Fluid Risks

The Politics of Risk-Scaling at Urban Rivers in Nairobi

Johannes Theodor Aalders

Master Thesis Series in Environmental Studies and Sustainability Science,
No 2015:005

A thesis submitted in partial fulfillment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science (30hp/credits)

LUCSUS
Lund University Centre for
Sustainability Studies

Fluid Risks

The Politics of Risk-Scaling at Urban Rivers in Nairobi

Johannes Theodor Aalders

A thesis submitted in partial fulfilment of the requirements of Lund University International Master's Programme in Environmental Studies and Sustainability Science

Submitted May 13, 2015

Supervisor: Elina Andersson, LUCSUS, Lund University

Abstract (398 words)
This thesis investigates the importance of scale for power dynamics in the negotiation of risks connected to Urban Rivers in Nairobi, Kenya. In addition to unequal distribution of wealth, global inequalities in the distribution of risk become increasingly important. Scale as a significant dimension of inequality is discussed in the context of Nairobi's urban, as water scarcity and flooding events are expected to increase and can both be observed within the highly heterogenic city of Nairobi. The thesis attempts to answer the conceptual question, *how is it possible to conceptually grasp the relation of risk and scale?* As well as the practical question of *what are the power dynamics of scalar negotiations of riskscapes?* Regarding the first question the concept of *riskscapes* is suggested and subsequently expanded to include an explicitly scalar dimension. A relational focus on fluidity and movement is put forward. This conceptual background interfaces with the methodology of *multi-sited ethnography*, which inspires the method of following the river through the fragmented city of Nairobi. In the case study, three examples of scalar politics of river-related risks in Nairobi suggest that 1.) the scaling of actors influences the ways they can participate in practices of risking. Risks for certain local communities seem to be approved by the government implying localisation of actors as a tactic within the politics of risks. The role of connections in localising or globalising actors is stressed. 2.) The example of the planned eviction of an informal market area along Nairobi River shows how political struggle is expressed in different scalar narratives of river related risks. While the government stresses risks for the entire area downstream of Nairobi to justify the eviction, the market stand owners evoke a much more localised framing of the risks they face. 3.) Both moments, scaling of risk-actors and scaling of risks is observable in the case of slum dwelling women at urban rivers. It is argued that women are discursively and materially framed to the household level, where they face the highest flooding risk. This informs the conclusion to regard the poor female body in the case of Nairobi as a *sacrifice-scale* where risks produced elsewhere are 'dumped'. This thesis' main contribution is the conceptual merging of the politics of risk and scale, the substantiation of this argument by a relevant case study and subsequently the spotlighting of dynamics of marginalisation through scalar negotiations of risk.

Keywords: Risk; Scale; Urban Rivers; Nairobi; Riskscapes; Multi-Sited Ethnography

Word count: 13 999

Acknowledgements
I thank all interviewees and everybody who reviewed my drafts. Special thanks to Wirry, Maxwell and Maina for keeping their stupid muzungu-friend alive, Wainaina for help with transcribing and translating from Kikuyu and Swahili, and Elina for her super-supervision.

Table of Content

List of Figures:

List of Abbreviations

MSE: Multi-sited Ethnography
NEMA: National Environmental Management Authority
WRMA: Water Resource Management Authority

How far did they fly? Five and a half thousand as the crow. Or: from Indianness to Englishness, an immeasurable distance. Or, not very far at all, because they rose from one great city, fell to another. The distance between cities is always small; a villager, travelling a hundred miles to town, traverses ***emptier, darker, more terrifying space****.*

– Salman Rushdi, The Satanic Verses

Prologue: What lies around the river bend

I had just visited Mr. Akotsi of the ministry of environment and water, situated in a shiny building in the west of the city centre that accommodates many offices of national ministries and authorities. We talked about global climate change, national policies and a city programme for the rehabilitation of urban rivers. My next interview would take me to Kiambui-slum on the other side of the town, squeezed between Moi Airbase and the Nairobi River. The distance is not even 10 kilometres but in Nairobi distances don't work like that. Depending on the time of the day and how well connected the destination is to the bus-lines, the *matatu* system, 10 kilometres can take you 20 minutes to 3 hours. So how far did I travel? 10 kilometres. 2 hours. From downtown to uptown. From the place of national policies to the place of actual grievances. From the global to the local – truly an empty, dark and terrifying space?

As I think about the *Satanic Verses*, I am uncomfortably aware of the air around me, hot and saturated with all kinds of unhealthy particles. When I come home I will wash my hair in a 10-liter bucket of water (it's dry season and there is a city wide water scarcity) and I know that it will be of a dark grey colour when I finish. The *matatu* crawls its way along the road, just like Nairobi River about 50 meters to my left, weary and worn out from the time it has just spent in the city, sluggishly flows – or rather stagnates – east. Its waters look like my washing water before I pour it out – cloudy grey and crowned by foam. For the time of my research I am its travel companion; I go where it flows. Did it too traverse the dark empty space between village and town? Did it travel across scales; did it come from global hydrological cycles, uncomfortably interwoven with global cycles of carbon and pollutants, passed by the national capital to end up with me in the local slum, where the 'local people' live everybody keeps talking about?

At Kiambui-slum I get out of the bus. Are we now at a local place? Is that a tautology? In one of the instable looking huts I meet Mafrida, a woman in her sixties, who sits on a small stool in front of her house, facing Nairobi River. She lives in this hut, in a slum, in Nairobi, in Kenya, in Africa, in the world. For her, at this place, this river is not a companion but 'nothing but a toilet', a necessary evil she just has to cope with. Twice, or even thrice a year the river bursts its banks and Mafrida has to evacuate

her house. What's more, in recent years the floods did not come predictably but all of a sudden – *Inakuja HO! "It may come while we are asleep, you step down and whoa! The house is flooded so you escape and leave the water to carry off plates, mattress and basically everything".* Her husband died, and she is virtually alone in her efforts to keep her family safe from the floods. If only her legs weren't so bad.

So why does she live here? Why does she take this risk? –"*I have nine grandchildren, they pick litter in form of scrap metal and plastics that when sold we get food on our table. It is problems that make us live here."* Plots at the riverbank are much cheaper than elsewhere and it offers an additional source of income. The river carries everything: plastic bags, human waste, dead animals, opportunities and lost hopes; it brings water, the source of all life, and it brings death. I stand on the bridge and see how all of this is passing by under me. Around the river bend there may be nothing but dark, empty, terrifying space. I am here to find out.

1. Introduction

The inequalities described in the prologue may present themselves as inequalities of wealth prima facie. However, it also became apparent that people like MAFRIDA[1] do not only face a lack of money but also an excess of risks. As Ulrich Beck (1992, p. 19) points out:

> "The problems and conflicts relating to distribution in a society of scarcity overlap with the problems and conflicts that arise from the production, definition and distribution of techno-scientifically produced risks."

Concomitantly, there arise a number of difficulties in describing this *Risk Society*. While it is difficult enough to define and attribute wealth, this problem is distinctly more intricate in the context of risk. I can look on my account to see how much money I own; society has developed currencies as a means to quantify wealth and institutions such as markets to exchange it. However, there is no 'risk account'. So who is actually at risk? Is the "World at Risk" (Beck, 2009) of climate change? The regions commonly used by the International Panel on Climate Change (IPCC, 2014)? Is it countries? Communities? Households? Individual bodies? Or is it somehow all at once? This thesis is less about finding the 'true' scale of river related risks in the case of Nairobi, but rather about the political consequences of each scalar framing; the things we describe or round off; things we draw on a map or leave out. These different ways of framing risks are not uncontested but arise from and produce conflicts and power dynamics.

Nairobi is particularly suitable to study these scalar framings of risk, as conflicts arising from water related risks – flooding or water scarcity – are expected to increase, especially in (East) Africa (Niang

[1] Interviewees are marked by small caps; see Appendix A1 for a complete list.

et al., 2014) and urban areas (Revi et al., 2014, p. 555). In the case of Nairobi, both drought and flood are experienced in the course of a year. Furthermore the high fragmentation of the city results in a setting where many very heterogeneous actors encounter each other at the site of water related risks – the rivers of Nairobi.

In order to understand these conflicts and the underlying negotiations and power dynamics it is therefore necessary to ask: *What is the importance of the scalar dimension in the shaping of risks connected to Nairobi's urban river*? Constituting this thesis' the guiding question. Connected to this, I scrutinise the following research questions:

1. How can the relation between risk and scale be conceptualised? (chapter 2)
2. What are the power dynamics of scalar negotiations of risks and risk-actors? (chapter 4)

These question investigate issues important for sustainability science and beyond. Especially the connection between scale and risk have not been discussed from a normative perspective. As a consequence respective dynamics of marginalisation are under-conceptualised and little understood in praxis. This thesis attempts to fill this gap, casting light in the *dark empty and terrifying space* between scalar levels of risk.

Structure of Thesis

The river is not only the object of study in this thesis but also a way of thinking about it. It is therefore possible to imagine this thesis' structure as the flow of a river (**Figure 1**) that has its origin in several riverheads at general schools of thought.

Two concepts are central to the deliberations in this thesis: risk and scale. A considerable part is therefore designated to discussing these concepts. I introduce the term 'riskscapes' as a way of describing the often conflicting interrelation of risks within certain territories and how they emerge from social practice. I argue that scale is an important dimension of riskscapes and subsequently establish a perspective that does not regard scale as an independent objective reality, but rooted in material and discursive practice. In a last conceptual step, these two streams of thought join in a discussion of the 'Scalar Politics of Risk'.

From this I derive certain demands for my methodology and argue that Multi-Sited Ethnography is most suitable to fulfil these. This methodology inspires the approach to 'follow the river' through the city as a way of structuring the research in Nairobi. I discuss practical challenges or 'rapids' arising from this and give special attention to the question of reflexivity and positionality.

Figure 1: Thesis Structure as a River. Source: Own

This leads to the last part of this thesis, the discussion of the case study, the river's 'delta'. After an introduction into Nairobi as 'Paradoxes of a Fragmented City', the example of the suburb of Ngong town illustrates how actors scale each other as well as the consequences this has on risky practices. Secondly, using the example of a conflict between riparian shop owners and national agencies at a market in central Nairobi I discuss how different actors scale risks differently as a tactic within power struggles. Lastly, I bring the first two aspects (scaling of risk-actors and scaling of risks) together, using the example of gender dynamics in Nairobi's riparian informal settlements

In a concluding chapter I reflect on the meaning of this thesis for a wider context, in how far it was possible to answer the research questions, as well as possible shortcomings. In a last step I discuss the thesis as a point of departure for further inquiry.

2 Conceptual Riverbed

2.1 Conceptualizing Risk(ing)

In this chapter I will first roughly differentiate the socio-cultural perspective on risk used as a conceptual basis in this thesis from techno-scientific concepts. Subsequently, I will work out more subtle nuances, namely the spatial and temporal dimensions of risk, which will be the main focus of subsequent parts.

2.1.1 Differentiation of the Concept

The concept of risk is used in a range of academic fields that may not have much in common otherwise: medicine, engineering, economics, psychology, law, mathematics to name but a few (Althaus, 2005, p. 569). This scholarly universality of the concept of risk results in a multitude of different definitions, and subsequently different epistemologies under which it is being studied (Lupton, 2013, p. 21). This can cause confusion, wherefore I deem it necessary to demarcate the socio-cultural perspective[2] on risk I will use as a starting point of this thesis (cf. ibid., p. 21) from conceptualizations used in other academic areas.

Many of the academic fields mentioned above have in common that they view risk as an ontological reality, as hazards that can be understood separately from processes within society; as some*thing* that can be measured, regulated and subsequently controlled (Lupton, 2013, p. 243). This implies a categorical division of nature and society, as risk is interpreted as descending upon society from the outside (Müller-Mahn, 2007, p. 5). At that, the epistemological interest lies within the sphere of the 'natural' world (Lupton, 2013, p. 7), whereas the social is regarded as a *black box* that may interact with the natural world but is not itself an object of investigation (ibid, p. 5 et seq.). In this view, risk is determined by the circumstances (e.g. the likelihood of a hazard and the consequences it would have (Coppola, 2011a, p. 28)) and agency is only acknowledged in so far as it changes these circumstances (see e.g.: Becker, 2014a, p. 218).

In contrast, some branches originating in sociocultural perspectives regard risk as a way for societies to act within a human-environment system (Becker, 2014b, p. 177 et seq.); as a way of relating to the world (Müller-Mahn, 2007, p. 9). Prominent scholars in this very broadly defined field are Beck (1992), Giddens (1999) Luhmann (1996) and Lupton (2013). In this thesis I use a critical realist approach to risk, acknowledging that certain phenomena, which may potentially harm or benefit people are 'out there'. However, I claim that this isn't the only thing that matters. Risk, as I understand it, is not mainly about

[2] There is no clear terminology to differentiate various definitions of risk. Being aware of its broadness and imperfections, I use Deborah Lupton's term "sociocultural perspective" (2013, p. 36 et seq.), which she distinguishes from 'techno scientific', 'cognitive psychology' and 'social constructionist positions'.

what is actually about to happen, but rather about how these potential events are being anticipated, processed and negotiated within society, as well as subsequent behaviours (Beck, 1986, p. 44 et seq.).

Risk in this perspective is not seen as abnormal or even avoidable but as an integral part of society (Büscher and Mascareño, 2014, p. 67), which can be regarded as a currency of sort to 'buy' benefits (Coppola, 2011b, p. 272). Büscher & Mascareño (2014, p. 68) see this seemingly paradoxical relationship between risk and benefits particularly in cities, as "the life-supporting mechanisms in modern cities are simultaneously life endangering" (see also: Giddens and Pierson, 1998, p. 101). At this point, a sociocultural approach to risk suggests to ask: whose lives are supported? Whose lives are endangered? We cannot assume that life in general is 'at risk' and one would therefore expect hard-fought negotiations within society about the question who is at risk and who is benefitting from this.

Ulrich Beck (1986, 2007) regards these risk-negotiations as a defining feature of modern society – the *risk society*. Based on the observation that wealth production is increasingly connected to the production of risks he defines the *risk society* by a shift from the logic of wealth distribution towards a logic of risk distribution (ibid, p. 25). This (uneven) distribution is not only distinguished in social strata but also spatially. As Beck (1992, p. 41) puts it: "There is a systematic 'attraction' between extreme poverty and extreme risk. In the shunting yard where risks are distributed, stations in 'underdeveloped provincial holes' enjoy special popularity". This suggests a *spatial dimension of risk*, which will be discussed in-depth in 1.1.2.

However, the interrelation between risk and power, as conceptualized here, is more complex than just a simple gravitational force pulling risks towards the nadir of power. Risk-negotiations do not only determine who is affected by which risk but also what is considered risky in the first place, thereby justifying exertion of regulatory power (Lupton, 2013, p. 116). Similarly, the invisible-making of other risks can be part of the tool box of power exertion, for example when a certain risk affects an opposing or *othered* group – such as flooding for riparian slum dwellers as Mafrida (see Prologue). Lastly, the way in which risks are framed has important implications for power relations. If for example the flood risk in Nairobi would be framed as an average INFORM risk index of 6.0 (IASC and European Comission, 2015) exclusively, differentiated impacts in relation to class, gender, age, wealth or area were invisible and would therefore not be acted upon. Beck (1992, p. 25) warns about this danger of the average: "A person who inquires about the average already excludes many socially unequal risk positions". Uneven expression of risks in space is one 'spatial dimension of risk', which constitutes a major part of the theoretical foundation of this thesis and therefore requires further discussion.

2.1.2 Riskscapes and the spatial dimension of risk

The temporal dimension of risk as the connection between past, present and future has received much attention in the respective literature (e.g. Alaszewski and Burgess, 2007; Althaus, 2005; Giddens and Pierson, 1998; Luhmann, 1993). "The Spatial Dimension of Risk" (Müller-Mahn, 2013, p. xvi; November, 2008) however remains little discussed, even though it is an important analytical category for understanding inequalities of risk-distribution. Talking about the spatial dimension of risk from the socio-cultural perspective delineated above, however, is not merely confined to *locating* risks, i.e. to define regions which are at risk of a certain hazard. Rather, it is about spatial *processes* of risk production & distribution (Beck, 1986, p. 25), and connection (Müller-Mahn and Everts, 2013, p. 23). This also entails the notion of risk-translations across sites and its subsequent change during this 'journey' (Doevenspeck, 2013; Müller-Mahn and Everts, 2013). In this context (Sutherland et al., 2012) introduce and Müller-Mahn & Everts (2013) expand upon the concept of *riskscapes* (a composite of 'risk' and 'landscape') in order to describe the interconnection of a multitude of risks in and with space, making it possible "to understand how these 'riskscapes' shape lives and spaces in various, at times contradictory and competing, ways" (ibid., p. 23). This concept of *riskscapes* forms one of the pillars upon which this thesis' conceptual framework rests and therefore needs further elaboration. For the purpose of this thesis it is important to stress three characteristics of riskscapes: their multiplicity, fluidity and subjectivity.

Riskscapes can be characterized by a *multiple multiplicity*. As mentioned before, they comprise a multitude of risks and their respective interrelatedness; risks that may be scaled on different levels respectively (Sutherland et al., 2012, p. 48). Secondly, riskscapes include a multiplicity of places that are related by the risks that connect them. These connections can entangle different locals into a 'globe', making the riskscape itself multi-scalar (Müller-Mahn and Everts, 2013, p. 22). Thirdly, their very ontological composition is multiple, as "[r]isks occupy territories that are made as much of meanings and 'imagined worlds' as they consist of tangible material stuff" (ibid., p. 35). Lastly, riskscapes are multiple in so far as there may be several conflicting riskscapes with reference to the same time and area (ibid. p. 24).

This simultaneousness of multiple, often contradicting riskscapes (as well as their aforementioned multi-scalarity) suggest a certain ontological *fluidity*. According to Müller-Mahn & Everts (2013, p. 24) riskscapes should not be imagined as fixed territories but rather as "fluid, irregular shapes" (Apparundai, 2006, p. 589), which emerge through (material) practice and therefore need to be understood as a process or "place-path arrays" (Schatzki, 2009, p. 40), i.e. as aspects of being interacting with processes of becoming and connecting. The central imperative derived from this is to comprehend

the tensions between riskscapes imagined and practiced by different actors, rather than to try defining one riskscape.

The two previous aspects of *riskscapes* imply the subjectivity of riskscape – or any landscape for that matter. There is never one objective landscape but a multitude of landscapes, depending on the perspective from which they are regarded (Müller-Mahn and Everts, 2013, p. 25). Landscapes are different to similar concepts such as 'area' or 'territory', as it implicitly includes a perspective, a body that is connected to its surrounding space by subjective experience, as illustrated by Figure 2. Just as two wanderers would navigate differently through the same area, so is the perception of riskscapes dependent on the unique positionality of each actor. Far from being individualistic, the concept of riskscape furthermore highlights the importance of collective sense-making – the agency of each actor "is bound up and nestled into the fabric of social groups and societies" (ibid., p. 25).

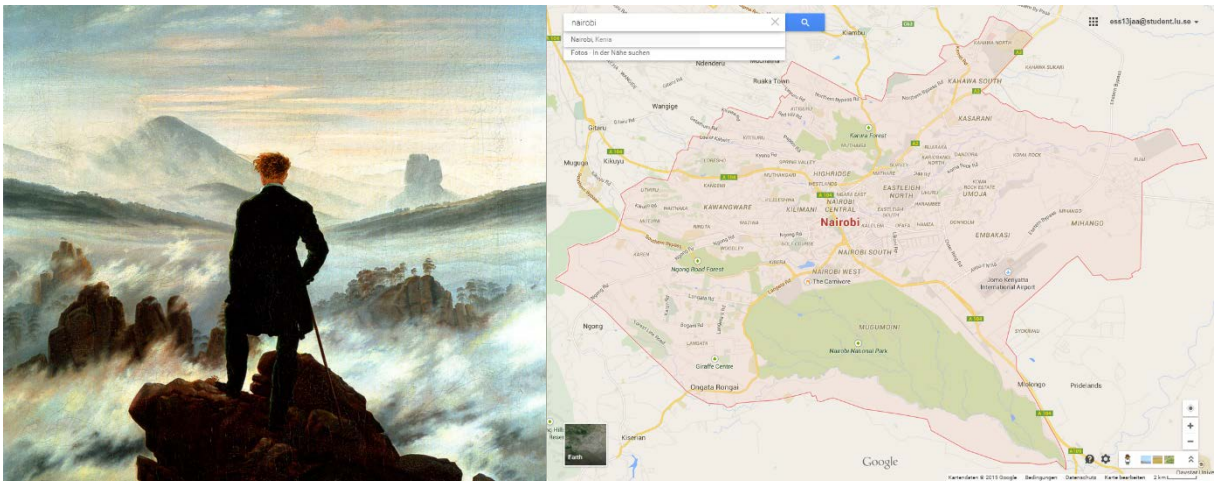


Figure 2: Landscape vs. area. Left: Casper David Friedrich's landscape painting "Der Wanderer über dem Nebelmeer" illustrating the existence of a 'point of views' in landscapes. Right: screenshot from GoogleMaps. The concept of 'area' only signifies its spatial extent but no position from where it is regarded. Source: Wikimedia Commons, GoogleMaps

2.1.3 Slow Disasters, Visibility and the Temporal Dimension of Risk

Even though in this thesis I focus on the spatial dimension of risk elaborated above, its temporal dimension cannot be ignored. Within the scope of this thesis I can merely refer to the discussion of the topic in the aforementioned literature (2.1.2) and concentrate on one aspect of the temporal dimension of risk, which is not prominent in the scientific debate but important for the purpose of this text. In *Slow Violence* Rob Nixon (2011) maintains that negative environmental effects harming the poor often take place on a slow and therefore invisible time scale. In 2.1.1 I established that in today's global society risks are exported or outsourced to marginalised regions – a recognition that Rob Nixon complements by stating that "neoliberalism internali[ses] profits and externali[ses] risks not just in spatial but in temporal term as well" (ibid. 2011, p. 35), and highlights a "transnational off-loading of risk from

a privileged community to an impoverished one" (ibid. p. 46)[3]. Nixon's main argument can therefore easily be transferred from the distribution of 'slow violence' to the distribution of 'slow risks'. Exposing the (economically) poor to risks produced within a global risk society may not always result in particular disasters but its effects may be disastrous nevertheless. As Becker (2014a, p. 57) points out: "our predisposition for the spectacular should not make us forget the many smaller events, […] whose cumulative impact on society in many ways vastly surpasses the few and dramatic". MAFRIDA in the example presented in the Prologue faces up to three flooding events a year – all undermining her livelihood in the long term, but none making it to the news. This living in denial is especially easy, when these risks can be justified as being the "latent side effects" (Beck, 1992, p. 34) of modernisation, "according to the motto 'in dubio pro progress', which means 'in dubio pro looking away'." (ibid., p. 34). However, as Beck points out later, precisely because of this 'looking away' risks are exponentiated and distributed (ibid. 1992, p. 42), festering under the vail of ignorance.

This provokes questioning one of the core concepts of risk studies, the disaster. One implicit assumption about disasters are their extraordinariness. Coppola (2011a, p. 10), while describing the four phases of disaster management states regarding the recovery phase that it "[i]nvolves returning victims' lives back to a normal state following the impact of disaster consequences". But what if this 'normal state' is in itself precarious? For MAFRIDA (and many other slum dwellers in Nairobi) it is 'normal' to live in a house that gets flooded by toxic water several times a year. This normalised 'slow disaster' experienced by many people described in the case study of this thesis is therefore off the radar of common perceptions of disaster. This also relates to the question how to define an 'international disaster', commonly understood as an event that prompts a national government to ask for external help (Wamsler, 2014, p. 19). This has important consequences for who is able to define the scalar level of disasters and subsequently its visibility.

2.2 The Politics of Scaling

These deliberations have opened up a variety of questions regarding the scalar dimension of risk. In order to be able to answer them it is necessary to consider the 'politics of scaling', which are being discussed in this chapter in general and with explicit reference to the politics of risk in 2.3.

2.2.1 Differentiation of the Concept: Relational Scalarity

Howitt (1998, p. 51) describes three "facets" of scale: size, level and relation. In this thesis I will focus on the last facet. However, this does not mean that the other facets are of no importance, since they appear in scale negotiations as well. These facets should not be seen as distinct and independent definitions of scale but rather features that receive different levels of heed depending on the respective

[3] This is comparable with David Harvey's (2003, p. 87 et seq.) notion of *spatio-temporal fixes*

approach. The *size* aspect is probably best understood as the geographic scale depicted on the bottom of every proper map and can best be translated with 'scope' or 'extent'. Depending on the size of the extract shown by the map, different entities are labelled and different structures are visible. *Level* relates to the hierarchical notion of scale and may be best understood as nested hierarchies illustrated by the example of the Russian Matryoshka puppets (Herod, 2011, p. 47). Thereby, the local or the body is situated within larger and therefore paramount levels.

To a certain extent, relational scalar approaches break with assumptions laid out above. From a relational scalar perspective we may for example question why nations of so different sizes – among them city states – appear to be on the same *level*[4] (Howitt, 1998, p. 52). Often with reference to Actor-Network Theoretical approaches proponents of a relational scalar approach assert that the global is not simply large (Law, 2004) – in fact, as Bruno Latour points out, when people are talking about the 'global' the accompanying hand gesture "is never bigger than if they were stroking a pumpkin" (Latour, 2005, p. 186). On a more serious note he continues that it is not the size that makes a Wall Street trading room an actor in the *global* economy, but its connectedness (ibid., 2005, p. 187), the *relations* it maintains with other places. In contrast to the idea of scale as a Matryoshka, this suggests a more complex understanding of scale as "a mosaic of unevenly superimposed and densely interlayered scalar geometries" (Brenner, 2001, p. 606), which are characterised by multiple possible meanings depending on the direction of inquiry and the social practices under scrutiny (ibid., p. 606). This implies the potential for conflicting claims within this scalar mess, a *trans-scalar intersectionality*, which can be temporarily hidden by "the creation of nested hierarchical structures of organization" (Harvey, 1982, p. 422). The hierarchy described in scale as *level* is therefore the outcome of scale negotiations – in other words: "Scale is the actor's own achievement" (Latour, 2005, p. 185). This is often referred to as scale framing or scale fixing (Ramasar, 2014, p. 37 et seq.), which can produce winners and losers and therefore include an important power dimension (e.g. Meadowcroft, 2002; Ramasar, 2014; Rangan and Kull, 2009).

2.2.2 Global Places, Local Globes

Implicit in the arguments presented above, there is a notion of fluid movements or translation between different scalar levels (Ramasar, 2014, p. 36). *Global* meaning may be produced at a specific *locality*, by actors which are in turn connected to *global* networks, which are rooted in certain *places* and so on (cf. Weisser, 2013). I argue that this process of translation between the local and the global can be understood as a movement of Hegelian dialectics. Just as the negation of any earlier stage of the dialectic is never wholly superseded (Russell, 1945, p. 732), the negation of the local in the process

[4] This necessitates a distinction between scale and level. I regard scales as ordering systems and levels as positions within them (Ramasar, 2014, p. 31). Some authors quoted here use the terms interchangeably.

of globalising does not eliminate locality. However, in contrary to Hegel, this process does not have a direction towards an Absolute Idea but is rather rhizomatic in structure. The process can be reversed and similarly the negation of the global through the process of localisation does not supersede the global, suggesting a concept of scalarity similar to Anders Blok's (2010) fractal topology of scale.

These deliberations result in an unwonted conclusion: There is no 'global' as a distinct entity; it only "emerge[s] through the imaginative abstracting from networked locals" (Lagendijk, 2002, p. 45). When I walk from downtown Nairobi to a slum in the far East of the city I do not actually transmigrate the distinct spheres of the global and the local. A relational scalar perspective sheds light on the 'dark and empty space' between scalar levels and subsequently makes it look much less terrifying: it is about the material and discursive connections between these and other places (Blok, 2010); connections we can follow and make the object of scrutiny. This allows a look on a much flatter world (Latour, 2005, p. 165 et seq), which however does not imply, as Marston et al. (2005) suggest, that scale is rendered unnecessary. Scale is indeed an important constituent in "the production, reconfiguration or contestation of some aspect of sociospatial organization" (Brenner, 2001, p. 599). Differences in power are real and are expressed and staged in scalar politics (e.g. Swyngedouw, 2004, p. 133).

At that, scale is not only "a way of framing political-spatiality that in turn has material effects."(Jones, 1998, p. 27) but also emerges itself from material practices of scaling (Ramasar, 2014). Similar to the way risk has been discussed as a concept transcending common distinction between materiality and idea, scale too combines these elements. As Brenner (2001, p. 600, own emphasis) asserts, scale can be understood as a process of hierarchisation "through which processes of sociospatial differentiation unfold *both materially and discursively*". In short: matter matters in scale-matters. This suggests a conceptual compatibility of the concepts of scale and riskscapes, which also combines material and ideational dimensions.

2.3 Scalar Politics of Risk

Figure 3: Nairobi River Joining with a Tributary at Waiyaki Intersection. Source: own.

Keeping the metaphor I am using throughout this thesis, it is possible to imagine the two concepts of risk and scale as two rivers joining and mingling their water. The result is not a simple sum of both conceptual streams, but necessitates some more elaborate considerations, which I present in the following, investigating research question one on the conceptual merging of risk and scale. At that, I mostly rely on own deliberations, since, as I will show, the existing literature combining scale and risk is insufficient for the purpose of my thesis.

Most of the literature covering risk and scale is associated with a practically oriented risk-management approach (e.g. Birkmann, 2007; Brown et al., 2012). The scale question is often invoked in regard to what administrative scale is responsible for dealing with a certain hazard (Brown et al., 2012; Zevenbergen et al., 2008); on what scale a certain hazard should be assessed (Garrick and Hall, 2014); or in the context of non-spatial scales, deliberating how risks can be organised in a hierarchy (Gardoni and Murphy, 2014). This assumes a certain relationship between actors, the risks they face and their respective scalar level. Simplified, this assumption may be summarised by regarding natural hazards and actors as rooted within a certain pre-existing scale[5]. The purpose of investigation is subsequently to identify these scales and then 'matching' risks with actors on an appropriate level, to subsequently answer the "question of the appropriate scale of assessment and decision making" (Garrick and Hall, 2014, p. 620). The ultimate goal is not a just distribution of risk but rather to ensure robustness of

[5] Garrick & Hall (2014, p. 20) write: "The river basin scale is the natural unit of assessment from a hydrological perspective […] However, not all issues of water security naturally fit into the river basin scale", implying a 'natural' scalar level of phenomena, as opposed to the discussions in 2.2.1.

statistics and decisions based upon them, in order to achieve a 'tolerable' level of risk (ibid., p. 620) for an entire *system* (Daudé et al., 2009).

In this thesis I take an explicitly different stance on the relation of risk and scale, implied but not explicitly formulated in Müller-Mahn & Everts (2013), and extensively studied by Blackburn (2014). Blackburn describes the mechanisms of scalar politics that favour actors on the national level in opposition to communities as well as the role of material disempowerment and processes of isolation in doing so (ibid., 2014). From this I derive the first dimension of scalar politics of risk: the *scaling of risk-actors* by ways of connection and disconnection (in accordance with the relational ontology of risk and scale established above).

The second dimension of scalar politics of risk is based on the assumption that the first dimension is connected not only to the scaling of actors, but also the scaling of the risks these actors face. Lindseth (2006) demonstrates how an 'issue', in his case a natural gas project, can be framed in different scalar levels. He shows, how the conflict-laden negotiation of scalar framings influences power dynamics (cf. Ramasar, 2014). Transferring this concept unto the politics of risk, I assume that it is possible to observe the *scaling of risks* as an important feature of negotiations of urban river riskscapes in Nairobi.

These two dimensions of scalar politics of risk can be integrated into the concept of riskscapes introduced above. The way social action assembles risks in riskscapes determines the way it is scaled. I therefore argue that this scaling of riskscapes has serious political implication. How does it influence whose risks are being perceived in what way? How is scale employed to maintain the supremacy of certain 'global' riskscapes against contradicting 'local' riskscapes? What does it mean for a certain actor when a risk it is facing is 'fixed' to a different scale than itself – e.g. erratic flooding due to *global* climate change in a *localised* slum in Nairobi? What consequences does the scalar framing have on the distribution of risks and benefits discussed in 2.1? In the following I will elaborate these questions in regard to Nairobi's river riskscape. However, first it is necessary to discuss the methodology required to develop answers to them.

3 Methodological Riverbed

3.1 Conceptual Demands for Methodology

In the following I will attempt to translate the theoretical deliberations into a methodology, suggesting the methodological approach of *Multi Sited Ethnography* (MSE).The central aim of the methodology can be summarised as: *To comprehend the tensions between riskscapes on different scales imagined and practiced by differently scaled actors.* This suggests a number of specific demands for the methodological approach.

The discussion of risk and scale has established the ontological principle that both concepts cannot be grasped by either materialism or idealism alone. The first demand for the methodology is therefore an epistemology that recognises *material as well as ideational* features. Referring to Platonic philosophy, I suggest to regard scales and risk as a *chora*, a space of relation and interaction between matter and ideas that cannot be assigned to either one, since "although it is understood in light of the idea/material dualism […], it simultaneously undermines that binary" (Herod, 2011, p. 32).

Resonating with the notion of the chora, I have argued for a relational approach to scale (e.g. Blok, 2010; Ramasar, 2014) and risk (e.g. Müller-Mahn and Everts, 2013, p. 40). This implies the second demand for my methodology, the ability to realise *relations* rather than focus on entities in themselves. Thirdly, I have developed the notion of *fluidity* and *movement* in both the concepts of risk and scale. Fluidity is both constitutive in the shifting frontlines of scalar negotiations (cf. Swyngedouw, 2004, p. 2) as well as for *-scapes* in general (Appadurai, 2006, p. 589) and riskscapes in particular, as they are enacted by social processes (Müller-Mahn and Everts, 2013, p. 26) and therefore move fluidly across scales. Lastly I have argued for the importance of *perspective* and subjective accounts on scales and riskscapes.

3.2 Multi-Sited Ethnography – Siddhartha vs. Mungo Park

A very close approximation encompassing these features is provided by the concept of *Multi-Sited Ethnography*, first introduced by George Marcus (1995). Originally conceived broadly as situated within "spheres of interdisciplinary work, including media studies, science and technology studies, and cultural studies" (Marcus, 1995, p. 95), it has often been used in connection to migration studies (see e.g. contributions in: Falzon, 2009a). However, I argue that many principles put forward by MSE are not exclusive to ethnographical endeavours to study culture, but can also be implemented more broadly in the study of phenomena that cannot be understood as singular and situated.

Central to this methodology is a relational scalar approach, whereby "[t]he global is collapsed into and made an integral part of parallel related local situations rather than something monolithic or external to them" (Marcus, 1995, p. 102), mirroring the notion of scale I have laid out in 2.2 (see also: Xiang, 2013). MSE does not conceptualise the 'site' as a bounded territory but incorporates the aspects of movement and fluid borders (Marcus, 1995, p. 97). Similar to the concept of *Follow the Thing Geographies* (e.g. Ian Cook, 2004; Pfaff, 2010), this premise is achieved by "follow[ing] people, connections, associations, and relationships across space" (Falzon, 2009b, p. 1), while not predefining, where the site is supposed to end (Marcus, 1995). To illustrate this epistemological point: In a single-sited design a researcher would sit at the river like Siddhartha, to contemplate in depth on the water before her eyes. In contrast, a multi-sited ethnographer would regard the flowing of the river as a decisive feature

in itself; she would therefore follow its flow like Mungo Park[6]; examine where it comes from, where it goes to and what happens on its way. This illustration is less metaphorical than it may seem – actually 'following the river', as I will argue later, is exactly how I engage with the politics of scaling within river-riskscapes. A focus on fluidity and relatedness helps understanding *subjective perspectives* not as natural units of difference but rather as hybrids, influenced by intersectional relations (Marcus, 2011, p. 19). MSE therefore combines the demands for the methodology of this thesis. Its ontological as well as epistemological focus on how things *move* and *relate* to other things allows to regard (from *subjective perspectives) fluid* assemblages that are constituted by *material objects, as well as ideas*.

3.2.1 Limitations of MSE in this Study

At this point the reader may wonder how it is possible to regard a case study 'multi-sited' when it was in fact carried out within a single city. A more extensive research would indeed have taken into account sites beyond Nairobi. Just as for Mungo Park, practical constraints limit the length of the studied stretch of the river, but do not lessen the focus on movement, connections and relations pursued on the journey. Marcus (1995, p. 110) calls this a "strategically situated single-sited ethnography", which is characterized by a recognition of the loose ends of connections to other sites, which cannot be followed but whose existence is acknowledged (ibid., p. 111). Secondly, in my opinion one does not need to travel long distances to visit several sites. As I will argue below, Nairobi presents itself as a highly fragmented city, featuring poor and wealthy areas; polluted and healthy; huge and humble. Within a spatially narrow area I have therefore indeed visited multiply sites.

One limitation that comes with multi-sitedness in general is potentially a lack of depth, especially as it is more difficult to spend a lot of time at one place in order to become acquainted with people and phenomena (Falzon, 2009b, pp. 7 & 8). I attempted to solve this problem by combining *thick* and *thin* description (Mand, 2011, p. 45), balancing the need to investigate several sites, without losing too many details. For example, I spent a week in Kibera and Ngong Slum respectively, while just passing by other sites.

A second limitation is the difficulty to define what I am actually following. When a child sets a paper boat in a stream and runs along the riverbank to see where it is going – does it follow the river or the boat? For a less metaphorical explanation it is important to differentiate between a methodical and an epistemological 'pursuit'. As I was physically tracking down the course of Nairobi's river I was thereby epistemologically chasing the risks associated with it, traversing scales, tangible materializations as well as discursive ideas. The discursive invasion of river branches often went beyond the physical extent of the river, as it let me for example to regulating agencies remote from the actual water.

[6] 18th/19th century explorer who attempted to discover the mouth of the Niger River.

MSE is indeed useful to keep track of this entanglement of knowledge practices and objects (Fortun, 2009, p. 83). This, however, raises the question how it is possible to follow it in practice.

3.2.2 Implementation of Methodology: Walking with the Water

The empirical body of this thesis is constituted by a total of 2 focus group discussions, field-observations (registered in a field note-book), and 44 semi-structured interviews. Most interviews were conducted with residents of slum areas but also with experts, homeless people, and residents of wealthy areas. Scheduled interviews were mostly about 30 to 45 minutes long; spontaneous interviews between five and 30 minutes[7]. Interview partners were selected on the basis of theoretical 'snowball' sampling (Liamputtong, 2008, p. 10) and availability sampling (Daniel, 2012, p. 82), as I approached people while walking alongside the river.

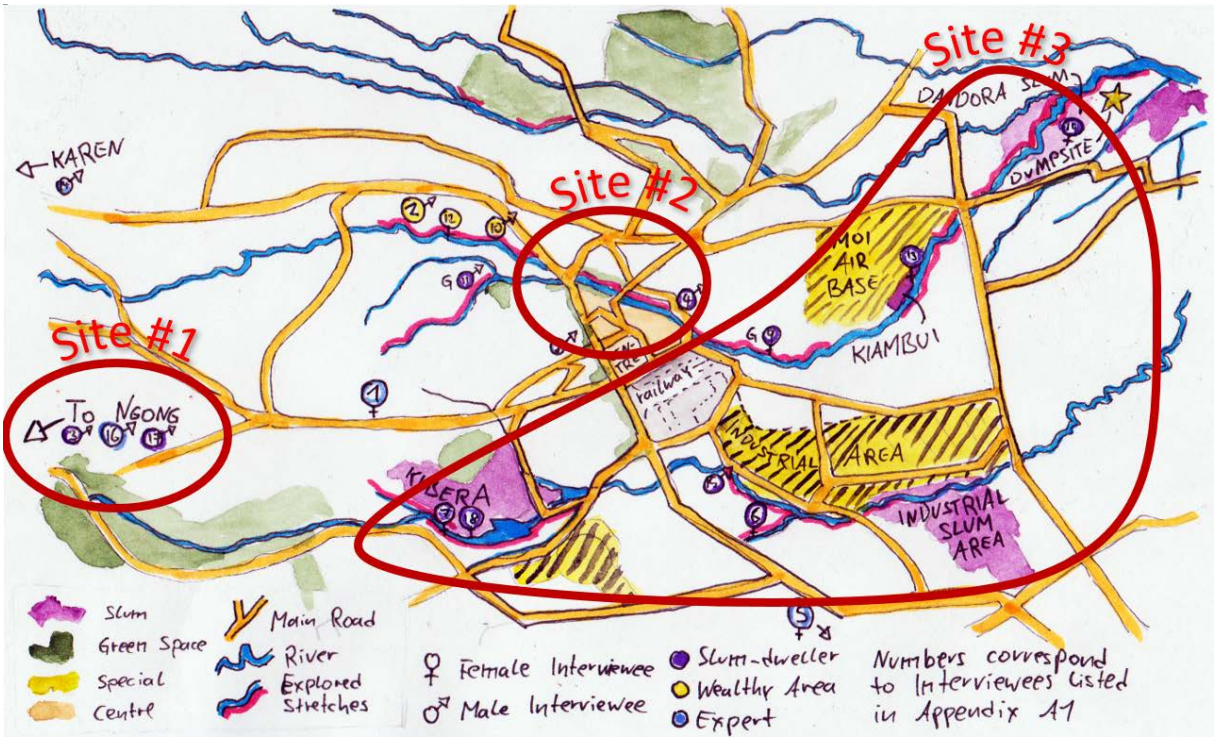


Figure 4: Map of Study Area, Nairobi. Own Cartography.

The fact that the research was conducted within a cross-cultural context requires some consideration. To overcome some cultural and linguistic boundaries I chose to work with several interpreters, which is not unproblematic, since certain meanings may get 'lost in translation' and bias or misunderstandings may impact the interviews (Jentsch, 1998; Liamputtong, 2008, p. 8). Furthermore, the high amount of tribal segregation in Nairobi meant that interpreters were often 'outsiders' themselves. On the other hand, translators are important insofar as they do not only translate words but also nuances of cultural meaning, rendering them as "cultural brokers" (Hennink, 2008, p. 25). Further benefits were that interpreters could show me relevant places, set me up with interview partners, and opening the

[7] See Appendix A2.

conversation, acting as "gatekeeper[s]" (Liamputtong, 2008, p. 10). As I spent a lot of time with some interpreters during my stay we shared a common understanding of the aims of my research, avoiding a common difficulty (cf. ibid., p. 8). Lastly, there is also an important safety aspect to consider. Especially in Kibera it was important to have a well-known and –respected person at ones side, who knew what places and people to avoid, when it was best to stay calm and when to run.

Another (though unusual) guide were the rivers and streams of Nairobi as they served as the starting point and a structure of my research in several regards. First, they sparked initial interest in the topic when I visited the town some years earlier. Second, they were my entry point in the field – after all Nairobi is quite big, making it difficult to decide where to start with interviewing people. The streams structured the way I was traversing the research area – if possible always along the river course. This in turn structured the way I was engaging with people. For example I met Wirry, one of my interpreters and guides, on my second day in Nairobi while he was relaxing at a small stream. This way of meeting people furthermore influenced the way I initiated the interviews. As the people I met where necessarily interacting with the river I was careering along in one way or another, I started most interviews by asking what exactly it was they were doing at the river, opening the conversation from a palpable situation. This also allowed people to *show* rather than *tell* what they were doing – be it washing plastic bags or clothes, or cleaning out the garbage. This made observations and own experience an integral part of the research (Falzon, 2009b, p. 9). Exposing my body (cf. Kimpson, 2005, p. 75 et seq.) to the often arduous wander alongside the river furthermore facilitated an understanding of the river as a connecting, or indeed disconnecting vector. At some places it was quite easy to follow official pathways, at other times I had to use unofficially beaten tracks or make my own through thick vegetation. Important at that were also the impediments I was experiencing. Often I had to abandon the river, because the vegetation was too thick, I encountered fences or people told me it was too dangerous to continue.

This way of using the rivers as entry points and pathways to and through my research resonates with Kvale's (2007, p. 19) metaphor of the interviewer as a traveller:

> "The interviewer-traveller wanders through the landscape and enters into conversations with the people he or she encounters. […] The interview traveller […] walks along with the local inhabitants, asks questions and encourages them to tell their own stories of their lived world."

My travelling with the river reflects the necessity for *movement*; and the awareness thereby of the river as a connection, establishing a relation between the people I met on my way, satisfies the need for *relationalism*. Engaging in the practices and *subjective perspectives* of the people I met and following the ever changing, indeed *fluid*, character of the river along its physical and discursive branches, implements the demand for recognizing *fluidity* between scales, the negotiation of risks and the fluid dialectic of *idealism and materialism*. I and my body as a receiver of material reality, as well as ideas

and stories are therefore necessary in order to meet the requirements of the methodological demand to transcend the idealism/materialism divide. This necessitates a discussion about the position of 'me and my body' during the research (Laine, 2000, p. 59).

3.2.3 Positionality and Reflexivity

Being a white male in Nairobi is being a living paradox, within a paradoxical city. As Ackerly & True (2008, p. 697) point out, the researcher's identity, and therefore the paradoxes associated with it, are always multiple: Being white (Kiswahili: 'muzungu') meant that I was potential victim for hagglers on the market and thugs on the street and at the same time associated with perpetrations of colonialism and modern day capitalist exploitation. As a 'muzungu' I am perceived to be rich – my bank account says otherwise. As an involuntary representative of the patriarchy I realised that I could be potentially threatening to women but at the same time I had the impression that many people saw white young researchers as synonymous to aid agencies that can offer protection. In some cases 'muzungus' are still treated with unbecoming respect – on the other hand most interviewees were older than me, constituting a less respectable position for myself.

It is therefore not only important to regard me and my body as a receiver of material and ideational signals, but also as a transmitter of signals of the same kind. As just pointed out, these signals are cast forth on many different wavelength and often carry contradictory messages. This implies that research is not only about the ascertaining of information but takes place in a field of complex power relations. Awareness of these and the accompanying reflexivity are an important aspect of research for several reasons. Ackerly & True (2008, p. 693) point out that "[…] we, as researchers, also participate in the projection of power through knowledge claims", implying an ethical imperative to reflect on the power the researcher exerts, especially since I check all the boxes of privilege: white, western, middle-class, heterosexual, male, able-bodied, cis-gendered.

The process of reflecting is not "mere navel gazing" (England, 1994, p. 244) but has also practical merits. When designing the research, I didn't have an explicit focus on gender. However, paying attention to absence and silence (ibid., p. 694) helped me to notice the suspicious absence of women at many places at the river. I soon noticed that two male researchers (the research-assistant and me) asking sensitive question about gendered violence, may reproduce oppressive power relations and an uncomfortable situation for the female interviewee. I therefore tried to raise questions of sexual violence again in a GROUP DISCUSSION, where several women and only one man was present, or when the interviewee was in the vicinity of friends and family (DORA), therefore changing the power-dynamics. In my opinion, this is not only the ethical way of conducting research, but also useful for the generation of knowledge. Even though in the written text, these reflections are confined to one chapter, they should be understood as a silent presence in the following discussions of the case study.

4 Case Study

4.1 Introduction: Paradoxes of a Fragmented City

One of the few comprehensive scientific accounts on Nairobi as a whole is subtitled *Les paradoxes d'une ville fragmenté* (Charton-Bigot and Rodriguez-Torres, 2006; Engl.: Paradox of a Fragmented City). Most visitors will probably agree that this is indeed an appropriate description of Nairobi. To understand these paradoxes and fragmentations is important if one is to understand the paradoxical implications of scale and fragmented risks, which are being discussed subsequently. As described in the methodological part I chose the urban rivers of Nairobi as a thread to seam together these paradoxes to a tellable patchwork of a story. Again I will use Nairobi River, my travel companion, as a storyteller.

Originating just before the eastern suburb of Kikuyu, Nairobi River starts its journey in a rurally dominated area. Here at the source, the original meaning of the word 'Nairobi' – *place of cool waters* (Undie et al., 2006) – still rings true. With over 1000mm per sqm of mean annual precipitation[8] this area is humid in comparison to the landscape the river will traverse further east (**Figure 5**). The colonial government of Kenya seized this apparently natural fragmentation and used it as a blue print for the establishment of a colonial city: "[…] Nairobi was the perfect Apartheid city without trying. White suburbs in breezy hills looked down on the Indian bazaar and railway workshops, with their African 'lines', on the hot and swampy plain" (Lonsdale, 2006, p. 19). Figure 6 shows how the urban fabric still displays features of this fragmentation, as wealthy areas are more likely to be situated at the cool and humid areas in the West, compared to slums, which tend to be situated downstream. Calculating the relation between the 'age' of the river (measured by metres it spend within the boundaries of Nairobi), and its riparian population ('wealthy' or 'slum') reveals a relatively strong Pearson correlation of 0,69 ($p < 0,01$) (own satellite image analysis and calculation). In short this means: The wealthy population tends to live where the river is still pristine and can enjoy its *benefits*, while the slum population downstream mainly faces its *risks*.

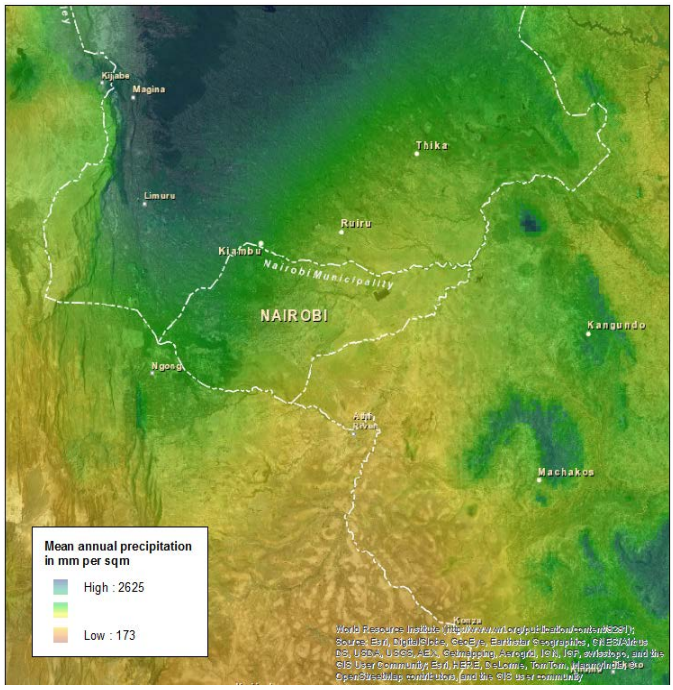


Figure 5: Mean Annual Precipitation of Greater Nairobi Area. Basemap&Data: ESRI; Cartography: Own

[8] Data: 1968-1970.

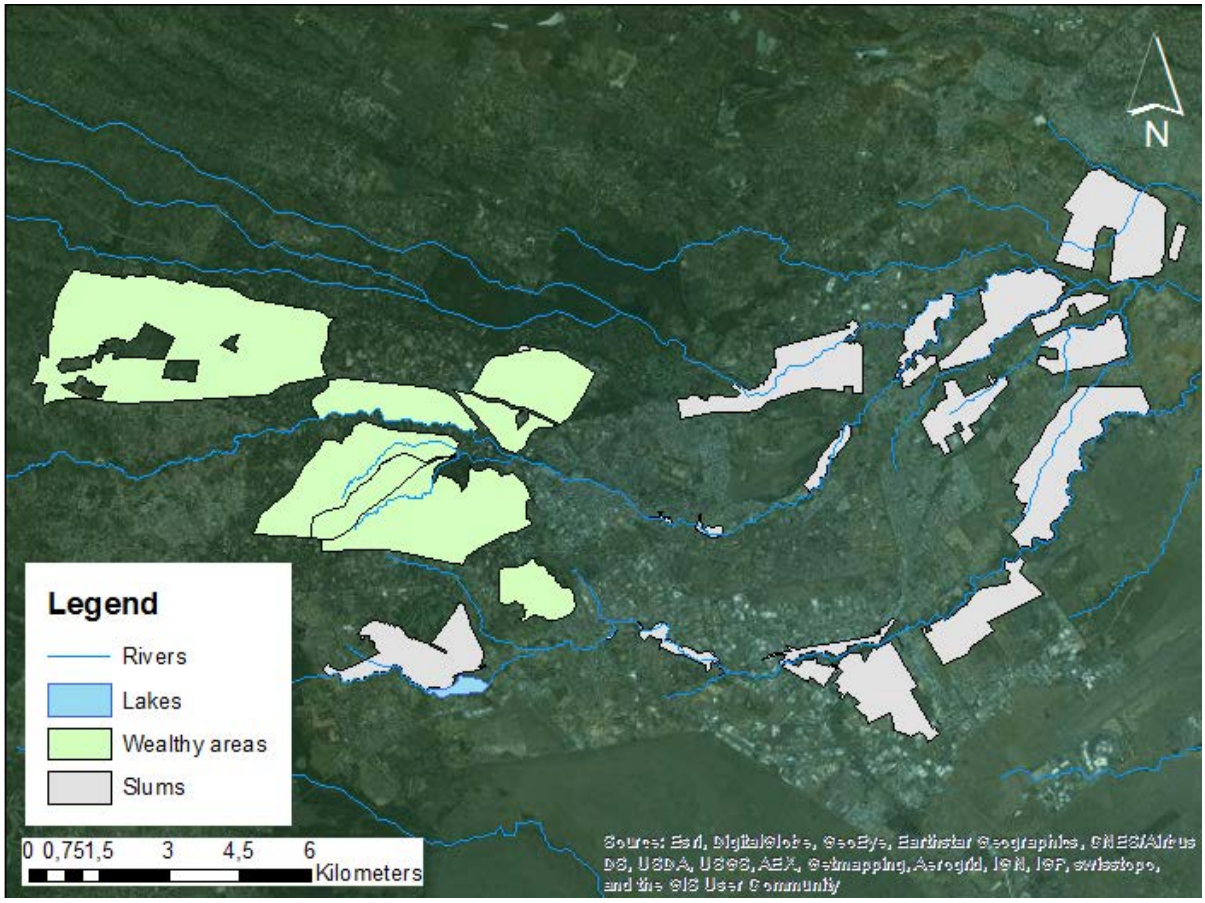


Figure 6: Distribution of wealthy areas and slum in relation to rivers in Nairobi. Note: River-flow East->West. Base-map: Esri; Data: own image analysis

Leaving the rural area of its source, Nairobi River enters the wealthy residential area of Kangemi and Muthangari – a truly cosmopolitan area, in which several embassies are located: First Vatican, subsequently Hungary, Somalia, Germany, Netherlands, Chile, Korea... Here, the river is not a natural hazard but an asset that adds value to international hotels, such as the *Riverview*; apartment prices are the highest in the town (Hass Property Index, 2014). River floods are either controlled by sturdy walls or by lavish areas of vegetation (Figure 7). People here have positive feelings towards the river: "Well, we are proud because we are closer to the river […] You are aware that water is life and as it flows and you are close – you feel part of it" (JAMES). The river continues to meander by one of Nairobi University's campuses. Subsequently, it is forced into a concrete strait-jacket for the first time before it passes the Michuki Memorial Park – the last patch of natural jungle, Nairobi's concrete jungle already within-sight.

Figure 7: Nairobi River in Westlands. Wealthy riparians are either protected by a green buffer area (left) or walls (right). Source: Own.

Figure 8: Street Family at Nairobi River. Source: Own

Surprisingly quickly the scene changes. Coming out the other side of the Globe-Cinema-Roundabout, the river enters another world. While walking along the river so far has been a pleasantly adventurous hike, I now felt uncomfortable the first time. “Go back to your country, motherfucker!” shouts a boy who can’t be older than six. Street families appropriated this area that was supposed to be a model for Urban River upgrades (EDWARD KIMATHI) – but it’s not Nairobi’s middle class that takes a stroll under the trees that line the river course (Figure 8). This seems to be the basic principle of this city: everything

works, but not how it's supposed to work. It is yet another paradox of Nairobi's fragmentation: the places of political power merely a kilometre upstream that define the role of the city on the international arena do not define the face of the city itself. Slums-dwellers and street children live in the gaps of city planning – and paradoxically these non-places define the city for most people who live in it (Charton-Bigot and Rodriguez-Torres, 2006, p. x).

Further down, the river and I pass by Gikomba market, a vibrant market for and by the urban poor. The river itself changed. Close by are car mechanics who specialise in spray painting busses – their discharge polluting the river. The water quality decreases further as the river passes by Nairobi Eastleigh and Kiambui-slum – the place where I met MAFRIDA – and subsequently Dandora-dumpsite as well as the adjacent slum areas. In contrast to the wealthy areas upstream, the vicinity of the river decreases the value of the riparian plots (ALEXANDER; MUTIENO). This means that the poorest of the poor live next to the river, increasing the criminal activities in these areas, constituting a 'chain-reaction of risk'.

When the river leaves Nairobi it is a different river altogether. It has seen a modern African city that can't really shake of its colonial past; a global metropolis, comprised of many tessellated locals. Within a few hours it has passed subsistence farms and high rise buildings; expensive villas and unstable huts; lush nature and concrete riverbanks. On the way the river itself changed – from a relatively clean stream to a flowing cesspool; from a thing that increases value to a thing that increases risk; from an object of pride to toilet. Nairobi River connects all of this.

The river, however, does not only connects different sites, but also scalar levels. When regarding the issue of river related risks from the level of the city, one sees a highly uneven spatial distribution of flooding and pollution risks. Douglas et al. (2008, title) found that the urban poor in Africa are extraordinarily exposed to "Unjust "Water"; environmental risks connected to urban rivers (ibid., p. 187) – a fact that implies spatially fragmented risks, which are nuanced along economic demarcation lines (Figure 9).

However, for many people living in informal settlements, such as MAFRIDA mentioned in the introduction, the problem is not flooding per se, but rather its increasing unpredictability. The interviews I conducted coincide with Douglas et al. (2008, p. 194), wo found that "[m]any local residents link increased flooding to both local activities and climate change". Interestingly, *global* climate change is nevertheless sometimes associated with local deforestation. When the topic was addressed DERRECK said that "[t]he reason is due to people cutting down trees; it leads to climate change and one is not able to predict the weather". In this instance, a rhetoric of (global) climate change is conflated with regional

deforestation and local effects, illustrating the fractal topology of scale discussed above. In section 4.2.3 I will discuss how these risks are even further differentiated on the household level.

Figure 9: Riparians in Slum area are most affected by annual floods. Recent high-waters have flushed away parts of this building in Dandora. Source: Own.

These notions of the scalar dimension of risk constitute different, sometimes conflicting riskscapes on localised, nationalised and globalised scalar levels. In the following I explore, how these overlapping riskscapes are negotiated; how these negotiations are shaped by existing power dynamics and how they challenge or reproduce them.

4.2 Negotiating Risk-Scales

There are millions of stories to tell about scaled risks at Nairobi River, but I will concentrate on three; following the river's flow starting at Ngong in the West, continuing to Gikomba market at Nairobi's centre and ending at its slum areas, mostly situated in the East (Figure 6). I will first elaborate on the implications of the scaling of risk actors (4.2.1) and subsequently expand on the scaling of riskscapes by actors on opposing sites of the negotiating-table (4.2.2). Lastly I combine these aspects and discuss their effects on marginalised scales (4.2.3).

4.2.1 localised vs. globalised actors

"strangely most of our informal settlements are located along rivers"

(EDWARD KIMATHI, Ministry of Environment and Water)

"Here, the government is small" (DANIEL KAHURA, Slum Dweller)

"It is problems that make us live here." (MAFRIDA)

In Ngong, just outside of Nairobi, the most remarkable feature is the huge Oloolua dumpsite, which has been established in a former stone quarry. Garbage collectors and sinister Marabou birds alike scavenge the fuming mountain of garbage. It is surrounded by an informal settlement, which has been built on a former sewage-lagoon left by the colonial government. The settlement clings to the slopes of the garbage mountain, only separated by a small seasonal river that has dug a canyon in the ground of waste, upon which an entire community is founded (Figure 10). The stream later feeds into Kandisi River and subsequently the Mbagathi. In the following I will present how these riskscapes are negotiated across several scales; how different sites, as well as risks and benefits are entangled and how related power struggles involve politics of scaling.

Figure 10: Canyon through a mountain of garbage. Left-side: Oloolua dumpsite; right-side: first structures of the adjacent informal settlement, which are flooded by the seasonal river each rainy season. Source: own

People living in informal settlement are often referred to as 'the local population' or 'the locals'. Even though every person *is* at some place and therefore local, in 2.2.2 I have established that this may not

be the true-ism it seems to be. The 'local population' at Ngong slum is in fact localised in the sense of being disconnected from places that are framed on a higher level. This coincides with Douglas et al.'s (2008, p. 191) claim that informal settlements are "often regarded as being outside accepted urban regulation and planning systems". When asked why the county government hasn't done anything to improve the sorry sanitary situation in the slum, PETER, a young slum-dweller answered:

> Peter: For us, the slum dwellers, no one bothers about us.
>
> Theo: So they do not care?
>
> Peter: Yes, they do not care. They only give many empty promises.

Apparently, the 'local' slum population cannot expect a meaningful impact on county politics; the politicians seem to be disconnected from their needs and sorrows. As DANIEL KAHURA puts it: *Hapa, serikali ni ndogo* – Here, the government is small. For example case of broken sewer lines, people in slum areas cannot expect a quick fix, additionally exposing them to the discharge from far-away places (Figure 11). Similarly, when asking about the actions by NEMA (National Environmental Management Authority) or WRMA (Water Resource Management Authority), I was told that these authorities "have done nothing since they are new and people do not know about them" (PAUL). This is particularly interesting in comparison to the statement of an hotelier of the 'Riverview Hotel' in the wealthy Westlands area, who told me that in case of increased pollution of the adjacent river "we can talk or raise a complain to the NEMA-people because the healthy status of the river is their concern, we tell them the pollution is spoiling the fresh Nairobi water" (LOIS). The hotel, even though it could be seen as 'local' as any slum-dweller in Ngong is therefore able to raise a complaint about 'Nairobi water', thereby re-scaling its local concern of pollution to a city-wide issue. The fact that they can even alert NEMA, a national authority, indicates that some actors even manage to re-scale the river-pollution at their doorstep to a national issue. It stands to reason that this upscaling is possible by means of connections the hotel sustains with the global tourism industry (and its money), which establishes a good relationship with the city government.

Figure 11: Broken Sewer Line in Slum Area. Nobody expects the government to fix things like this, which expose slum dwellers to 'imported' risks from other areas.

The dumpsite can be understood as a material manifestation of a *temporal fix* (see 2.1.3) to Nairobi's garbage problem; a spatial but also scalar export of risks from a place of national concern to local insignificance. The materiality of this connection is evident in the reeking garbage trucks that connect the benefitting sites of waste production in the centre to the risky and localised dumpsite in Ngong. However, the risk-journey does not end here, as people living in Ngong informally translate these involuntarily imported risks into benefits by scavenging the dumpsite or letting pigs feed on it (Figure 12). The pig-breeders I talked to would never eat their own pork as it is likely contaminated but prefer to 'export' the risk further to their customers by selling it – potentially even in the city centre, creating what Beck (1992, p. 23) calls a "Boomerang Effect" of risk, exemplified by a conversation with PETER:

> Theo: Do you eat the pork – pig's meat?
>
> Peter: I don't know where they take them after slaughter but personally I do not take.
>
> Peter's friend: If you go to the butchery, you cannot differentiate.

Figure 12: "Do you eat the pork?" Sow Feeding on Garbage in Ngong. Source: Own

In 2.2.1 I have established the notion of scale as actors' achievements. The deliberation of this section seem to attest to the notion that the scale an actor achieves is directly connected to its ability to deal with risks. The ability to up-scale a certain *place of concern* by means of relations to other actors is not only depending on the power relations an actor is able to tap but also reproduces them (cf. Brenner, 2001, p. 604). Isolation is not only accompanied by localisation but is directly involved in the process of localisation. At the same time, informal re-exportations of risk may be able to avoid or even undermine these power-relations.

4.2.2 Risk to the Nation vs. Risk to the Livelihood

"We try to make life as dangerous as possible for them" (DOLORES, NEMA, off record)

In 2.2 I argued against a purely cartographic understanding of scale representable by the black and white symbol on the bottom of a map. I also argued that riskscapes cannot be cartographed by means of Euclidian distances. Sometimes, however, scalar negotiations of risk manifest themselves in a simple length, measurable in metres. EDWARD KIMATHI works for the Ministry of Environment and Water and heads the rehabilitation programme for urban rivers in Nairobi (see also: Chanda, 2010). He told me about rehabilitation efforts in Gikomba, an informal market area at Nairobi River. One of the main issues was the ministry's ambition to remove structures within a certain distance to the river in order to avoid pollution:

> "We wanted 30 metres off the river, lots of negotiations were done. However, it was not successful since the argument was that some livelihoods would be lost, then we reached to an agreement of 6 metres. There are a lot of stakeholders, politicians, administration, the government agencies dealing with the environment… It is a multi-stakeholder thing." (EDWARD KIMATHI)

In this quote two diametrically opposing arguments are visible: One group wants to build as close to the river as possible because it offers affordable land in an economically vibrant area. On the other side are groups that argue that structures close to the river contribute to pollution and should therefore be situated as far away from the river as possible. I argue that this 'multi-stakeholder thing' is also multi-scalar. To establish this argument it is necessary to explore the ways different groups scale risks connected to Nairobi River.

The rational of people insisting on having their shop close by the river is rooted in a localized riskscape. Individual economic benefits are weighed against individual risks of damage to the market stall during a flooding event. This connects to a desire to manage own affairs without any intervention by the government, which is perceived to be corrupt and uncaring:

> "[…] People in the government are those that are always hungry, like if you pour water in dry land; the ground swallows up the water. Again, they consider us as poor and unimportant but they cannot take us away from here […]."[9] (DANIEL KAHURA)

A localized riskscape effectively supports a discourse of emancipation and independence from government or other 'outside' intervention. As expressed by the above quote by DANIEL KAHURA, the government is described as considering poor people as unimportant, which means that the government in turn cannot tell them where to live. Localising the risk of flooding and economic security (unlike e.g. Sweden, where both is perceived to be the responsibility of the government) retains agency of those working in Gikomba.

On the other side of the conflict a more nationalized understanding of the river-riskscape prevails:

[9] Translated from Kikuyu by Wainaina Wambui

> "The rivers help even people downstream like in Machakos in the eastern part of Kenya and it even flows up to the Indian Ocean." (Dolores, NEMA)

The question of the width of the eviction-strip along Nairobi River is therefore placed within a national riskscape. Discursively, this line of argumentation stresses connection of people owning a market stand in Gikomba to far-away (human and non-human) downstream actors across half the country. Accordingly, DOLORES states that if the 30-metres-eviction project in Gikomba is successful "our oceans will be cleaner; of course we are talking about the marine life – they will have a longer life" (DOLORES), an argument that establishes a scalar level even beyond the national.

Regarded from the theoretical perspective established in 2.3, there are two explanations for this (attempted) scale-fixing of river risks to the national level: 1.) justifying intervention and 2.) silencing counter arguments. Regarding the first point, agencies such as the *National* Environmental Management Authority or the (national) Ministry of Environment and Water need to justify their direct intervention into the livelihood of the people at Gikomba market by framing the 'distance question' within a national riskscape of pollution and environmental protection. Regarding the second point, a thus established scalar fix on the national level would subsequently de-legitimize localized accounts on the 'distance question' - they thereby become the "Unseen Majority" (Amnesty International, 2009). These 'local people', it can be argued from the nationalized perspective, cannot see the 'whole picture' and may even be selfish in their focus on their own affairs. This appeal to the national or even continental benefits is reflected by a statement of Kenyan Prime Minister Raila Odinga who said in 2008 about Nairobi's river clean-up: "This is an important day for *Kenya and for Africa*. […] We long for the day when *our nation* can again be proud of this river, which could provide water to *millions*" (Olsen, 2010; own emphasis).

This rationale justifies denying people assistance with the flooding risks they are facing. When asked, if it was possible to introduce an early warning system for slum-dwellers in Gikomba and elsewhere, EDWARD KIMATHI said:

> "It is very possible but I think in Nairobi the Trick is […] we may not really require people to stay at the riverbank so… We would rather have that they are moved off, than encouraging them to stay there."

This corresponds with a statement by a NEMA officer, who told me: "We try to make life as dangerous as possible for them" (DOLORES). The invisible-making of localised risks in favour of nationalised risks and benefits is simultaneously used to keep flooding risks dangerous enough to encourage eviction without the politically unfavourable need to actually evict people. Slow, localised, and thus invisible risks are hoped to do the job.

The framing of the 'distance question' to a nationalized riskscape is achieved by discursively retracing connections between Gikomba and the rest of the country along the physical branches of Nairobi River.

This demonstrates the logic behind a *relational topology of scale* (Blok, 2010) and its material dimension par excellence: in the case presented above scale within a riskscape appears "as a sociomaterial product or achievement" (ibid., 2010, p. 898). Scale is an arena for the staging of conflicts but is not purely determined by discourses of power but is rooted in the physical topology of the landscape, such as the course of the river that carries pollutants from Gikomba to other places in Nairobi. Scalar negotiations of risk furthermore materialize in the urban fabric of Nairobi – in this case in form of a certain distance structures maintain to Nairobi River. The *modus operandi* of these negotiations is dominated by processes of connection and disconnection; by assembling and dis-assembling.

4.2.3 Sacrifice-Scales

"You sit and then begin to chat; you know what people do…" (OLIVER)

In the preceding discussions I may have given the impression of scale being the only determining factor within power relations. This is of course far from the truth. In fact, the case of risk scaling at Nairobi's rivers hints at the importance of *trans-scalar intersectionality* (see 2.2.1), which I seek to demonstrate in the following by a discussion of scalar politics of gendered risks. At that I want to stress two aspects: The effects on female riskscapes by a scalar fix of women on the very local household level and secondly the concept of 'sacrifice-scales' to describe the tendencies to translate risks across sites and scalar levels to be finally 'dumped' at the localised, poor and invisible level of the female body.

4.2.3.1 Gendered Places, Gendered Risks

In 2.2.1 I established that scales and especially levels within scales are culturally charged, which is expressed for example in a perceived hierarchy of scale, wherein the global is framed not only as bigger and 'higher' but consequently also as more important and powerful, compared to the minuscule local level (Herod, 2011, p. 86), which is perceived to be depending on the 'global context' for meaning (Latour, 2005, p. 165 et seq.). This cultural charging interfaces with patriarchal and heteronormative imaginations of gender, whereas the powerful global level or public sphere is associated with the masculine and the impotent local or private with the feminine (Herod, 2011, p. 86). This has important implication for riskscapes in Nairobi's slum-areas.

In the case of Nairobi River one finds that women are comparatively more affected by flood risks in informal settlements than men. ANGELA WAINAINA, executive director of the Institute for Environment and Water Management explains this particularity like this:

> there are quite a number of women who have actually lost their livelihood, because if you go to the slums, you find that during the day most of the people who are left there are women so the women are the ones who are doing all the small-scale businesses and men are more likely to go for casual labour in other places. So, yes, women are more affected in a sense that they are more the ones who are doing this... more kind of businesses in the slum areas and the slum areas are also the ones which are most affected by floods.

This conjecture is confirmed by accounts of some women (for example DURKASH) living in the slums:

> Durkash: You find that [the rain] comes and you are not sure when the floods are going to come […]. Now, you find it is normally challenging to the women; maybe you find the woman is a single parent, she has got kids in that house, she doesn't know where to take them or what to do because it is something which has just happened all of a sudden.
>
> Theo: Is it more likely that a woman is at home alone?
>
> Durkash: In most cases, it is normally women with the children in the houses.
>
> Theo: Why do you think is that?
>
> Durkash: […] [M]aybe the men have gone to work, or they are somewhere having fun; the women has been left home alone.

In these quotes it becomes apparent how riskscapes are connected to gendered, spatial and material practices of scaling. The mobility of men and their subsequent higher presence in the public sphere (either working or hanging around) reproduces male dominance in these areas, which are associated with a hierarchical superior level, while confirming the female confinedness to the household (level). This dynamic shapes the riskscape of river floods in slum areas insofar as it establishes the female body as the main 'recipient' of flood risk, which have their origin in economic disparities and settling patterns on the city-level, as well as regional water-flow regimes and global climate change (see DURKASH-quote above). This suggests a particular role of the female body as a 'risk sink'; a point I will elaborate in the next part.

4.2.3.2 The (female) Body As a Sacrifice-scale

In 2.1.3 I discussed how "the invisible risks win the race" (Beck, 1992, p. 45), in the sense that ignorance of certain risks provides the "political soil on which the risks […] grow, bloom and thrive" (ibid., p. 45). These invisible 'sacrifice zones' have been discussed in different political and academic contexts, for example Klein (2014); Hedges & Sacco (2012) or Endres (2012). Similar to the concept of *slow violence*/disaster (Nixon, 2011), they can only be sustained "as long as the sacrifice zones are kept safely out of view" (Klein, 2014, p. 268). Rob Nixon has discussed the hiding of "violence that occurs gradually and out of sight" (Nixon, 2011, p. 2); Klein argues that all sacrifice-zones have in common that they are "out-of-the-way places" (Klein, 2014, p. 268), situated geographically but also socio-economically at the periphery. Adding to these, I argue for a third factor, the existence of *sacrifice-scales*, which are equally invisible when intersected with socio-economic factors and gender. Localised riskscapes, enacted by poor urban female riparian slum-dwellers are 'off the map' of other more dominant riskscapes, too 'small' to be even sketched in. Following my previous argument that poor women in the context of this study are fixed to the household or even body level, I now supplement this argument by demonstrating that many risks which originate elsewhere, traverse the *dark, empty and terrifying space* between scalar levels, transported, translated and transformed to be eventually 'dumped' at the *sacrifice-scale* constituted by the localised female body.

As outlined above, there are several aspects of the *sacrifice-scale*. First is the appropriation of the public sphere by men and the subsequent super-localisation if women; secondly the making-invisible of the female body and lastly the 'dumping' of risk at the scale of the (poor female's) body. Regarding the first point, it is insightful to regard a quote by OLIVER, a member of an all-male group of self-proclaimed hustlers at the river side in the industrial area of Nairobi.

> Theo: I noticed there is not a single woman sitting here, why not?
>
> Oliver: They are in there [pointing at the next house].
>
> Theo: So the women do not like coming here?
>
> […]
>
> Oliver's friend: No, they can't be here, because here it is a men-point.
>
> […]
>
> Theo: Are there women points somewhere at the river?
>
> Oliver: No. I don't see.

Figure 13: A 'Men's Point'. A group of men relaxing at the riverside near Gikomba market - a common scenery. Source: Own.

Based on extensive observations, the public sphere – especially at the river – is dominated by male presence. The scenery is characterised by groups of young un(der)employed men, who often spend their days chatting, drinking and smoking marijuana (Figure 13). Some homeless men live on the river-side, since it is often free of any structures and relatively cool even in the dry season (JUGUNA & FRIENDS).

Especially in those areas that have been upgraded and therefore feature a pleasant natural surrounding are appropriated by men. These 'men's points' in fact stretch across most of uninhabited areas along the Urban Rivers in Nairobi.

The second point regards the invisible-making of risks and their respective potential victims. Rivers traversing slum areas do not seem to be on the map of urban planners in Nairobi – quite literally so (Figure 14).

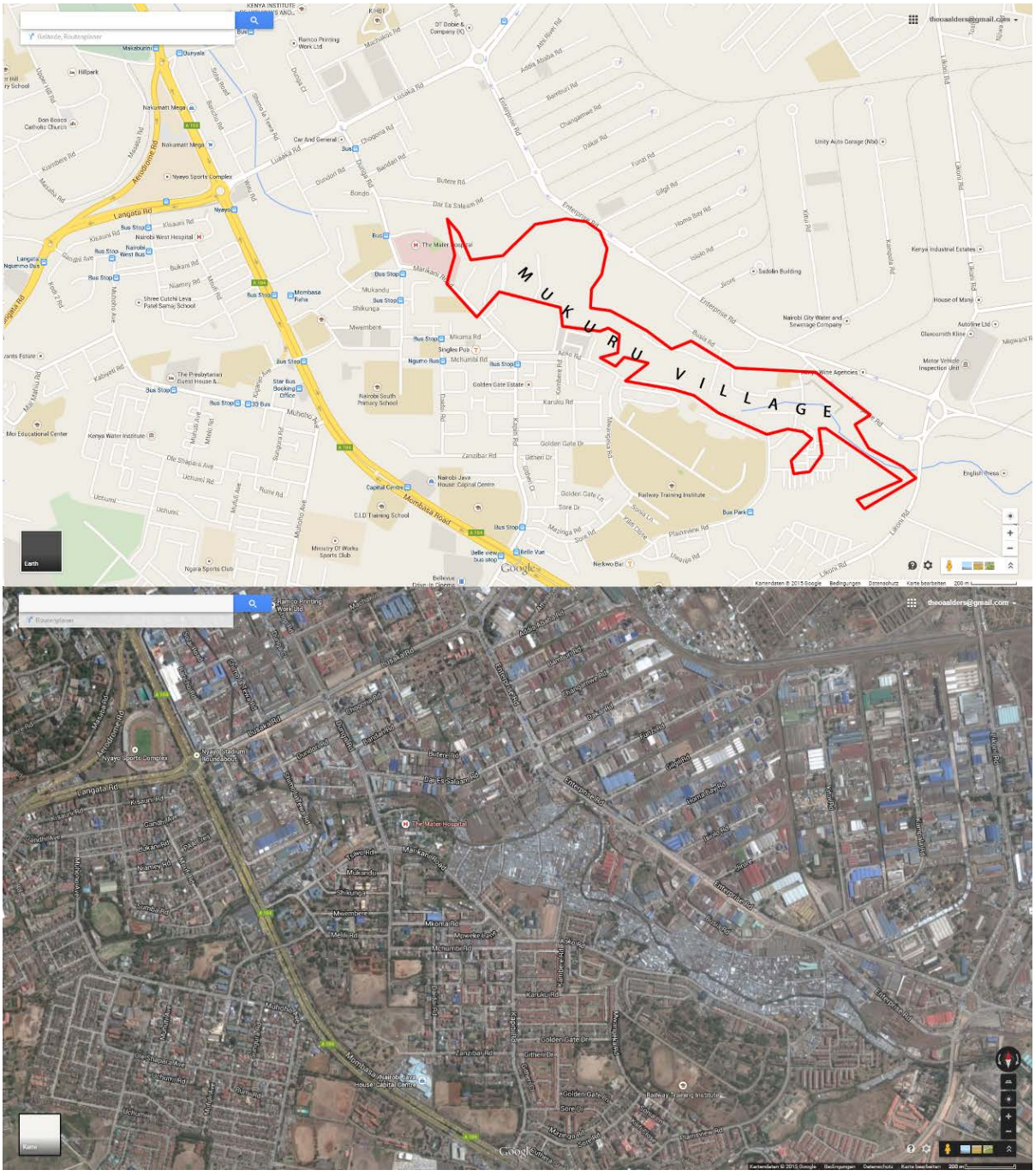


Figure 14: Rivers off the map. Comparing GoogleMap to GoogleEarth satellite image reveals that large parts of the river traversing the informal settlement are not part of the map. Red line indicates Mukuru Slum. Source: Google, own design

This is reflected in many people's perception of the government as detached and uncaring (cf. 4.2.1), especially so in the context of sexual violence – "You have to take care of yourself" (REBECCA), is a common attitude. Despite efforts by some organizations to make "private violence [a] public concern" (Erikson & Rastogi, 2015, title), the risk of sexual violence is not yet successfully scaled unto a level beyond the victim's body – it is a private risk, *something you have to take care of yourself*. Furthermore, sexual violence seems to be normalized to a certain degree, something that just happens – "you know what people do":

> Theo: How come there are men point and no women point?
>
> OLIVER: Because they are scared to be on this side of the river. That's the reason. That's why you can't get them. You cannot get them here because they are scared.
>
> Theo: What do they believe could happen? They get robbed or…?
>
> Oliver: Rape cases.
>
> Theo: In this area there has been rape cases reported?
>
> Oliver: Not yet.
>
> Theo: But it could be?
>
> Oliver: Yes.
>
> Theo: Why do you think it is here and not somewhere else?
>
> Oliver's friend: Because it is cool [temperature].
>
> Theo: It is a cool area, so rape happens in cool areas?
>
> Oliver: You sit and then begin to chat, *you know what people do*.

As outlined in 4.1, river sides are generally an area of increased criminality but many women still often have no choice but to use water from the river, either to wash clothes (typically 'women's work'; e.g. DURKASH), fetch water (PATRICIA) or for other commercial purposes (ROSE). Lush vegetation, even though contributing to the river's health is therefore an additional risk factor for women, because they often have to intrude into a 'men's point'. DORA, who lives in a slum close to Nairobi's industrial region mentions another risk connected to riverine vegetation:

> Dora: One day I was going with my slasher, as I was clearing the *nini*... the bush to work at the river. It was two years ago. So I was wanting to start my work I saw a man... He was sleeping at the river, but he was treating his pants like this [imitates masturbation motion]. He was doing me like this [imitates suggestive gesture], so I had to jump inside the water to rescue myself [...]
>
> Theo: Really? Ayayay... So you think it is more dangerous because there are bushes and you can't see it from outside?
>
> Dora: Yes.

Women do therefore not only face a majority of risks connected to natural hazards. Additionally, *benefits* on other scales derived from riverine vegetation and other risk-reduction measures turn out to

produce *risks* on the level of the body, where it intersects with female gender and informal settlements. Figure 15 shows examples of river-restauration measures that have benefits on the city or even catchment-area level, while producing risks for women. Similarly, benefits realised on the household level, which are produced by women's work at the river coincide with risk for women on the level of their bodies, as they face risk of toxic water (REBECCA), sharp objects in the water (ROSE), or rape (GROUP-DISCUSSION). Referring to what has been established in 2.1.2, the translation of risks across sites and scales reveals the temporal but *not* scalar concurrency of risks and benefits. At what scales then the risks are realised is a question of power dynamics, which can be revealed by the mode of inquiry developed in this thesis.

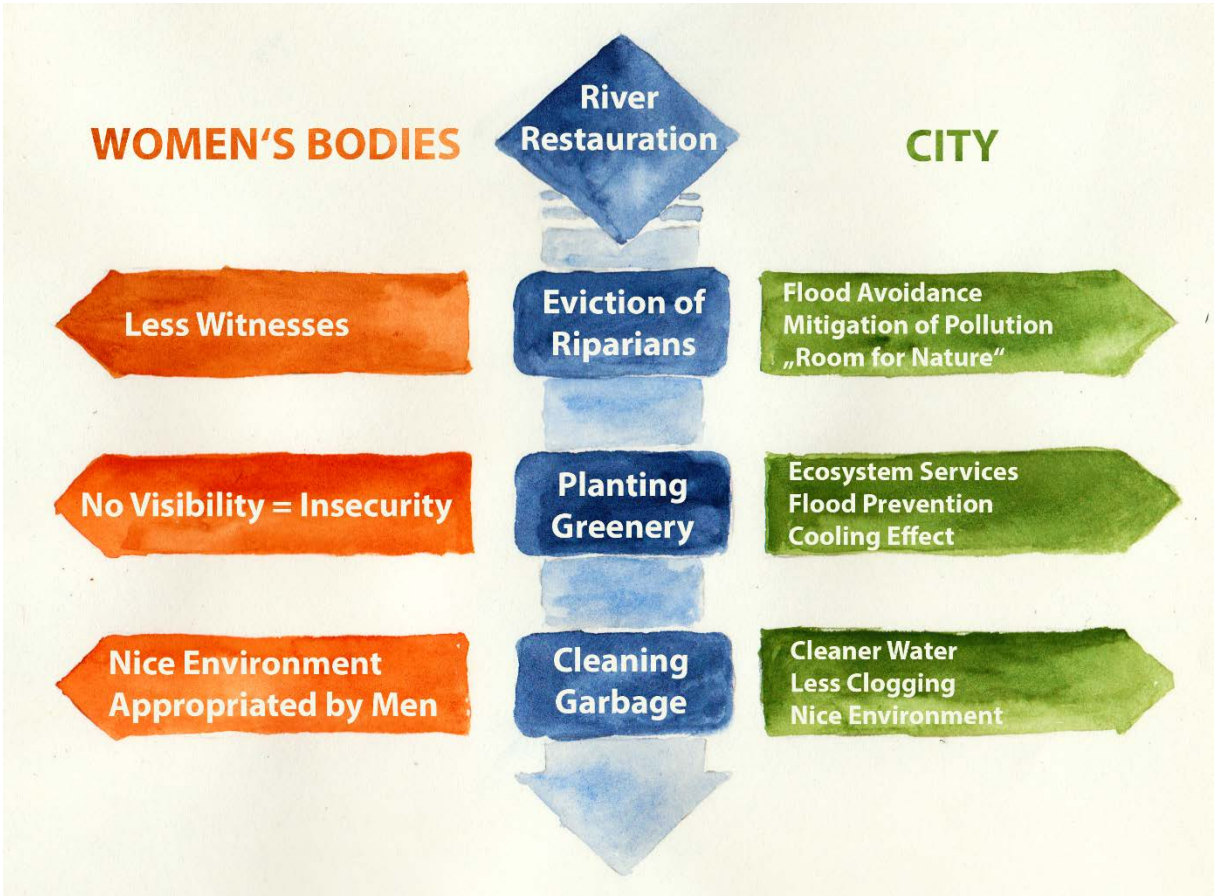


Figure 15: Whose risk, whose benefit? Upgrading measures (blue) produce benefits (green) on the city-level but risks (orange) on the level of the female body. Source: Own.

This is connectable to Rob Nixon's account on the *colour of disaster* and the invisibility of violence against the black body (Nixon, 2011, p. 59). From a perspective of intersectionality, and drawing on feminist literature (e.g. Mohanram, 1999; Valle, 2013) one has to add the *gender of disaster*; the assertion that the black, (economically) poor and female body is especially vulnerable. According to Nixon (2011, p. 59), this vulnerability is created by a "battery of distancing strategies", disconnecting,

localising and subsequently concealing the bodies of DORA and other economically poor women in Nairobi, who experience this *slow disaster* of ongoing gendered risks at Nairobi's urban rivers. By means of these distancing strategies certain actors are disconnected and, following Blok (2010), localised. Subsequently, 'slow' and therefore not only invisible, but also 'out of the discussion'-risks can be unloaded at these sacrifice-scales.

5 Conclusion

"Sunlight is the best antiseptic." (Shue, 1980, p. 36)

In this thesis I have facilitated a theoretical as well as an applied and concrete understanding of the power dimensions in the connection between scales and risk to equal degrees. I hope to have shown the importance of a strong conceptual foundation to detect and analyse injustices in a complex world that may remain opaque if a theoretical foundation does not help discovering where to look and by giving a vocabulary and grammar to describe what has been found. The merging of critical understandings of scale and riskscapes developed in this thesis as the answer for the first research question proved to be highly useful in this regard. This theoretical framework was necessary to answer the second research question, *what are the power dynamics of scalar negotiations of risks and risk-actors*? It's investigation revealed how scalar framings of certain risks can be used to marginalise groups, interests, and ideas by practices of discursive and political disconnection. By taking the scalar level of risks for granted these tactics remain invisible and subsequently even more effective. On the other hand the potential for using scalar negotiations of risks as a way to oppose the marginalisation for example of the female body in riparian slum communities cannot be realised unless and until awareness about the emancipating power of risk-framing is established.

I argued that by questioning the scalar level in which risks are framed it is possible to deconstruct formally opaque ramifications, which respective risk-framings have on the way risks are perceived and acted upon. This is particularly important in the context of environmental issues such as climate change, as the latest IPCC report's call for "integration across scales" (Burton et al., 2014) in the context of the management of climate change related risks. It furthermore poses important questions regarding Ecosystem Services (e.g. Millennium Ecosystem Assessment, 2005): At what scalar levels are benefits from these services realised? Do they coincide with risks on other levels?

I see two major gaps in this thesis. The first one is due to the spatial limitation of Nairobi city. The globalised level could therefore not be addressed adequately. Many of the risks I have described in this thesis are connected to wider riskscapes, spanning several river catchment areas and, due to cli-

mate change, even beyond to places of globalised decision making (or in this case rather decision postponing). A truly multi-sited account could correct this shortcoming, by connecting these places to the scope of the research.

A second point that needs further consideration is the question whether it is possible to derive concrete solutions for the problems describe above based on a scalar account of risk. This undertaking would specifically need to investigate possibilities to build connecting vectors between globalised and localised places, which are not partial one-way-streets (e.g. exploitation of resources, 'risk dumping' in localised *sacrifice zones*). I can imagine that relations between individuals are promising in this regard. It is for example possible to conceive an investment-scheme for risk-reducing measures (e.g. solar panels that yield income during the dry season). The financial risk would thereby be transferred from localised individuals in Kenya to people in the industrialised world, making the success of the investments a globalised concern. I suggest to investigate whether this or similar solutions are a viable solution to the problems revealed by the scalar perspective on risk presented in this thesis. If so, this connection would traverse the *dark, empty and terrifying space* between the localised and the globalised; lightning it up, filling it with meaning, and making it much less terrifying in the process.

References

Ackerly, B., True, J., 2008. Reflexivity in practice: Power and ethics in feminist research on international relations. Int. Stud. Rev. 10, 693–707. doi:10.1111/j.1468-2486.2008.00826.x

Alaszewski, a. M., Burgess, a., 2007. Risk, Time & Reason 37–41. doi:10.1080/13698570701612295

Althaus, C.E., 2005. A disciplinary perspective on the epistemological status of risk. Risk Anal. 25, 567–588. doi:10.1111/j.1539-6924.2005.00625.x

Amnesty International, 2009. Kenya - The Unseen Majority: Nairobi's Two Million Slum-Dwellers. London.

Appadurai, A., 2006. Disjuncture and Difference in the Global Cultural Economy, in: Durham, M.G., Kellner, D.M. (Eds.), Media and Cultural Studies.

Beck, U., 2009. World at Risk, 1st ed. Polity Press, Cambridge, Malden.

Beck, U., 2007. Weltrisikogesellschaft. Suhrkamp, Frankfurt am Main.

Beck, U., 1992. Risk Society - Towards a New Modernity. SAGE Publications, London, Newbury Park, New Delhi.

Beck, U., 1986. Risikogesellschaft - Auf dem Weg in eine andere Moderne, 1st ed. Suhrkamp Verlag, Frankfurt am Main.

Becker, P., 2014a. 9. Developing Capacities for Resilience, in: Sustainability Science: Managing Risk and Resilience for Sustainable Development. Elsevier, Amsterdam, pp. 207–243. doi:10.1016/B978-0-444-62709-4.00009-9

Becker, P., 2014b. 7. The World as Human-Environment Systems, in: Sustainability Science: Managing Risk and Resilience for Sustainable Development. Elsevier, Amsterdam, pp. 177–194. doi:10.1016/B978-0-444-62709-4.00007-5

Becker, P., 2014c. 4. Our Disturbances, Disruptions and Disasters in a Dynamic World, in: Sustainability Science: Managing Risk and Resilience for Sustainable Development. Elsevier, Amsterdam, pp. 57–119. doi:10.1016/B978-0-444-62709-4.00004-X

Birkmann, J., 2007. Risk and vulnerability indicators at different scales:. Applicability, usefulness and policy implications. Environ. Hazards 7, 20–31. doi:10.1016/j.envhaz.2007.04.002

Blackburn, S., 2014. The politics of scale and disaster risk governance: Barriers to decentralisation in Portland, Jamaica. Geoforum 52, 101–112. doi:10.1016/j.geoforum.2013.12.013

Blok, A., 2010. Topologies of climate change: actor-network theory, relational-scalar analytics, and carbon-market overflows. Environ. Plan. D Soc. Sp. 28, 896–912. doi:10.1068/d0309

Brenner, N., 2001. The limits to scale? Methodological reflections on scalar structuration. Prog. Hum. Geogr. 25, 591–614. doi:10.1191/030913201682688959

Brown, C., Ghile, Y., Laverty, M., Li, K., 2012. Decision scaling: Linking bottom-up vulnerability analysis with climate projections in the water sector. Water Resour. Res. 48, 1–12. doi:10.1029/2011WR011212

Burton, I., Dube, O.P., Campbell-Lendrum, D., Davis, I., Klein, R.J.T., Linnerooth-Bayer, J., Sanghi, A., Toth, F., 2014. Managing the Risks: International Level and Integration across Scales, in: Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R., White, L.L. (Eds.), A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge and New York, pp. 393–435.

Büscher, C., Mascareño, A., 2014. Mechanisms of Risk Production in Modern Cities. Nat. Cult. 9, 66–86. doi:10.3167/nc.2014.090104

Chanda, O.M., 2010. Nairobi River Rehabilitation And Restoration Program: Sewerage Improvement Project - Summary of Environmental And Social Impact Assessment.

Charton-Bigot, H., Rodriguez-Torres, D., 2006. Nairobi Today - The Paradox of a Fragmented City. IFRA nairobi, Mkuki Na Nyota, Dar es Salam, Nairobi.

Coppola, D.P., 2011a. 1 - The Management of Disaster, in: Introduction to International Disaster Risk Management. Butterworth-Heinemann: Elsevier, Oxford. doi:10.1016/B978-0-12-382174-4.00001-X

Coppola, D.P., 2011b. 5 - Preparedness, in: Introduction to International Disaster Risk Management. Butterworth-Heinemann: Elsevier, Oxford. doi:10.1016/B978-0-12-382174-4.00005-7

Daniel, J., 2012. Sampling Essentials : Practical Guidelines for Making Sampling Choices. SAGE Publications, Thousand Oaks.

Daudé, E., Provitolo, D., Dubos-Paillard, E., Gaillard, D., Eliot, E., Lanflois, P., Zimmermann, E.P., Saint-Gérand, T., 2009. Spatial risks and complex systems: methodological perspectives, in: Aziz-Alaoui, M.A., Bertelle, C. (Eds.), From System Complexity to Emergent Properties. Springer-Verlag, Berlin, Heidelberg, p. 369. doi:10.1007/978-3-642-02199-2

Doevenspeck, M., 2013. An Impossible Site? Understanding Risk and its Geographies in Goma, Democratic Republic of Congo, in: Müller-Mahn, D. (Ed.), The Spatial Dimension of Risk. How Geography Shapes the Emergence of Risks Capes. Routledge, New York, London, pp. 137–153. doi:10.4324/9780203109595

Douglas, I., Alam, K., Maghenda, M., Mcdonnell, Y., Mclean, L., Campbell, J., 2008. Unjust waters: climate change, flooding and the urban poor in Africa. Environ. Urban. 20, 187–205. doi:10.1177/0956247808089156

Endres, D., 2012. Sacred Land or National Sacrifice Zone: The Role of Values in the Yucca Mountain Participation Process. Environ. Commun. A J. Nat. Cult. 6, 328–345. doi:10.1080/17524032.2012.688060

England, K.V.L., 1994. Getting Personal: Reflexivity, Positionality, and Feminist Research∗. Prof. Geogr. 46, 80–89. doi:10.1111/j.0033-0124.1994.00080.x

Erikson, A., Rastogi, S., 2015. Private Violence, Public Concern. [no city].

Falzon, M.-A., 2009a. Multi-Sited Ethnoraphy: Theory, Praxis and Locality in Contemporary Research. Ashgate, Farnham, Burlington.

Falzon, M.-A., 2009b. Introduction - Multi-sited Ethnography: Theoy, Praxis and Locality in Contemporary Research, in: Falzon, M.-A. (Ed.), Multi-Sited Ethnography. Theory, Praxis and Locality in Contemporary Research. Ashgate Publishing, Farnham, Burlington, pp. 1–23.

Fortun, K., 2009. Scaling and Visualizing Multi-sited Ethnography, in: Falzon, M.-A. (Ed.), Multi-Sited Ethnoraphy: Theory, Praxis and Locality in Contemporary Research. Ashgate, Farnham, Burlington.

Gardoni, P., Murphy, C., 2014. A Scale of Risk. Risk Anal. 34, 1208–1227. doi:10.1111/risa.12150

Garrick, D., Hall, J.W., 2014. Water Security and Society: Risks, Metrics, and Pathways. Annu. Rev. Environ. Resour. 39, 611–639. doi:10.1146/annurev-environ-013012-093817

Giddens, A., 1999. Risk and Responsibility. Rev. Lit. Arts Am. 62, 1–10. doi:10.1111/1468-2230.00188

Giddens, A., Pierson, C., 1998. Coversations with Anthony Giddens: Making Sense of Modernity. Stanford University Press, Stanford, Calif.

Harvey, D., 2003. The New Imperialism. Oxford University Press, Oxford, New York.

Harvey, D., 1982. The Limits to Capital, Contemporary Sociology. Verso, London, Newbury Park, New Delhi. doi:10.2307/2068701

Hass Property Index, 2014. The Property Market in 2014 - Annual Report. Nairobi.

Hedges, C., Sacco, J., 2012. Days of destruction, days of revolt. Nation Books, New York.

Hennink, M.M., 2008. Language and Communication in Cross-Cultural Qualitative Research, in: Liamputtong, P. (Ed.), Doing-Cross-Cultural Research - Ethical and Methodological Perspectives. Springer, Dordrecht, pp. 21–34.

Herod, A., 2011. Scale. Routledge, London, New York.

Howitt, R., 1998. Scale as relation: musical metaphors of geographical scale. Area 30, 49–58. doi:10.1111/j.1475-4762.1998.tb00047.x

Ian Cook, 2004. Follow the Thing: Papaya. Antipode 36, 642–664. doi:10.1111/j.1467-8330.2004.00441.x

IASC, European Comission, 2015. INFORM Country Risk Profile: Kenya [WWW Document]. Inf. Index Risk Manag. URL http://www.inform-index.org/Portals/0/InfoRM/2015/Country_Profiles/KEN.pdf (accessed 4.2.15).

IPCC, 2014. Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge and New York.

Jentsch, B., 1998. The “Interpreter Effect”: Rendering Interpreters Visible in Cross-Cultural Research and Methodology. J. Eur. Soc. Policy 8, 275–289. doi:10.1177/095892879800800401

Jones, K.T., 1998. Scale as epistemology. Polit. Geogr. 17, 25–28. doi:10.1016/S0962-6298(97)00049-8

Kimpson, S.A., 2005. Stepping off the Road: A Narrative (of) Inquiry, in: Brown, L., Strega, S. (Eds.), Research As Resistance - Critical, Indegineous, and Anti-Opressive Approaches. Canadian Scholars’ Press, Toronto, pp. 73 – 96.

Klein, N., 2014. This Changes Everything - Capitalism vs. the Climate.

Kvale, S., Pub, P., Pub, O., Isbn, P., Isbn, O., Pdf, T., 2007. Doing Interviews Epistemological issues of interviewing Epistemological issues of interviewing Chapter objectives research interview 11–23. doi:10.4135/9781849208963

Lagendijk, A., 2002. Beyond the Regional Lifeworld against the Global Systemworld: Towards a Relational -Scalar Perspective on Spatial-Economic Development. Geogr. Ann. Ser. B. 84, 77–92. doi:10.2307/3554435

Laine, M. de, 2000. Fieldwork, Participation and Practice - Ethics and Dilemmas in Qualitative Research. SAGE Publications, London, Thousand Oaks, New Delhi.

Latour, B., 2005. Reassembling the Social: An Introduction to Actor-Network Theory. Oxford University Press, New York.

Law, J., 2004. And if the global were small and noncoherent? Method, complexity, and the baroque. Environ. Plan. D Soc. Sp. 22, 13–26. doi:10.1068/d316t

Liamputtong, P., 2008. Doing Research in a Cross-Cultural Context: Methodological and Ethical Challenges, in: Liamputtong, P. (Ed.), Doing-Cross-Cultural Research - Ethical and Methodological Perspectives. Springer, Dordrecht, pp. 3–20.

Lindseth, G., 2006. Scalar strategies in climate-change politics: Debating the environmental consequences of a natural gas project. Environ. Plan. C Gov. Policy 24, 739–754. doi:10.1068/c0513j

Lonsdale, J., 2006. Town Life in Colonial Kenya, in: Charton-Bigot, H., Rodriguez-Torres, D. (Eds.), Nairobi Today - The Paradox of a Fragmented City. IFRA nairobi, Mkuki Na Nyota, Dar es Salam, Nairobi.

Luhmann, N., 1996. Gefahr oder Risiko, Solidarität oder Konflikt, in: Königswieser, R., Haller, M., Maas, P., Jarmai, H. (Eds.), Risiko-Dialog. Deutscher Instituts-Verlag, Köln, pp. 38–48.

Luhmann, N., 1993. Risk: A Sociological Theory. Walter de Gruyter, Berlin, New York.

Lupton, D., 2013. Risk, 2nd ed. Routledge, London, New York. doi:10.1007/s007690000247

Mand, K., 2011. Researching Lives in Motion - Multi-sited Strategies in a Transnational Context, in: Coleman, S., Hellermann, P. von (Eds.), Multi-Sited Ethnography: Problems and Possibilities in the Translocation of Research Methods. Routledge, New York, London, pp. 41–53.

Marcus, G.E., 2011. Multi-sited Ethnography - Five or Six Things i Know About it Now, in: Coleman, S., Hellermann, P. von (Eds.), Multi-Sited Ethnography: Problems and Possibilities in the Translocation of Research Methods. Routledge, New York, London.

Marcus, G.E., 1995. Ethnography in / of the World System : The Emergence of Multi-Sited Ethnography. Annu. Rev. Anthropol. 24, 95–117.

Marston, S.A., Paul, J., Iii, J., Woodward, K., 2005. Human geography without scale. Trans. Inst. Br. Geogr. 30, 416–432.

Meadowcroft, J., 2002. Politics and scale: some implications for environmental governance. Landsc. Urban Plan. 61, 169–179. doi:10.1016/S0169-2046(02)00111-1

Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Synthesis. Island Press, Washington, DC. doi:10.1196/annals.1439.003

Mohanram, R., 1999. Black body: Women, Colonialism, and Space. University of Minnesota Press, Minneapolis.

Müller-Mahn, D., 2013. The Spatial Dimension of Risk: How Geography Shapes the Emergence of Riskscapes. Routledge, London, New York.

Müller-Mahn, D., 2007. Perspektiven der geographischen Risikoforschung. Geogr. Rundsch. 59, 4–11.

Müller-Mahn, D., Everts, J., 2013. Riskscapes - The spatial dimension of risk, in: Müller-Mahn, D. (Ed.), The Spatial Dimension of Risk: How Geography Shapes the Emergence of Riskscapes. Routledge, London, New York, pp. 22–36.

Niang, I., Ruppel, O.C., Abdrabo, M.A., Essel, A., Lennard, C., Padgham, J., Urquhart, P., 2014. Africa, in: Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R., White, L.L. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Oxford University Press, Cambridge and New York, pp. 1199–1265.

Nixon, R., 2011. Slow Violence and the Environmentalism of the Poor. Harvard University Press, Cambridge, Massachusetts, London.

November, V., 2008. Spatiality of risk. Environ. Plan. A 40, 1523–1527. doi:10.1068/a4194

Olsen, E., 2010. Nairobi River Peace Initiative [WWW Document]. URL http://www.globalpeaceconvention.org/component/content/article/43-overview-and-application/175-nairobi-river-peace-initiative.html (accessed 5.8.15).

Pfaff, J., 2010. A mobile phone: mobility, materiality and everyday Swahili trading practices. Cult. Geogr. 17, 341–357. doi:10.1177/1474474010368606

Ramasar, V., 2014. Fluid Governance Scalar politics in the South African waterscape. Lund University.

Rangan, H., Kull, C. a., 2009. What makes ecology `political'?: rethinking `scale' in political ecology. Prog. Hum. Geogr. 33, 28–45. doi:10.1177/0309132508090215

Revi, A., Satterthwaite, D.E., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R.B.R., Pelling, M., Roberts, D.C., Solecki, W., 2014. Urban Areas, in: Field, C.B., Barros, V.R., Dokken, D.J., Mach, K.J., Mastrandrea, M.D., Bilir, T.E., Chatterjee, M., Ebi, K.L., Estrada, Y.O., Genova, R.C., Girma, B., Kissel, E.S., Levy, A.N., MacCracken, S., Mastrandrea, P.R., White, L.L. (Eds.), Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge and New York, pp. 535–612.

Russell, B., 1945. The History of Western Philosophy And Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day, 4th ed. Simon & Schuster, New York.

Schatzki, T., 2009. Timespace and the Organisation of Social Life, in: Shove, E., Trentmann, F., Wilk, R. (Eds.), Time, Consumption and Everyday Life - Practice, Materiality and Culture. Berg, Oxford, New York, pp. 35 – 49.

Shue, H., 1980. Basic rights: Subsistence, Affluence, and U.S. Foreign Policy. Princeton University Press, Princeton.

Sutherland, C., Scott, D., Brooks, S., Guy, H., 2012. Lay Knowledge of Risk: Exploring the "Riskscapes," in: Bloemertz, L., Doevenspeck, M., Macamo, E., Müller-Mahn, D. (Eds.), Risk and Africa. Lit Verlag, Zürich & Münster, pp. 47 – 86.

Swyngedouw, E., 2004. Scaled Geographies: Nature, Place, and the Politics of Scale Erik, in: Sheppard, E., McMaster, R.B. (Eds.), Scale and Geographic Inquiry - Nature, Society, and Method. Blackwell Publishing Ltd, Malden, MA, USA, pp. 129–153. doi:10.1002/9780470999141

Undie, C.-C., John-Langba, J., Kimani, E., 2006. “The Place of Cool Waters”: Women and Water in the Slums of Nairobi, Kenya. Wagadu 3, 40–60.

Valle, M., 2013. The Vulnerability of the Black Female Body [WWW Document]. BK Nation. URL http://bknation.org/2013/11/vulnerability-black-female-body/ (accessed 5.11.15).

Wamsler, C., 2014. Cities, disaster risk and adaptation. Routledge, London.

Weisser, F., 2013. A document’s geography: The United Nations Climate Change Conference as the local site of global policies. Bayreuth.

Xiang, B., 2013. Multi-Scalar Ethnography: An Approach for Critical Engagement with Migration and Social Change. Ethnography 14, 282–299. doi:10.1177/1466138113491669

Zevenbergen, C., Veerbeek, W., Gersonius, B., Van Herk, S., 2008. Challenges in urban flood management: travelling across spatial and temporal scales. J. Flood Risk Manag. 1, 81–88. doi:10.1111/j.1753-318X.2008.00010.x

Appendix

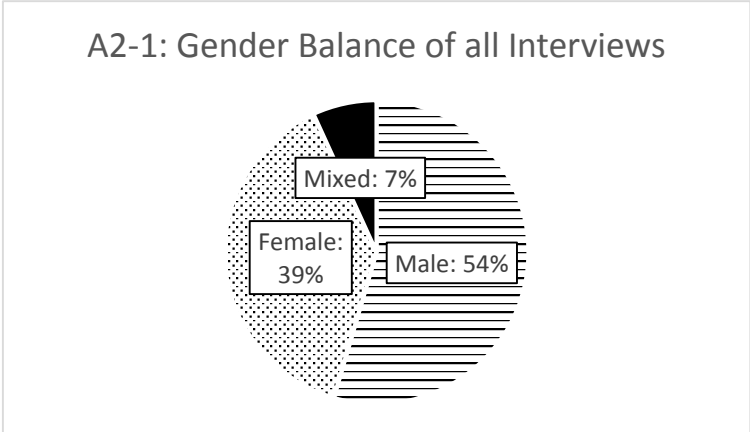
A1. Interviewees cited in text

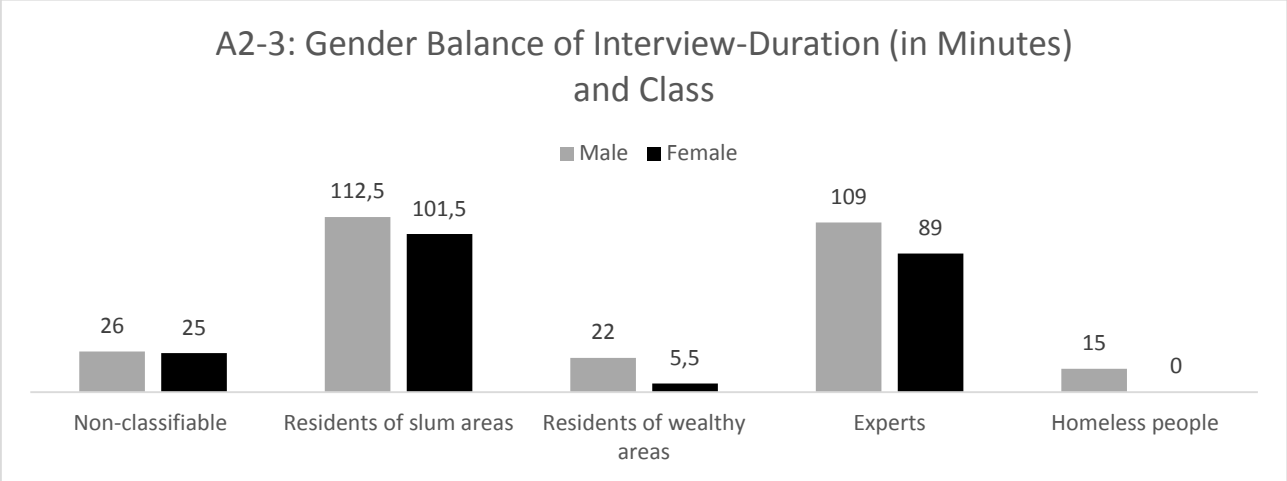
Name	Date	Category	Description
Angela Wainaina (Pseudonym)	24.02.2015	Expert	Angela Wainaina works as executive director of the Institute for Environment and Water Management, we are a non-governmental organization , NGO, registered in 2010. The NGO's focus is on water justice and gender issues.
Alexander	20.02.2015	Wealthy Area	Works and lives at 'Riverside' one of the most expensive areas in Nairobi, directly next to Nairobi River.
Daniel Kahura	29.01.2015	Slum Dweller	Daniel Kahura lives in Ngong, makes his living by doing different daily labours and by working a small patch of land next to the river that passes by the Ngong dumpsite. He would like to use the water for irrigation but says it will poison the crops.
Derreck	17.02.2015	Slum Dweller	Derreck and his friends live and work close to Gikomba market and use Nairobi River for several purposes. When I met them they were making some money by cleaning shoes.
Dolores	25.02.2015	Expert	Dolores is head of the 'quality section' of NEMA, which is responsible for licensing facilities that discharge into rivers.
Dora	19.02.2015	Slum Dweller	Dora and her Family live in a small informal settlement close to the industrial area of Nairobi and are affected by flooding events.
Durkash	09.02.2015	Slum Dweller	Durkash is a young women living in Kibera. She doesn't interact with the river much but is afraid to come near it, because she is worried about getting raped.
Edward Kimathi (Pseudonym)	03.02.2015	Expert	Eric works for the Ministry of Environment and Water and is director in charge of the urban river installation programme. He is involved in the '30-meter' question; i.e. how many market stands near Nairobi river have to be demolished.
Group-discussion 1	17.02.2015	Misc.	One day I met by chance a group of women (only one man -–he was the 'supervisor'), who were just making a break from cleaning the river after Gikomba Market. They were working for a government sponsored programme to restore Nairobi's river.
James	20.02.2015	Wealthy Area	James owns a large plot directly next to Nairobi River in Westlands, a wealthy area in Nairobi. He is proud of the close river and his huge adjacent garden.
Juguna & Friends	16.02.2015	Homeless	Juguna and his friend have built a little shelter next to a calm area of the river. They live from

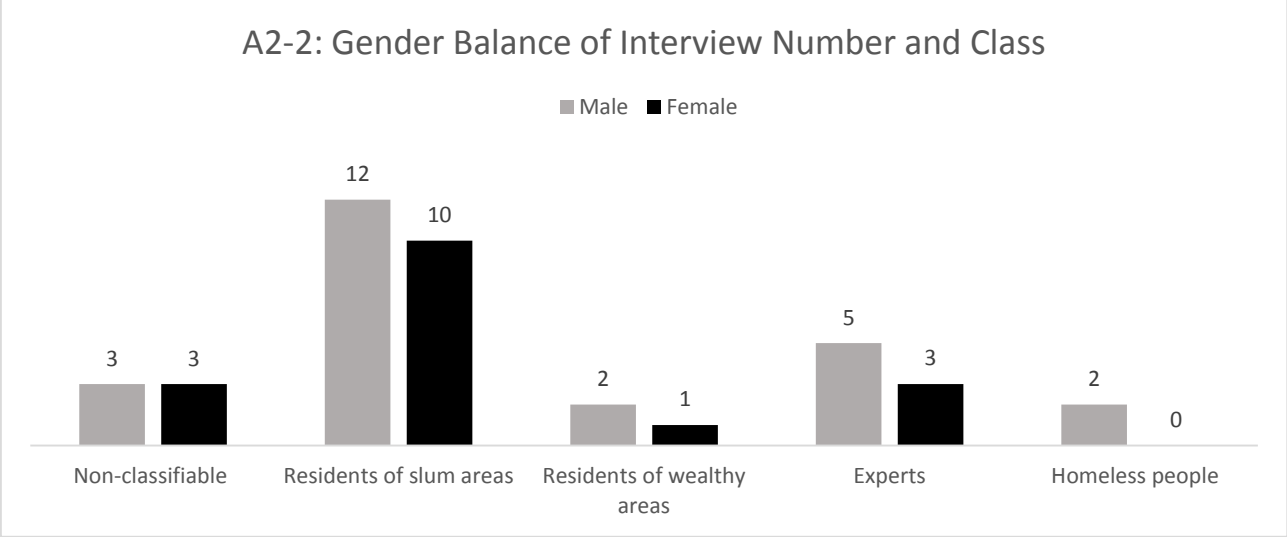
			selling things they fish out the stream as well as a small garden they irrigate with its water.
Lois	20.02.2015	Expert / Wealthy Area	Lois is a hotelier at 'Riverview' Hotel, which gets its special charm from a scenic and cool garden directly next to Nairobi River.
Mafrida	03.02.2015	Slum Dweller	Mafrida is probably in her sixties and lives with 9 children, she adopted from her own children or from other people around the area. She sells water, has a bad leg and is heavily affected by the river floodings.
Mutieno	02.02.2015	Expert	Mutieno works for "Nairobi Water" in Karen and is responsible for monitoring the top-1000 water consumers in this area.
Oliver	19.02.2015	Slum Dweller	Oliver is a self-described Rastafari. He and his 'gang' guided (and protected) me along the river in the industrial area of Nairobi.
Paul	10.02.2015	Expert	Paul works for a local water management group and was my guide in Ngong, his home town.
Peter	29.01.2015	Slum-Dweller	Peter is about my age and is a proud Rastafari, which however does not keep him from helping his family in rearing pigs.
Rebecca	05.02.2015	Slum Dweller	Rebecca is a young woman living in Kibera, who uses Nairobi River for washing of clothes. She is aware of the 'rape problem' in Kibera in general and along the river in particular but asserts that 'you have to take care of your self'.
Rose (pseudonym)	23.02.2015	Slum Dweller	Rose makes her livelihood by collecting dirty plastic bags from Dandora-dumpsite, washes them in Nairobi River and re-sells them for a microscopic profit margin.

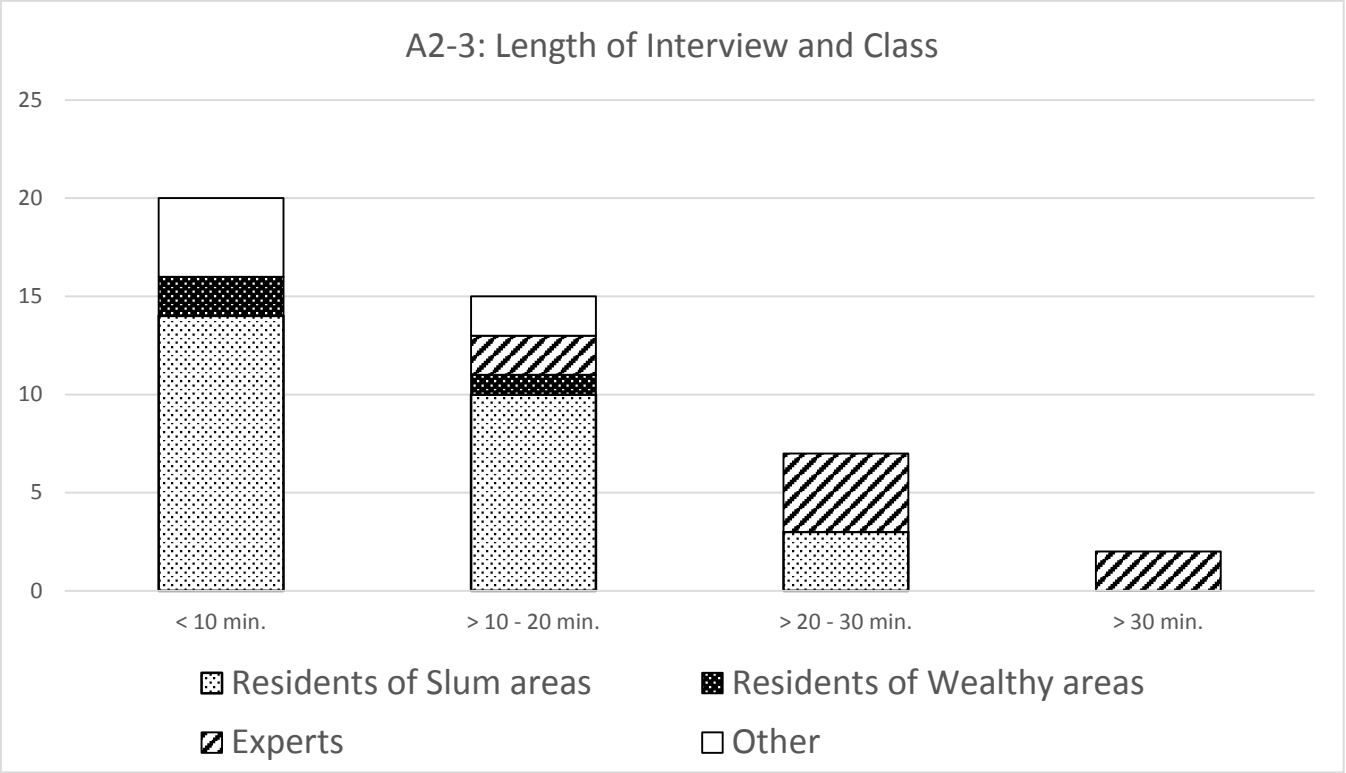
A2. Overview of Interviews.

Overall, I conducted 44 Interviews between January 21st and March 2nd 2015. I divided them into 5 'classes': Residents of slum areas, residents of wealthy areas, experts, homeless people, and non-classifiable in the following figures give an overview on the distribution of interviews according to 'class' and gender. Note: The research was conducted during the end of a dry season.








A2-3: Length of Interview and Class
25
20
15
10
5
0
< 10 min.
> 10 - 20 min.
> 20 - 30 min.
> 30 min.
Residents of Slum areas
Residents of Wealthy areas
Experts
Other