a future that may never come—despite those in power being fully aware of the small chance of that future coming to pass anytime soon.

When the project begins to delay or stall, withholding planning details and timeline changes from those most affected leaves them unable to anticipate future developments due to the opacity of those in power. As we elaborate in detail in the presentation of our empirical data in section four, people in the non-economy of anticipation become aware of this widening gap between what was promised to them and what actually seems to be happening. Lesutis (2022a) calls those affected the "Anticipation Populations" describing them as groups given uncertain hopes of inclusion in state-led development, yet often left in a precarious position as promised benefits fail to materialize and inequalities deepen. The gap between promise and what is unfolding during (stalled) construction, creates a dizzying diplopia, a figurative and literal "double vision," where the overlap of promised and probable futures makes it impossible to orient toward any one future. Rather than seeing no future worth investing in, people grow increasingly skeptical of the unrealistic futures promised by developers, leaving them reluctant to invest in any potential future, including their own.

3. Research area and methods

The Thwake Multipurpose Dam is a dam project on the border of Makueni and Kitui counties in the semi-arid region of Kenya, south of Nairobi. The dam is located just below the confluence of the perennial Athi River and the seasonal Thwake River. The roots of the project date back to the 1950s (African Development Bank, n.d.), and was originally planned under the colonial administration. However, it never materialized and preparatory work only began decades later in 2016. The dam is being built to supply water to the Konza Technopolis, a planned ICT hub south of Nairobi that is set to become the future "Silicon Savannah." In addition, there are a number of objectives related to climate adaptation and water management for the water- scarce regions of Makueni and Kitui, as well as a small component for hydropower generation. The

generated electricity is required for the distribution of water to higher areas. The "food deficit" counties of Makueni and Kitui are to receive water for the irrigation of 40,000 hectares of land (African Development Fund, 2013). The project is funded in parts by the Kenyan government and through the African Development Bank (AfDB). Most of the funds provided by the AfDB are sourced from the World Bank (African Development Fund, 2013). The construction of Thwake Dam is structured in four phases, one is water storage, two is implementing hydropower production (20MW), three is water supply to Konza and other urban centers, and four is the irrigation scheme.[9]

The research team for this study consisted of the authors of this article, as well as a Wote-based consultant familiar with the dam development, who assisted in liaising with public and private officials and in translating interviews conducted in Kamba when Author 2 was absent. The research was further supported by a local community elder, who is well-known in the area and played a crucial role in connecting the researchers with residents in the vicinity of the dam site. The fieldwork consisted of two phases. In mid-2023, author 2 & 3 spent one week around the Konza Technopolis and the Thwake Dam construction site for an initial visit and to informally engage with stakeholders and residents. In early 2024, author 1 & 2 continued with an in-depth analysis of the current socio-political dynamics, focusing solely on the Thwake Dam. This decision was made because the success of Thwake Dam is a precondition for the future and success of Konza Technopolis.

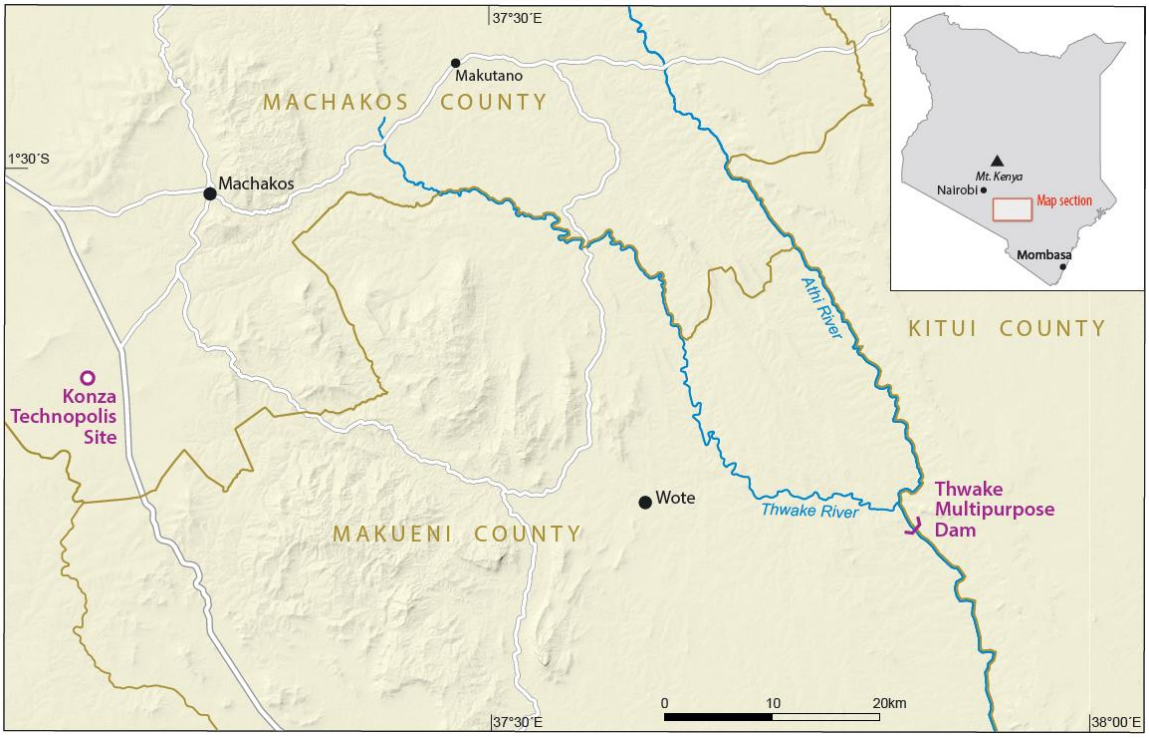

Figure 12. Location of the Thwake Mulipurpose Dam. Source: Field data, 2024

[9] The 2013 project appraisal report considers hydropower as phase three and water supply as phase two (African Development Fund, 2013). As several respondents understand water supply as phase three, we assume that this order has changed since the publication of the report.

Over a field stay of three weeks in 2024, the authors conducted 18 semi-structured interviews with individuals who live in the immediate vicinity of the construction site, but who were not or only partially compensated during the resettlement phase. The goal was to assess the transition from the planning to the construction phase with these informants. For reasons of accessibility and to focus on communities in which many are to border the dam and the dam reservoir, locations on the side of Makueni County were targeted. The interviews revolved around the history of the dam, changes in livelihoods, community bonds, and changes in aspirations, as well as anticipations influenced by the ongoing construction and political communications. In addition, four county and local level politicians were interviewed to gain an understanding of the political dynamics. The research concluded with interviews with consultants directly involved in the construction works and with a visit to the construction site. For the sake of anonymity, their roles cannot be disclosed in detail.
The next section presents our findings from the Thwake Dam site, providing a detailed account of how the promises made at the planning stage are—or are not—translating into material outcomes in Kenyan infrastructure politics.

4. Thwake Dam under construction: Translating promises in infrastructure politics

The Thwake Multipurpose Dam project re-emerged modestly as part of Kenya's Vision 2030, the country's development blueprint launched in 2008. According to the AfDB appraisal report and the Environmental Impact Assessment, the project's general objectives are to "open up the region" (African Development Bank, n.d.) and to improve water supply and irrigation systems, benefiting approximately 1.3 million people and creating over 7,000 jobs (African Development Fund, 2013). After years of litigation over the tendering process, the project was finally "under construction" by late 2017. As the project progressed, so did the communication surrounding it; the first issue of the *Thwake Dam Journal*, published by the Ministry of Water, Sanitation, and Irrigation, was titled "At the cusp of economic revolution: How Thwake Multipurpose Dam is set to change fortunes." Here, the dam was being hailed as an economic catalyst for the entire Lower Eastern region of the country and as a contributor to food security. While we acknowledge the limited significance of such political communication materials, they nonetheless demonstrate the confidence with which developers have promoted the megaproject, and echo the language used to promote the project to the residents in the affected region.

Imagining: The promise of Thwake Dam in public participation and resettlement

Preparations for the Thwake Dam began some 60 to 70 years before the first stone was laid. Plans for the project can be traced back to the colonial administration. The site of today's Thwake Dam was identified as a suitable location for large-scale water storage.

Traces of the planning for the megaproject were very present in the area, as a water level gauge was built around the site of the dam and beacons were placed in the area. As engineers and planners moved in and out of the area over the years, the idea of a dam at the confluence of the Thwake and Athi Rivers was a very present but distant reality for the people of the area, but none for which anyone was actively preparing. With its long history, the vision of a dam in the region had become part of the collective memory. People who are now adults would grow up hearing about the Thwake Dam.
Talks about the Thwake Dam gained public and media attention after the initial tender and environmental impact assessment around 2013. However, legal issues surrounding the bidding process delayed the actual start of construction for several years. During this time, respondents recall a period marked by uncertainty, yet also one characterized by proactive measures, as people began to prepare for expected changes. Within this process, few people were able to take advantage of the situation. With the necessary financial resources and access to information about the project, some were able to purchase land and develop it with the intention of making a profit once land acquisition by the state began. Apart from land, business opportunities arose and were explored in areas also far from the actual construction site. With the expected influx of thousands of workers, some speculators invested in hotels, rentals, churches, restaurants, and shops in anticipation of the construction of the Thwake Dam.
However, when in 2016 the first sensitization workshops were held to raise awareness about the project in the community, the majority were still relatively in the dark and could not believe that this time the dam would actually be built. Repeating the promise of a project too often tends to weaken it, to the point where the dam turns from promise to punchline:

> I had always thought of it as a joke, but I started seeing the seriousness of the matter when people started selling their land. (Interview in Kathukuni, January 2024, translated from Kamba)

The meetings held by the National Land Commission and the Ministry of Water in 2016 revolved around two key issues; the first was to obtain community consent for the construction of the project, as public participation is enshrined in the Kenyan Constitution. Secondly, the aim was to raise awareness about compensation for the approximately 1,000 affected landowners and to negotiate a fair rate for the land, as well as for any structures and development on it. Overall, the compensation process was indeed perceived as relatively fair. After the initial rejection of the project and the proposed amount of compensation, the results after renegotiation were viewed positively by many, with no reported cases of compulsory land acquisition. However, the issue of public participation—and thus the basis for what followed—appears to have been flawed or outright abused. Residents noted that the meeting's timing excluded many working community members, leaving mainly elder representatives to attend participation meetings. Consent was informal, based on a simple show of hands and

allegedly, developers[10] filled the meetings with "outsiders" who were compensated to sway support, outnumbering local voices and concerns. This allowed the developers to tick off "community consent" despite lingering disagreements. People who were rather optimistic about the project from the start, rather than those who had to resettle, were most convinced that the dam would be a solution to the water shortage in the area. As with many semi-arid lands in Kenya, intensification of agricultural practices and the production of high-value crops require sources of irrigation. Water is further a crucial aspect for livestock production. The developers made use of this aspect, not only to position the dam as a solution to the climate risks of the Lower Eastern region and to attract funding from the AfDB, but also to promote the project locally. Phase four of the project is to establish "irrigation works for up to 40,075 hectares of land in Kitui and Makueni counties" (African Development Fund, 2013, p. 3). This prospect, even though no information about the location of the irrigation scheme has been made public, has raised hopes and changed the imaginations and aspirations of the people in the area, as well as those of outside investors.

An additional factor in anticipatory actions arose from the financial compensation that was paid out to the displaced. When it became apparent that compensation would include not only the land itself but also the improvements made on it, some individuals acted quickly to increase their potential compensation. Many of these actions could have ended up being misguided if the project had not been implemented. The promise of infrastructure and the large-scale acquisition of land by the State before the actual construction of the project set in motion economies of anticipation.

> […] actually what happened, when it became apparent that this project will take off and some people knew early enough that there is going to be compensation, we had cases whereby some locals planted extra plants with an eye of compensation, because besides the land, they [the developers] were paying for […] mango trees and so forth, so, because there are people who knew about the compensation almost a year to, so they went ahead and planted more trees, you know? You find that someone has had 10 trees and now all of a sudden they plant like a hundred trees, so they were strategic they knew by the time compensation come I will have 110 trees. (Interview Local Government Official, Wote, January 2024)

Building: The socio-political dynamics of Thwake Dam under construction

The Thwake Multipurpose Project is described by most residents of the area as a project that began in an unexpectedly positive way. Public participation was largely neglected, but what followed during the compensation and resettlement process did not live up to the public's fears as described in the previous section. In the vast majority of cases, compensation was paid on time, allowing displaced families to purchase land elsewhere and to construct new homes. One of the key political promises, and one that was strongly advocated for by county politicians, was to use locally available resources

[10] We use the term developer to refer to the stakeholders involved in the implementation of the project. These are mainly the client, the Kenyan Ministry of Water, Sanitation and Irrigation, the construction company China Gezhouba Group and the AfDB as the financier.

for the construction of the dam, but more importantly, to hire mostly local people to increase employment opportunities for the affected communities. While there were concerns about workers migrating from areas far away from Kitui and Makueni counties, the economic impact of increased employment was felt and seen as beneficial to the entire region and the impact on local centers was quite significant. However, all these positive effects came to a halt when the COVID pandemic also brought the fast-advancing Thwake Dam to a standstill. Work stopped for several months in 2020, and when it resumed, things never went back to normal from the respondents' point of view. The working hours of unskilled laborers were increased, and their daily wages were reduced to approximately US$3.50 per day, all while the cost of living in Kenya rose dramatically. Additionally, the number of workers hired per day was reduced. At times, due to budget problems of the Kenyan government and subsequent delays in the disbursement of funds, the construction company ran out of money and delayed the payment of wages (Maundu, 2023).

Since then, years into the construction phase, the initial promises have begun to crumble. Today, hopes that all the benefits will be realized are low. The promise of improved access to water serves as a clear example of how a promise can ignite hope and change people's aspirations. During the planning phase, water as an abundant resource was a central theme in the narrative, with developers and government officials assuring communities that the dam would provide reliable water for irrigation, household use, and livestock. This promise resonated deeply in a region prone to droughts, raising hopes for improved livelihoods and ultimately driving community support for the project. However, while the project is under construction, accessing water has become drastically more difficult for an indefinite time. The construction company has erected a fence around the construction site that extends several hundred meters from the dam wall. As a result, local people have to walk long(er) distances to access the Athi River. With the increased presence of crocodiles and hippos in the river, the construction of the dam has heightened risks for people and livestock near it. The developers' corporate social responsibility measures to provide boreholes for safer and easier water access have been slow and remain inadequate to date.

The construction phase, which naturally precedes any potential benefits and progress, inflicts immense hardship on the people in the area. This is most evident in the constant blasting and explosions from the quarry (see also Owuor *et al.*, 2023), which have been so detrimental to the people of the area that a committee of senators has been convened to investigate the matter (Senate Standing Committee on Lands, Environment and Natural Resources, 2021) and to suggest improvements. However, as of early 2024, residents had not seen any significant changes. According to the respondents, the blasting has caused cracks in their houses[11] and has negatively impacted the health of people and livestock. The unpredictable timing of the explosions

[11] While the authors cannot verify the causation, almost all the houses in the area had visible cracks and damage.

causes regular, stressful disruption in the area. Additionally, dust from the quarry contributes to respiratory problems, and heavy vehicles have damaged all access roads to the construction site. In the build-up to the project, developers and political representatives did at no point prepare the residents for these and other circumstances:

> […] I have always been of the view that during the time of this project implementation, the local community has gotten more losses than gains, the only profit that we can get is probably after the completion of the project, but during the implementation it was expected that we will get some gains but we were so wrong, we got so many losses. (Interview, Local Government Official, Wote, January 2024)

In addition to the actual losses and hardships, the uncertainty about the future of Thwake Dam adds to an already confusing situation for the inhabitants. As mentioned above, the multi-purpose dam is being constructed in four phases. Phase 1 is underway and consists mainly of water storage through the construction of the dam wall. At the time of writing, phase two (the hydropower component) is dependent on finding new development partners[12] while phases three and four are still many years away, even in optimistic planning. Phase four, the irrigation scheme, has generated the most hope and predictions of improved agricultural systems. However, not only is phase four in the indefinite future, but people living in the area do not even know where the water will flow and from where it will be accessible, making it impossible to act towards that future.[13] Concerns are mounting over who will benefit from the irrigation scheme, as there are rumors that the state plans to purchase approximately 100,000 hectares for the irrigation phase of the project. Before the project, these details didn't matter much to the local people—it was a vague future anyway—but now that the people of the area are directly affected, they expect to be informed about the outlines of the project's components. As the Konza technopolis was the impetus for the dam project, there is a serious risk that once the phase of supplying water to the new urban techno-center has been reached, the main objective will have been achieved. Birkenholtz calls the diversion of water from agrarian contexts to new centers of capital a state-led process of "dispossessing irrigators" (2016), with immense consequences for the livelihoods of farmers.

5. Stalling: Non-economy of anticipation around Thwake Dam

> You know us, we were the ones told before the commencement of the project that we would be the first to benefit the most from the dam. As you see me here, [I] am a businessperson but since this dam was started, our business went nyweeee [went down or were dwindling] […]. At times we

[12] https://www.youtube.com/watch?v=GaYBdaGKXtI [last accessed 07 May 2024], Interview with CS Zachariah Njeru.

[13] According to respondents involved in the construction process, the irrigation scheme is to start a few kilometres downstream of the dam, outside the communities where data for this study was collected.

> come to find that, you know, the employees from the dam, how their work comes to a stop when the project stalls, we also put a stop to our business. You know we give credit [to the customers] and wait for payment at the end of the month. You find that how we thought we would improve is not the case. We feel like we lost hope in this dam. We feel like we were taken advantage of. We feel like we have suffered from it, people did not end up benefiting from it. (Interview in Nguumo, January 2024, translated from Kamba)

When work resumed after the first wave of the global pandemic, nothing seemed the same. While this was certainly a gradual process, for the respondents and workers in the research area, the construction of Thwake Dam could be divided into pre-pandemic and post-pandemic. In the post-pandemic era, the politics of infrastructure development and its usual delays and funding problems took over the Thwake Dam project, and like so many others before it, things didn't go according to plan. The project ran into its first funding problems, the first delays in implementation began to appear, employment began to decrease, the local economy suffered, and soon the project came to a standstill for several weeks. Since then, construction has never resumed at full capacity, and in 2024 the contractor asked for another extension to complete the first phase, which was granted until the end of the year but ultimately not met. As of early 2025, work has stalled again, a political blame game has emerged, all the while the situation around the construction site is becoming increasingly blurry.

This situation creates two overlapping visions of the future for the people living around the Thwake Dam. With one eye, people can still see the vision produced for example by the *Thwake Dam Journal* that promised that the region was "At the cusp of economic revolution"; with the other, they see the more pessimistic vision that they extrapolate from the series of setbacks and disappointments that have characterized the construction process so far. The "disquieting ambivalence" (Lesutis, 2022b) of this diplopia does not offer a future or "dream zone" towards which people can orient themselves (cf. Cross, 2015, p. 426). In the case of Thwake Dam, where people have come to realize that the areas around the dam wall will not be transformed into dream zones, what remains is mostly apathy or simply managing the status quo. This apathy runs so deep that some even hope to be displaced when, for example, the road is built or the first pipes are laid—seeing displacement and the associated compensation as an opportunity to start afresh in a new context where they have more control over their future.

This is the result of over-promising, not only of the benefits the dam will bring to the region once and if it is built in all four phases, but also of the promises made specific to the time of construction. Pre-construction community meetings failed to adequately communicate the immense impacts of the construction to affected households and residents. As Owuor *et al.* (2023, p. 9) concluded in their study of resettlement around the Thwake Dam, "Though dams, like other development projects, are designed to improve livelihoods for the host community, unintended consequences, such as loss of livelihood, shattered social ties, and land dispossession, may overshadow the projected

benefits. The psychosocial burden due to increased uncertainty over the future may further complicate the already precarious conditions for the individuals."
Infrastructural violence unfolds around the dam in two ways, long before its completion. The first form of violence is the materially prolonged and indefinite burden of living near the construction site, and the second is the immaterial losses experienced by those living around the crumbling promises of infrastructure, unable to orient oneself towards a future. On the one hand, there are the losses of misguided anticipation and investment, but also the sense of betrayal and (as the above quote so powerfully illustrates) the growing realization that the prospect of development and consequent improvements in everyday life were political deceptions in the interests of others who are to benefit.
Building on this, the empirical evidence presented here suggests the need for an active academic discussion on the landscape of anticipation regarding infrastructure under construction. Specifically, we assert that the marginalization of those most affected is driven by intentional false promises, which are perpetuated throughout the construction process. A central component of the marginalization of those most affected is the immense lack of information by the developers coupled with the upholding of promises that clearly cannot be kept.

6. The non-economy of anticipation and "built-in" violence

The infrastructural promise or "logic of improvement" (Braun, 2020) is used as an important political tool to keep what Cross calls the "economy of anticipation" (Cross, 2015) alive. With our notion of the non-economy of anticipation, we describe the time during project implementation when this infrastructural promise has lost its force or is superimposed by the immensely negative consequences of the construction work. It is an attempt to highlight the insecurities and everyday hardships and, to a certain extent, the betrayal of the people most affected by project implementation as a result of the political game that unfolds around the implementation of megaprojects. People respond to delays, secrets, and unfulfilled promises in various ways. Workers go on strike, not merely as a struggle for inclusion, but as a demand for fairness and justice. Landowners who were either not included or only partially compensated live double lives. They purchase land further from the dam while holding onto portions near the dam in hopes that these areas will eventually be included in compensation decisions. For instance, the story of a man in a small, lifeless market illustrates this predicament, where he does not stay because he perceives it as a viable future but, solely to make sure his right to compensation is not waived in his absence. Additionally, compensated families who have relocated return to farms on the compensated land or utilize these lands for a few seasons of crops before the dam is completed and fills with water. These abandoned lands are seen as opportunities for a future, however temporary, yet they also deny a sustainable future. Reclaiming these already compensated lands also

indicates the delay of the project and the intention of former landowners to "do something on the land instead of watching it lie idle."

The non-economy of anticipation creates ruins even before the project achieves its goals. While ruins and ghost towns are part of the displacement process, they are also created by false promises and project delays. The sites, villages, and centers around the Thwake Dam are full of shops, restaurants, and rental houses set up in anticipation of a thriving business, only to close before the project is even completed. If you squint just right, you might be able to see the affluent future "dream zones" that the people anticipated when they built these structures. Now, however, these visions coexist with the sinking realization that these dream zones were just that: dreams—ephemeral and unattainable, with no grounds on which to build a future.

Projects such as mega-dams often go over budget, are delayed, and under-utilized, and yet the promises used to gain approval for these very projects continue to be made at the expense of those most affected by them. This reflects a form of infrastructural violence inherent in mega-dam developments within Kenya's modernist political landscape (Lesutis, 2022a). Li (2018) describes these inherent forms as the "built-in" violence of infrastructure, a form of harm that becomes normalized through certain infrastructure developments. The non-economy of anticipation describes a situation where the vibrant activity of anticipating the future is still present as a ruin of its former self but is now overlaid by violent uncertainty and apathy. Fueled by the opacity of infrastructure planning in Kenya, the future around infrastructure is presented by developers as a vague promise, even when that future is already materializing and clearly heading in a different direction. Unlike during the planning and preparation of the dam's construction, where the violence of displacement was open, visible, and more sudden, during the construction it is a process that is slowly uncovered.[14] Rather than problematizing the actual implementation of a mega-dam in the region, we have focused on the misuse of the infrastructural promise and the extreme lack of information about infrastructural planning. We show how infrastructural violence (Rodgers & O'Neill, 2012) unfolds around large-scale infrastructure long before the project is actually completed. However, while our approach does not aim to critique the act of construction itself, it nonetheless arrives at a similar conclusion: the violence in our case study displays characteristics of being "pervasive, routine, and built-in" (Li, 2018, p. 335).

7. Conclusion

In this article, we move the discourse on economies of anticipation from the planning stages of infrastructure projects to the construction phase. We show how the lack of transparency about project details and subsequent project phases forces regions to a standstill, creating uncertainty that prevents any action towards the future. Infrastructural violence can therefore arise from completely immaterial aspects of the

[14] See (Kallianos *et al.*, 2023) for a discussion of more indirect, cross-scalar, and gradual forms of "infrastructural harm."

project, independent of project outcomes and potential future benefits. Infrastructure politics, in which costs and project timelines are systematically underestimated and benefits overpromised, mean that communities around construction sites are unprepared for the hardships associated with megaproject development. In this way, the marginalization of already peripheralized communities materializes during the time of construction. The article examines how the initial promises made to get the necessary support and funding for the infrastructure project are tested in the time under construction, which can lead to disillusionment for people who initially bought into the promises and made anticipatory investments accordingly. We contribute to the discourse on infrastructural promises by introducing the notion of the "non-economy of anticipation," a state where the ruins of the promises are too present to allow people to move on, yet too absent to inspire confidence in the future. The non-economies of anticipation exist in a state of paralyzing "double vision" of two futures, one characterized by eager anticipation, the other by disenchantment.

Building on the political ecology of dams, the case of the Thwake Dam illustrates how the stalled construction phase intensifies socio-political tensions. The "non-economy of anticipation" concept reveals how the uncertain and prolonged nature of construction immobilizes local communities, leaving them unable to navigate or invest in their futures. This paralysis exposes residents to the compounded negative impacts of living in a region "under construction." By examining the construction phase of the Thwake Dam, we show that the infrastructural violence of mega-infrastructures is not only built into the materiality of the object but also deeply embedded in the politics of infrastructure development. Furthermore, we contribute to a temporal political ecology of dams that emphasizes the distinctive character of each phase of infrastructure development. Even as infrastructure temporalities are fluid and non-linear, the people living around Thwake Dam perceive a clear development from high expectations to a significant decline, whereby the inflection point was the time of construction.

In analyzing the material and immaterial violence associated with large dam projects, the different phases of infrastructure development provide critical insights into the forms of violence that are experienced and help to identify the groups that are affected by them. Both differ significantly between the planning, preparation, and construction phases, as our case study shows. By conceptualizing the construction phase as a distinct and critical period in the lifecycle of infrastructure projects, we aim to inspire further empirical and theoretical investigation into the unique forms of violence and marginalization that manifest themselves during this phase.

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7.4 Claim-making in hydrosocial spaces: The temporality of displacement around Kenya's Masinga Dam Reservoir

Arne Rieber & Benson Nyaga
Published in *Area* in 2025.

Journal Citation: Rieber, A. & Nyaga, B. (2025) Claim-making in hydrosocial spaces: The temporality of displacement around Kenya's Masinga Dam reservoir. *Area*, 00, e12993. Available from: https://doi.org/10.1111/area.12993

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Claim-making in hydrosocial spaces: The temporality of displacement around Kenya's Masinga Dam reservoir

Arne Rieber, Benson Nyaga

Abstract

The political ecology of dams offers an important perspective for analysing the interplay between ecosystem change and social power dynamics in the context of modern development visions. Currently, there is a resurgence of 'dam fever' in Kenya under President Ruto's green growth vision, which envisages the construction of 1,000 small and large dams across the country. This article shows that, while new dams are being planned, the first wave of dam development in Kenya in the last century is not a closed historical event, but continues to generate conflicts and claim-making around reservoirs, and continues as an active dynamic in the here and now. To date, the communities affected by the cascade of five large dams on Tana River, which is currently being proposed for expansion, have not been adequately compensated for the losses they suffered between the 1960s and 1980s. This lack of compensation has reinforced the displaced com- munities' rights to the submerged lands and buffer zones around the dams, even though these rights remain unrecognised within contemporary Kenyan legal frameworks. This case illustrates how the failure to provide compensation during displacement not only leads to significant loss of land, livelihoods and household assets, but also to ongoing claim-making over land and water and the contestation of the hydrosocial territory of dam reservoirs. By exploring the temporalities of infrastructure and hydrosocial spaces, this paper shows how claim-making is rooted in these temporalities, and how these temporalities result in the ongoing burden of securing one's very existence around infrastructure.

Keywords: dams, hydrosocial, infrastructure, Kenya, political ecology, temporality

Introduction

The Masinga Dam reservoir on Kenya's Tana River was filled in 1981 to store water for agricultural and household use as well as hydropower production, initiating a process of displacement of the residents of the area. In 2021, 39 years after the dam was commissioned, this process had not been settled. On the morning of 24 April 2021, a group of 'security forces' as well as Kenyan riot police went into the village of Ndunguni, a small community bordering the Masinga Dam reservoir, to remove any permanent structure as well as evict around 50 households to enforce the claim of the Tana and Athi Rivers Development Authority (TARDA) over the land, a claim that is grounded on the apparent fact that TARDA had secured a title for the land 40 years earlier. From the perspective of the evictees, this claim is highly contentious in several ways. For example, the evictees were not aware that the land had been transferred to state ownership at that time, and they were not fully compensated for their land when the dam was built. The question arises whether it is even possible to rightfully displace people twice within the same project. Many of the residents of Ndunguni market originally came from areas that were later submerged by the dam. If the land had been unsuitable for resettlement, shouldn't that issue have been addressed from the outset? Having not been fully compensated for the ancestral land submerged by the dam, and having lived in Ndunguni for a good 40 years – most of them undisputed – the residents have developed a very strong sense of belonging to the land. Additionally, after nearly all the households have experienced a generational change since settling in Ndunguni market, there is simply nowhere else to go.

In this article, we approach the Masinga Dam reservoir as a hydrosocial space (Liao & Schmidt, 2023), where power is exercised through infrastructure and by rendering the dam a technical issue, the infrastructural artefact is being used to strip certain citizens of their rights (Octavianti & Charles, 2019). We will show how TARDA uses technical aspects, such as the protection of the dam's reservoir, to displace the area's inhabitants to make way for elite investors and revenue gen- eration. By examining TARDA's role in Kenyan water governance and specifically around the operation of Masinga Dam, and to a smaller extent around Kiambere Dam, we introduce the notion of infrastructural time-knots and the temporality of displacement.

Hydroscial spaces, where water and society shape and remake each other (Linton & Budds, 2014), are contested spaces (Boelens et al., 2016; Hommes et al., 2016; Swyngedouw, 2009). Dam reservoirs and dams in general reconfigure power and control. Reservoirs are embodiments of 'humanized waters' (Boelens et al., 2016, p. 3), allowing government authorities to realise spatial visions and control the access to the resource of water over expansive spaces. Building on the examination by Boelens et al. of 'hydrosocial territories' as 'spatially bound, subject-built, socionatural networks that are produced by actors who collaborate and compete around the definition, composition and ordering' (Boelens et al., 2016, p. 4), we add a temporal dimension to investigate how claim-making around hydrosocial spaces is historically rooted,

contested in the present and directed towards the future. We treat the concept of hydrosocial territory as a distinct sub-category of hydrosocial spaces, centring on the contestations of their spatial aspect. In our empirical example, this com- bination of heuristics reveals the key actors and different interest groups, the strategies used to enforce state power and elite interests, and how history and de-historicisation are used to contest claims.

We believe that by adding the notion of time-knots (Carse & Kneas, 2019) and temporality of infrastructure (Anand et al., 2018; Gupta, 2018) to this strand of hydrosocial scholarship, we are able to capture the temporal dimension of these interactions as it highlights the layering of historical and contemporary claims over these hydrosocial territories. Geographic work on space and time as interrelated dimensions (Berry & Cohn, 2023) complements this approach by emphasising the spatial dimension of hydrosocial imaginaries, showing how they mediate collective claims and values through spatial and temporal processes. This approach provides an understanding of the environmental justice implica- tions inherent in hydrosocial transformations and the temporality of the struggle for environmental rights in dam devel- opments, contributing to broader debates on the political ecology of water and dams. In doing so, this article contributes to critical infrastructure studies by showing how the contemporary reworking and discursive production of the reservoir is tied to the overlapping timeframes of infrastructure developments.

The temporal perspective on displacement and hydrosocial territories

The development of dams leads to altered river flows, changes in land use and disruptions to existing water access systems. Changes in the hydrosocial cycle through dam developments, that are part of national efforts for hydropower production, large-scale irrigation and flood control, create unequal benefits and losses among those who depend on the resource (Swyngedouw, 2009). These projects prioritise national interests, consequently relegating local water users along the river to a lower priority. This restructuring of hydrosocial relations extends over vast areas, often dozens or even hundreds of kilometres upstream from the dam. Within these hydrosocial spaces around dams, questions of whose water and whose land overlap and co-produce each other. Large-scale dam developments aim to address this question by restructuring property rights through voluntary forms of displacement or more forceful measures, such as evictions or compulsory land acquisitions. However, as we will demonstrate in this article, the restructuring of property rights, especially when perceived as unfair by the dispossessed, does not replace the human need for access to water and does not sever the economic, social, and cultural connections that individuals and communities have to the land. This results in hydrosocial territories (Boelens et al., 2016), an analytical lens to examine how access to water and the buffer zone of the dam is restricted, contested, redefined and organised.

Our underlying hypothesis is that the contested nature of the hydrosocial territory of dam reservoirs is significantly influenced by its history and temporality. The imaginaries and political promises used to secure the necessary political and public support for dam implementation, as well as the construction phase and displacement processes, all influence the subsequent contestations of the territory. Current claims over water and land rights are strongly shaped by previously held rights or those secured since the construction of the dam. These claims are rooted in an institutional bricolage (Cleaver & De Koning, 2015), where overlapping legal and customary systems are manipulated by more powerful actors. Unequal power relationships and differing epistemological frameworks about land and water rights and the right to compensation (Hoogendam & Boelens, 2019) further compound these issues, manifesting in everyday struggles and disputes over access and control.

For this, we draw on Drapier et al.'s (2024) notion of hydrosocial heritages, which emphasises the historical legacies embedded in hydrosocial territories, and Hommes' approach on the linkage between infrastructure temporalities and hydrosocial territories (Hommes et al., 2016, 2022): 'in order to fully grasp hydraulic infrastructures in their sociopolitical and material complexities and dynamics, it is necessary to follow infrastructures and their related imaginaries through time' (Hommes, 2022, p. 595). In order to examine the complex influences of displacement on hydrosocial territories and the (un)making of hydrosocial territories, infrastructural time-knots provide a helpful framework. In infrastructure politics, planners aim to present a linearity of implementation and clear phases of infrastructure development. However, inspired by Chakrabarty's concept of time-knots (2000), Carse and Kneas argue for time-knots as a starting point for analysis in order to develop a 'more expansive understanding of what these projects are, how they shape social life, and how they come to matter' (2019, p. 15). By working through the 'often entangled form of temporal reckoning' (Carse & Kneas, 2019, p. 11) of infrastructure, we analyse how claims, imaginaries, promises and hopes once held, and how power and violence once exerted during planning, construction or operation, shape the contemporary, decades-old hydrosocial territory of the Masinga Dam reservoir. Contemporary claims are deeply rooted in and in constant exchange with these infrastructural temporalities. With the concept of time-knots, we understand infrastructure projects such as dams, as sites where multiple, conflicting temporalities coalesce around their materiality.

Researching hydrosocial territories on Tana River

In 2022, a 3.3 billion dollar investment agreement between the UK and the Kenyan government was signed at the Conference of the Parties 27 (COP27) in Egypt. After decades of planning and failed attempts to secure funding, this deal aims to 'fast-track' the construction of the High Grand Falls Dam on Kenya's Tana River by a British consortium. The proposed multi-purpose dam is designed to generate 1 GW of electricity, support irrigation schemes, and provide flood control and water storage.

When we approached the case of the High Grand Falls Dam (Rieber et al., 2025) to research the anticipation of the displacement of 4,500 households or more (Njeru, 2022), we started by examining previous dam developments on the river, namely the construction and operation of the Masinga, Kamburu, Gitaru, Kindaruma and Kiambere dams (in order from upstream to downstream). We carried out archival research at the National Archives of Kenya, examining government and donor reports to contextualise the historical development of dams along the Tana River.
In addition, our research on the High Grand Falls included 35 interviews with riverine residents and 10 interviews with stakeholders and public officials in Nairobi and Embu County. These stakeholders included two TARDA directors, the current Senator of Embu, and various county and sub-county officials. Furthermore, nine in-depth interviews were conducted in 2023 and 2024 with individuals residing near the Masinga and Kiambere dams, complemented by an analysis of media coverage of the 2021 evictions. Already in our initial research trip in 2023, it became clear that we were not simply investigating past displacement processes to inform our study of the High Grand Falls project. Instead, we found ourselves in the midst of an ongoing, recently intensified and violent struggle over the buffer zone of existing dams and the land adjacent to the reservoirs, which deserves its own analysis and is presented in this article.

The temporality of claim-making around the Masinga Dam reservoir

To understand the events of 24 April 2021, it is necessary to trace the history and time-knots of the hydrosocial territory surrounding the Masinga Dam reservoir. It is a story that ultimately boils down to the question 'who has the right?' The immense violence and destruction experienced by the people of Ndunguni was executed in the name of TARDA. TARDA's mission is to protect the water bodies in the river basin. In order to do this, or possibly for very different motives as we will show in this section, TARDA opened a court case in 2017 (Kenya Law, 2020) against 27 households in the village in order to obtain the legal basis for an eviction order.

> Now the big question when this [court case] started, I asked myself, these 27 people [accused], most of their children are over 30 years old. How old is the [main] accused? He is over 40 years and he has been here for 30 good years. Who has the right? (Interview with accused, 2024, Ndunguni)

When asked when the presence of the 250 or so people in Ndunguni village began to be questioned by TARDA:

> When TARDA said this is their land? Just recently, not long time ago [...]. Recently.
> Interviewer: So for 30 years no one bothered you?
>
> [...] Nobody even came to claim. [Only] recently. (ibid.)

In 2020, TARDA won the court case in the Environment and Land court in Embu: 'The Plaintiff has demonstrated on a balance of probabilities that the Defendants have encroached and trespassed upon the suit properties' (Kenya Law, 2020, p. 8).
Between 1980 and 2015, there was no relevant interaction between the Ndunguni community and any government authority. Land in the area had not been formalised, or so people thought, and was therefore perceived to be under customary tenure. In 2015, TARDA called for public participation meetings to inform the community about the plan to establish a quarry in the area. Although the prospect of better employment opportunities seemed attractive, the expected impact of large trucks on the roads and the constant dust likely to be generated by the quarry led the majority of com- munity members to oppose the plans. This apparently led to dissatisfaction within TARDA, which was seeking to generate much needed revenue. TARDA was originally set up in the 1970s to implement the Masinga and Kiambere dams. Today, TARDA is a regional development authority with an expanding but rather vague mandate under the Ministry of Regional Development. Large dam developments are now managed by the Ministry of Water and its associated agencies. Somewhat removed from the management of prestigious large-scale development projects, it is today forced to generate revenue for its own operations: 'actually to me TARDA competes direct with the local communities, this is an agricultural institution' (clan elder, 2024, Kiritiri) which becomes evident when the authority starts leasing the buffer zone land to investors.
TARDA's attempts to control the dam's buffer zones are described as rather erratic, and cultivation of land near the dam's reservoirs is somewhat cyclical between investors paying a lease to TARDA and local people reclaiming what they perceive as their land or open public land available to anyone. According to a county government official (Interview, 2024, Embu), evictions such as the one in Ndunguni market in 2021 are by no means unique; evictions around the reservoirs began around 20 years ago and have occurred intermittently in different locations. Ultimately, TARDA lacks the capacity to enforce a buffer zone that should in their view be kept clear in order to protect the reservoirs or to ensure that it is only cultivated with TARDA's permission. This inability raises crucial questions: why is there even a need to enforce TARDA's claims? Why is the hydrosocial territory of Masinga Dam constantly contested by residents who continue to move into areas that TARDA is trying to control? Unsurprisingly, this brings us back to the time when it all began – when the dams were merely imagined, hopes were projected, and promises were made.

> It must be strongly emphasised that for any type of resettlement undertaken detailed planning would be re- quired to ensure a stable conservation farming system, otherwise rapid deterioration of the new area would be inevitable. This planning and its layout on the ground must take place in advance of any settlement (Tana River Development Authority, 1976).

In the 1976 Pre-Construction Environmental Impact Assessment, TARDA proposed three resettlement strategies: First, implementing no strategy at all, which would likely result in residents inhabiting areas bordering the reservoir. Second, establishing a small area for small-scale irrigation, with the 'benefit' that the anticipated 1,000 affected house- holds could be resettled on smaller plots of land than they previously occupied. Third, relocating the people to an entirely different area with a low population density. As we learn from our interviewees, apart from a very small number of households that actually were offered to resettle to the Mwea irrigation scheme, TARDA ultimately went with strategy one. People were approached ahead of the inundation of the land of Masinga Dam by local government officials and asked to leave wherever the water would reach. Our interviewees, who were in some cases young and not the decision- makers in their households at the time, recall this process as informal but relatively unopposed for three main reasons. First, the affected households were promised adequate compensation for relocation. Second, the land in the area was relatively sparsely inhabited; allowing people to find land close to the water. Finally, the communities were assured they would receive stable water sources and the development of social amenities. When inquiring about the effects of points two and three, we learn of a very different current reality. For those who did not settle in the very vicinity of where the reservoir extends today, water has become an immensely scarce resource, both for home consumption and agriculture.

> [the dam] has not helped me in any way because it would have been fair for us if we had water connection. The dam is also infested with crocodiles, which attack our people. So the dam came with a lot of suffering. (Interview with Ndunguni resident, 2024).

Furthermore, respondents assert that they have never been compensated, while TARDA insists that compensation has been paid. However, the available evidence, beyond the large number of people affected, tends to point against TARDA, particularly in the context of the Kiambere Dam, the second implemented by TARDA on Tana River. The World Bank, which was partly financing the construction of Kiambere Dam, states in its completion report that 'the resettlement of the populations displaced by the project has not been executed in an acceptable manner' (World Bank, 1993, p. 6). It further goes on to reveal how TARDA secured itself an extensive buffer zone, more than would be required for the protection of the dam reservoir, and how a World Bank-commissioned study concluded that the resettled experienced loss of land, livestock and access to resources (World Bank, 1993). The World Commission of Dams lists Kiambere Dam as a worst practice case (World Commission on Dams, 2000), and the Japan International Cooperation Agency found in 1998 that '[t]he previous experience in Kenya indicates that the local population have not derived significant benefit from the presence of the new reservoirs, … [and] [f]amilies that were displaced were not properly resettled' (Japan International Cooperation Agency, 1998, Chapter 5). It is interesting to note that while these institutions and agencies are very clear in their assessments, they use framings that are softer than the obvious injustices that their

findings imply. Finally, Clelland states in his study in Kitui County with residents around Masinga Dam that '[t]he widespread perception was that the compensation process was unfair, unclear, non-negotiable and that corruption had occurred' (Clelland, 2021, p. 997).

As a result, and regardless of any legal titles that TARDA may have secured by quietly converting land into public land, the people living along the Tana River claim the land not only on the very likely basis that they were never compensated for it, but also because the original developmental promises were never fulfilled. The historical decisions around resettlement, when TARDA chose not to pursue a resettlement strategy during the construction of the dam, or simply did not have the resources or capacity to do so, and the resulting sense of betrayal by one's own government, have not diminished in their impact on the local population. As noted above, most of our interviewees were relatively young when the dams were built, and the leadership of the local clans has changed since then. Yet this sentiment is active and alive, inherited from the parental generation, making the struggle for compensation and rights to the land around the dam cascade a generational struggle. This unravels one of our time-knots back to an environmental impact assessment in 1976, but it is only one of many that contribute to the contestation of the hydrosocial territory of today. Migration into the area and the resulting increase in population density, as well as people settling along the cascade, some in the early 1980s and others more recently, make issues of justice and injustice much more complex.

Figure 13. The remnants of the violent evictions in Ndunguni Market in 2023.

The village of Ndunguni itself is claimed by not only the current residents and TARDA, but also by a neighbouring clan who claim that the land was under their tenure and was used for grazing before people resettled there (clan elder, 2024, Kiritiri), resulting in a web of claims that makes it almost impossible to undo the non-compensation of the 1980s. Interviews with county government officials and the senator for Embu County show that the fact that some of today's inhabitants migrated to the area only after the dam was commissioned is being used to de-historicise any claims to the land by the entire community. Migration is used to under- mine the legitimacy of claims arising from decades of undisputed settlement on the land. This position is supported by the fact that the Kenyan constitution does not provide for squatters' rights on public land. Recent scholarship on river- hood (Boelens et al., 2022) and water ethics (Schmidt, 2023) highlights how hydrosocial territories are a reflection of legal pluralism and competing notions of justice. Consequently, addressing the initial question of 'who has the right' requires an approach that recognises intersecting inequalities and different institutional frameworks: 'Thinking in terms of river- hood guides inquiry into the different ways that rivers are imagined, defined, built, produced, and lived as socionatural, political-economic, and cultural-symbolic systems' (Boelens et al., 2022, pp. 1127–1128).

However, in practice, this pluralism is deliberately disregarded, and the political representation of communities along the Masinga reservoir is limited. National

government representatives have largely ignored the ongoing problem of TARDA's failure to find equitable solutions around the dams. This neglect may stem from a fear of retribution from higher authorities, discouraging local officials from addressing the issue on a larger scale. More importantly, the affected communities are predominantly Kamba, a minority within Embu County, which likely contributes to their marginalisation and the lack of urgency in addressing their grievances by elected officials at the county level (Figure 1).

To conclude our empirical illustration, we return to Ndunguni village on 24 April 2021. Riot police and a group of 'security' forces had moved in the morning from the reservoir through the houses built near the dam, destroying the permanent structures and forcing out the residents.

Arriving at Ndunguni market, about a kilometre from the dam, the security forces and bulldozers levelled everything. Residents watched from a distance and took refuge in Ndunguni Primary School. The events did not go unnoticed and the community was able to mobilise others from the area the next day. On the second day, a standoff occurred between the residents and the riot police, with the community making it clear that they would not leave peacefully. At this point, there was political and media attention, which eventually led to the withdrawal of the eviction forces. For the next three weeks, the affected residents stayed in the primary school and received humanitarian aid from the Kenyan Red Cross and other NGOs. After this period, the school had to reopen for the next term and people were asked to find another place to stay. With nowhere else to go, the people of Ndunguni re-built their houses and slowly their shops in the market and are back on their original land (at the time of writing). At the same time individuals responded to TARDA's actions by burning and demolishing TARDA offices in the area (Republic of Kenya, 2021). As a result, TARDA's attempt to claim the land of Ndunguni has led to a reduction in its presence in the area (Figure 2).

With the remnants of demolished structures (see Figure 1) still visible in the Ndunguni marketplace, the traumatic memories of the attempted evictions of 24 April 2021 have become an unavoidable part of the daily life.

Figure 14. New and demolished structures at Ndunguni Market.

Conclusion

Thirty to forty years after the planning and construction of the two largest dams on Tana River, Masinga Dam and Kiambere Dam, daily life along the reservoirs remains deeply intertwined with the decisions made at the time. With compensation and displacement never properly addressed, a perpetual cycle of claims, conflict and displacement has emerged.

By understanding hydrosocial territories around dams as deeply rooted in the temporality of infrastructure development, we show how contemporary conflicts, legal disputes, and resource user conflicts are rooted in the conscious neglect of historical dynamics, the silencing of past injustices, and the de-historicisation of claims to land and water. Our empirical investigation of the temporal knots shows how difficult it is to examine environmental justice around infrastructure, decades after its implementation, as many other temporal knots have been added to the equation. Nevertheless, it is a necessary perspective that helps to reveal the nature of the contested territory and how contemporary strategies are used to negate claims or construct new definitions of the hydrosocial territory. By linking infrastructural temporalities with spatial reconfigurations, this work highlights the importance of addressing the interconnected dimensions of space and time within political ecology and critical infrastructure studies. The actions of the Kenyan development authority TARDA around the dam reservoirs illustrate these dynamics in practice. By

retroactively created legal geographies and by framing its actions as purely technical – specifically, the protection of the dam's reservoirs – the interests of elite investors are being served at the expense of local residents that have inhabited the land for decades. By ignoring these historical rights of affected residents and instead calling out individuals who arrived in the area much later, the complexity of layered claims and differing epistemological frameworks are exploited through 'legal forum shopping' (Boelens et al., 2022) to undermine legitimate claims.

The temporality of displacement is evident in the study of the Masinga and Kiambere dams. When fundamental is- sues are not addressed in the planning stages of large infrastructure projects, they become inevitably linked to later stages in the infrastructure lifecycle. The struggle for compensation, access to water and access to land around the Masinga Dam reservoir has become an intergenerational struggle, with the next generation fighting the struggle they were born into or grew up with.

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7.5 Conditional Futures of Infrastructure: Past Promises of the Unbuilt Crocodile Jaw Dam in Kenya

Arne Rieber

The chapter is part of a book proposal submitted to Brill, 'Infrastructuring Africa', edited by Eric Kioko, Theobald Theodory and Max Chuhila. The editors have accepted the revised chapter as ready for publication after review by the editors and an external anonymous reviewer.

The supervisor has given permission for this work to be used as part of my cumulative dissertation project. The reference list of the subsection refers only to citations within the proposed chapter.

Conditional Futures of Infrastructure: Past Promises of the Unbuilt Crocodile Jaw Dam in Kenya

Arne Rieber

Abstract:
In recent years, an influx of investments in Kenya's northern drylands has sparked a wave of contentious politics over infrastructure development, as national development planning is clashing with livelihood realities on the ground. In the context of the LAPSSET transport corridor, the decades-old plans for the large-scale Crocodile Jaw Dam in the Ewaso Ng'iro basin have been revived but to date never materialised. While numerous publications have addressed the question of why infrastructure projects often fail to materialise, the debate on how non-materialising projects shape local futures has more recently gained scholarly attention. In this chapter, I contribute to infrastructure studies by examining past future visions and imaginaries developed by affected individuals along the river. I find that a number of actors and mostly the local communities were excluded from the project's developmental promise, leading to intense contestation by advocacy groups and local politicians. As the proposal lost traction, limited awareness raising led to divergent visions and imaginaries within communities. The apparent lack of developmental promise led to both opposition and the formulation of ambivalent visions and conditional futures.. By introducing the concept of 'conditioned futures', this chapter highlights how affected populations develop future scenarios that are contingent on specific conditions being met. These conditioned futures are a response to the uncertainties and ambiguities inherent in the anticipated project implementation. The chapter calls for a stronger focus in future studies on how affected population groups develop such conditional futures in the context of promised infrastructure.

Keywords: Infrastructure, Dams, Conditional Futures, Contentious Politics, Imaginaries, Promises, Kenya, LAPSSET

Introduction

Infrastructure politics in East Africa has been shaped in recent years by emerging promises and visions of growth corridors and transport corridors. Several projects are currently in a phase that falls between planning and construction. Some sections of these projects have been put into action, but they are spread out throughout the planned corridors. In Kenya, it is the Lamu Port and Lamu-Southern Sudan-Ethiopia Transport Corridor (LAPSSET), the former government's (self-proclaimed) most ambitious infrastructure project in East Africa. Apart from the SGR railway mega-project, LAPSSET has taken a large share of the infrastructure spending in the country, most notably through the extension of Lamu Port and highway links to South Sudan and Ethiopia. These developments and ongoing debates about the future of infrastructure have sparked economies of anticipation (Elliott 2016; Greiner 2016; Mkutu 2021), altered future visions and aspirations of communities and individuals in the regions, and ignited arenas where future developments are negotiated and contested (Boelens et al. 2022). Infrastructure, and even more so plans for infrastructure corridors, come with a promise. The role of infrastructural promise has been extensively researched in recent years and has contributed significantly to a better understanding of the ontology and temporality of infrastructure. In this chapter, I would like to extend this perspective to an infrastructure project where the developmental vision is so vague and the beneficiaries so unclear that at the time of planning, it seemed to be an infrastructure with no promise. For those most impacted, there is still no clear benefit, except for the significance assigned by people and local bureaucrats themselves. The Crocodile Jaw Dam, which I use as an empirical example of an infrastructure with an exclusionary developmental promise, was planned to provide water for the proposed Isiolo Resort City in northern Kenya. However, the resort cities - currently lagging behind the implementation of LAPSSET - will not be developed until the necessary infrastructure such as dams, roads and railways are in place. The proposed resort city at Kipsing Gap, just outside Isiolo Town, is around 80km from the dam site. The vision of creating a resort city in the arid regions of Kenya, which was to become a Las Vegas-style tourism hub in Kenya's north, with water provided by the Crocodile Jaw Dam, was consequently not carried and supported by a visible actor. This invisibility of the beneficiary caused an imbalance in the political arena, favouring otherwise less powerful actors such as local politicians and advocacy groups. The contentious politics (Lind, Okenwa, and Scoones 2020) around the dam and the lack of clear benefits for involved local and county governments put the Crocodile Jaw Dam in a state of non-materialization. However, with the LAPSSET plans still envisioning three resort cities along the corridor, the project is looming over the area.

In this chapter, I focus on two key issues. First, I want to present the imaginaries, visions and aspirations developed by the people who might eventually be affected by the dam. Local awareness raising and consultation with local communities in the

planning stages of the dam around 2012-2014 were rare and fragmented. This exclusion of local representatives from the project and the project's contestation had consequences for the definition of visions of the future. Second, I want to examine how future imaginaries are changing across space and along the river. As dams have impacts far beyond the actual construction site, the research team adopted a transect or 'follow-the-river' approach in the methodology, interviewing resource users from upstream to downstream of the proposed dam site. Dams and dam projects cause severe disruptions for users of river resources. These disruptions can be made visible before the actual construction of a dam by examining the visions and aspirations of users along the river, as anticipatory capacity outlines the threats associated with the disruption. Ultimately, our case study reveals the profound implications of dam development and planning, and suggests the extent to which developers of dam projects would need to engage and consult with water users far beyond the areas around the dam site. The case of Crocodile Jaw Dam provides evidence that lack of consultation with downstream users leaves space to local actors to shape future visions in the region. In cases where these actors (local bureaucrats, politicians, traditional authorities) have no interest of following the project's narrative, counterproductive (from an implementation perspective) future visions can multiply within affected communities. The conceptual point I would like to emphasise in this chapter is the need to allow for 'conditional futures' in future studies of infrastructure projects. Wherever plans for a project are not clearly defined in detail, there is room for local authorities or affected people themselves to fill in the gaps. This ambiguity can be filled by individuals with scepticism, but also with hope and enthusiasm for change. In places where people are struggling to meet basic needs, change can be perceived not only as a threat but also as a way out. This leads to the conditioning of visions of the future. Conditioned futures define the parameters within which one would support change or seek alliances to collectively resist what is coming. The chapter therefore contributes to the discourse on contentious politics by highlighting the multiple layers of individual responses, as opposed to the more unified positions typically taken by organised groups. This nuanced understanding is crucial for understanding the broader impacts of infrastructure promises, especially those that are repeated continuously over time, and the potential anticipatory actions they inspire in affected communities.

The Infrastructural Promise of Large Infrastructure

Plans for the implementation of new or the extension of existing infrastructure follow a certain predefined vision. For the analysis of the Crocodile Jaw Dam, the debate of the infrastructural promise is central, as it was arguably lacking for key actors in the political arena. Dams themselves are based on geographical or spatial (hydosocial) imaginaries (Gutierrez et al. 2019). The promise formulated around this imaginary in the planning phase is seen here as the mediator between the infrastructural imaginary and the imaginaries formulated by those affected.

The infrastructure promise may be directed towards enhancing the mobility of individuals and the transportation of goods, stimulating economic growth, ensuring the provision of essential public services or the containment of natural hazards. The promised impact of infrastructure is manifold. '[Material infrastructures] have long promised modernity, development, progress, and freedom to people all over the world' (Anand, Gupta, and Appel 2018). Pivotal works around promises and visions of infrastructure in recent years have contributed more and more to a better understanding of the role of such narratives by governments and planners. They have highlighted how the sole promise of infrastructure through 'politics of aspiration' (Müller-Mahn, Mkutu, and Kioko 2021, 1071) is a form of future-making, by altering and influencing the anticipation, aspirations and future vision of those involved and affected.

This chapter frames the case study conceptually by looking at the promises surrounding dams and infrastructure projects. The infrastructural promise, just like material infrastructure itself comes in two dimensions. First, the promise surrounds the artefact itself. It can include the engineering or the architectural masterpiece, but also what the infrastructure is going to do at the very location it is built. The second dimension are the intangible promises, where the artefact is to bring positive changes to the social and economic areas of the everyday life, way beyond its locality. Both dimensions create imagined futures (Beckert 2016). The artefact itself carries with it the image of modernity (Anand 2017; Gupta 2020), of state power (Werner 2014) and an aesthetic (Larkin 2013) – in the case of dams - of the engineering power that allows humans the control over the seemingly unstoppable resource of water, resulting in a 'spectacle of modernity' (Dye 2022). Beyond the artefact itself, the promise of mega-infrastructure extends to broader visions of national growth and prosperity (Plummer 2019), and has been widely used in nation-building (Desalegn and Solomon 2022; Enns and Bersaglio 2020; Wimmer 2018). However, the notion of the infrastructural promise inevitably leading to prosperity and human well-being has been challenged (Lawhon et al. 2023). Infrastructure politics is at the end, no different from other areas of politics, with differing interests and visions clashing in the negotiations around future infrastructures (Müller-Mahn, Mkutu, and Kioko 2021). Infrastructure can exacerbate existing inequalities (Apostolopoulou 2021; Howe et al. 2016), become the barrier for some while improving mobility for others (Aalders 2020) and ultimately is a trade-off between interests of different groups in society. It is in this context, that questions arise how futures among potentially affected population groups are shaped, when the developmental vision does not directly addresses them. Is an infrastructural promise needed for affected people to develop a positive imagination around it?

This question in mind, I proceed to engage this not by looking at constructed artefacts but by looking at a project that has not materialized, as it cannot obscure with its material impact. To do this this chapter is focussing at the planning phase of an infrastructure project, or in other words, at its current state of non-materialisation. Construction around the Crocodile Jaw Dam has not yet begun and, although it is still

a point of discussion (Kinyanjui 2023) and on the list of envisaged projects in the national water planning (Ministry of Water, Sanitation and Irrigation, n.d.), the beginning of the physical implementation seems far. The state of non-materialization is in our understanding less a technical one but one where visions of a project are slowly vanishing and where future visions in the area only rarely would revolve around the project. This perspective allows for an attempt at a retrospective understanding of past anticipations and an analysis of the infrastructure promises that were not kept, were not strong enough to push for implementation, or were not held high enough by political actors and developers. The promise of (large-scale) infrastructure creates economies of anticipation, in which spaces are created where 'the future is felt, encountered and inhabited' (Cross 2015, 425). Consequently, this chapter traces the ruins of the infrastructural promise. When considering the potential of infrastructure promises, non-materialisation can be and is used as a strategic tool. When infrastructure projects are associated with promises of progress and prosperity, it is often a rational choice for political leaders to exploit these promises as long as they maintain their visionary appeal. When a project ceases to represent a better future, it tends to fade from public discourse. I argue that the Crocodile Jaw Dam was initially intended to hold an infrastructural promise. However, in the face of opposition from key political actors, the project was quickly abandoned because it no longer, or rather never embodied a dreamscape of modernity (Jasanoff and Kim 2015). Consequently, perceived benefits to the national government of continuing with the project appeared to be minimal. Pushing for a large-scale project where there is nothing to gain became irrational. The notion of a lack of an infrastructural promise is not to exclude other decisive factors, such as the rising public concern of the Kenyan debt-burden and competing priorities within LAPSSET implementation, both likely contributing to the non-materialisation.

The political arena, is a fictional space with distinct geographical characteristics in which infrastructure is negotiated and contested in its process from initial idea to construction. The political arena emerges where different actors begin to negotiate around the visions and technical plans of a project, with the aim of gaining influence over the project's design. The government, together with incumbent actors (Fligstein and McAdam 2012), who are the more powerful actors such as infrastructure developers, development agencies and parastatals, use the infrastructure promise to gain the support of other actors in the field, but also those who are relegated to the spectator stands of the arena. Challenger actors (Fligstein and McAdam 2012) are less established or less powerful actors who seek to disrupt the order in the field or arena. To achieve this, they engage in contentious politics (Lind, Okenwa, and Scoones 2020) and seek strategic alliances to re-balance power asymmetries within the political arena. The contestations within the arena and the promises related to infrastructure are affecting marginalized actors, with impacted communities frequently falling within this group. Future imaginaries are altered by the contestations and the promises within the arena. I define imaginaries at the individual level as a means to 'cope with uncertain

futures and by fostering projective agency capacity' (Bazzani 2023, 387). Imaginaries emerge due to the insecurity of the future but are also used to fill this void (ibid.). Desirable futures are shaped by 'ethics of possibility' (Appadurai 2013) which is guided by imaginaries (Bazzani 2023) as opposed to 'ethics of possibility' which deals with expectations (Appadurai 2013).

After a presentation of our methodology and research area and an introduction to the case study, it is discussed how being side-lined in the political contestations has led to future imaginaries of the dam project and what factors have led some individuals to see a certain ambivalence in the project, while for others the dam has become a dystopian image. I find this analysis useful for two reasons. First, future imaginaries cause anticipatory action and economies of anticipation (Cross 2015). Future imaginaries have an impact in the here and now. Second, by engaging with 'disciplined imagination' (Gümüsay and Reinecke 2022, 238) and 'conditioned futures' we can better identify desirable and desired futures.

Research Approach and the Upper Ewaso Ng'iro Basin

The research around the Crocodile Jaw Dam consists of two field visits in late 2022 and early 2023. Much of the research focused on the history of the Crocodile Jaw Dam and a retrospective understanding of the contestation and negotiations around the project that emerged when the dam was announced as part of the LAPSSET corridor. To this end, limited archival material was analysed, tracing the first visions of a dam as far back as the colonial rule. In addition, 15 stakeholder interviews were conducted in Nairobi, Nanyuki and Isiolo with actors that were directly involved in the negotiations or contestation of the dam.

For this chapter, however, I want to draw much more from the interviews we conducted with resource users along the Ewaso Ng'iro River. In order to analyse imaginations of the future and to understand how futures are shaped by the actions of actors and actor groups, in-depth interviews were conducted with 34 households along the river. In addition, two focus group discussions were held, one with elders from the Ewaso community and one with a women's group outside Oldonyiro town. Both discussions helped to gain a better understanding of past developments in the area and around the dam site. As the impacts of dams are felt far beyond the actual construction site, the research team used a transect approach, or more simply, a 'follow the river' approach. Downstream users are usually more affected than upstream users, but the construction of dams can necessitate changes in upstream water management (Yangouliba et al. 2022). In our case, it was Ewaso in Laikipia County where the first communities to be strongly affected by the dam were identified. The dam would inundate a significant portion of the Ewaso community's land and require the resettlement of a number of households. Discussions with community members focused primarily on broad issues related to changes in livelihoods and general aspects of their daily lives. The interviews then moved on to look at aspirations and expectations for the future, exploring how

individuals envisioned their own lives and, where applicable, the lives of their children. Towards the end of each interview, participants were asked about their awareness of previous discussions about the dam and how they perceived their position in relation to the project.

The communities upstream of the proposed dam site in Laikipia County are home to Maasai pastoralists. A common source of income is the making of beads and other items of clothing, which are sold to tourists who stay in the surrounding private conservancies. This complements the main income from pastoral activities. However, pastoralism is increasingly threatened by changes in land use in the region and an ongoing process of exclusion from rangeland in surrounding conservancies. This was particularly evident at the time of the research, when the region was experiencing its worst drought in around 30 years. Most of the people interviewed had lost the vast majority of their herds in previous seasons. The situation was no different in the communities surveyed further down the river. From Ewaso, the team travelled through Oldonyiro Town, Tuale, Longopito and Kipsing in Isiolo County, concluding the research at Westgate and Archer's Point in Samburu County. Archer's Point was chosen as the end of the research area because the Isiolo River joins the Ewaso Ng'iro River just below the town. This means that the area between the dam and Archer's Point will be most affected by any changes in water flow caused by the dam, as there are no other relevant tributaries before Isiolo River.

Field assistants supported the work by translating from Maa and Samburu into English. In Isiolo and Samburu counties, Samburu pastoralists are the majority group. Semi-sedentary pastoralism is the predominant livelihood in the rural areas along the river. Dependence on the river and its water levels is high, as water infrastructure is virtually non-existent except in centres such as Oldonyiro town. Seasonal streams reduce the need and time spent fetching water on the Ewaso Ng'iro, but aren't available all year round. The Ewaso Ng'iro itself can dry up for several months a year, forcing water users to dig for water in the riverbed during droughts. The water scarcity is also influenced by water use in the upstream areas where larger farms practice high intensity and capital intensive agriculture (Ericksen et al. 2011; Kiteme 2020).

The research team consisted of the chapter author and three research assistants, one for each county. Although the distances between the research sites along the river are limited, the cultural contexts are quite different. It was only by working with local community members (in all cases college/university graduates) that it was possible to gain trustworthy contact with people in the region. Further, it would have been difficult to navigate the security situation in the area, which in recent years has seen armed conflicts between herders and problems with banditry. This research therefore needs to openly acknowledge the indispensable role of 'brokers' (Eriksson Baaz and Utas 2019) and problematize the fact that while data was collected together and through the brokers, the analysis and production of this article was carried out without the same 'collaborative' spirit. From the moment of recruiting suitable candidates to facilitate access to the field - which was done with the help of the Indigenous Movement for

Peace Advancement and Conflict Transformation (IMPACT) and the Samburu Women Trust, which are well known CSOs in the region - power dynamics were established and it was clear from the outset to all parties involved that the final product of the research would not be able to adequately acknowledge the importance of the work of the research assistants. The reason for this is not the unwillingness to share authorship or the silencing of research assistants. None of the members of our partner institutions would have been able to take on the role of both author and expert of the local context. The research area is, by all standards, remote and the ethnic background, as well as knowledge of the area, is crucial to the successful facilitation of research activities (see Jenkins 2018). Therefore, the only practical solution was to recruit assistants as facilitators or consultants to the research, rather than in a co-researcher role. No critical reflection will be able to overcome this. Ultimately, the articulated visions and imaginaries discussed in detail in this chapter run the risk of being analysed through a lens of the future and future-making that is very different from that of our research participants. In addition, the translation of statements into English, which is not the first language of anyone involved in this research, means that inaccuracies must be taken into account, although every effort has been made to ensure that the translation is accurate. Following Temple and Edwards (2002), I would therefore like to make visible the role of assistants and the fact that assistants may have brought their own ideas, values and beliefs to their work and to the translation, just as any other researcher would (Turner 2010). This can be problematised when translation is considered as an isolated part of the research and needs to be reflected in the analysis, but it is also an immense additional perspective in the research process as a whole and an important contribution to knowledge production in a context where the lead researcher was constantly negotiating 'multiple axes of belonging and not belonging' (2002, 9).

The promise of Crocodile Jaw Dam

The Dam and the promise of the Crocodile Jaw Dam reemerged in the context of the LAPSSET corridor. The corridor aims to connect the Lamu port at the Indian coast with Kenya's north and its neighbours South Sudan and Ethiopia. Isiolo Town functions as a node where highways, railways, and oil pipelines are to connect. These infrastructures of mobility and transport are to be complemented by the construction of resort cities along the corridor. One is envisioned just outside of Isiolo Town under the name Isiolo Resort City. Since water is scarce in the region, plans for the Crocodile Jaw Dam were revisited as a potential solution to provide water to the resort city and the growing town of Isiolo. The idea of the LAPSSET corridor and the developments around Isiolo Town resonate with visions of opening up the frontier (Schindler and Kanai 2021) and to extend state-power (Chome et al. 2020) to northern Kenya. The promises of development and mobility have spurred anticipatory investments in the

region (Elliott 2016) but also lead to conflicts among potentially affected population groups (Mkutu, Müller-Koné, and Owino 2021).

While the idea of the dam dates back to colonial time (Sir Alexander Gibbs & Partners, 1949) the plans for the dam emerged in full force for the first time in the 2010s, when the National Water Conservation and Pipeline Corporation commissioned an Environmental Impact Assessment (EIA) for the dam (CAS Consultants [2014] 2016). It was the same EIA that laid the groundwork for the fierce battles between strategic groups that ensued over the dam project and marks the starting point of our attempt to trace past anticipations. With the EIA it became clear that with the dam, Ewaso Ng'iro's water use would now primarily serve the needs of the urban areas around Isiolo and provide water for a resort town. It provoked the very core question of the hydro-social cycle (Linton and Budds 2014). Who controls the water flow, and for whom is water abundant or scarce in the basin? The dam was to store flood water for the year-round supply of the resort city. It also promised year-round supply of a minimum flow of water to downstream areas. The latter was, however, challenged by a number of downstream political representatives for two reasons. First, the time to fill the reservoir would've caused immense pressure to downstream areas for several months or years. Second, downstream ecosystems around Lorian Swamp require floods and large amounts of flood water to sustain. Local politicians and communities in this area were highly sceptical if sufficient amounts would be released in rainy seasons and therefore opposed the project on local and county level. At the same time, the question of who is to actually benefit was vague. It was a vague promise of a resort city, which to date has not been sufficiently conceptualized. None of the respondents to this study had substantial information of who is to develop the resort city, at which exact location and with which goal.

Dystopian and Ambivalent Futures along the River

In the following section I want to discuss the imaginaries that were formulated by individuals in anticipation of the dam and future developments in general in the Upper Ewaso Ng'iro Basin. Contrary to the immense opposition by advocacy groups, many have formulated a more ambivalent stance towards the project. This is by no means an attempt to undermine any activities by civil society groups in this chapter. It does show, however, the performativity of actions by challenger actors and the contentious politics of infrastructure developments in Kenya. Advocacy groups build their actions on decades of work around infrastructure planning and the long experience on the effects of infrastructure projects in Northern Kenya. When consistently observing local communities being excluded from project benefits, opting for fundamental opposition may be considered a rational choice. Nevertheless, I would like to attempt to give agency to the sometimes much more nuanced visions formulated by our interviewees, without contextualising anything *for them*. Taking the imaginaries of the future as they were formulated does shed light on future aspirations around promised infrastructure

and how visions of the future differ along the river. I find that access to water infrastructure and the degree-of-affectedness by the proposed dam play a major role. Analysing (and to some extent over simplifying) the 32 interviews, I find that four respondents were unaware of the dam project, four were undecided about their own position on the project, eleven tended to be supportive of the development and thirteen were clearly opposed. These figures have no quantitative significance, but they do suggest that there is no single voice for 'the community'.

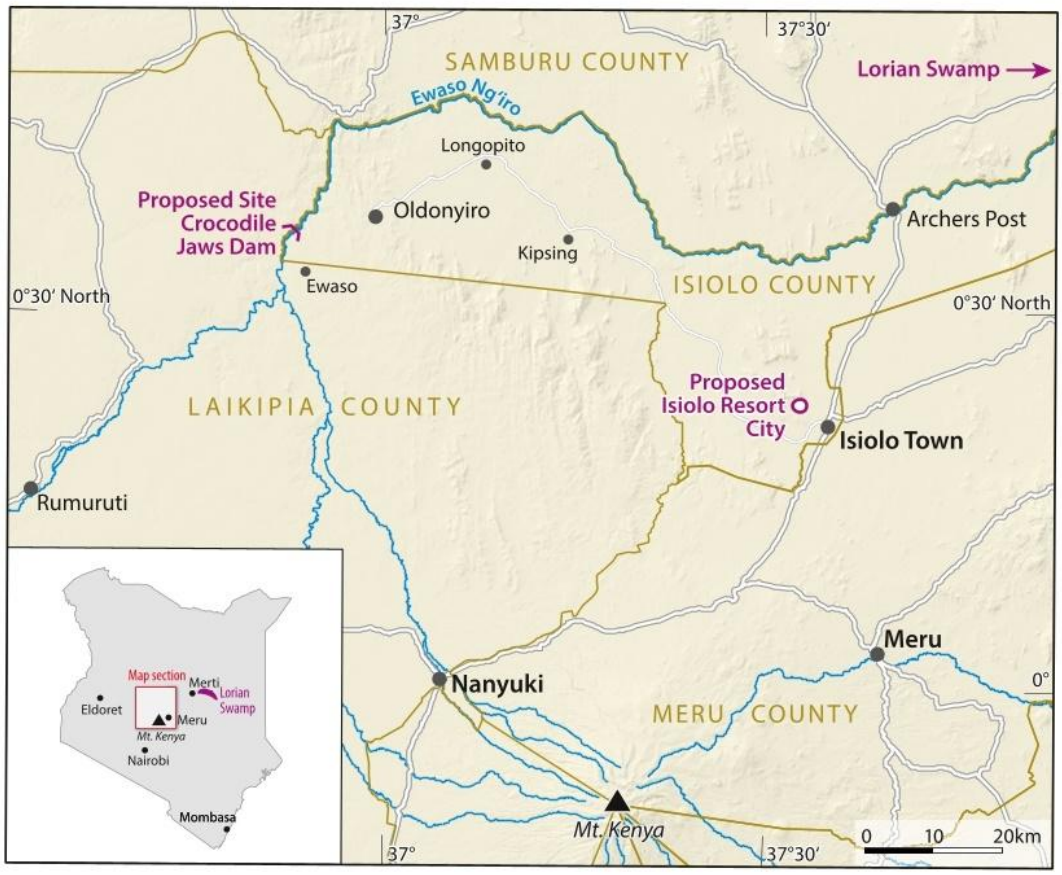

Figure 15: Following the River in the Upper Ewaso Ng'iro Basin (Design: Martin Gref)

The retrospective analysis of future visions begins at Ewaso Market in Laikipia County. The market is situated on a plateau, a two to three hours' drive over gravel roads from Laikipia's capital, Nanyuki. The market has a few well-stocked shops, a water point and schools. From the market, homesteads of community members stretch towards the Ewaso Ng'iro River and the Isiolo County border. From an outsider's perspective, one could try to create a narrative of untouched open land in north-eastern Laikipia, and the surrounding conservancies rely heavily on this, but the reality is too stark. The road first passes through fenced-off plots near Nanyuki, where land is being sold to the country's middle and upper class investors. Soon after, fenced and guarded public and private conservancies lead the way to Ewaso and the western parts of Isiolo County. The community is therefore enclosed in a space between conservancies, fenced plots and Isiolo County, where other ethnic groups control the land use. As a result, pastoral

mobility is today severely restricted[15] (see Unks et al. 2019 for an in-depth study on restricted mobility and its impact on pastoralism in Laikipia County), creating vulnerability in times of drought[16] and was more than evident at the time of the study (see also Etzold and Müller-Koné 2023). In the horrendous drought between 2020 and 2023, most households had lost close to all of their livestock[17]. Income from making and selling beads and other handicrafts to tourists as well as income from employment has therefore been increasingly important. Nearby conservancies occasionally bring groups of tourists to the community's cultural village, where visitors are introduced to Maasai culture and have the opportunity to purchase souvenirs.

The Ewaso community is the only community that would be affected by displacement due to the dam's construction. Since the dam site is downstream from Ewaso, the already limited available grazing land would be inundated and 160 individuals (at the time of the EIA (CAS Consultants [2014] 2016)) would have to resettle to upper areas of the community's land. Yet, it is this community, where I observe the least outright resistance (apart from the rural centres) to the project but a balanced or ambivalent position between respondents. It is the above context, a context of emergency during a long-lasting drought, which can lead to a sentiment of urgency for change. The dam itself never carried an active promise for the communities, no respondent recalled being part of the few participation meetings held by the project developers around ten years ago. It is one's own imagination of the dam that can carry a promise, without anything having to be formulated. It is clear that dams come with ancillary infrastructure that will (better) connect the community with Isiolo and Nanyuki. Any construction site requires workers. This opens economic opportunities, both by direct employment for community members[18] but also in offering services, shops etc. for the large number of workers temporarily moving into the area[19]. Our interviews included a question how parents (when applicable) would envision the future of their children. While some did mention the importance of a future in pastoralism there was a near uniform response across all research locations about the importance of education. The desired future, which for many respondents was not to be separated from the probable future, included income from employment. With pastoralist activities in a crisis, aspirations of the future revolve strongly around alternative income sources. One other aspect that came up in the conversations with people in Ewaso and later in Oldonyiro was cultivation of crops and the ability to set up kitchen gardens for planting of vegetables[20]. Visions of blocked water embody the ambivalence of the dam in the

[15] Interview 22 October 2022 – Assistant Chief, Male, Ewaso & Elder, Male, Ewaso & Focus Group Discussion 01 November 2022, Ewaso & Focus Group Discussion 05 November 2022, Oldonyiro

[16] Interview 22 October 2022 – Elder, Male, Ewaso & Focus Group Discussion 01 November 2022, Ewaso

[17] Interview 31 October 2022 – Woman, Ewaso & Interview 31 October 2022 – Woman, Ewaso & 01 November 2022 - Focus Group Discussion & 06 November 2022 – Woman, Kipsing

[18] Interview 31 October 2022 – Two residents, Ewaso, Female

[19] Interview 22 October 2022 – Resident, Ewaso, Female

[20] Interview 22 October 2022 – Resident, Ewaso, Female & Focus Group Discussion 05 November 2022, Oldonyiro

community. The reservoir as a place of horror, that submerges homesteads and where human-wildlife conflicts would cost community lives[21] while on the other hand, the reservoir can be the solution to the pressing water issues and could open opportunities towards an agro-pastoralist life[22].

When discussing the willingness for protest and to resist to e.g. giving up land and resettlement, demands in the community are linked to incorporation into the development vision and the implementation of the dam. The demands for inclusion are varied but often quite modest. Common demands include employment in the construction process, adequate compensation for resettlement and the loss of grazing land, improvements to local schools and clinics, and, above all, better access to water for domestic use and livestock[23]. However, informants were rather unsure if protests would organise: 'if there is command from the government there is no one to oppose it' (translated into English from Maa)[24].

When researching the inherent uncertainties of mega infrastructures, it can hardly be expected that the position by potentially affected people is strong and definite. Hence, I emphasize the importance of concentrating on *conditioned futures* when examining the connection between infrastructure and the expectations of the affected population. To comprehend the dynamics of anticipation, alignment, resistance, and opposition to (large-scale) infrastructure projects, consideration is given to the conditioning of individual opinions based on highly personalized factors. People's perceptions of a particular infrastructure project depend on personal criteria and are influenced by the extent to which the project's vision addresses the concerns of affected individuals and communities. Consequently, in order to communicate a receptive outlook towards the project, conditioned futures are often expressed, reflecting a willingness to cooperate with the implementation of the project *if* certain criteria are met.

Moving our research further into Isiolo County, we stop in Oldonyiro town. Oldonyiro is a regional market with shops, small hotels, a weekly livestock market and is the largest settlement in the western part of Isiolo County. I refer to it as an urban area here, although its size hardly justifies this. The aspirations in Oldonyiro are different from those of the more rural households downstream, and for the purposes of this analysis it is helpful to make this distinction. Oldonyiro has been struggling with water supply for years. The original water infrastructure is becoming less and less viable, and the ruins of past water futures are visible all around. A sand dam has helped to store water from seasonal streams, but it does not solve the problem of piped water scarcity. Livelihoods are different from those of rural households and the benefits of improved infrastructure for easier transport and trade that could come with the dam are attractive to residents. Being the only larger settlement in the region, one can expect the influx of workers, engineers and experts to concentrate around Oldonyiro. This

[21] Interview 31 October 2022 – Resident, Ewaso, Female
[22] Interview 31 October 2022 – Resident, Ewaso, Female
[23] Focus Group Discussion 01 November 2022 - Ewaso
[24] Interview 31 October 2022 – Resident, Ewaso, Female

would spur local businesses and driver the anticipation of formal employment and temporal work among younger residents. Hence, visions of the dam here tend to solve these issues:

> I told you intially the population [in Oldonyiro] is increasing and settlement is increasing. […] urban settlement which needs a lot of water to maintain it as compared to the pastoral life, in that context up to now I have not seen any other source of water which can sustain the population increase of Oldonyiro as compared to that mega-dam if it can materialize. […] We'll expect some people to come there to do fishing, we'll expect to do some people to do boat driving there, some tourism activities will come up there and in this context it will be an income generating or an socio-economic part which will be a positive side of the project. People will do irrigation. So in that part improve food security to the communities or the people.[25]

The differences in imaginaries of the future become more pronounced and increasingly negative when one moves from Oldonyiro to the lower areas between the proposed dam site and Isiolo Town. A road connects Oldonyiro and Isiolo, roughly following the course of the river for some 40 kilometres. The road takes us to the sparsely populated areas of Tuale, Longopito and the small centre of Kipsing. The pastoral households in this area have a very different imaginative relationship with the Crocodile Jaw Dam. As one moves downstream from the dam site, the supposedly positive effects of the dam, such as ancillary infrastructure, employment, economic opportunities, and reliable water storage, are no longer relevant. What remains is the immense impact the dam can have on the water flow of the Ewaso Ng'iro. Already a water-scarce river in this part of the basin, households fear that water will be blocked for long periods and diverted to Isiolo town[26]. As the river already dries up occasionally, 'Crocodile Jaw Dam is just adding a problem on another problem'[27] [translated into English from Samburu]. If the river would dry up, it would require livelihood changes and fuel conflict over water resources [28].

The promises of the engineering plans in the EIA to provide a steady minimum flow of water once the reservoir is filled (CAS Consultants [2014] 2016) are largely unknown to the people, as community sensitisation has never been done on a larger scale. While the EIA (ibid.) claims that community sensitisation was carried out by the consultants, this was only at points around the dam site. People downstream were never involved, and were left to rely entirely on hearsay in the region or the word of local politicians. The EIA was published and accessible, as was a study by the advocacy group Samburu Women Trust (2015) which was overall very critical about the dam but also highlighted

[25] Interview 03 November 2022 – Local Politician, Oldonyiro
[26] Interview 04 November 2022 – Resident, Tuale, Male & Interview 10 November 2022 – Resident, Westgate, Male & Interview 10 November 2022 – Resident, Westgate, Male
[27] Interview 10 November 2022 - Resident, Westgate, Male
[28] Interview 10 November - Reisdent, Westgate, Female

the positive impacts of improved water availability. Both reports, however, did not receive larger attention or were inaccessible to the people interviewed for this research. Informants were rarely able to recall any details about the dam, but usually the vision of the dam was vague and abstract, often filled with own interpretations of what a dam project would and could mean for the area. As a result, a number of informants felt that the storage of immense amounts of water was a scenario with horrendous potential in the event of a leak[29], as the technical capacity of such a dam was questioned.

Nevertheless, one aspect was mentioned by several interviewees in the downstream areas and discussions around this emerged from community meetings with local politicians. The communities lack reliable water infrastructure. As pipes from the dam to Isiolo Town and Isiolo Resort City would have to pass through the area, demands are being made to benefit from this[30]. Again, this is linked to conditional futures. If both a steady supply of water from the river and water points at the pipes are maintained and implemented, many would agree to the project and perceive this scenario as potentially beneficial to their lives and livelihoods[31].

It is the immense void left by infrastructure planners and the government that allows for different interpretations of a project and the projection of hope and solutions to pressing issues into it. While more than half of the respondents are totally opposed to any infrastructural intervention in their home area, others see potential benefits for their lives or the lives of their family members. These benefits do not always outweigh the scepticism, but they do provide a basis for not immediately opposing developments as one envisions it.

Why the communities were never properly sensitized by the developers can only be a matter of speculation. It could be that the government agencies were not well coordinated with the national government's planning priorities, or that funding was eventually unavailable. Some stakeholders have speculated that it is strategic, as it is difficult to build opposition based on uncertainty.

> […] how many people understand about the […] dam, how many? Have you ever seen anyone talking about [it in] the media, publicly, and its benefits or its importance? […] to me, the project might be good, but why is the government not bringing public education, so that the community can interrogate and agree to a set of norms. Why are they waiting up to the last minute?[32]

Individuals deal with these uncertainties in different ways. It is clear that the ability to take risks, or the degree to which they are affected by the project, plays an important

[29] Interview 10 November - Resident, Westgate, Male
[30] Interview 06 November 2022 - Resident, Kipsing, Female & Interview 06 November 2022 - Resident, Kipsing, Female
[31] Interview 08 November 2022 - Resident, Tuale, Female & Interview 08 November 2022 - Resident, Tuale, Male
[32] Interview 26 February 2023 - CSO representative, Nanyuki

role. Those whose lives and livelihoods depend entirely on water from the Ewaso Ng'iro River are the most opposed. The possibility that the dam could cut off the region's lifeline is too great a risk to take. For others who are only indirectly affected, or who have other sources of water or income, the potential benefits of the dam become more attractive in their vision of the future. Ewaso Ng'iro as a lifeline also resonates with the epistemology of the river, an aspect that is difficult for outsiders (such as myself) to grasp. Nevertheless, it is necessary to highlight, that while this chapter cannot fully address this aspect, the Ewaso Ng'iro is both the material and immaterial lifeline for the people of the area. The riverbed is used for initiation ceremonies, prayers and sacrifices. If the water flow were to be redirected, trees of cultural significance could disappear. While the focus here is on individuals who have more ambivalent attitudes towards the project, the developers' neglect of cultural aspects of dam construction and the horror of a potential dam collapse demonstrate the infrastructural violence (Rodgers and O'Neill 2012) of the imaginary created by the mere promise of infrastructure.

We end this follow-the-river approach in Archer's Post in Samburu County. In our discussions with sand harvesters at the river it becomes more and more evident that discussions about the dam have largely died down in the years since the Environmental Impact Assessment was published, and many stakeholders have not been engaged with the topic of the dam for years. For individuals in the region, the dam does not hold much relevance or urgency today in the daily lives and many of the men that are earning a living by digging sand from the river are too young to have heard of the project[33]. With the political arena becoming invisible, visions of the dam in the region have started to vanish. In many interviews the interview partners had to be actively reminded of the dam that was once discussed.

The interviews sought to understand past expectations and visions of the dam. A task that posed immense methodological challenges. How can interviewees distinguish between the current opinion of *a* dam on Ewaso Ng'iro and the past opinion of *the* Crocodile Jaw Dam on Ewaso Ng'iro? While it was possible to make this distinction in a number of interviews, the majority of the interviews ended up discussing scenarios for a hypothetical dam today. Nevertheless, it has helped us to understand and empirically demonstrate three important aspects. Firstly, infrastructure planning is uncertain and so are the expectations of those affected. Visions of the future are often conditioned because they are out of control or, in other words, controlled by other actors (e.g. planners, developers, government). Secondly, the capacity to anticipate positive outcomes depends on the extent to which individuals are dependent on the river. When the stakes are high, people tend to resist intervention. Third, the case study provides a clear example of the contentious politics of infrastructure planning in Kenya. Advocacy groups and civil society organisations immediately mobilised against the project to fight for the inclusion of communities in the project's vision, especially

[33] Focus Group Discussion 11 November 2022 – Archer's Post

the ones downstream. At the local level, individuals exhibited less opposition than one might expect based on the mobilization against the project.

Conclusion

In this chapter I have sought to identify the past anticipations of those affected by an infrastructural promise. Ultimately, the promise of Crocodile Jaw Dam remains unfulfilled to date. In its planning stages, the plans were fiercely contested by a number of actors while the water users of the Ewaso Ng'iro were largely side-lined in the discussion. Our case study provides an empirical example of how affected people react to being excluded from both the negotiations of the project and the project's vision. The dam was never promised to be the solution to the region's immense water crisis, but it was supposed to provide Isiolo town with a reliable source of water and enable the planning of a resort city to attract foreign investors and tourists. But even though the implementation of the project had the potential to be at the expense of the water users in the Ewaso Ng'iro basin, the futures imagined around the dam were not only images of suffering and exclusion. A number of people, especially those residing closer to the site of construction, entangled their futures or the futures of their family members to the development of the dam and developed their own infrastructural promises that include an improvement in the often precarious lives and livelihoods. For some, large-scale infrastructure inherently holds a promise that doesn't require explicit articulation. Further, the inherent uncertainties of infrastructure planning, exacerbated by the lack of information provided by the project developers and the Kenyan government, creates an imaginative void that is filled according to very individual factors, capacities and the environment in which individuals are situated. The result is for many the need to formulate conditioned futures, in which individuals develop multiple future scenarios as well as counter-imaginaries (Hommes, Hoogesteger, and Boelens 2022) in which they would envision to act according to certain variables. Acknowledging conditional futures is an important tool for future studies to better identify desired futures in the context of large-scale infrastructure investments. Where the persuasive power of spatial imaginaries fail, the 'emptying of the future' (Tups and Dannenberg 2021) is countered by conditional futures, in which agency over the future is upheld by affected individuals. This chapter shows how an infrastructure imaginary that unfolds in a particular place and encounters local realities evokes an ambivalent response. '[I]n contexts where investments are yet to happen, and where an epistemic rift between the cultural repertoires of the state and/or bearers of capital and *local communities* does not exist, the outcome is much more complex and varied' (Chome 2020, 325, italics in original). We can conclude from our case study that where infrastructural imaginaries are not strongly communicated and where the infrastructural promise does not take hold of the future, the future is filled with a variety of imaginaries by those potentially affected.

The differences between individual perspectives on infrastructure development and the political contestation by advocacy groups provide an example of the contentious politics of infrastructure development in northern Kenya and the LAPSSET corridor. Building on past experiences, civil society organisations and human rights groups aim to block infrastructural interventions. In an effort to include the views and voices of the local populations directly affected, the approach is to adopt a fundamentally oppositional stance, possibly exaggerating demands in order to secure a minimum of concessions. While this may not be directly representative of every individual in the region, fundamental opposition is a viable option for many people further downstream of the proposed dam site. This is because the downstream communities do not expect to benefit from the economic opportunities during the construction phase or from the ancillary infrastructure that would be built. I have shown, the situation flips relatively drastically for those living below the dam wall. The promise of the dam shapes violent imaginaries of horror, both through its dystopian materiality and the exclusionary political force it embodies. Both has certainly outlasted the planning of the dam itself and left subtle traces among downstream communities. While material effects of the infrastructural imaginary on the life of affected groups along the river has been limited, the sense of being side-lined and excluded from decision-making within the Kenyan state was reinforced.

Today, the Crocodile Jaw Dam is a promise of the past that doesn't have much relevance in people's everyday lives. It has lost both the horror and the promise over the last years. However, the dynamics that emerged earlier, with all their implications of creating hope, fear, horror and a sense of being excluded and marginalised, can emerge again rather quickly. The dam is still included in government plans of projects to be implemented, and politicians use the promise of the dam to fight for government resources and electoral support (elsewhere). However, I understand the project in its current state as a decades-old ghost project and a case of non-materialisation of infrastructural promises.

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8 Summary and contribution to the political ecology of infrastructure

This dissertation framework, together with the articles, seeks to address the two key questions outlined in the introduction. Here, I summarize the main arguments made in response to these questions before developing some concluding reflections on the temporality discourse in infrastructure studies and the concept of future-faking, exploring its implications for infrastructure development in practice. I conclude this framework text with an outlook on the future directions of a political ecology of infrastructure and the limitations of this dissertation.

Q1: How does the anticipation of dams shape the political arenas around them?

Three of the articles in this dissertation deal with infrastructure that has yet to materialise. Both the Crocodile Jaw Dam and the High Grand Falls Dam are on the shelf of possible dam projects in Kenya, but so far no more than feasibility studies, community meetings or digital renderings can be discussed as material outcomes. Both projects can be considered ghost projects, looming over the areas and haunting the people who live there. However, at the time of the research they have very different characteristics. Ghost projects, in my understanding of the term, come and go in waves, and arguably are only in a ghostly state when they are not actively promoted, part of grand development visions, or, on the other hand, actively and fiercely contested. The trajectories that the two projects are currently taking are opposite: the Crocodile Jaw Dam, which was a heated issue in the 2010s, is on its way and for some has already returned to its ghostly nature of being somehow there but very much in the background, while the High Grand Falls Dam is certainly not a ghost in the sense of an imaginary invisibility. On the contrary, it is being actively brought into the Kenyan public's imagination through big media headlines, press releases, conferences and grand promises of what the dam will bring.

What the two projects show, however, is that both when the project is an invisible ghost and when it becomes a very present vision, it affects the regions in which it is a future possibility, sometimes even far from the actual dam site. In the three articles (7.1, 7.2 and 7.5) we discuss how visions, aspirations and anticipations are affected by the plans and the public negotiations and contestations in the political arena, but also how very material changes take place. The concept of the economy of anticipation (Cross, 2015a), which understands large infrastructure projects as arenas where the unknowable future is engaged through planning and forecasting, shaped by aspirations and imagination, and deeply felt through emotions such as hope, desire or fear. This is readily observable in land markets, as we present in 7.2, where 'these processes are shaped by the entanglement of speculative investments with the everyday dreams that

animate ordinary lives, the hopes of farmers and the rural poor' (Cross, 2015b). The immaterial effects are most visible in 7.1. and 7.5 where we show how the open neglect of pastoral livelihoods leads to a sense of exclusion and marginalisation, which calls into question the very future of the livelihood by those affected.
Where I see a difficulty, and this was already quite evident in the case study of the Crocodile Jaw Dam, is how to approach ghost projects methodologically when they are in a rather elusive state and not a contemporary political issue. Both of our non-materialised cases were of recent significance, and so our interviews, focus group discussions and participatory methods engaged with people's recent memories or current visions and anticipations. When a dam has not been a major public issue for some time, at least around the Crocodile Jaw Dam, other factors become so much more determinant of everyday practices and actions that it is difficult to clearly contribute transitions, actions or societal changes to the ghost project. It seems that, with the methods at hand, ghost projects are best explored by geographers when they emerge as visible *monsters* (Aalders & Kimari, 2025) or *dreamscapes* (Jasanoff & Kim, 2015; Müller-Mahn, 2020), but researching the direct effects of a ghost project looming in the background might be better investigated retrospectively by our historian counterparts. However, this does not prevent us from answering the original question. Projects and the political arenas around them leave material and immaterial traces in the regions in which they are promoted long before they begin to materialise. People, stakeholders, economic actors, politicians, etc. start to act towards a future, take this into the political arena, where these actions co-produce each other. As soon as the future is a possible future, people and actors will move towards it in various ways. The moment developers make this future seem probable, this dynamic intensifies and leads us to the second question.

Q2: How does infrastructure politics unfold in hydrosocial spaces around the construction and operation of dams?

Two of the articles in this dissertation examine infrastructure that is either already operational or under construction, allowing for an analysis of its material consequences, including land-use changes, shifts in water flow, ecological alterations, and transformations in property systems. However, both articles go beyond these material impacts. While each article has a distinct focus, both explore the political dynamics that emerge around large-scale infrastructure projects – not merely as a result of their negative consequences, but as effects driven by political power plays, strategic agendas, and, in some cases, outright unlawful or ethically questionable exertions of power over people. In both cases, those affected by the infrastructure do not primarily express an inability to adapt to its material impacts. Rather, the real issue lies elsewhere. In Article 7.3, it is the misuse of political promises – the performativity – that prevents people from planning for the future, while in Article 7.4, legal forum shopping (Boelens et al., 2022) by national elites is used to strip communities of their

land rights around the dam reservoir, leading to severe negative consequences for their lives. I want to focus here on the issue identified in 7.3, the misuse of political promises, as this is a phenomenon that we can observe globally and is not reserved to dam developments but happens with a large number of large-scale infrastructure project and with mega projects as a whole.

With the article on the 'Non-economy of anticipation' (Rieber, Kioko, et al., 2025), together with the elaborations on future-faking in section 4.3, I highlight an inherent flaw in the way infrastructure projects are planned, promoted and ultimately developed in democratic systems. While some deal with this from a perspective of how core functions in infrastructure development will lead to underperforming systems, I in this dissertation and we as a project team and colleagues highlight how these misleading promises lead to immaterial and material harm for all those that bought into the promise.

I frame this as infrastructural violence that is inherent to infrastructure development. In infrastructure development, there is strategic misrepresentation of project details and benefits. It has become normalized in infrastructure politics that initial figures for large projects serve primarily to get the project approved. Developers know it, financiers likely know it, and politicians see it as necessary. As a result, the public is presented with timelines, costs, and benefits that – particularly in the case of hydropower dams – are often meaningless.

The problem with hydropower dams is twofold: first, they are prestigious mega-projects, launched with great political fanfare; second, they inevitably cause harm, no matter how well they are planned or how much mitigation is attempted. The combination of infrastructural spectacle (Lesutis, 2022) and the overpromising of benefits amounts to nothing less than future-faking.

The effects of this are well documented in the articles presented here. When developers and governments in Kenya announce a multipurpose dam project, they must perform a process of obtaining community consent, as required by the Kenyan constitution. To justify public spending or borrowing, they highlight major national benefits while also promising significant local benefits. By asserting that the project is imminent – especially when land acquisition begins – the vision of the dam becomes a probable future. For those unfamiliar with the typical delays and cost overruns of mega-projects, the proposed timelines and benefits appear realistic.

This creates an economy of anticipation, where people begin making decisions based on the proclaimed future. Any investment, action, or inaction influenced by these promises is, by definition, misguided – though the extent depends on the outcomes. Regardless, all will be misled. Beyond its economic impact, this pattern raises serious concerns for democracy. When large projects repeatedly face delays and cost overruns, trust in public institutions erodes. If the full, most likely costs and timelines were known from the outset, would public support have been the same? What other projects could have been funded instead? In the case of energy infrastructure, was this the most cost-effective choice per unit of electricity generated?

Ultimately, future-faking is a narcissistic and violent practice that has been normalised in today's infrastructure politics. It leads people to make misinformed investments that can be existentially damaging.

As highlighted in the first research question, political dynamics, negotiations and contestation over promoted visions lead to material changes on the ground. This underlines the need to study material impacts at all stages of the infrastructure life cycle, including but not only when infrastructure is realised. A qualitative temporal approach and the revisiting of infrastructure projects can be highly productive for a deeper understanding of infrastructure within political ecology. Therefore, I understand the immense contribution of the temporality of infrastructure discourse to the political ecology of dams not so much as to break the linearity of infrastructure development – this point is well established and evident in dam development and can be observed in all of the case studies in this dissertation – but to show how today's development is deeply informed by previous contestation, discourse and planning, and how it is at all times informed by the anticipations, hopes and fears of the infrastructural future. This does not mean, however, that we cannot study a dam *under construction*; on the contrary, as we show, it is ultimately necessary to study certain phases of infrastructure development, and call them as such, in order to uncover the performances and performativity of those in power who adapt (or have to adapt) these performances to the (promoted) linearity on which they rely. Neglecting these distinct phases risks overlooking the fact that future-faking is not a general or diffuse phenomenon, but one that is strategically deployed at specific moments, with its negative effects shifting between different groups over time.

Concluding this dissertation with an outlook and a potential way forward, I believe Political Ecology can build on these findings, particularly in research on large infrastructure projects at or before their inception. Flyvbjerg (2009) argues that in infrastructure politics, the worst projects often win the tender because their promoters deliberately misrepresent costs and benefits, making them appear more attractive to decision-makers and the wider public. There is a strong need to expand this discussion beyond management and economics, bringing it into critical infrastructure studies to analyse the practices that enable such misrepresentation. Future-faking is not merely a failure of planning; it is an expression of power that systematically redistributes risks and benefits, disproportionately affecting marginalized parts of the society. By promoting speculative futures that often fail to materialize as promised, infrastructure development becomes a mechanism of exclusion, deepening inequalities in access to land, water, or wider economic opportunities. Coupling this with a temporal perspective on how infrastructure is developed can significantly inform debates on justice and ethics in large-scale projects. Therefore, expanding research on future-faking and the non-economy of anticipation, I believe, is crucial. This can be done in contexts globally, everywhere where infrastructure is being developed and financed by more or less democratic actors. This also ties into a broader need within Political Ecology to examine not only the material impacts of infrastructure but also the ways in

which speculative futures are mobilized to consolidate power, reconfigure space, and justify interventions in land-use.

Building on this, the geographical expansion of another key concept is both timely and necessary. In the C03 project, we have reinvigorated the concept of the political arena of infrastructure development, initially developed in studies on development projects in Western Africa. A first engagement with our arena concept has been done by colleagues Aalders & Kioko (2025) in their analysis of infrastructure sabotage in a case from Kenya, offering a valuable critique and expansion. While our own contribution also focuses on Kenya, I see significant potential for applying this concept more broadly to infrastructure projects in diverse global contexts. Understanding how political arenas emerge, shift, and influence decision-making across different regions could provide new insights into the relational and contested nature of infrastructure development.

Finally, this dissertation started to engage with the thematic focus proposed for the final phase of the CRC C03 project: waterscapes (Swyngedouw, 1999). However, here we can also see the limitations of this cumulative dissertation. While I have shown how people engage materially, emotionally, and imaginatively with water infrastructures, I have only touched on the deeper co-production of social and water dynamics. A more detailed exploration of the spatial dimensions of this co-production is particularly valuable for linking infrastructure studies to debates about water justice. While I have leaned more towards hydrosocial territories as an analytical framework, the distinction between waterscapes and hydrosocial territories seems marginal, with significant thematic overlap. Their application depends more on what is being researched than how (Flaminio, Rouillé-Kielo, & Le Visage, 2022) and is viewed as complimentary (Karpouzoglou & Vij, 2017). Both perspectives allow us to examine how hydraulic infrastructures not only transform land and water use, but also extend state power, restructure property systems, and formalise or regulate social practices, leading to profound social and environmental changes in the affected regions. These dynamics warrant closer examination, particularly in relation to power, governance and the uneven distribution of benefits and harms.

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