Forest histories and nuclear futures: mapping resources, value, and change in southern Tanzania

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Abstract

At a time when an estimated one-quarter of UNESCO sites of natural world heritage are threatened by existing or proposed extractive projects, this thesis explores the histories and futures in and around sub-Saharan Africa's oldest and largest wilderness area, where Tanzania's first uranium mine is quiet as it completes its sixth year of delays. Today's contested perceptions of the future of the UNESCO World Heritage Site Selous Game Reserve are a product of the social construction of wilderness that has been developed and applied over time to African landscapes through (post)colonial models of conservation. While the rationale for conservationists' opposition to extraction has been articulated, this thesis examines the historical dynamics of local expectations of extraction.

The thesis argues that the multiplicity of valued resources at stake in and around the mine demands an approach that takes into account uranium, but also wildlife, land, and water. This natural resource intersectionality also reflects the scales at hand: a mineral deposit containing globally significant amounts of uranium, a wilderness area the size of Switzerland, and the infinite lifespan of uranium's radioactive decay. Ultimately, the study maps the ways that the incursion of mining activities is destabilizing the local order. Across scales of space and time, the Selous emerges, not as a primordial forest wilderness, but instead as a sacrifice zone, set aside for de-territorialization, discipline, and extraction. I demonstrate that it is the heritagization process that helps to re-imagine, and therefore re-create, the past, but also that it projects particular ambitions ahead: an imagined, pristine Selous woodland of past, intervening in the present, and influencing the future of the Reserve. I investigate the conceptual nexus between conservation and extraction, challenging simplistic narratives which place the two in opposition. As the mine languishes, the thesis provides evidence from neighbouring villages suggesting that despite seemingly universal support for the mine, there is uncertainty and ambivalence toward the future, with or without uranium.

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This thesis is dedicated to Claudia Comberti, who continues to inspire me.

Glossary of Acronyms and Abbreviations

AA	Authorized Authority
APU	Anti-Poaching Unit
CBCTC	Community Based Conservation Training Centre
CBO	community-based organization
CCM	*Chama Cha Mapinduzi* (Party of the Revolution)
ESIA	environmental and social impact assessment
FRELIMO	*Frente de Libertação de Moçambique* (Mozambique Liberation Front)
GFT	Game Frontiers of Tanzania Ltd
GIZ	German Agency for Technical Cooperation
GST	Geological Survey of Tanzania
IAEA	International Atomic Energy Agency
ISL	in situ leach (mining)
IUCN	International Union of Conservation of Nature
KfW	German Development Bank
KUNA	*Kikundi cha Kuza Uchumi Wa Namtumbo* (Association Promoting Economic Growth for Namtumbo)
MOU	Memorandum of Understanding
n.d.	no date
NEMC	National Environmental Management Commission
NGO	non-governmental organization
NTE	non-targeted effects (of radiation)
ROSATOM	State Atomic Energy Corporation ROSATOM (Russian)
SCP	Selous Conservation Programme
SECAD	Sustainable Conservation and Development of the Selous Niassa Ecosystem
SGR	Selous Game Reserve
TAEC	Tanzania Atomic Energy Commission
TANAPA	Tanzania National Parks Agency
TanRoads	Tanzania Roads Agency
TaWA	Tanzania Wildlife Authority
TNA	Tanzania National Archives
Tsh	Tanzanian shilling
TUAM	Tanzania Uranium Awareness Mission
UNESCO	United Nations Educational, Scientific and Cultural Organization
VGS	Village Game Scout
WMA	Wildlife Management Area
WWF	World Wildlife Fund

Note on Translation

Throughout the text, I integrate Kiswahili in various ways to ensure the specific words and voices of the participants are heard in this thesis and also to acknowledge that I am not a native Kiswahili speaker. When direct quotations were possible to note, the original Kiswahili is included in quotation marks and an English translation follows in parentheses. For purposes of anonymity, an audio recording device was not used during any Kiswahili conversations. As such, in instances when direct quotation was not noted, a paraphrase translation appears in the text followed by an approximation of the original Kiswahili in parentheses. All translations are my own.

Chapter 1 Introduction

The Mkuju River Project

Inside sub-Saharan Africa's oldest and largest wilderness area, Tanzania's first uranium mine is quiet as it begins its sixth year of delays. The Mkuju River Project, as the mine is known, is ultimately owned by Uranium One, which is one of the largest uranium mining companies in the world and the international mining arm of the Russian State Atomic Energy Corporation (ROSATOM). Per Tanzanian law, the mine is owned and operated under a locally registered company, Mantra Tanzania Limited (Mantra). The project received its Tanzanian Special Mining License in 2007. The company anticipates bringing U.S. $1 billion in foreign direct investment over the twelve-year life of the mine.

The mine is located wholly within the Selous Game Reserve, considered sub-Saharan Africa's oldest and largest protected area. Approximately the size of Switzerland, the Selous is considered a key habitat for elephants, and has the ability to preserve a vast woodland ecosystem covering much of the Rufiji River watershed. For these outstanding traits, in 1982 the Selous became a UNESCO World Heritage Site. In 2012, the Tanzanian government successfully lobbied the World Heritage Committee to alter the border of the UNESCO site to allow for the Mkuju River Project to move ahead. The Mkuju River Project in the Selous Game Reserve represents the first time the World Heritage Committee permitted such an annexation of a natural heritage area to allow for extraction. This project, therefore, sets a precedent for mining in protected areas, and other countries may now follow Tanzania's lead and apply for modifications to UNESCO sites to allow for extraction.[1]

[1] An estimated twenty-five percent of World Heritage Sites are threatened by existing or proposed extractive projects (Osti et al. 2011).

A series of delays impeded the development of the Mkuju River Project. During the two-year delay caused by the World Heritage Site modification process (2010-2012), the 2011 triple disaster in Japan created a climate financially unfavourable for moving the project forward. Then, in 2014, following the ravages of the most recent spike in elephant poaching, the World Heritage Committee voted to add the Selous Game Reserve to the list of Sites in Danger, amidst some allegations that the mining project may have led to increased poaching in the area. In response to low prices of uranium, in 2016 the parent company announced plans to delay mining at Mkuju River until uranium prices stabilize above $55/pound (lb) (Nickel 2016). In 2017, Uranium One confirmed it applied for permission to suspend the project for at least three additional years, a decision they blamed on the depressed market for uranium (Basov 2017).

This study of value(s) and expectations draws upon the realities in and around the Mkuju River Project, which present the opportunity to examine the ways in which conservation meets and mingles with planned mineral extraction. This chapter introduces the study and outlines two main conceptual orientations for examining the overlapping and sometimes conflicting value(s) and expectations around extraction and conservation. The first framework considers the role of space, place, and scale where colonial and post-colonial history demands a critical examination of natural resources and their management. The second framework explores the integral role of temporality. The Mkuju River Project provides an entry point with which to study the shifting of values in the liminal time before a major development project begins. Further, ethno-historical analysis of the various regimes of value(s) at play in this specific place illustrates the significance of an examination of pasts as well as potential futures. My findings from the villages around the mine to elites in the administrative capital speak to the ambivalent expectations people have for the planned

mining project and ongoing conservation activities, while highlighting how a history of marginality may influence why there is such strong local support for the mining project.

Research Framework and Questions

My research examines the perceptions and narratives of value and expectation, along with evolving systems of control, as a rural area in Tanzania faces mineral extraction. In the context of a conservation area facing potential mining, how do people navigate competing regimes of natural resource management and associated value systems? In what ways can ethno-historical analysis contest narratives created by technologies of heritage and extraction?

To answer these questions, I weave together the spatial with the temporal dimensions of the lived experiences in and around the planned mining area, building upon prior works which employed a political ecology perspective to appraise the application of power in environmental conflicts (Martinez-Alier et al. 2010). I dialogue with the anthropology of space and place to ground my study in an understanding of the transformation of the physical environment over time. Nature, wilderness, and landscape conceptually link the mining site and the Selous with disparate actors near and far. I also engage with the overarching theme of time—historical trajectories with expectations for the future—in the context of the infinite lifespan of the radioactivity of uranium. The design of the study embraces its own liminality. Field research took place in the period before mining actually commenced. Any uncertainty about the future weighed as much on villagers with limited access to information as on myself as a researcher. By contextualizing expectations within history, including those of local and national events and trends, I intend to contribute to the anthropological debates on futures and expectations.



Figure 1 National Parks, Game Reserves, and Game Controlled Areas in Tanzania. (Map by Mike Shand).

Conceptual Orientations

As mentioned above, Tanzania has licensed a uranium mine in a protected wilderness area, the Selous. From this liminal point in time between licensing and beginning mining in earnest, I look both to the villages around the mine for their experiences as well as to national and international level actors who are invested, in various ways, in the natural resources in the area. This study investigates how the administration of conservation and extraction, seemingly incompatible regimes of resource management, is perceived on the local level, reflecting not only national priorities, but also historical trends and past personal experience. I expand on existing studies that increasingly place wildlife conservation as part of the same framework as mining to provide a unified lens with which to examine extraction, regardless

of the kind. Adding to the rich field studying the impact of resource extraction, this study makes use of ethnographic research and also historical analysis of natural resource management in the area to contextualize ambivalent expectations for the future. I seek to explore the ways in which historical trends, some forgotten in dusty archives, others re-remembered by elders, can be brought together in order to shed new light on current development of resources. My research challenges the sometimes-ahistorical framework applied to large-scale extraction projects, further exploring the dynamic ways in which value(s) are created and modified.

To accomplish this, I rely on two conceptual orientations, the first of which focuses on scale, space, and place in order to attend to the vastness of the Selous, with its outsized role in many imaginations. Colonial Tanganyika created the conditions under which the administration could annex land and resources, over time creating enormous uninhabited spaces like the Selous (Neumann 1998; Sunseri 2009). The concept of wilderness, and how this relates to Western concepts of nature, was applied to African landscapes through colonial models of conservation. Employing a political ecology perspective, this framework embraces a multi-scaled approach, able to jump from national level conservation initiatives to their local implementation and impact on (non)human populations and their complexities in the context of the Mkuju River Project (Goldman 2009; Schroeder 1999). The political ecology approach also allows elite actors, who exercise power from the distant coastal administrative hub of Dar es Salaam, to be considered along with villagers living at the edge of the Selous.

From this critical perspective on conservation, I turn to review the study of value(s) in anthropology and how these will assist in my examination of the changes in the physical and socio-economic landscape in and around the Mkuju River Project. The situation appears to inevitably push conservation interests against those of extraction, presenting the opportunity and obligation to examine the negotiation of associated values. More ephemeral than the

tangible construction of the mine and the conservation projects associated with the Selous Game Reserve, are the ways that people understand the changes taking place in the area and their plans for the future. In an area where outside actors privilege wildlife and wilderness, there is a novel natural resource of interest, uranium. The incursion of uranium mining activities is destabilizing the local order, which is still being re-established.

The second conceptual orientation engages with temporality, weaving it together with the formation of values and the (dis)connections with value. The moral foundation of values influences the perception of the future and the navigational strategies implemented. Positive expectations of hope and fearful projections of future possibilities influence people's navigational strategies during periods of uncertainty. Heritage acts to connect the present to the past. The Selous is subject to heritagization through its listing as a UNESCO site of natural World Heritage, a categorization that I argue impacts the construction of the future as well as the past of the Reserve. Based on Tanzania's history of natural resource management, (post)socialist, colonial, and precolonial trends must be taken into consideration to contextualize current events. Additionally, I examine how people continually modify their relationship with past events, sometimes activating memories in ways that impact their interpretation of the present.



Figure 2 The Mkuju River Project uranium mine in the Selous Game Reserve, shown bordering the Selous Niassa Wildlife Corridor. The Corridor is composed of five Wildlife Management Areas including the Mbarang'andu Wildlife Management Area. (Map by Mike Shand).

Scale, Space, Place

Wilderness, Nature, Landscape

The Selous, today considered the largest wilderness area in Africa and a sport hunting destination, was reported by European visitors to be devoid of large game in the 1860s (Kjekshus 1977). This brings up underlying questions: What is wilderness? Who gets to decide? Why should it be protected? *From what* are we protecting it? *For whom*? Looking at this study, we can narrow this question to: Why is the Selous being protected? Protected areas, whether forests, game reserves, or national parks, represent key spaces for studying the socio-ecological impact of policies controlling natural resources. Since the nineteenth century, these areas 'have been at the fault lines of contact between rural societies and state forces that connected East Africa to an international commercial economy' (Sunseri 2009, p.xi). This section weaves together the social construction of concepts of nature and

wilderness with theory of landscape in order to form a coherent framework with which to examine the development of the Mkuju River Project inside the Selous Game Reserve.

Neumann (1998) contextualizes today's understandings of African protected areas within the history of landscape ideals in the United States and Victorian England. Wilderness played a necessary role in the American imagination for pioneers who 'conceived of themselves as agents in the regenerating process that turned the ungodly and useless into a beneficent civilization' (Nash 2001, p.43). By the mid nineteenth century, wilderness in the U.S. transitioned from merely a space of conquest to be 'recognized as a[n American] cultural and moral resource and a basis for national self-esteem' (Nash 2001, p.67). Wilderness became a place of awe and provided proximity to the divine. Amidst discontent with civilization, Americans looked nostalgically on the frontier past, seeing valuable traits associated with wilderness: 'virility, toughness, and savagery' (Nash 2001, p.145). With increasing appreciation for wilderness came sorrow at its loss and the growth in demands for the government to preserve wild spaces for future generations. Based on this concept of wilderness, Americans created the first national park system, a model replicated in sub-Saharan Africa and around the world.

Similar to American ideals of wilderness, Victorian romanticizing of landscapes influenced colonial decisions about wilderness, nature, and natural resource management. These ideals continue to guide the creation, implementation, and management of protected areas in Tanzania (Neumann 1998). Neumann explains, '[t]he question of what Africa should look like implies an aesthetic judgment' (1998, p.15) and colonialism 'allowed Europeans to impose their image of Africa upon the reality of the African landscape' (Anderson and Grove 1987, p.4). In the minds of Europeans, Africa became an Eden to the spoiled, civilized Europe (ibid.). As colonial conservation policies increasingly denied Africans access to natural resources, continued sport hunting symbolized European dominance and masculinity,

with hunters being likened to scientists and naturalists. Literature celebrating hunters indoctrinated the next generation of empire makers/enforcers, blurring the line between hunting and war (MacKenzie 1988).

From a critical perspective on the project of conservation, with its roots in Western notions of wilderness rather than universal values and motives, we can step back and consider protected areas as part of the larger world. The concept of landscape brings a challenge to the distinction between places of nature and places of (agri)culture (Descola and Pálsson 1996). This nature/culture binary (Dove et al. 2011; Smith 2010; Descola 2002), homogenizes the complex ways in which people interact with, and are impacted by their environments. Today, multi-species ethnography has reduced the boundary between human and non-human in anthropology (Hastrup 2014). Still, the discipline faces 'a challenge of integrating the wild and unexpected into their analyses' (ibid., p.17) with debate ongoing (Ingold 2016; Descola 2013). The work to re-conceptualize this dualism began in the 1990s, triggered by mounting ethnographic evidence of different cosmological relationships between humans and non-humans, in addition to challenges based on evidence of the impact of environments on biological evolution, the impact of humans on the environment, and also in the existence of material culture tradition among primates (Descola and Pálsson 1996).

However, the place of nature in relation to humans has long been a topic of philosophical inquiry. Philosophical traditions which see humans as the crowning achievement of creation, above all other living beings, stem from monotheistic religions, and were rekindled through Enlightenment science (Hastrup 2014). It is based on this abstraction that, in the Western sense, nature can be understood as and created to be separate from humans, a concept put into practice by European expulsions of Africans living in protected areas (Beinart 1989; Townsend 2000; Dove and Carpenter 2008). Taking the distinction between humans and non-humans in Western thought even further, Descola posits that

‘[t]here is a homology between the way in which we address “nature” and the way in which we address “others”’ (2002, p.111). American ideals of a wilderness set apart from people, based on an ‘othering’ of nature, led to the creation of the first national park system, which therefore required evictions of native peoples from spaces deemed to be ‘natural’. Despite these tendencies, the critical examination of the nature/culture binary does not mean Westerners are unable to reconcile nature and culture. It is evident through memory and spiritual attachment to certain spaces that Western ideology can integrate nature and culture (Schama 1995; Abramson and Theodossopoulos 2000). The idea of nature, as a social construct, should not necessarily be deconstructed, denigrated, or rejected outright. Ethnographic data may present evidence of ideologies corresponding with Western notions of nature (Descola and Pálsson 1996).

The challenge remains to ensure anthropology recognizes that there can be different cosmologies of nature and culture. The Selous Game Reserve, according to conservationist literature, is considered a natural space, an ‘ecosystem’, and part of the larger ‘Ruvuma Landscape’ (Symington and Marchant 2012). The employment of the concept of ‘landscape’ to describe the environs of the Selous deserves further examination. Although material and geographical, ‘[a] landscape is a cultural image, a pictorial way of representing, structuring or symbolizing surroundings’ (Cosgrove and Daniels 1988, p.1). Here, Cosgrove and Daniels emphasize that landscapes are socially constructed abstractions of physical spaces. Ingold (1993) challenges this assertion by Cosgrove and Daniels, of the dichotomy between landscape and the self, instead proposing that by ‘dwelling’ in the landscape, we are as much a part of the landscape as the landscape is a part of us, and therefore that landscape should be understood as the world as it is known by those who dwell in it. Ingold’s argument, challenging the separation of the self from the physical world or an abstraction of the

physical world, stands as a major contribution to the dialogue on the (de)construction of the nature/culture binary.

Landscapes can be imbued with values and meanings that vary over place and time (Lowenthal 1986; Penning-Roswell 1986). By bearing the marks of (under)development, landscapes can stand as visual representations of the global processes that brought about those physical changes (Smith 2010). Landscapes also hold power over people in varying ways (Penning-Roswell 1986, p.116).[2] This portrayal of the landscape as an actor, able to compel people to feel, or to act in certain ways, appears vividly through the construction of memorials, which will be considered later in the section. Nonetheless, it is clear that: '[t]he meanings we comprehend and the values we hold about landscape appear to be intimately connected with the way we perceive landscapes and this in turn appears to relate to our landscape experiences' (ibid., p.114). Penning-Roswell underscores how, because of our own values, we interpret landscapes in various ways. The flexibility of the concept of landscape is based on our own values, but also results from the term's multiple, layered meanings as a gaze, in terms of portraiture, as a text that can be read, or as a veil to be uncovered (Wylie 2007). Landscape conceptually acknowledges that nature and culture 'both shape and are shaped by each other' (ibid., p.9; Schama 1995; Harrison 2004).

The flexibility that gives 'landscape' the ability to conceptually bend to fit any context, also seems to be one of its weaknesses. When nature is no longer bounded by proximity, 'the village green is nothing less than the entire globe' (Descola and Pálsson 1996, p.13) and the application of 'landscape' to describe certain spaces can be arbitrary. If landscape is a gaze, then it is arbitrarily the gaze of a certain privileged 'self'. The gazer is responsible for the definition of the boundaries of the landscape. How? By the placement of

[2] There is a broad field of studying landscape values in geography, which uses quantitative or quantifiable data to measure the values people associate with landscapes and the personal ties formed to those places. For a review of this field, see Brown and Raymond (2007).

their body? Or as a result of their body's own (limited) ability to see beyond? Further, if landscape is a text, can we question the legitimacy of the text by acknowledging it is not accessible to all, by way of illegibility or illiteracy? The landscape perspective may present the possibility of circumventing the confines of the nature/culture binary, but it also arrives with its own set of limitations.

Setting aside the subjective character of landscapes, it is clear that spaces can hold special meaning (Schama 1995). Through the experience of physically being in a space, there is an embodied knowledge of a place (Harris 2007). Abstractions from this knowledge can be used to depict spaces, through photos, drawings, paintings, and maps, which can then be used to analyze how people are attached to places, employ resources, and generally relate to the world. Basso (1996) illustrates how places are connected with stories, and receive names used to refer to those stories in daily life, through his research making maps with the Apache people in the southwestern United States. Standing the test of time, these artefacts can function as tools to examine the space without ever physically being there. Further, they present an opportunity to probe the positionality of their author within the terrain they depict and beyond.

Drawings, paintings, and photos are rare for the area of the Mkuju River Project while, in contrast, maps are relatively prevalent. The pervasiveness of maps of this area for conservation, for mining, and for governance justifies special attention. Maps are physical manifestations of the value systems of those commissioning the depiction (Harley 1988), literally drawing out the power relations, cultural beliefs, and taboos along with the topographical features and (in)tangible borders. Maps, through the decisions to include and exclude information, the mistakes made and repeated, even the perspective of the depiction, demonstrate these social constructs (ibid.; Scott 1998; Fotiadis 2009). Maps have incredible power—to create or change borders, erase the existence of villages, and make 'visible' (Scott

1998) people, resources, and practices for further control by the state. Basso's (1996) mapping of place-names revealed sensitive sites, which explains, in part, why the White Mountain Apache Tribal Council determined none of the resulting maps should be published. The drawing of maps, by transforming the physical experience of being in a space into a drawing, or through modifying an existing map, represents one 'way of knowing' a place (Harris 2007). Maps can transcend and/or embody the ways of knowing a domain, illustrating the significance of connecting scale, space, and place.

Value(s)

Cutting across scales, connecting people geographically separated, and speaking to the complexity seen in specific places, value(s) is/are a key concept for this study. At the Mkuju River Project, a novel, internationally valued commodity, uranium, is unsettling existing orders emphasizing the economic importance of tourism geared toward the consumption of wildlife and wilderness. The financial value of these 'goods' seems to be inversely related, a perception that perhaps belies ways in which underlying value systems significantly overlap. This section presents a genealogy of the examination of value(s) upon which this study builds. Much of the study of the creation of value is based on Marx's writings on use-value and exchange-value. Early anthropologists saw gift giving cultures around the world as a window with which to analyze humanity's creation and maintenance of value and values (Mauss 2016). Radcliffe-Brown (1952) saw value as a relationship (or an interest) between a subject and an object. Group common interest in an object, therefore, correlated to the object having social value to the group. Firth (1964) examined the relationship between social organization and values, as well as the role of the anthropologist in such an examination. It is clear now that value and values are inherently entangled. That values impact the creation of value systems and vice versa is the essence of this entanglement. This section of the literature

review attempts to tease out lines of inquiry into both concepts with a focus on the value and values of nature and natural resources.

In his effort to advance a theory of value, Graeber (2001) collects most of the social theory of value into three streams: values of what is socially good, economic value, and value as a kind of linguistic difference. He notes the entanglement of these three streams of theories of value and that there are problems with theories that attempt to bring them together. Graeber reviews previously existing analyses of value. He sees Appadurai's (1986) 'regimes of value', 'tournaments of value', and 'politics of value' as most important to the field for creating new ways of examining how objects move around. Graeber summarizes Strathern's (1988) theory of value as 'the value of an object, or a person, is the meaning they take on by being assigned a place in some larger system of categories' (2001, p.41).

Another route to examine value engages with questions of morality. Morality has long been a central concern of anthropology since the days of Durkheim, Marett, and Evans-Pritchard (Laidlaw 2013). The 'Durkheimian problematic in the study of morality' (Robbins 2007, p.294), wherein anthropologists tend to consider morality permeating all aspects of culture, overwhelmed the study of morality in the discipline since the early days. Challenges to this problem, from Laidlaw, Robbins, and Lambek, among others, merited morality and values greater centrality in anthropological theory. By disentangling culture from morality, Laidlaw (2002) points out that the moral domain exists because culture leaves room for conscious decision-making, rather than creating an obligation lacking freedom of choice. In his influential examination of morality, Robbins proposes refining Laidlaw's framework in order to make theory of value—in the ways it can 'help us specify why cultures allow choice … and how choices are felt to be moral ones' (2007, p.296)—a more central component of our concept of culture and cultural change. Lambek (2013) further expands on virtue as a

reasonable, reflective practice, and explores the value of acts, working toward a ritual theory of value.

We see numerous examinations of the ways in which value(s) are tied to knowledge and power. Through participant observation, anthropology is methodologically suited to translate ways of knowing across temporalities, contexts, and mediums (Harris 2007). The filtration and mediation of knowledge through layers of personal experience adds to the multiple ways of knowing. Indigenous ways of knowing (Breslow 2014; Basso 1996), the study of technology's entanglement in society (Austen and Headrick 1983; Gupta 2015), and the political ecology of science (Davis and Zanotti 2014) represent a few avenues of recent anthropological examination of the creation and management of knowledge. These ways of knowing are tied to values, and the creation and distribution of knowledge is inherently political and embedded in the historical context (Scott 1998; Harris 2007). In this study, I trace the ways in which knowledge about uranium and about the status of the mine's development are translated and negotiated between various actors, from 'experts' in Dar es Salaam to (sometimes) optimistic villagers around the mine. The devaluation of local knowledge is one of the underpinning theories of James Scott's (1998) assessment of state practices. Systemic values are at play in the ways in which types of knowledge are appraised. Additionally, the evaluator's own base of knowledge informs their value system, and therefore their preference for one type of knowledge over another.

As with the various ways of knowing, we cannot inquire into values as if they are monolithic or static. Taussig (2010) analyzes representations of the devil in Colombia and Bolivia, studying conflicting, multiple values. Based on ethnographic research on plantations in Colombia, Taussig examines commodity fetishism, which he sees in the belief that people who make deals with the devil to gain wealth go on to find the money devalued in ways that only be recouped by sacrificing the soul of a child during baptism. The evolving,

transformative role of money in this ethnography supports the idea that value is multiple and dynamic. Translating this concept to a rural African context, Shipton (1989) correlates currency and value with social change to create a holistic analysis of the factors influencing value. Shipton illustrates the social life of money where a rural economy partially accepts cash, challenging models of rational economical actors and instead pointing to the cultural influence on decision-making. In doing so, Shipton reveals that the multifaceted ambivalence of cash speaks to the similarly complex attitudes of people and their (changing) place in the world.

Changes in culture and pollution also present opportunities through which to assess values. Robbins (2007) finds the frictions around cultural change to be the ideal space to study values in his examination of the relationship between values, religion, and morals among recent converts to Christianity. Robbins calls for further examination of 'the nature of unresolved value conflicts' (2007, p.300) because it is within these conflicts and associated cultural changes that freedom of choice appears, presenting an opportunity to study how morality influences culture. Multiple and conflicting values are similarly exhibited in the context of contamination, taboos, and, more generally, pollution (Douglas 1966). Douglas proposes that laws of nature are integrated into society's value systems, yet, her functionalist approach deters her from paying attention to how taboos and values change over time.

We can see a significant body of literature examining the role of value(s) and nature. Building on the social construct of 'nature' outlined earlier in the chapter, this literature explores ways to impact the relationships people have with 'natural' spaces. The recent commodification (e.g. payment for environmental services), marketization (e.g. carbon markets), and privatization of forests, wildlife, air, land, water, and the effects of climate change provide another angle on the value of those natural resources as well as the value systems that assign and contest those values (Kallis et al. 2013; Gómez-Baggethun et al.

2010; Stern 2006; Costanza et al. 1997; Gallagher and DiNovelli-Lang 2014). Escobar's (1995) study of development and its systematic inability to accept the complex and different also finds the same themes in conservation projects. When nature is assigned a financial worth based on a certain set of values we can sometimes ignore or misrepresent the values of the people living physically close to that specific 'natural' place (ibid., p.204).

The field of economics is beginning to account for similar concerns regarding the multiple and conflicting impacts of commodifying nature. Recent studies highlight the ways in which development programmes paying people for conservation behaviours deemed desirable (e.g. not cutting down forests) sometimes undermine intrinsic motivations for conservation (Rode, Gómez-Baggethun, and Krause 2015; Gómez-Baggethun and Muradian 2015; Luck et al. 2012; Kerr, Vardhan, and Jindal 2012). Economists have dubbed this 'motivation crowding', which connects monetary valuations of natural resources and conservation behaviours with an impact on conservation attitudes, reinforcing the dynamic character of value systems. With wealthy, largely Western, countries looking to pay poorer, developing countries to undertake efforts thought to mitigate the effects of climate change, we can see how the monetization of nature can have multiple effects on attitudes toward conservation. Looking to the complex relationships with natural resources in this study, we can see that the Tanzanian model of creating Wildlife Management Areas (WMAs) is designed to encourage people to protect wildlife by linking it to the benefits they receive from tourism profits. This is examined in the context of the Mbarang'andu WMA (located at the border of the Selous and the Mkuju River Project), in the following chapter.

Capitalization and commoditization of nature can also be seen through the framework of the extraction of natural resources. There are numerous studies of this intersection of natural resources and value as understood through industrial extraction efforts, from Indonesia (Peluso 1992) to Bolivia (Nash 1979; Taussig 2010) to Papua New Guinea (Kirsch

2007). Anthropology offers critical insight into mining (Ballard and Banks 2003), oil extraction (Rogers 2015; Berhrends et al. 2011), and the study of associated concessionary politics (Hardin 2011). One common theme of analysis that emerges in these cases where valued international commodities are extracted, is the development and evolution of core-periphery relations. These skewed relations are symptomatic of the value(s) at stake with extraction. Peluso (1992) argues that forest-based conflicts in areas around the world result from disagreements between scientific and societal systems of value. Theoretical core-periphery distinctions may align with the boundaries established and managed by extraction. These may translate into spaces of socio-economic inclusion and exclusion, ultimately resulting in the creation of inequality and transformation of values (Halvaksz II 2013). The monetary value of natural resources is demonstrated by the expensive extraction processes undertaken and embodied by the wealthy corporations exploiting resources, not to mention the lengths to which countries will go to invite extraction. This financial value contrasts with the value systems that become increasingly clear during times of threats to, degradation of, or destruction of natural resources.

The theoretical exploration of value(s), crisscrosses the scales, spaces, and places considered in this section. The question of value assumes that the object of value (for example, a natural resource) exists and the development of various strands of social theory have advanced academic inquiry into natural resources in a number of ways. The following section considers the ways in which materiality, relationality, and ontology can be mobilized to examine the value of resources. This will be used to situate how an intersectional approach might be applied to resources.

‘Constructing’ Resources as an Object of Enquiry

From the study of materiality, we have a better understanding of how ‘objects move’, in terms of the ways in which they are socially constructed and create sociality, without fetishizing the objects themselves. Strang (2014) highlights how the physical characteristics of water are fundamental to the transportation, production, consumption, and potential of water as a resource. This materiality, Strang finds, co-creates ‘dynamic and mutually constitute[d] relationships’ (2014, p.143) with the materiality of human bodies and also the original and secondary locations of the resource. This kind of relationality expanded our understanding of relationships in terms of relatedness and kinning, such as the incorporation of another’s traits via new technologies, but also in terms of multiple kinds of human and non-human relations (Carsten 2011). The study of materiality, as in Carsten’s (ibid.) analysis of bodily substances and Strang’s (2014) analysis of water flows, is based on the work of earlier anthropologists, emphasizing material things ‘as physical constituents of sociocultural practice’ (Bakker and Bridge 2006, p.12) and material culture as ‘constituents of social relations’ (ibid.). By incorporating materiality into the study of resource geographies, Bakker and Bridge see a way to study resources beyond dualistic categories (of nature/culture, production/consumption, and beyond) and to establish, through embodiment, ‘the social construction of the material world without falling into the trap of social reductionism, and similarly engages with the material conditions shaping social life without falling prey to biological essentialism’ (2006, p.16).

Both relationality and materiality help cross scales and cross otherwise siloed domains; both push against human-centred world views. Also challenging this human-centred analysis, the debates around ontology highlight the fluidity of human, non-human, and non-living relations and worlds. Mario Blaser’s (2009) contribution, ‘political ontology’ continues the examination of the politics shaping a particular world, where the term ‘is meant to

simultaneously imply a certain political sensibility, a problem space, and a modality of analysis or critique' (Blaser 2013, p.552). Along these lines, 'ontological conflicts' involve 'different assumptions about "what exists"' (Blaser 2013, p.547) for instance, that the construction of the nature/culture binary is one ontology among many. Political ontology, though critiqued for being essentializing, exoticizing, and perhaps even patronizing, still forms a valuable contribution to what a decolonial anthropology that is not human-centred might look like. Blaser's analysis of resources is particularly useful because it highlights how resources 'are entities to which indigenous and other place-based peoples are related in diverse ways. And I stress that the relations are diverse rather than assume that the notion of property can encompass those relations' (2009, p.891). Blaser's findings are generally echoed by that of other environmental anthropologists (Peluso 1992), but still seem to represent a human-focused construction of resources. While materiality is useful for understanding individual objects, its use for distributed substances like natural resources appears to be somehow limited.

Where previous work on materialities considered objects as individual artefacts, the introduction of 'resource materialities' (Richardson and Weszkalnys 2014) helps to fill a gap in understanding 'the distributed and relational character of resources' (2014, p.16) and is also meant to serve as a guide for navigating the complex ethnographic situations wherein resources often are found. In addition to integrating ontologies, ways of knowing, and embodiment with relationality, Richardson and Weszkalnys highlight infrastructures of resource exploitation (extraction and distribution) which they see as 'key enactments of resource potential' (2014, p.20) making a valuable contribution to the conceptualization of resources prior to extraction. Further, the authors' conceptualization of 'resource environments' redirects analysis away from resources as essential, natural substances, 'to the complex arrangements of physical stuff, extractive infrastructures, calculative devices,

discourses or the market and development, the nation and the corporation, everyday practices, and so on, that allow those substances to exist as resources' (2014, p.7).

Much of the social theory mentioned above focused, with good reason, on the agentive properties of things and the agency of humans. Although there is exploration in the literature regarding the construction of agency as something other than a human quality (Bakker and Bridge 2006), there remains a sense that it is 'humans who are in a position of mastery and control over what is portrayed as an essentially passive material world' (Richardson and Weszkalnys 2014, p.11) despite ample evidence of resources subverting human control (Strang 2014). While the materiality of resources may be able to 'express the generative capacities of biophysical processes [of resources], without either having to appeal to the agency of an external nature or rendering agency a function of a lack of knowledge or control' (Bakker and Bridge 2006, p.19) there still seems to be some room for further theorization of the (re)actions (if not agency) of inorganic materials. Aside from the introduction of the terminology 'resource environments' (Richardson and Weszkalnys 2014), recent studies make scant or cursory acknowledgement in the conceptualization of resources of the receipt of influences, as in the way humans and non-humans are impacted and transformed in various ways.

The recent trend emphasizing a focus on one resource (Appel, Mason, and Watts 2015; Rogers 2015; Barrett and Worden 2014) advanced our understanding of the materiality of resources and the complexities of their socio-political, environmental, relational, and economic construction. But the singular attention begs the question—what is lost by such a narrow focus? What aspects of the relationality of resources are made peripheral or minimized in the process of writing the story of one resource? This question stems not so much out of an allegation of fetishizing commodities, but because it marginalizes the ways human and non-human resources are mutually impacted by each other. In the context of

resources, Bakker and Bridge argue the problem of the agency of the living and non-living is the result of: 1) a failure 'to take into account the different modes through which material properties come to have political life' (2006, p.11) of which they see mine tailings as an example; and 2) that 'this conception of "nature's agency" relies on a dualist ontology of subjects (having agency) and objects (on and through which subjects' agency is expressed)' (ibid.), which they recall has been the subject of extensive critique. Where Bakker and Bridge see materiality as the theoretical tool to avoid these conceptual obstacles, the mine tailing example suggests that while materiality may be an important analytical tool, it is relationality which will highlight the web connecting the waste as it leaches through the environment, often beyond the control of both humans and non-humans. This thesis will suggest that these sites of intersection and impact are also key to the 'becoming' (Zimmermann 1933) of resources. A focus on intersectionality continues the work of materiality, relationality, and ontology in decentring from an understanding of the world wherein only humans have agency. Adopting Kimberle Crenshaw's (1989) term, an intersectional approach to resources is informed by the pathbreaking work of Crenshaw and other feminists of colour in addressing the racism present in feminism. While there are risks to incorporating any terminology or theory outside the discipline it was originally intended for, including the appropriation of the term, tokenization of the concept, and misrepresentation (Bilge 2013), there is also potential to open new lines of enquiry.

Kimberle Crenshaw's original formulation of intersectionality critiqued dominant forms of analysis of discrimination for thinking only along 'a single categorical axis' (1989, p.140): either sex or race. The focus on the single axis meant this kind of conceptualization automatically marginalizes those who are multiply-burdened by racism and sexism, Black women. Her argument turns on the contention that, 'Because the intersectional experience is greater than the sum of racism and sexism, any analysis that does not take intersectionality

into account cannot sufficiently address the particular manner in which Black women are subordinated' (ibid.). This theoretical divergence in the analysis of the ways different forms of discrimination, oppression, and social inequality overlap and interact along multiple axes informs my engagement with natural resources. I interpret resource intersectionality as an extension of materiality, which emphasizes an in-depth examination of a (single) resource in the context of a web of humans and non-humans influencing its 'becoming' (Zimmermann 1933) and the case-study method of ethnographic examination of resource extraction (for example, Nash 1979).

This approach suggests looking at resources along multiple vectors to more fully conceptualize those that might be 'multiply burdened' and multiply constructed. Throughout the thesis, the following vectors will be considered: spatial, temporal, and social. Considered broadly, the spatial vector, like relationality, facilitates an analysis capable of crossing otherwise incomparable scales: for example, a globally important but rapidly shrinking elephant population and the watershed of the Rufiji River. The temporal vector could be used to examine the immediate fears about elephant destruction of lives and agricultural livelihoods along with the slow accumulation of chemical toxicity sometimes seen in mining areas. The social vector similarly lends to multiple interpretations: the varied actors in the ongoing story of the development of the Mkuju River Project, but also about how multiple resources interact with each other. Finally, the intersectional approach returns the sometimes abstract or macro examination of resources to the notion that resource construction, extraction, transformation, transportation, and consumption are inherently political, and inseparable from social justice implications. The racial, gendered, class, and colonial roots of resource extraction must continually be brought back into the examination of the construction of a resource, and an intersectional stance engenders such a grounding. At the intersection of resources with other resources (whether human, non-human, or non-living), we can consider

what is actually done, without needing to assess or assert an intention in the process of intersection. The intersection of resources takes place (as in the case of mine tailings and ground water) and can have (physical, political, existential, economic, and more) impacts regardless of whether or not there is intentionality, and therefore it is through these intersections that we may be able to advance our understanding of each resource.

From this basis, of establishing how resources come to exist, we inherently acknowledge that they are not static. Value(s) (including those of resources) are deeply impacted by time and must also be appreciated for their dynamic ability to evolve. The next section considers the overarching theme of temporality and how it informs this study.

Temporality

Expectations

Expectations are intimately tied to the construction of value. Through the Mkuju River Project, with its massive implications for infrastructural and economic development, this study illustrates the varied, complex expectations of uranium. Anthropologists are increasingly engaging with the study of expectations, infusing ethnographies with perceptive analyses of conditions of uncertainty, as well as of the varied affects and emotions tied to expectations—hope, anxiety, frustration, and fear. Much of the research on the anthropology of expectations stems from James Ferguson's work. In a seminal volume aptly entitled *Expectations of Modernity* (1999), this author writes of the copper mining industry in Zambia and how its decline altered the 'script' that depicted Zambia as a middle-income country until the 1980s, as Zambian copper became less valuable and external debt increased. He finds that material comforts and expectations for those comforts eroded (ibid., p.12).

The study of youth proves a fruitful angle from which to continue examining expectations for the future. Honwana and others apply the concept of 'waithood' to describe

the liminal experience of young people who strive to move into adulthood but lack the skills or opportunities to obtain jobs and lead independent lives (2012, p.3; Sommers 2012; Masquelier 2013). Without homogenizing the experience of 'waithood' or the contexts causing it to occur, there is now a niche of sensitive ethnographic examinations of the expectations—hopes, dreams, and anxieties—of young people. These ethnographies attend to the obstacles facing youth, as well as their survival strategies, advancing our understanding of how youth are coping with the challenges posed by the failures of neoliberalism, the recent economic downturn, and national politics, specifically in Africa (Cole 2010; Weiss 2009; Mains 2012; Vigh 2006; Sommers 2012). Pratten (2008) reveals how youth associations and societies in the Niger Delta ambivalently incorporate masquerade figures in ways that express their hostility toward and awareness of their own marginality.

Broadening the conceptual engagement with ambivalent expectations for the future from individuals, we can include organizations. Green (2012) analyzes expectations of development through the perspective of the creation and development of non-governmental organizations (NGOs) in Tanzania that have no immediate prospects for actually carrying out their missions due to lack of funding. The expectations of these organizations relate to an active effort to change their hypothetical place in the context of development from peripheral to adjacent. This ambivalence of expectations steers us away from the often positive, creative, or neutral as well as the individualistic aspects associated with the study of youth.

Expectations with a negative connotation appear in the so-called resource curse (Weszkalnys 2011; Reyna and Behrends 2008; Reed 2009; Appel 2012; among many others). Weszkalnys (2008) questions the role of expectations of oil in São Tomé and Príncipe, adding to a field examining the anticipation of large-scale extraction projects. This anticipation of oil joins similar cases around the world where, despite evidence of the limited ability for large-scale extraction projects to provide sustainable benefits to the wider

population, the imagined world of post-extraction prosperity dominates (Weszkalnys 2014; Reed 2009). Often, expectations for the future are more complex and ambivalent than purely hopeful, presenting the opportunity for examination of a 'resource affect' (Weszkalnys 2016). Employing a 'resource materialities' perspective (Richardson and Weszkalnys 2014), which suggests the value of placing questions seeking an understanding of resources at the centre of ethnographic research (how resources came to be appreciated, how resources are used, and how resources came to exist), anthropological theory can further examine the difference between expectations and imagination through the window of natural resources. Adopting this framework, this study places uranium at the centre of inquiry.

The ambivalent connotations of expectations and anticipation of youth, modernity, and development lead to another avenue of exploration of expectations, through risk and uncertainty. In examining the Mkuju River Project, contaminations of (non)human bodies and systems are most immediately applicable. Calculations of risk were originally designed as a neutral tool for assessment of events and possible outcomes. Since the 1960s, academics increasingly questioned the concept of risk as an apolitical, objective term. Mary Douglas (1992) has been particularly influential in the academic debate on risk, identifying that perception of risk depends on the time frame and the role of knowledge, or rumours, as well as what is considered acceptable. One of Douglas's strongest arguments is for the role of culture in the perception and definition of risk (1992; Douglas and Wildavsky 1982). Because of these factors, which can never be the same for all people, Douglas argues there can never be a single concept of risk. Building on this assumption, Hecht (1996) takes a step further, seeing that the construction of risk can be part of the process of creating social identities. Using cultural analysis in their investigation of social forces behind the American environmental movement, Douglas and Wildavsky (1982) find that, though experts are consulted for the assessment of risk, they do not always agree on problems or solutions, in

part because moral systems and political inclinations define when risks are perceived to become unacceptable. In the most important addition to the study of risk, Beck (1992) asserts that we are in a transition from an industrial society to a 'risk society' that is producing risks as well as wealth, and is increasingly focused on minimizing 'bad' risks. In this context, it seems that anthropology is the discipline best suited to reverse the general social science trend to simplify the complexity of risk in context, by employing ethnography to reveal the contextual importance and the relational aspects of risk (Boholm 2003).

Risk associated with radioactive uranium calls for special attention in this thesis. In her examination of the value of life in the post-Chernobyl context, Adriana Petryna (2002) engages extensively with theories of risk relating to exposure to radiation. Petryna explores the relationship between scientific knowledge of radiation and perception of risk. Uncertainty about risk, as perceived by the public, was worsened in the Chernobyl case because of scientific discrepancies and their political and moral underpinnings. Petryna asserts that knowledge about radiation risk is 'brokered' (ibid., p.51) by political, economic, and scientific factors. Conflicting information about the risks associated with radiation leads to situations of uncertainty (ibid.; Abbott et al. 2006; Barnes 2016).

Rather than emphasize risk, this thesis highlights the underlying state(s) of uncertainty. We might conceptualize uncertainty as separate from risk and danger, something not necessarily mitigated by more knowledge (Samimian-Darash and Rabinow 2015). Foregrounding uncertainty as a line of inquiry received criticism due to the difficulty of studying something so ubiquitous, which is everywhere and nowhere at the same time. Still, the anthropological investigation of uncertainty has a long genealogy, from Evans-Pritchard's (1937) study of witchcraft and magic which examined the ways the Azande mitigated uncertainty. Recent anthropological exploration of uncertainty, particularly in Africa, highlights that it is a dominant trope, and can reveal a positive, productive space, not

necessarily constricting options due to the vulnerability of actors living with limited knowledge of future events (Cooper and Pratten 2015). To attend to the concerns of the universality of uncertainty, this thesis narrowly approaches uncertainty through the vector of rumours (Bonhomme 2012). Risk and uncertainty in association with the Mkuju River Project receive in-depth consideration in chapters seven and eight.

In the liminal spaces occupied by people attempting to plan with imperfect knowledge of the future, like those impacted by the Mkuju River Project, anthropology adds interesting theories, grounded in West African ethnography. The theory of social navigation, developed by Vigh (2006), describes the strategic decision-making process revealed by ethnographic research on young male soldiers in Guinea Bissau. Identifying young men as agents guiding their lives through the complexities of the warzone, Vigh refuses to paint these soldiers as passive actors who move through the war as victims or pawns. Similarly, Utas (2005) finds social navigation an apt description of the tactical, strategic decision-making in the cultivation and maintenance of relationships by women and girls in Liberia. In and out of war, the theory of navigation returns agency to actors often considered marginalized, whose calculated plans during times of uncertainty tend to be ignored in favour of large, outside forces (Archambault 2013). Social navigation allows for a sensitive examination of the ways in which people in the area around the Mkuju River Project, as well as national-level and international actors, integrate expectations, hopes, risks, and value(s) into a framework for planning for the future, without forgetting that each brings with them historical connections with the resources at stake.

Heritage, Memory, History

Continuing to engage with the second conceptual line of inquiry, around temporality, this section concentrates on the past, through a consideration of heritage, a reflection on memory, and then finally accounting for history. Since UNESCO inscribed the Selous Game Reserve

on its list of World Heritage Sites, a summary of recent discussions of heritage may be relevant. Scholarly work claims that heritage has reached a stage of ubiquity in contemporary times, but because it is omnipresent yet constantly evolving, it has become a difficult term to define (Harrison 2013). Still, there are certain agreed upon aspects of heritage. Heritage reflects a concept of modernity based on a linearity of time, separating past from present. A perceived threat or risk motivates some contemporary heritage preservation practices. Many agree that heritage is contested and evolving (De Jong and Rowlands 2007; Harrison 2004). Heritage may be performed for the 'other' in ways that illuminate the ongoing dialogue between the present and the past (Harrison 2004). Tucker and Carnegie (2014) illustrate this tension through the performances of tour guides at the UNESCO listed Göreme Open-Air Museum, consisting of Byzantine churches in Turkey, who share unofficial, sometimes contradictory narratives of the site with non-religiously affiliated tourists, rather than with religious pilgrims.

The concept of 'world' heritage, based on the idea of 'universal' heritage values, is contested both in terms of who owns heritage in addition to how heritage is defined (Harrison 2013). The 1972 Convention Concerning the Protection of the World Heritage and Natural Heritage (the Heritage Convention) produced a regime to manage 'world' heritage. The World Heritage Committee, composed of twenty-one elected states and a bureau that carries out daily activities, is responsible for inscribing and preserving sites on the World Heritage List. States party to the Heritage Convention can nominate spaces, performances, practices, artefacts, and archives for consideration for the World Heritage List.[3] Through this process, UNESCO and the World Heritage Committee 'promote technologies for producing pasts and futures' (De Jong and Rowlands 2007, p.15) and inevitably transform the places, objects, and

[3] For a detailed overview of the World Heritage Committee nomination and review process, see Maswood (2000).

practices they attempt to preserve (Berliner 2012). The nominees are then subject to evaluation in connection with expert advice from agencies affiliated with the World Heritage Committee.

In 1992, the World Heritage Committee adopted the term 'cultural landscape' to define spaces where environmental and cultural features are present (Misra 2008), reflecting ideas that landscapes can be part of individual and collective heritage (Harrison 2004). 'Natural' landscapes, such as the Selous, are included on the World Heritage List as a separate category. The value systems supporting UNESCO sites of World Heritage are also linked with the financial value associated with the label. Inclusion on the list of World Heritage, with its potential to bring more tourists and revenue to a site, can be highly valuable for a country, and, as a result, the UNESCO governing bodies hold power in terms of defining natural or cultural 'world' heritage (Harrison 2004). This commoditization of places, practices, and objects of heritage is one example of the role that value systems—in this case one in which the World Heritage regime defines what can be considered to be of 'outstanding universal value' to humanity and posterity—play in constructing the monetized value of something intangible. The role of the World Heritage List in ascribing value and worthiness to that heritage site cannot be separated from the (unintended?) consequence of diminishing the worthiness of the people associated with that cultural practice, landscape, or object. This abjection may come by being labeled as non-modern through their relations with this heritage of old, or by marking those people as threats to the integrity of this element of natural, cultural, or intangible heritage (Peutz 2011).

The UNESCO World Heritage Site, the mine, and the development (e.g. paved roads) associated with this particular extractive project may suggest an infrastructural angle of analysis (Larkin 2013). Infrastructure characteristically operates on multiple levels concurrently. The UNESCO label, along with the mine, will bring Tanzanian natural

resources (wildlife and uranium) into pre-existing international networks. The supra-national organization regulating 'world' heritage and the global uranium market are composed of systems with specific internal and external political dynamics and histories. Beyond the technical, tangible influence of change, infrastructure is inscribed with the hopes and expectations of people who may see themselves connecting with the 'modern'. Infrastructural projects of modernization, while building over history, can in some instances make the past increasingly tangible, and the future ambivalent. As Masquelier (2002) articulates in her study of the modernity of an asphalt highway in Niger, the paved road and its benefits are calculated against and are also inseparable from its connection to a colonial history of violence and memories of forced labour among some Hausaphone Mawri. Particularly in the post-colonial context, where infrastructural initiatives often represent the state's investment in a project of modernization, futures are inherently connected with developmentalist ideals.

Discussions of heritage necessarily become entangled with discussions around memory and memorialization. The making of heritage depends on technologies designed to encourage remembering, or by 'coordinated' acts of forgetting episodes of history (Harrison 2004; Connerton 1989). In the early twentieth century, the Durkheimian scholar M. Halbwachs demonstrated that memory is not the function of an individual mind in isolation, but a social fact (Coser 1992). Halbwachs did not deny that individuals remember, but highlighted that memories are socially referenced across time as well as space. Specifically, he demonstrated how 'social memory' requires support from the associated social group (e.g. religion, class, and nationality). He also considered how present circumstances impact the remembering of historical events. Based on the Halbwachian models of social and collective memory, Mary Douglas (1986) examined how institutions direct public memory. Research built upon this foundation now identifies the role of memories shared within generations in

shaping differential experiences of the present based on those shared memories of the past (Connerton 1989).

History, like memory, can be deployed as a political tool (Lunstrum 2010), and in this way I see it as inevitably linked with contextual knowledge production (Harris 2007). In chapter two, I search through history in the context of the creation of a protected area, the Selous Game Reserve, and in chapter three I investigate how memory and history are strategically deployed to justify claims to the space (and wealth) of the uranium mine. To this end, I engage along and across the grain of archival evidence (Stoler 2009) to contextualize the seemingly unprecedented discovery and development of uranium in Tanzania. This strategy is influenced by the critical turn of the social sciences which opened new ways to employ historical studies. Social histories, and their critiques, can demonstrate the power of anthropological participation in subject-making and knowledge-making, particularly through the discipline's entanglement in colonial regimes.

In anthropology, Wolf (1982) influentially called for renewed efforts to set aside tendencies to see non-Europeans as pristine and isolated prior to European contact and instead to seek out the history of the non-elites and those (perhaps) without (intentional) representation in traditional historical sources. Wolf drew attention to the need for a sensitivity to the manifold ways geographically distinct parts of the world experienced connection before Europeans arrived. Although criticized for fetishizing commodities, the combination of history and anthropology yielded productive studies of the social history of commodities (Mintz 1986). Such commodity histories inform our understanding not only of the physical objects themselves, but also about their place in the world. In some ways following the anti-colonial trajectory of African history, the emergent field of environmental history opened up a historical analysis that emphasizes the non-human (McNeill 2001; Balée 1998). African environmental histories have developed dramatically since the last quarter of

the twentieth century (Beinart 2000; Moore 1998a; Carruthers 2004; Giles-Vernick 2002), allowing for a subaltern (re)examination of history (or histories) and the study of the political deployment of history in the context of natural resource management.

This section engaged broadly with elements of temporality. Bringing together heritage, history, and memory with expectations for the future, including uncertainties associated with uranium mining, temporalities underlie many aspects of the development of the Mkuju River Project. Although bygone, the past, through heritage, memories, and history, can still impact the present as well as the future. Given the significance of the past, the next section reviews the political ecology of Tanzanian natural resource management.

Contextualizing Tanzanian Natural Resource Management

To appreciate the development of the Mkuju River Project, we can situate it within the history of Tanzanian natural resource management, because rich natural resources have undoubtedly shaped Tanzania. From precolonial times to present, natural resource management and policy furthered a development agenda by controlling the rural population. Tanzania's historical experience, due to its position along a major ivory and slave trading route, as a German and then British colony, and its ongoing negotiations of its post-colonial, postsocialist future can be examined through the evolution of its natural resource management policies. The development of ideologies behind state ownership and private ownership of property applied to resources including land and sub-surface minerals can also be applied to forest resources and wildlife management. One-third of Tanzania's land is currently protected under a tiered conservation scheme that evolved from German colonial hunting sanctuaries to what exists now (World Bank 2014)—the largest estate of protected areas in Africa (Brockington, Sachedina, et al. 2008). Tourism, mainly in these protected areas, accounted for nearly fourteen percent of Tanzania's gross domestic product in 2016

(WTTC 2017). The intense levels of conservation activities and associated wildlife tourism suggest why Tanzania has become such a locus for the study of natural resource management practices in sub-Saharan Africa.

Antecedents in Precolonial History

There is little historical evidence regarding precolonial Tanzania outside of the coast, where the Indian Ocean trade network thrived, and written histories are available. Some historians posit that the low fertility of Tanzanian soils resulted in limited surplus, few technological advances, and few complex societies (Sheriff 1979). Regional trade routes in the interior focused on key goods, including iron, salt, and ivory and, until the late eighteenth century, it is thought that the interior of Tanzania developed without the influence of the Indian Ocean trade, or other external, global forces (ibid.; Iliffe 1979). The precolonial economy, though having a firm foundation in the trade of ivory and slaves in addition to animal husbandry and agriculture, disintegrated in the 1890s when German influence solidified (Kjekshus 1977, p.182). From forest products including timber, honey, and wax to underwater reefs and stocks of fish, to the tourism potential of attractions like Africa's tallest mountain, Mt. Kilimanjaro, the rest of this section takes a broad view of the category of natural resources and their exploitation throughout Tanzania's history. It illustrates how the political ecology of Tanzania today resulted from, and fits into, the larger story of the colonial legacy (Benjaminsen et al. 2013).

Colonial Influences on Natural Resources and their Management

Tanzania's natural resource management regime creates spaces that range from state-controlled, limited use national parks, to community-based conservation initiatives with theoretically devolved natural resource management regimes. This system traces its roots to

the times of German colonialism. German influence started in coastal areas in 1884 when agents of the German East Africa Company usurped chiefs' rights over land and forests (Sunseri 2009, p.22; Schabel 1990). In May 1891, the German colonial government introduced the first forest ordinances to regulate tree cutting and rationalize fee collection (on mangrove poles and firewood). German forestry systems came from European ('scientific') forestry, a system premised on beliefs of the scarcity of forests, and that forest resources were key to state revenue and economic development (Sunseri 2009, p.33). These models of state forestry, practiced in Asia, emphasized the separation of people from forests, and the principle that forests were to be managed for fuel and timber industries, are foundational for conceptualizing spaces of 'nature' (Descola and Pálsson 1996), as well as control over natural resources.

The roots of liberal resource control policy can be traced back to European concepts of property ownership and the creation of the concession system. In Tanzania, this began with the German Imperial Land Ordinance of 1895, in which all land not belonging to 'natives' or private individuals became 'crown land'. German rule was interrupted in 1905 by the Maji Maji War. The largest armed resistance against German colonialism in what is now Tanzania, the Maji Maji War has been the subject of intensive scholarly analysis (Iliffe 1967; Monson 1998; Ranger 1968; Adas 1979; Giblin and Monson 2010). Compelling explanations identify that rebellion began in southeastern Tanzania, in an area far from the most intense German development, but instead, where access to forests were drastically reduced by forest ordinances (Sunseri 2003). The war spread across the entire southern half of the colony and, by 1907, the Germans suppressed the rebellion with a scorched earth campaign. Shortly thereafter, World War I brought hostilities to the colony again. German and British forces crisscrossed the country, conscripting soldiers and porters, and ignoring German conservation initiatives by utilizing forest resources and wildlife to provision troops, resulting in

immediate devastation from military struggle, and associated impacts from famine and disease (Iliffe 1979).

Through the Treaty of Versailles, part of German East Africa, re-named Tanganyika, fell to British control. The Tanganyika Territory continued to supply natural resources to its European colonizers, with minimal infrastructural investment in the area. After World War I, the British reviewed German plans and reassessed their forest policies. The amount of land under protection did not change substantially (Neumann 1997), but the British eliminated reserves that were destroyed or neglected and created new 'Native Authority' forest reserves. The British bolstered the power of the 'chiefs' who administered the forest reserves via this Native Authority. The British also instituted a regime of scheduling trees and, therefore, the criminalization of other logging practices (Sunseri 2009, p.83). In addition to forest products, the British colonial regime set its sights on land. The British administration's Law of Property and Conveyance of 1923 went farther than earlier German regulations to annex occupied or supposedly unoccupied lands.

In addition to British interest in controlling forest resources and expanding the amount of government land, we can also see increased attention to sub-surface mineral rights. The Mining Ordinance of 1920 claimed underground minerals for the British Governor (Emel et al. 2011). Major gold discoveries in Tanganyika in 1921 influenced the colonial government to revise the mining policies to grant additional rights to large-scale miners, resulting in the 1929 Mining Ordinance. We can see how British colonial policy combined a desire to annex further land while rendering a scattered rural population primed for taxation and coerced labour through 'Closer Settlement' policy implemented from the 1930s-1940s. Concern about the advancement of the tsetse fly and the accompanying trypanosomiasis (African sleeping sickness) (Ford 1971) led the British, ostensibly, to institute the Closer Settlement policy to move peasants out of fly-ridden forests and woodlands into larger

villages (Sunseri 2009; Picard 2010; Neumann 2001). The implementation of Closer Settlement policy in the Selous is examined in chapter two.

Post-Colonial and (Post)socialist Natural Resources and their Management

British expansion of forests in the 1950s fuelled resentment that helped coalesce parts of the population behind the Tanganyika African National Union (TANU) (Sunseri 2009), which eventually led Tanganyika to independence in 1961. Once independent, TANU removed chiefs and absorbed the power they had over forests through the former Native Authority forest scheme. TANU saw forests as important for timber, poles, and fuel. Illegal encroachment on forests occurred countrywide, and, in a divergence with colonial policy, TANU permitted greater peasant access to forests (Sunseri 2009, p.143). In 1967, President Julius Nyerere introduced the Arusha Declaration and the *Ujamaa* African socialist experiment began. The Arusha Declaration, as did previous colonial ideologies, called for natural resources to be utilized, however, it added a socialist perspective, noting that natural resources would be collectively, rather than privately, owned and should benefit the country and future generations.[4] A main tenet of *Ujamaa* was 'villagization', the collectivization of the dispersed rural population into planned villages (Picard 2010; Scott 1998; Lal 2012). By 1976, between five and thirteen million people were relocated in an effort to make the distribution of state services (e.g. health and education) and agriculture more efficient. From 1975-1977, the country experienced drought and President Nyerere called on the nation to farm everywhere possible, and, as a result, conservation priorities were set aside (Sunseri

[4] This, in some ways, marks a departure from Nyerere's statements in 1961, known as the Arusha Manifesto, which emphasized the conservation of wildlife and wild spaces.

2009). In the name of developing the fledgling nation, in the first two decades of independence, Tanzania's forest resources were made available for extraction.

The socialist period drew to an end in 1986, when Tanzania accepted World Bank structural adjustment policies, and set itself on a path of economic liberalization. As part of this transition, in addition to reversing the nationalization of large industries, the structure of governance in Tanzania underwent a process of decentralization, emphasizing the autonomy of local government authorities (Kessy and McCourt 2010). During the same period, from 1985-1995, came incredible growth in protected areas in the form of Forest Reserves, Game Reserves, Marine Parks, National Parks, and Wildlife Management Areas (WMAs) in Tanzania (Brockington, Duffy, et al. 2008). Neoliberal ideas appear to be pervasive in the more contemporary conservation policies and practices seen in Tanzania. This took place parallel to the rise of tourism, especially ecotourism, touted as the way for conservation to pay for itself (ibid.). In association with this neoliberal growth came a renewed commitment to preserving wildlife by forcibly excluding people from protected areas: a 'fortress' strategy for conservation emphasizing fences for exclusion and fines for illegal use of resources (Brockington 2002).

In the late 1990s, partly in response to the often-violent forms which 'fortress' conservation assumed, Tanzania introduced legislation requiring conservation efforts to also benefit the people of Tanzania. This took the form of embracing the community-based natural resource management ideology and paving the way for WMAs (Igoe and Croucher 2010). Ecotourism, through WMAs and other protected areas, was depicted as a magic bullet, solving the perceived problems of development and conservation simultaneously. Although this is a tenet questioned extensively in recent literature, this developmentalist idea is still influential to Tanzanian conservation policy. Tanzania continues to increase the number of WMAs and remains committed to its conservation agenda. With some controversy, Tanzania

permits sport hunting within certain protected areas, including the Selous. This aligns with one perspective in conservation philosophy which promotes hunting as a tool for devolving resource protection to private hunting companies that protect wildlife in their concession (and therefore their investment) while generating a profit for the national government through various associated fees (Nelson 2009; Sachedina 2008; Benjaminsen et al. 2013; Baldus and Cauldwell 2004; Lindsey et al. 2012; Peterson 2004; Loveridge et al. 2007; MacDonald 2005; IUCN/PAPACO 2009).

The evolution of Tanzania's natural resource management ideologies can be seen specifically through shifting mining policies. After independence, President Nyerere espoused beliefs of self-reliance, including that Tanzania should not allow large-scale mining until Tanzanians had the ability to act as skilled mineworkers. The 1969 revision to the 1929 mining legislation reflects this change, granting absolute authority over the mining permitting process to the government and vesting all sub-surface minerals as property of the President of the country. Nationalization of gemstone mines and gold mines continued until l979 when the legal framework for mining began to change again. By the mid 1980s, the industry liberalized and private foreign entities could again purchase licenses for large-scale mining activities. Following structural adjustment policies, the State Mining Company (STAMICO) ceased to control the mining industry. Small-scale and artisanal mining remained safeguarded until 1996, when Tanzanian police violently evicted small-scale miners from an area to be given to Canadian mining giant Barrick Gold, further signalling the shift away from socialist commitment to self-reliance and toward a neoliberal model of extraction. The Mining Act, 1998, granted long-term land tenure to mining companies and asked for a small percentage of royalties, following neoliberal models.

Tanzania's increasingly neoliberal vision for the future includes a pledge to increase domestic mineral extraction as part of its commitment to becoming a middle-income country

by 2025. Numerous mining review commissions convened in response to widespread domestic disappointment with the limited financial benefits coming to the country from mining, ultimately resulted in a new mining law in 2010. This law requires the Tanzanian government to own equity in projects with capital investment larger than $100 million and increases royalties from three to four percent for gold (Emel et al. 2011). Despite the recent stagnation of mineral prices on the international market, Tanzanian President Dr John Magufuli successfully campaigned in 2015 on promises to increase mining in the nation, including uranium, and since then Tanzania's Ministry of Energy and Minerals continues to allocate uranium exploration licenses.[5]

This overview of the evolution of Tanzanian natural resource management traced precolonial emphasis on ivory trade, to colonial ordinances which sought to take control over land and other natural resources from the largely rural population, to a brief socialist experiment, and on to the neoliberal model in which Tanzanian natural resource management practices fit today. The themes of controlling rural populations and of denying rural populations access to natural resources repeat throughout this history. Moving from the rather abstract notions discussed in the theoretical framework and conceptualizations of the political ecology of Tanzanian natural resource management, to the realities of rural Tanzania, the next section discusses the methodology employed in this study.

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[5] Magufuli has shaken up the Tanzanian mining industry since 2017. Tanzania accused gold mining company Acacia of evading taxes in 2016 and underreporting the minerals contained in its concentrate exports, which they settled for $300 million. This led to a March 2017 export ban on Tanzanian gold and copper concentrate exports and the firing of the minister of Energy and Minerals, Sospeter Muhongo, in May 2017. In July 2017, Tanzania passed new mining laws aimed at redistributing wealth by requiring the government to own at least a sixteen percent stake in mining projects, increasing royalties, giving the government permission to revoke or renegotiate contracts, and removing the right to international arbitration. In August 2017, Tanzania blocked the export of a shipment of diamonds, allegedly undervalued by $15 million. In October 2017, Magufuli split the Ministry of Energy and Minerals into separate ministries. In February 2018, companies were given three months to come into compliance with new mining regulations: indigenous companies are to be given preference in mining licensing and supply sourcing, mining activities must be banked and insured through local firms, and more (Latif 2018). This thesis uses the name Ministry of Energy and Minerals, reflecting the terminology of the period of study.

Research Methods

Introducing myself to villagers around the Mkuju River Project, I often received variations on the question: 'Why are you here?' Depending on the day, this somehow existential question kept me grounded and focused on the original intentions of the research. From the start, I wanted to examine the intersection of conservation, development, and extraction. Inspired by existing studies in similar contexts around the world, I hoped to move past narrow, sensational, or glossy portrayals of conflicts over natural resources and instead deeply immerse myself in an area, learning the root causes bringing us to the apparent junction of seemingly incompatible resource management strategies and value systems. The particular details of the Mkuju River Project—its implications for the examination of heritage and value, in addition to the relative uniqueness of studying the development of a country's first uranium mine—appealed to me as I was considering various places of 'friction' (Tsing 2004) where I could potentially site my research.

In the process of designing this study around the development of the Mkuju River Project, I felt the direction paved by trying to resolve two dilemmas. The first relates to space and scale. How could I design a methodology to appreciate the immensity of the Selous Game Reserve? The Selous physically occupies an enormous space in the country. It funds the 'cash cow' (cash elephant?) that is the Ministry of Natural Resources and Tourism, but without carrying political weight. Decisions associated with the Selous have had an (equally) outsized impact on the creation and evolution of Tanzanian political ecology. In addition, I wanted to conduct a study that would investigate the emergence of the mine on the micro level without ignoring the macro level, training attention on local and also national, regional, and international actors. This required creating a methodology sensitive to various experiences in different geographical spaces and scales. It also opened up the possibility of analysis of the interaction between players across scales.

The second dilemma presents itself, broadly, as time. All the research for this thesis took place before mining started, when there was a real chance the project could fail. Although examining a failed project can have merit (Latour 1996), I wanted to keep a view of this single mining project within a larger context of natural resource management in the area; the success or failure of my study could not be correlated with that of the project. However, uncertainty toward the future with or without the mine inevitably drove me to concentrate on expectations for the future. From a theoretical perspective as well as from experiences on the ground, placing a priority on collecting ethnographic evidence regarding this aspect of anticipation became imperative to the study. Even though it seemed critical, expectations felt increasingly ephemeral the closer I came to investigating them. This fascination and frustration with futures and the importance of considering how people in complex, shifting situations make decisions, gave way to a realization that this theoretical preoccupation meant I risked 'running the race wearing blinders'. Concentrating only on expectations for the future constrained me to an ahistorical, forward-looking framework.

Responding to the constriction caused by a focus on expectations led me to attempt to integrate a level of ethno-historical analysis. The historical angle integrated a sensitivity to time passed as well as what lies ahead into my framework of political ecology and expectations. Pressing past the human-centred investigation of expectations to include forests and their futures and pasts, I saw that integrating archival evidence would lead to a more robust methodology for considering pasts and futures in the specific space around the Mkuju River Project. Knowing the archives were unlikely to contain voices outside of the colonial regime, I set out to collect oral histories from villages around the planned mine. I also hoped to explore historical material that could tell the story of the inanimate, valuable mineral in question. This framework of histories and expectations all stood in the shadow of the infinite,

intangible potentiality of radiation associated with the uranium to be mined at the Mkuju River Project.

Maps of the Selous and maps of the uranium mining prospects are common, and visually appealed to me. The content of these two kinds of maps might cover the same geographic area, but frequently have little shared information. Merging the materiality of resources in this area with an attempt to grapple with the vastness of the Selous wilderness, I continually returned to maps. The image of these two very separate genres of maps, speaking to the epistemologies of conservation and extraction, became another element of the study's methodology.

Methodology

To meet the scaled needs of my study, I worked at multiple levels. Starting with the mine as a focal point, I expanded to make the area surrounding and including the mine the place of primary interest. I identified the villages closest to the mine, all in the ward of Likuyu. This geographical and governance attention coincided with where the road to the mine would pass, as well as the location of most of the mining company's community-oriented corporate social responsibility projects. The activities in the villages appeared disjointed from the decisions made about mining activity and the related infrastructural and policy planning going on around it. So, I went to the decision-makers. I conducted elite interviews at the District headquarters, in Namtumbo. I went to Songea, the regional seat, to learn from regional administrators and civil society groups active on the issue. In the administrative capital, Dar es Salaam, I engaged with larger domestic and international organizations as well as various regulatory and government officials.

I divided my research into four main sections by research activity: three ethnographic and the fourth archival. The first section centred on history and general familiarity with the

villages closest to the mine, the second on natural resource management and mapping in those villages, and the third in the villages on expectations for the future. The field research periods ran from August 2014 to August 2015, and May to August 2016. I conducted research in the villages almost exclusively in Kiswahili. I did not work with a translator or research assistant, and all translations and paraphrases that follow are my own. In each village, I was assigned a minder. These people, and many others, assisted me in various capacities from introducing me to villagers to helping me to literally find my way.

For the first phase of my research, I prioritized collecting oral histories, beginning participant observation, and introducing myself to the village where I would spend the greatest amount of time. It was immediately evident that there was suspicion about my presence in the area and hence the common inquiry as to why I was there. There were many questions about whether I worked for the mining company, was part of the Tanzanian government, or was an independent mineral surveyor. Over time, many of these concerns were allayed. Focusing the beginning of my research on oral histories and life histories allowed me to accomplish several things. This logistical decision took into account my positionality and allowed me to introduce myself to elders in the village. I demonstrated that I would be present in the village to learn from speaking with people, and that I had an interest in the history of the village. In addition, meeting and interacting with elders gave the rest of the villagers a chance to see my intentions and methods, forming a foundation of predictability and mutual trust.

I began the process of collecting oral histories with introductions made by village leaders. Research conversations nearly always took place at the home of the elders. This led to snowball sampling based on the participants' suggestions of who to speak with in order to gather additional histories. The process for collecting a life history began with introductions and an explanation of my efforts to collect histories of the village. Where the elder was

unwilling or unable to start the conversation, I prompted with suggestions of where they might start their story: the year and location of their birth. From there, they would continue with their memories and I would ask clarifying questions when needed. During this phase of research, I had the opportunity to visit the mine, where I spent three days and toured the facilities.

During this period, I also participated in village government meetings in order to develop an understanding of the workings of a single village, as a unit and how it fit with larger district, regional, and national politics. This included extended, serial interviews with village leaders, appointed and elected. Throughout this time, I learned more about the mining company's corporate social responsibility projects in the villages and participated in meetings between the mining company and village representatives. In addition, during this time I identified key village-level interlocutors whose life paths intersected with the plans for the mine. This included three main individuals and their families. The first centred on a female village-level administrator. A female who runs a business provisioning the mining company acted as the second. A woman whose husband works for the mining company served as the third. These three key interlocutors were women. In the past, there has been a bias in studies of extraction projects centred on the male-dominated experiences of mining, and the field has benefitted from recent examinations of the role of gender in extraction (Kotsadam and Tolonen 2016). Considering that the majority of manual labour jobs in the mine will likely be filled by men, focusing on women appeared as a way to understand how the future looked from the perspective of those outside of the mine. Additionally, in this village and many others, women are usually immediately responsible for accessing and managing natural resources (Harnish 2013). Women are often the primary farmers in the family, they are responsible for collecting water for household purposes, and they are usually responsible for provisioning the house with fuel (firewood, charcoal). Centring my methodology on women

allowed me to see how natural resources are accessed and how uncertain futures are navigated near the planned mine before industrial extraction began.

In the second research phase, I attended to natural resources in the area. I continued to follow the life choices and events impacting the three key interlocutors and their families during this time. As part of my effort to understand the transformation of space across natural and political boundaries, I decided to engage in map analysis and map making. I examined maps of the area, including maps relating to natural resource conservation, uranium mining, and government maps. I met with mapmakers to discuss the cartographic process. Village leaders explained the history of their village maps and together we analyzed the maps. With support and permission from the village leadership, I began to map natural resources of importance to the village. This involved visiting water wells, sources of clay for bricks, areas mined for sand used for making plaster, rivers, quarries, ponds, and forests. On each mapping visit, at least one person, usually a woman who used the resources personally, would accompany me. This drew from various studies demonstrating the value of walking in specific places and using mapping to access information about resources and their contextual management which would otherwise be unavailable (Basso 1996; Schama 1995; Moore 1998b). I recorded the location of the resources using a Global Positioning System (Garmin eTrex 10 GPS), photographed the sites, and recorded information relating to the history of the resources and the ways in which the resources were utilized. Additionally, since land is a critical resource (Peluso 1995), I mapped areas where there were conflicts over land use and ownership.

The final ethnographic phase focused on expectations. Throughout the previous three phases, the topic arose organically from time to time. In the end, this passive ethnography did not seem to give people a chance to voice their opinions about their expectations. Women, in particular, might not openly discuss plans for the future or opinions about village activities in

ordinary conversation. I decided to explicitly discuss expectations to try to overcome these limitations. I generally discussed expectations in the context of collecting additional oral histories with new participants. During this phase of research, I emphasized speaking with youth, who I identified as being between the ages of eighteen and forty-five, about expectations for the future in the three villages composing the governance unit (ward) closest to the Mkuju River Project. I invited participants to discuss plans for their personal future, personal economic prospects, in addition to expectations of how the village will change. I provided short and long-term frames of time for the participants to consider their expectations: in the coming year, five years, and ten years.

My ethnographic research in the villages around the mine anchored historical research I conducted in various archives. I examined archives predominantly at the Tanzania National Archives (TNA), but also at the British Library, Rhodes House Archives, the East Africana Collection at the University of Dar es Salaam, and the Geological Survey of Tanzania (GST). I unsuccessfully attempted to access the archives at Peramiho Mission. I also attempted to access the Tanzanian Military Archives, but I was not granted access to the archives in time to be included in this study. At the various archives, I searched for information related to the creation and management of the Selous Game Reserve, especially the southwestern section. I looked for documents relating to the Ndendeule people who are the predominant group living in the area around the mine. I also searched for the history of uranium mining in Tanzania. Finally, I looked for information that related to the existing academic discussion about Tanzanian natural resource management.

Beyond the archives, I tried to follow the threads of activities taking place in the villages. In Dar es Salaam, I conducted elite interviews with donor organizations funding projects in the area. I interviewed organizations implementing the donor-funded projects in the area around the mine. I interviewed government officials regarding mining, conservation,

and development in Namtumbo, Songea, and Dar es Salaam. The elite interviews I conducted found a bridge point in a small number of civil society organizations active in the villages themselves. Representatives from these organizations became key interlocutors in this study, gatekeepers with knowledge at the local level and an understanding of the macro level politics driving the project's development, or lack thereof.

Limitations and Ethics

My positionality as an unmarried, young, white woman conducting research in a rural, predominantly Muslim area of Tanzania influenced my research. Cutting both ways, positionality can open and close doors in all research. White privilege greased the wheels for certain interactions, and having white skin created obstacles at other times (Kvale 2006). Being a woman drew attention from a variety of actors, but also allowed me the opportunity to engage with Tanzanian women in ways they might not have been comfortable doing with a man. These realities impacted the methodology I designed and reworked in the field setting as well as in my analysis.

Ethics of a study involving large-scale extraction in a poor, rural, isolated area are complex. In terms of receiving consent from research participants, I privileged anonymity over obtaining recorded consent, and did not use audio recording for any Kiswahili conversations. Except for participants fluent in English, from whom I collected written consent for their participation, I acquired oral consent from all other participants. In situations such as this, where existing power dynamics have created a culture of suspicion, attempting to secure written consent seemed inappropriate for my research. By obtaining oral consent and anonymizing all notes unless participants asked to be identified, I promoted an atmosphere of trust with interlocutors. This study received ethical approval through the Central University Research Ethics Committee (CUREC) at the University of Oxford. The

fieldwork associated with this study was reviewed by and received approval from the Tanzanian Commission for Science and Technology (COSTECH). Further, the Tanzanian Ministry for Natural Resources and Tourism, Wildlife Division, provided approval for me to enter the Selous Game Reserve and interview Selous staff as needed for research.

As mentioned previously, maps reinforce, promote, and allow the persistence of discourses of power defining the spaces they depict. By making my own maps, I engaged directly in some of the reifying activities that I attempt to analyze. The dangers of this methodology include: reinforcing existing power structures, creating new power structures, making 'invisible' people and resources 'visible' (Scott 1998), allowing mapping errors to persist, creating new mapping errors, and many more. However, these ethical obstacles seemed worth the risk in order to take a fresh look at the often-told story of resource exploitation. Existing players in mapping in the area are more powerful and create maps of greater credibility. The power structures that make my mapping less of a threat, underscore the importance of creating new maps that illustrate discourses of value that might not appear currently 'on the map'. To attempt to balance these competing demands, I use the maps I made for analytical support, but the maps themselves do not appear in this thesis.

Archival research is also inherently limited. Archival research in Tanzania can only begin with an awareness that the records available represent only a fraction of the historical record. At the TNA, there are no digital archives available, and many of the archival materials are disintegrating. At GST some digital archives are available, but the agency emphasizes its role as providing prompt assistance for customers purchasing maps. Tanzanian law prohibits public viewing of archival material less than thirty years old, or if a file is still active. Additionally, it is to be expected that many files will be missing, due to either poor organization, an inefficient filing system, loss over time, theft, or age. Historians also surmise that during World War II the British colonial government re-used paper and

therefore erased archival information. For these reasons, archival research faces limitations in Tanzania. My study of the German archives was limited in scope to specific areas of interest, rather than a full examination of the archival inventory, due to my own limited language ability.

Thesis Outline

The research conducted in and around the Mkuju River in southern Tanzania engages with the interplay of history, heritage, value, and expectations with regimes of natural resource management. Conducting research in the period of time before major extraction began, this study reveals how individuals plan for their futures in the face of uncertainty. By emphasizing the *longue durée*, I intend to contextualize the current situation and positionality of actors within the historical record. Across scales and space, the thesis situates changes in ecology and land use amidst associated economic opportunities as well as limitations. Within the overarching theme of time—historical trajectories with expectations for the future and the infinite lifespan of radioactivity associated with uranium—this study re-examines the communities versus extraction narrative. The thesis breaks down into three sections: chapters two and three are about the past; chapters four, five, and six focus on the present; and chapters seven and eight look to the future.

In chapter two, I interrogate the Selous Game Reserve and its transformation over time. This section uses the cultural construction of nature, and a political ecology framework to consider changes in woodlands and land use over time. Arguing that the narrative of the Selous as a pristine wilderness is a misnomer, it investigates the human histories within this woodland. Within the broader context of the history of protected areas in Africa, I explore the specific history of the Selous and its environs, particularly regarding significant population changes. Following in the path of Fairhead and Leach (1995), I pair analysis of historical

records and ethnographic work. In doing so, I unravel how the miombo woodlands of the Selous are transformed and reveal the sometimes-hidden human histories within the wilderness. By piecing together oral histories and archival research, I aim to construct a more complex history of the Selous, one which shows how the Reserve has been repeatedly set aside for extraction.

Chapter three connects the human history of dispossession in the supposedly pristine Selous with planned uranium mining at the Mkuju River Project. I review the history of uranium as a global commodity, and then concentrate on uranium mining in Africa. Through archival revelations, I tell the story of the many false starts in the hunt for uranium in Tanzania, culminating in the discovery of the Nyota Prospect, which became the Mkuju River Project. I weave together this archival history with the ways in which people are actively engaging with their own pasts to navigate their current situations. I tie together these disparate historical trajectories—of the Selous and of Tanzanian uranium—with the concept of a 'sacrifice zone' in order to understand remote spaces subjected to extraction.

In chapter four, I discuss further the construction of nature as a culturally specific landscape, and tie concepts of wilderness with questions of ownership and control of these spaces under the auspices of the UNESCO-ification of the Selous. I examine the application of the UNESCO World Heritage Site category as a technology through which a so-called wilderness becomes 'heritage' of past and of future. From this angle, the agency of the UNESCO World Heritage Committee illuminates the power dynamics of a supra-national institution and its entanglement with member states and transnational private entities.

I highlight how this case adds to the growing body of literature on the so-called ecotourism-extraction nexus in chapter five. This nexus challenges simplistic narratives, which place ecotourism and extraction projects in opposition with each other. This chapter reveals how conservation and extraction interests can align. To do this, I focus on corporate

social responsibility projects, which intertwine mining companies with hunting companies and conservation initiatives. In this analysis, I reframe this node of engagement to place wildlife conservation and mining both in the category of 'extractives' in a way that contests assumptions that conservation is a universal good, or anything other than dependent on socially constructed concepts of nature.

The forces guiding conservation and extraction interests that dominated the previous chapters are moved to the background in chapter six, where I look at the connections between the value of land and land use management. I delve into how land, as perhaps the most important natural resource near the mine, is drawn into larger questions of value. Land use by locals, land acquisition by outsiders, and the annexation of land for government purposes are each considered. Here, I build on the anthropology of value and scrutinize the entanglement of value and values. I also start to survey how changes related to the mine are impacting nearby villages. To do this, I integrate critical map reading along with my own mapping activities.

Moving away from spatial preoccupations of the present, I examine expectations of the future in chapters seven and eight. Overwhelming local support for the project pins hopes for economic development on the mine, assuming it will bring jobs, corporate social responsibility projects from the mining company, and improved infrastructure. Yet, due to Tanzania's long history of mining, even though the Mkuju River Project is in an area without a history of large-scale mineral extraction, people are aware of some of the difficulties that might lie ahead when areas rapidly urbanize as a result of mining booms. Knowledge and rumours about uranium itself, its characteristics, risks, and uses as well as knowledge about the project, are shared and spread throughout the area around the mine. The economic, environmental, and social impacts of mines are well studied, and I build on this field by engaging with expectations and uncertainty to see how different actors are planning for the

changes coming to the area. I also address some questions of how new commodities and economic opportunities enter this rural part of southern Tanzania, and how associated knowledge is created and negotiated.

I conclude by reviewing how the area around the Selous Game Reserve became marginalized over the past century, serving as a peripheral area and a source of resources for extraction. The Mkuju River Project represents, not so much a project to damage a pristine wilderness, as another instance of extraction from the margins of Tanzania. Within the uncertainty of the situation, in the context of fluctuating demand for uranium and therefore the uncertainty of the mine, we have the ability to examine how people at all levels continue to navigate their futures. The narratives of wilderness and the technologies of heritage that erased the human history of people in the Selous created a group of people who experienced repeated dispossession. In the eyes of international conservation actors these people are assumed to have depleted the Selous of its valuable wildlife (elephants) and are now supporting a form of extraction (mining) that could further damage the ecosystem. By examining the value systems and taking an intersectional approach to natural resources this simplistic narrative falls apart. People in villages around the mine act based on value systems reflecting the precarity of their existence at the edge of a poorly managed game reserve with few options for economic advancement.

Chapter 2 Wild Pasts

Following in the path of Fairhead and Leach (1995), this chapter pairs ethno-historical analysis with ethnographic research. How can ecological history, in tandem with ethnographic research, advance a nuanced understanding of the historical evolution of natural resource management in southern Tanzania and the Selous specifically? To answer this question, this chapter confronts the narrative of the Selous as an ancient wilderness area, building on existing scholarship deconstructing concepts of nature and wilderness. To do this requires both an intimate ethnographic examination as well as a zoomed out, more detached consideration. I engage with material from colonial archival records, records of African liberation movements, narrative life histories, and original ethnographic research in order to piece together a social history of the southwestern part of the Selous, the site of planned uranium mining. Recounting these human histories in the Selous will be a key element of this chapter and its challenges to the 'wilderness narrative' of the Reserve. By integrating human and ecological histories, the Selous emerges as a place of refuge as well as a place of violence. The human histories left out of the wilderness narrative, once revealed, engender a re-examination of the area as a place of discipline, and perhaps also a peripheral area set aside for extraction. Valerie Kuletz (1998), and others (Cottle 2013; Fox 1999; Endres 2012), use the term 'sacrifice zone' to describe areas that have been 'de-territorialized' and set aside for the benefit of others, cementing its own path to degradation. The chapter lays the foundation of an argument for thinking of the Selous as a sacrifice zone, demonstrating that any uranium mining would be merely the next chapter in this long history.

Southern Tanzania and Protected Areas in Historical Perspective

> A group of us sit in the shade under the thatch-roofed *banda* in Likuyu Sekamaganga, one of the seven member-villages of the Mbarang'andu Wildlife Management Area. An elderly woman, a middle-aged man who is a neighbourhood leader, and a few young men and women discuss the ways people in the village use forest resources. They go into the forest to collect wood poles for building houses. They use the bark of certain trees to make rope to tie the poles together. They collect wild fruit. Everyone knows where to get the fruit, which is plentiful, I am patiently told. I asked how people felt about not being allowed into the nearby Selous to use the forest resources. The old woman says that they never benefit from the protected areas and that they go in anyways. The neighbourhood leader jumps in to say they never illegally enter the Selous to poach. He reminds the woman that they are very grateful for the maternity ward that the Wildlife Management Area built for the village just that year. Nodding in agreement, the woman remains silent for the rest of the conversation.
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Tanzania's protected areas testify to the Western models of nature that pervaded the minds of European colonial administrators responsible for creating conservation areas in Africa and elsewhere. The concept of 'wilderness', which was used to justify the creation of protected areas, emerged from Western notions of nature, and, in particular, out of the dualism separating spaces deemed 'natural' from those considered 'cultured' or 'civilized'. 'Wilderness' would be an extreme type of natural space, understood as primordial lands that were untouched and void of human settlement since the most distant times (Nash 2001; Beinart 1989; Townsend 2000; Ellen 2008). This conceptual construction of 'wilderness' as a special unpolluted space (Nash 2001) ignores the deep history of human interaction with and modification of landscapes (Neumann 1998). This dichotomous interpretation of space, as enacted through colonial policies, often denied alternative cosmologies of the relationship between humans and non-humans.

The construction of wilderness was conceptual, but also social. This ideology of wilderness, and the search for it, often endorsed the removal of local people from African protected areas, and, paradoxically, the import of rangers, scientists, and (foreign) tourists (Beinart 1989) to meet the aesthetic preferences for what protected areas should look like

(Neumann 1998). The legacy of the imagined African wilderness that Europeans brought with them to Africa in the days of colonialism lives on today. Popular media depictions create or foster the development of certain ideas about Africa and wildlife (Lutz and Collins 1993; Lekan 2011). Although not homogenous, narratives of the anthropomorphism of charismatic African animals, the idea of (white) humans protecting African wildlife, and a brewing 'crisis' facing African wildlife streamed into the imaginations of western audiences from colonial times until today.

In the midst of British Empire, these African wildlife narratives appeared in multiple forms, including that of the exotic African adventure book genre. Frederick Courteney Selous, a British-born elephant hunter, explorer, and naturalist, grew to fame writing about his experiences in South Africa from 1871 until his return to England in 1896. U.S. President Theodore Roosevelt, himself a force behind the creation of American national parks, called Selous the greatest big-game hunter (Baldus 2009a). In 1915, Selous returned to Africa to fight as part of the British World War I offensive in German East Africa, falling during the battle at Beho-Beho, in Mohoro Game Reserve. In honour of the famed hunter, the British later consolidated and renamed the reserve: the Selous Game Reserve. Although his hunting achievements were mostly in southern Africa, naming the protected area after Selous ties together the threads of popular depiction of 'African wilderness' with the romantic image of white hunters. The narrative of the white foreigner taming the African wilderness underscores the place of the Selous in Western imaginations. A selection of titles of recent popular literature featuring the Selous includes *Secret Eden: Africa's Enchanted Wilderness* (Robins and Kaplan 1980), *Ivory Knights* (Gordon 1991), and *Wild Heart of Africa* (Baldus 2009b), underlining the continuity of earlier colonial themes regarding notions of wilderness (Gissibl 2016). To contextualize the lived experience of those in the opening vignette with these portrayals of the Selous Game Reserve and conservationists' commitment to a particular

socially constructed notion of wilderness, we can start by looking back to the earliest days of the Reserve.

The Selous Game Reserve: Past and Present

In 1896, the German colonial government set aside two reserves, one of which became the Selous Game Reserve, making it the oldest protected area in Africa (Baldus 2006). Among the game and hunting regulations promulgated from 1896, the Germans made game licenses compulsory for hunting elephants, prohibited killing adult female elephants, set rules to confiscate tusks weighing less than fourteen pounds, and required hunters to relinquish one tusk of every pair to a district station (Beachey 1967). The British permitted trophy hunting in the Reserve, and renamed (1922), consolidated, and expanded the Selous from the 1920s to the end of colonial rule in 1961 (Matzke 1977; Neumann 2001). Independent Tanzania maintained the existence of the Selous, with boundary modifications through the 1960s and 1970s. With trophy hunting still permitted, in 1982, the UNESCO World Heritage Commission inscribed the Selous on its list of sites of outstanding universal value. The Selous remains a destination for sport hunting, attracting private investments from hunting safari companies and tourists by way of trophy fees, trophy-handling fees, hunting block fees, permit fees, and conservation fees.[6] The Selous continues to be a hotspot for elephant poaching and ivory trafficking.

[6] Tourist hunting, regulated through the Wildlife Division within the Tanzanian Ministry of Natural Resources and Tourism, receives great scrutiny for perceived opacity and corruption (Baldus 2006; Baldus and Cauldwell 2004). Elephant hunting safaris in the Selous cost approximately $30,000. Tanzania views regulated hunting as a key component of their conservation strategy in areas that are not suitable for photographic tourism. The Likuyu (southwestern) Sector of the Selous is generally agreed to be one such place. Academic and public debate continues over the effectiveness and morality of trophy hunting as a conservation strategy, which is considered in chapter four of the present thesis.

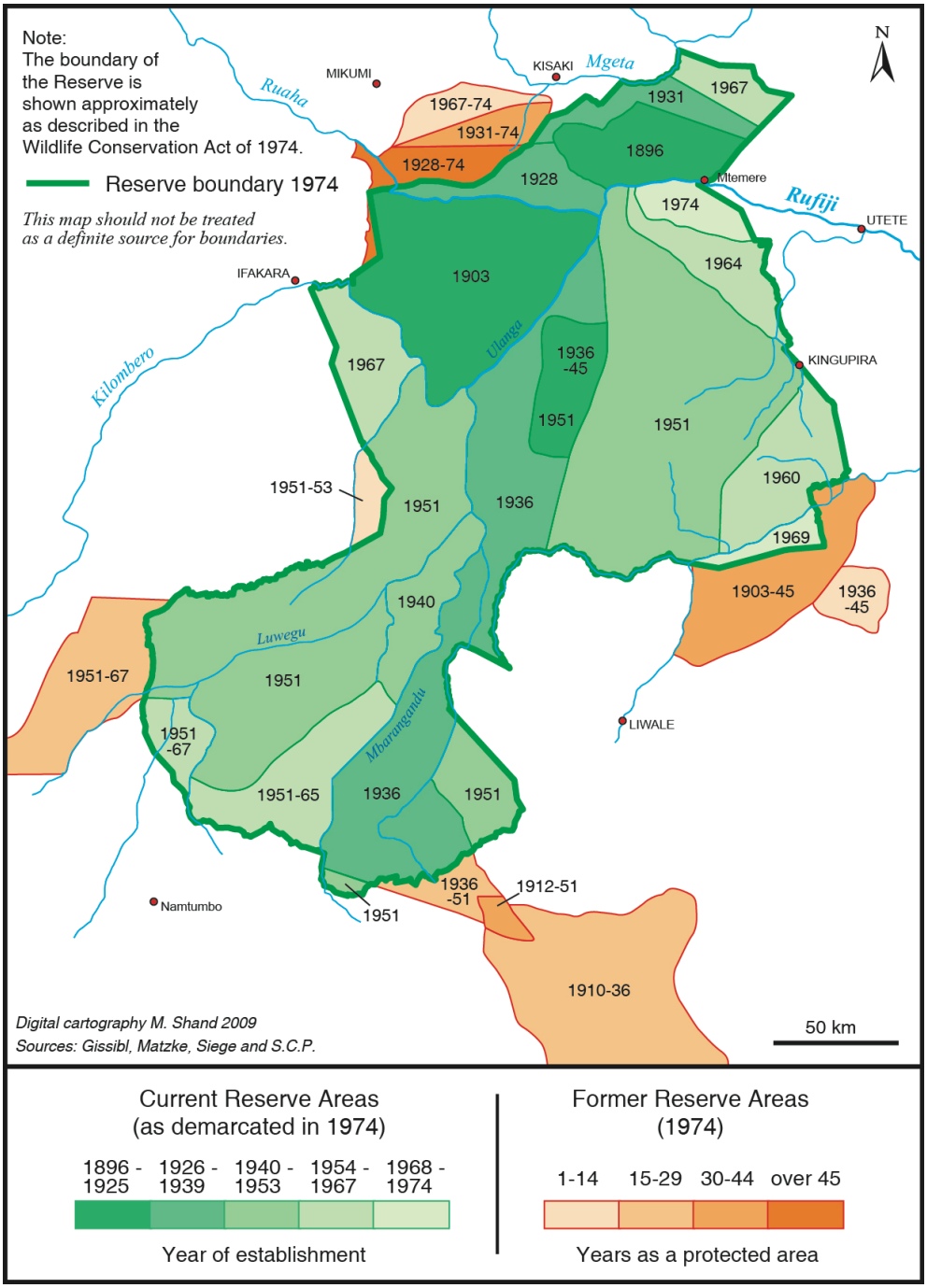


Figure 3 Map showing the Selous Game Reserve and its boundary changes over time. (Map by Mike Shand (Baldus 2009b)).

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'It's true that three years ago, poaching here was very high. That is obvious.'

Musiba Kombo, the sixth game warden of the Likuyu (southwestern) Sector of the Selous, sits behind a desk cluttered with papers. His office in the Game Reserve compound is just inside the gate controlling access to the road that leads into the Selous and on to the uranium mining camp. He starts to review the history of his sector, from its inception to today, in 2014. The Likuyu Sector was previously part of Kalulu (southern) Sector. In 1991 rangers were transferred to Likuyu Sector to protect the newly created southwestern Sector. The game

> rangers used to live in the village (Likuyu Sekamaganga) and then in 1995, they started living in the campus where we are meeting. The campus formerly belonged to NHCR [possibly a misspoken abbreviation for UNHCR]. Refugees from Mozambique and Burundi lived there. When the refugees left, the government requested the area for game ranger housing. The plan was accepted in 1995 and they relocated that year. Likuyu Sector covers 3,968 square kilometres. It is divided into three hunting blocks—areas six, seven, and eight. There is only hunting tourism in the sector. The annual hunting season runs from July 1 to December 31. The game ranger activities include patrolling the area to protect animals in the hunting blocks and making sure the neighbouring Wildlife Management Areas are free from poaching.

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Academic debate continues over the historical population of elephants in southern Tanzania through the various waves of ivory trade from precolonial, colonial, and post-colonial periods (Alpers 1975; Håkansson 2004; Gissibl 2016). Without a census until the twentieth century, population estimates may be gleaned from archival sources. As mentioned previously, the area of what is now the Selous was reported by European visitors to be devoid of large game in the 1860s (Kjekshus 1977). Archival records from the 1920s suggest that elephant populations became problematic in the area, with hunting licenses and government Cultivation Protectors working to hunt elephants that raided farms, suggesting a more robust population (Swynnerton 1926b; No author 1924). The Selous elephant population then dropped from an estimated 110,000 in the early 1970s to around 55,000 in 1986 to less than 30,000 in 1989.

This precipitous population drop and the resulting international attention led to the Selous Conservation Programme (SCP). The German government-funded project aimed to rehabilitate the Selous and allow communities in the surrounding areas to sustainably manage and benefit from wildlife and natural resources (Baldus 2006). From 1989 to 1991, the Tanzanian government launched a paramilitary anti-poaching effort: *Operation Uhai* (Life). The operation resulted in the arrest of over two thousand poachers and confiscation of illegal weapons and wildlife traps from villages bordering the Selous, but came at a high financial cost while creating hostility and mistrust among local residents (Picard 2010). At around the same time, wildlife and ‘wilderness’ became increasingly valuable for tourism and timber

became a pillar of the Tanzanian economy (Picard 2010; Brockington, Duffy, et al. 2008; Neumann 1998).

The SCP reflected the contemporary ideas about natural resource management. One tenet of the SCP espoused the idea that communities around the Selous should act both as buffers and protectors of the Selous. This led to the creation of a new category of protected areas, the Wildlife Management Areas (WMAs), discussed in detail later in the chapter. The SCP also aimed to change the management of the Selous from the top down. Focusing on the ministry level management of the Reserve, the programme required a retention scheme in which profits from Selous tourism would be funnelled back into its administration.[7] The SCP ended in 2003. Various tasks completed under the project, including technical reforms to the administration of tourist hunting systems and a Hunting Policy of 1995, languished without implementation. The Tanzanian government began to dismantle the retention scheme in 2006. The same year, poaching appeared to be on an upward trend (Baldus 2006).

In 2013, a census estimated 13,084 elephants remained in the Selous of the 100,000 present in the 1970s, indicating a dramatic spike in elephant poaching (Environmental Investigation Agency 2014; TAWIRI 2013). It is estimated that between 2009 and 2014, sixty percent of Tanzania's elephant population disappeared. Following the release of the census data, in October 2013, the Tanzanian government launched a paramilitary anti-poaching initiative: *Operation Tokomeza* (Terminate) (Legal and Human Rights 2015). In December 2013, a parliamentary investigation into human rights abuses, including murder, rape, torture, and theft committed by the Tanzanian military forces deployed for *Operation Tokomeza*, resulted in the suspension of the operation. From his office at the Likuyu Sector headquarters, Mr. Kombo shared that '[t]here were rumours' at the time that Chinese people

[7] The retention scheme ensured the financial sustainability of the Selous based on a budget retaining fifty percent of Reserve revenue. Many conservationists consider the retention scheme critical to the effective management of the Selous.

who were in southern Tanzania building a road from the western town of Namtumbo to the central town of Tunduru, along the southern border of the Selous, used that as an opportunity to 'facilitate poaching'. Kombo went on to say that people of south Asian descent were also working on the road from Namtumbo to Tunduru and they were similarly involved 'in the activity'. In 2014, the World Heritage Committee voted to add the Selous Game Reserve to the list of Sites in Danger because of the grave threat to the Selous elephants.

The German government saw most of its investments from the earlier SCP either fail or run into disrepair after a few years of neglect from the underfunded management of the Reserve. The German government committed to a €10 million, three-year series of projects aimed at bringing the Selous back from the perceived brink of disaster. Realizing the funding would be insufficient, in 2014 the Germans committed €8 million toward providing an additional two years of funding for the project.[8] The five-year, €18 million project, called 'Sustainable Conservation and Development of the Selous Niassa Ecosystem' (SECAD), focuses on three goals: increasing the capacity of administrative management of the Selous, equipping and reinforcing the law enforcers of the Selous (game rangers and wardens), and supporting community-based natural resource management surrounding the Selous.[9] Funding for SECAD comes with two contingencies: that the Selous maintain a budget retention scheme, and that the Selous remain a UNESCO World Heritage Site. SECAD, in addition to

[8] Through a separate funding stream, the technical development arm of the German development bank, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), helped create the Tanzania Wildlife Authority (TaWA). TaWA gained full jurisdiction over the operation of all Game Reserves and other non-National Park protected areas from the purview of the Wildlife Division. TaWA came into force on July 1, 2016.

[9] The project officially launched in June 2017. An estimated €2 million will go to Frankfurt Zoological Society to work with the Selous to strengthen management and law enforcement during the first three years of the project. Approximately €1.5 million will be granted to WWF to continue its existing work in five struggling WMAs surrounding the Selous. A consulting firm will use the remaining funds to manage the construction of infrastructure projects in the Selous ranging from building ranger posts, to constructing tourist airstrips and entrance gates.

the project creating the Tanzania Wildlife Authority (TaWA), will make the German government one of the biggest investors in the Selous.[10]

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> Mr. Kibonde holds court in the anteroom of his office in a wood-panelled trailer parked behind the Ministry of Natural Resources and Tourism headquarters in Dar es Salaam. He invites me to sit on the couch across from him and continues his conversation with a Tanzanian requesting permission to conduct research in the Selous. Benson Kibonde, Chief Game Warden of the Selous, was recently called out of retirement following a decades-long career in the Selous to help shepherd the Reserve through an administrative transition from being a part of the Wildlife Division to being the main component of the new parastatal organization Tanzania Wildlife Authority (TaWA). While he considers the student's request, he begins a conversation with me. It is 2015 and I recently returned to Dar es Salaam after nearly a year of fieldwork in villages bordering the Selous Game Reserve, and I asked about the funding coming into the Selous. He tells me that in my country, Yellowstone National Park has an annual budget of $150 million. So, he says, the €10 million coming from the Germans for the Selous is a pittance. He returns to his conversation with his colleagues about the conservation research in question.

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Management and intervention, across highs and lows of fiscal soundness, created the Selous as it is today—its miombo woodland forests, home to herds of elephants and other wildlife. Through its existence, the Selous prevents development in nearly the entire Rufiji River watershed. International actors remain concerned for elephant populations in the Selous, going as far as to warn that elephants could be locally extinct in the Selous by 2022 (Dalberg for WWF 2016; Frankfurt Zoological Society 2014; INTERPOL Environmental Security Sub-Directorate 2014; Environmental Investigation Agency 2014). The U.S. Fish and Wildlife Service temporarily banned the import of Tanzanian elephant trophies in 2014 and placed restrictions on lion trophies in 2016, impacting Tanzanian safari companies. However, safari tourism continues; hunting companies applied for 2018-2022 Selous hunting block leases in 2016.

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[10] In 2017, the World Bank also proposed a $150 million loan which includes the 'southern circuit' of tourism (Ruaha National Park, Mikumi National Park, Udzungwa Mountains National Park, and the northern photographic safari section of the Selous). The same year, the United Nations Development Programme also launched a project focusing on the southern circuit.

Despite the presence of hunting companies and paramilitary forces protecting the Reserve, it is hardly fortified (Brockington 2002). The boundary of the 44,800 square kilometre Reserve is rarely marked using fences. Mr. Kombo, the warden of the southwestern sector of the Selous, said that in 2013, there were 250 game rangers for the entire Selous, although numbers have improved since then. The porous border, which would require both political will and sufficient capacity to control, is by design. As part of the broader 'Ruvuma Landscape', the Selous can be seen as surrounded by buffer zones including Wildlife Management Areas (one of which is the Mbarang'andu) and National Forests (such as the East Undendeule National Forest) and linked with other protected areas by wildlife corridors (for instance, the Selous-Niassa Wildlife corridor, connecting the Selous with Mozambique's Niassa Reserve). The free movement of wildlife between these protected areas is part of a conservation strategy. The strategy comes at a cost, often to human neighbours. As one Selous game warden, stationed in Likuyu Sector, commented before joining a patrol to try to stop elephants from entering bordering villages to eat crops: 'the elephants don't know the boundaries'. The buffer zones surrounding the Selous created as part of the SCP, such as the Mbarang'andu Wildlife Management Area, considered in the next section, form an integral part of efforts to manage the ecosystem of the Selous and are a key component of the political ecology of conservation in Tanzania.



Figure 4 A map of the North East Undendeule Forest Reserve, part of the buffer zone of the southwestern part of the Selous, hangs on the wall of the village office in Likuyu Sekamaganga. Hand written on the old map: gold, diamonds, and uranium. (Map used with permission from the village).

History of the Mbarang'andu Wildlife Management Area

In Tanzania, Wildlife Management Areas (WMAs) reflect a spirit of devolving power over natural resource management to communities, moving away from a 'fortress' conservation mentality, which focused on fences and law enforcement.[11] The German government-funded SCP initiative to protect the Selous supported the creation of a buffer zone around the Reserve which could provide conservation-based income for the impoverished communities on the border. The Mbarang'andu Wildlife Management Area, called '[t]he wildlife and uranium hot spot' by its consortium, started in 2003 and was gazetted in 2006 following intensive external support to complete the twelve-step WMA demarcation procedure.[12] German funding supported seven villages to conduct land use mapping and planning, helping the villages set aside 2,471 square kilometres of land for conservation in the WMA.[13] The Mbarang'andu hunting block received a category II rating and an estimated value of $30,000. In 2008, Game Frontiers of Tanzania Ltd (GFT) became the sole investor in Mbarang'andu and, to present, exercises exclusive rights to hunting tourism within the WMA.[14]

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[11] The 1998 National Wildlife Policy of Tanzania (revised in 2007) committed to community involvement in wildlife conservation. Please see Appendix A for further information regarding the process of forming a WMA.
[12] Support came from the following: Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation, GTZ, now GIZ), Wildlife Conservation Society of Tanzania, Gauff Engineering, and WWF.
[13] The seven member villages include: Kitanda, Nambecha, Likuyu Sekamaganga, Kilimasera, Songambele, Mchomoro, and Mtera wa Mwahi.
[14] In late January 2018, the Natural Resources and Tourism Minister demanded a number of hunting company operators appear in Dodoma, Tanzania for questioning in regard to an alleged wildlife poaching and trafficking syndicate. This singled out five individuals, described as powerful national actors who are major drivers of poaching, and associated with the 2017 murder of PAMS Foundation conservationist Wayne Lotter. Those mentioned with operating blocks in the Selous, including Eric Pasanisi, in association with his company Barlette Safari Corp. Ltd.; Ahmed Huwel, owner and operator of Mkwawa Hunting Safari Ltd.; as well as the operator of Mbarang'andu WMA hunting company Game Frontiers of Tanzania (Domasa 2018). Benson Kibonde, the aforementioned Selous Project Manager, is currently running anti-poaching operations in the Selous concessions run by Mkwawa. Pasanisi and his father Gerard are considered the most powerful hunting figures in Tanzania.

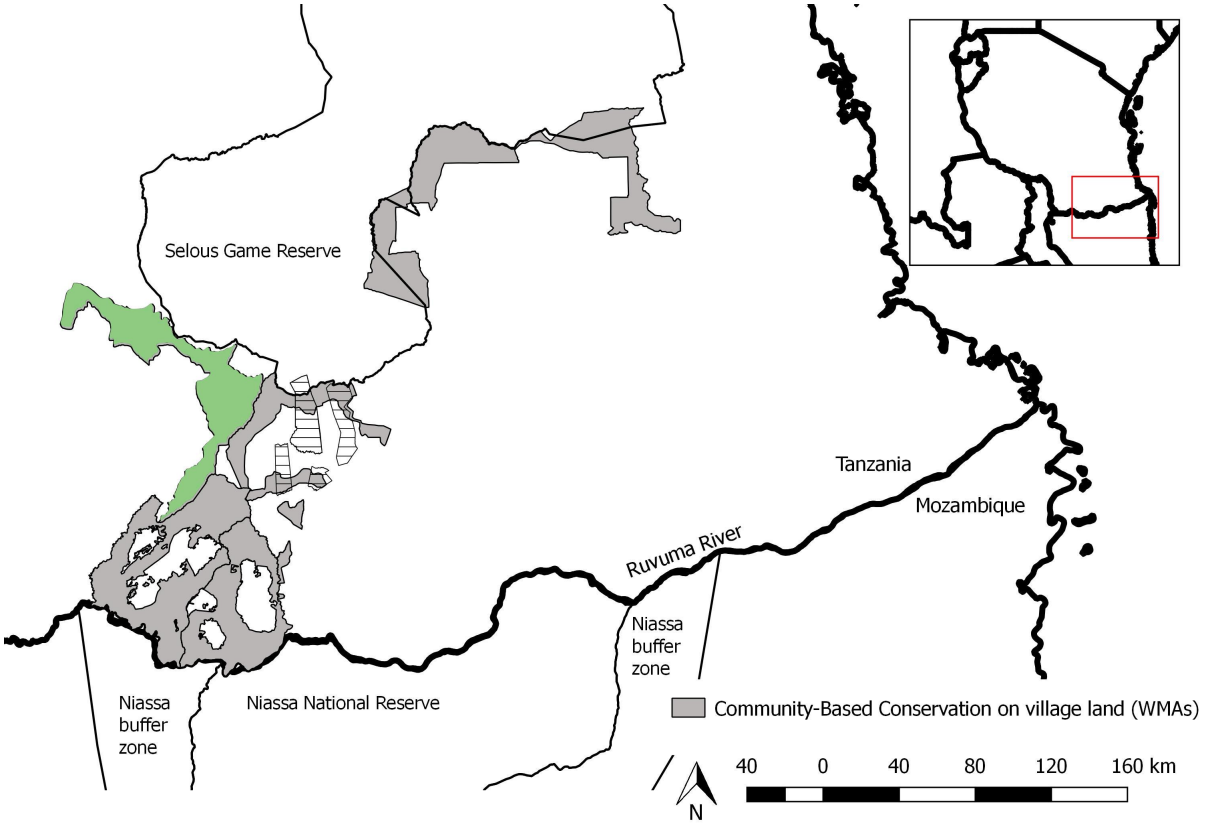


Figure 5 The Mbarang'andu Wildlife Management Area is shown buffering the Selous Game Reserve. (Map by Jevgeniy Bluwstein, modified to highlight the Mbarang'andu). The borders of this protected area, and the others featured on this map, are contested (Bluwstein and Lund 2018).

Village leaders cite the Mbarang'andu for its positive influence of building a village maternity ward, and distributing profits to each member village, as mentioned by the leader in the vignette at the beginning of the chapter. In addition to providing each village with tourism profits (9 million Tanzanian shillings (Tsh) in 2014[15]), over the years, the WMA undertook a variety of development projects ranging from providing desks for primary schools in member villages, to distributing solar lights to local dispensaries and police stations, to providing funding for two member villages to construct medical dispensaries. The WMA funded the school fees of 160 students in the area. In an effort to mitigate their reliance on tourism proceeds, the WMA began a beekeeping project, providing village groups with

[15] In 2014, Tsh 9 million was worth approximately £3,330.

nearly 200 hives. The 'Friends of Mbarang'andu', considered in detail in chapter five, is an organization of private entities which provides additional support to the WMA.

Village Game Scouts (VGS) enforce the natural resource management laws applicable to the WMA. Seventy-two people hailing from the seven WMA member villages form the VGS force. The scouts' responsibilities include accompanying hunting safaris and enforcing the natural resource management regulations set up by the WMA. VGS are involved in managing conflicts between wildlife and the villages within the WMA. The scouts also carry out patrols through the Mbarang'andu. Although they receive paramilitary training including handling firearms, they are not permitted to carry rifles. In the case of problematic wildlife in Mbarang'andu, armed Selous game rangers support the VGS response. The training and employment of scouts, aligned with a core belief in the ideology of the WMA, creates a direct pipeline by which conservation knowledge can enter communities hosting protected areas. Further, the payment of VGS acts as an economic stimulus for villages with large populations of wildlife. However, these salaries are low and VGS who patrol the protected areas may also profit in other ways from their specific knowledge, providing poachers with information on the location of valuable wildlife or the location of VGS patrols.

Mbarang'andu is said to be among the more successful WMAs in Tanzania because it has an investor. Yet, even within the Mbarang'andu success story, there is ambiguity. The Mbarang'andu seeks to diversify itself to ensure a more secure revenue stream, rather than relying on hunting profits. In a paradoxical scheme, in addition to its beekeeping programme, the Mbarang'andu plans to bring a zoo to its headquarters in Namtumbo Town. Additionally, the hunting company GFT won the contract for the Mbarang'andu hunting block without engaging in a competitive bidding process, undermining the commitment to a transparent WMA procedure maximizing profits for communities. Further, all WMA profits from

investors go directly to the Ministry of Natural Resources and Tourism.[16] By bypassing the local WMA, village leaders can never know exactly how much of the profit they receive. They are suspicious of the amount that the government remits to them. Benson Kibonde, the long-time Chief Warden of the Selous, said that WMAs were 'tricky… the last kickings of a dying horse'. He saw that, from a conservation prospective, WMAs promote 'loose wildlife utilization'. 'WMAs are so vulnerable', he said, tracing this back to the WMA mandate lying with the communities, which meant the Director of Wildlife in the Ministry of Natural Resources and Tourism could not intercede if villagers want to, for example, graze cattle in a conservation area. He elaborated that WMAs 'often spend more on the books than on the ground'. Kibonde's view of WMAs reflected his experience as well as his belief in the power of the national government's natural resource management capabilities, and the limitations of a devolved system of wildlife and wilderness management.

Land governance issues, which plague the country, are amplified in the context of WMAs. In June 2016, a group of seventy elephants from the Selous spent nearly one week in Mtonya village (Likuyu Ward, Namtumbo District). Village leaders raised the alarm with the Namtumbo District Natural Resources Officer. Shortly thereafter, Selous game rangers came to Mtonya to try to herd the elephants back into the Selous. The elephants damaged and ate crops in Mtonya, which lies on the border of the Mbarang'andu WMA. Outside the Mtonya village office, a group of villagers met to commiserate and wait. They could not return to their fields, despite the demands of the harvest season; they feared the elephants. One man voiced the group consensus, that Likuyu Sekamaganga has the WMA, but Mtonya still pays the price with ruined crops from elephants, buffalo, and hippopotami. As the villager said, villages not invited into WMAs, like Mtonya, are left without any financial benefits of

[16] Companies pay the government directly. The government is responsible for distributing fifteen percent to District Councils and sixty-five percent to the WMA itself, retaining twenty percent at Wildlife Division (Institute of Resource Assessment (IRA) 2007; Noe 2013).

wildlife tourism, while dealing with problematic wildlife. The elephants eventually left Mtonya, but in the process of returning to the Selous, the elephants trampled through the village of Likuyu Mandela. Mandela, as it is known, was annexed out of Likuyu Sekamaganga in the early 2000s when Mozambican refugees temporarily settled in the area decided to remain in Tanzania after their country's civil war ended. Even though Mandela is wholly within Likuyu Sekamaganga, and Likuyu Sekamaganga is a member of the Mbarang'andu WMA, this membership did not transfer to Mandela.

In June 2016, the Mandela village chairman went to the nearby Community Based Conservation Training Centre in Likuyu seeking an answer to a question about the procedures for the village conservation committee. The chairman wanted his village to join as a member of the Mbarang'andu WMA. I asked him why he wanted to join now. He said, 'they did not want us to join until now. They have set us aside. They do not want us to join the programme' (*Hawataki mpaka sasa. Wametutenga watu kufika. Hawataki sisi kuingia kwa mpango*). He said that Likuyu Sekamaganga village did not want Mandela to join. When I asked why that was the case, he explained that, '[t]hey have their own issues. They want to call it their own' (*Wana mambo yao tu. Wanataka kuwaite wao)*. He explained one of the major obstacles to joining a WMA was that they need a village registration number to enter, and Mandela, like many villages, is unregistered. Once they get the registration number, they need the government to survey the land and borders of the village. Only after those steps are completed can they enter the WMA. The chairman said he initiated the registration procedure in 2015 but that he cannot know (*siwezi kujua)* how long the process will take.

Belief in the power of WMAs continues despite the programme's well-documented flaws (Noe 2013; Picard 2010; WWF 2014; Institute of Resource Assessment (IRA) 2007; Kangalawe and Noe 2012). Through the €1.5 million SECAD grant from KfW, the German Development Bank, WWF will carry on its existing activities in WMAs around the Selous.

The WMAs created on the border with the Selous that lack investors (in practice, only existing on paper) will be the focus of the SECAD project.[17] The SECAD project also aims to help WMAs create Authorized Authorities (AAs) that can advocate for WMAs, help search for investors in wildlife tourism, and support income-generating activities for WMAs. The inclusive ideology of community-based conservation, seen as WMAs in Tanzania, contrasts with the power non-governmental organizations and government actors hold over peasants in the creation and management of village-level protected areas. Villages continue to make sacrifices to submit themselves to the process of becoming a WMA or bear the burdens of sharing a border with a protected area and its problematic inhabitants. The ability of WMAs to produce results for their dual bottom line—poverty alleviation and conservation—remains questioned. Despite ideological differences with earlier conservation models, WMAs represent the most recent iteration of natural resource management seen around the Selous. The WMAs and Game Reserve, which dominate the southern Tanzanian landscape, grew from the conservation policies created during colonial times and enforced ever since. Other factors may have also played a role in creating the landscapes of miombo woodlands valued in part for their wildlife, which meet today's expectations of wilderness. The next section explores historical events and interventions that impacted the Selous and the surrounding areas.

Forest Transitions and the Evolution of the Selous

Portrayals of the untamed Selous, marketed as a virgin wilderness and uninhabited Eden, so worthy of fabulously expensive tourist hunting expeditions, implicitly deny human historical

[17] These WMAs include: Kisungule, Nalika, Kimbanda, and Chingoli. Together with Mbarang'andu, these WMAs form the Selous-Niassa Wildlife Corridor.

influences. However, human presence or absence can impact forest cover and wildlife populations. Attempting to appreciate changes in forests over time, I engage with the concept of 'forest transition' (Mather and Needle 1998), which concerns itself with the ways forests change over long periods of time. The term was originally conceived based on historical studies of European forests in which forest cover declined and then increased over time, thought to be associated with societal shifts resulting from industrialization; recent studies suggest there may be multiple pathways to transition (Rudel et al. 2005). This section takes inspiration from the long-term timeframe of 'transitions' to think about large-scale changes in the forests of the Selous, rather than short-term changes (for instance, the seasonal effects of shifting cultivation).

To do this, I offer a critical history of the southwestern part of the Reserve. This brings the history of the Ndendeule people who live in the area (Namtumbo District, Ruvuma Region), together with ecological history in order to challenge the narrative of the Selous as a pristine wilderness and further unwinding the dichotomy separating nature from culture in certain cosmologies. This requires considering information from disparate sources: 1) actors representing the colonial government and mentality who were the architects of the earliest state-level natural resource management interventions in the area, and whose impacts we continue to see today; and 2) voices of the colonized, who felt the oppression of colonial resource management policies, and whose descendants' current experiences can be seen partially in light of the historical record. Colonial records offer the primary source for information representing colonial actors. Voices of colonial subjects, in this case as in most, are more difficult to find. Histories extrapolated from a reading of colonial records along and against 'the archival grain' (Giles-Vernick 2002; Stoler 2009), stand as part of the effort to amplify the whispers of ordinary people under the grip of colonial regimes. In addition, narrative histories from elders living in the area of interest recalling their own colonial-era

childhoods and the histories they know of their parents and grandparents lives round out the limited information available elsewhere. In this section, I explore how people lived inside the Selous and were forced out, and how this is interrelated with non-humans (forest, elephants, and tsetse flies). Presenting a more nuanced version of the Selous reveals how human processes helped to create the oldest, largest African wilderness area that UNESCO deemed of outstanding universal value.

Precolonial Histories

> Outside the lawyer's office on the dusty main road through Namtumbo town, I stand while four men wait on a threadbare couch; we pretend not to overhear the raised voices coming from the other side of the wall. When the meeting ends and I am invited inside, the lawyer is sitting behind a dark desk. He identifies as part of the majority ethnic group in the area around what will become the uranium mine: Ndendeule. We discuss his visits to the villages around the mine, and why he encouraged villagers to not sell their land. I mention my interest in the history of his people, and he offers: Ndendeule comes from *ndendavula* or *ndendabole* (what can I do? /what should I do?) in the Ndendeule language, KiNdendeule. Before the tribal war and the war with Germany, the Maji Maji War, the Ndendeule had lived in Songea. The invading Ngoni overpowered the Ndendeule in Songea—they cried *ndendavula!* (what can I do!) So, the Ndendeule people fled to the Namtumbo area and what is now the Selous for safety. Before that, the Yao people, from Tunduru, were slave traders. They came from Tunduru to Songea to kidnap Ndendeule people and take them to Mtwara on the coast. *Warabu* (Arabs) from Arab states like Oman, Iraq, and Saudi Arabia came to southern Tanzania to hunt elephants for their ivory to sell at the coastal market. The Ndendeule people were captured as slaves and forced to carry the tusks from elephants hunted in the area to the markets in Mtwara. Now, the lawyer concludes, the Ndendeule, as a group, are weak because all the strongest were taken into the slave trade. That's why they cried, 'what can I do!' They were too weak to fight off the invasion of the Ngoni, he says, too weak to fight off slave-trading Yao people.
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We can contextualize the lawyer's oral history of the Ndendeule people with more general historical information. Precolonial long-distance trading routes linking the interior of Africa with the coast and the Indian Ocean trade network, mentioned in the introductory chapter, place southern Tanzania at the heart of the movement of people and ivory to coastal cities on the Indian Ocean. In the early seventeenth century, Yao traders moved iron-smelted goods, tobacco, and animal skins along trade routes they created from around Lake Nyasa toward

Kilwa at the coast (Alpers 1967; Iliffe 1979). By the end of the seventeenth century, ivory became part of this trade, coming from Yaoland (southern Tanzania, northern Mozambique), but also from Malawi. Although slave trade existed before, it was not until the first half of the eighteenth century that slave trade became of historical significance, at the convergence of French and Arab demand for slaves (Alpers 1967).

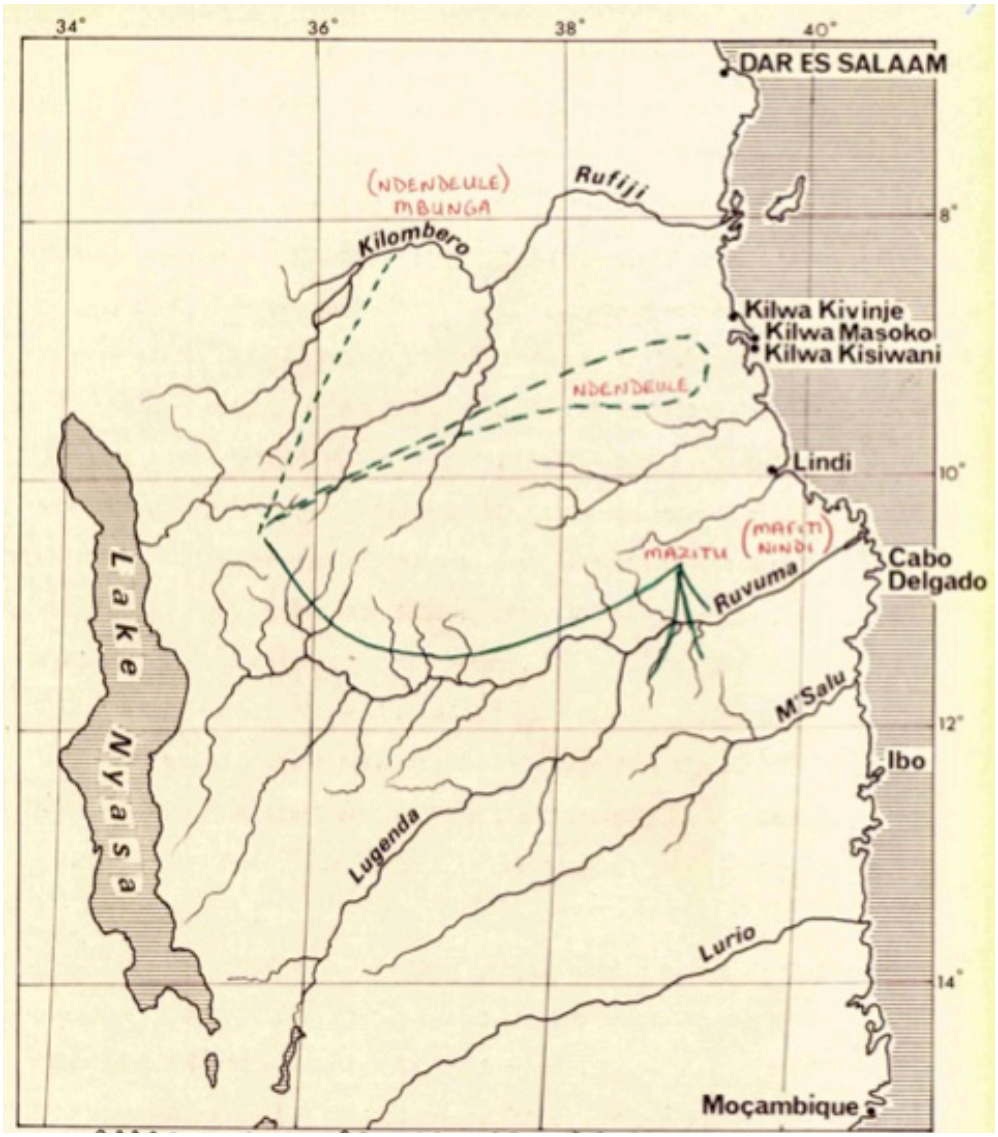


Figure 6 Map approximating routes of Ndendeule migrations in the nineteenth century. (Map by Patrick Redmond (1972)).

The Ndendeule people, part of the wider Ngindo language speaking universe in southern Tanzania, in precolonial times were said to live without a centralized government in small settlements scattered throughout the forest, relying on shifting agriculture and hunting

(Larson 2010; Larson 1976).[18] As Kilwa grew to become East Africa's main slaving port, 'stateless peoples of south-eastern Tanganyika' (Iliffe 1979, p.41) (which would likely include the Ndendeule) were the first populations targeted for enslavement. Alpers (1975), however, argues for the pre-eminence of the ivory trade, rather than that of slaves, at the Tanzanian ports of Zanzibar and Kilwa into the early nineteenth century. Soft, East African ivory, easier to carve than harder West African or expensive South East Asian ivory, became sought after (Beachey 1967). Alpers (1975) traces the ivory the Yao brought to Kilwa via a southern route, from the Bisa (Malawi) who received the ivory through trade with the Kazembe (Zambia). Another ivory trade route, operated by the Nyamwezi (western Tanzania), followed the Ruaha River (central Tanzania) to the coastal Kilwa area. Koponen (1988) and Beachey (1967) trace several long-distance trade routes active in the late nineteenth century that crossed southern Tanzania and what is now the Selous on the way to the coast. Porters carried ivory, and often sicknesses (Larson 2010), from the coast to the interior then back to the coast until the late 1870s, when the end of slave export meant slaves, now no longer profitable, could be used as free labour (Alpers 1967).

A small body of literature on the history and anthropology of the area of interest, Namtumbo District in Ruvuma Region, supplements oral histories like that of the lawyer, and fills in gaps in the broader history of the region. British colonial officials, in particular the anthropologist Gulliver, provide the richest written histories of the Ndendeule people before colonialism. Adding the various works of Gulliver together with other sources, Redmond records the history of 'Ndendeule nationalism' (1972), and Edwards (2003) compiles an updated history of the Ndendeule people. There is consensus that, in the middle of the nineteenth century, the principle group of people in the Matagoro Hills and the valley of the

[18] Chapter six details past and present Ndendeule land use.

Hanga River, what is now the Songea area of Tanzania, was the group that we will call the Ndendeule (Gulliver 1955). These people spoke a Bantu language, shared cultural and linguistic connections with the Ngindo-Ndonde peoples who lived further to the east, recognized no lineal reckoning of descent, and had no centralized political system (Gulliver 1971). Previously fluid ethnic identities became increasingly unambiguously reinforced around the early 1850s when the Ngoni, as part of their long migration from southern Africa, arrived in the area and defeated and subjugated the Ndendeule. Gallagher (1974) and Gulliver (1971) agree with the lawyer's version of history of the emergence of the name 'Ndendeule' for peoples conquered by the Ngoni, and both go farther to explain the term referred to a number of different groups.[19] Regardless of the heterogeneity of the group, in the 1880s, the Ndendeule people moved eastward, away from Ngoni control (Edwards 2003) toward where they live now in Namtumbo District.

One Ndendeule elder from Mtonya village recalled he was told that people saw the Ngoni and were afraid and agreed to say they were Ngoni (*Watu waliwaona na waliogopa na walikubali kusema ni Wangoni)* during the invasion. He explained the Ngoni took many slaves and killed many people, which is why they were feared. He said his own grandfathers came from Liwale, to the east, and that they were part of the group of Ndendeule who moved closer to the Ngoni after the tribal war (*wote wamehamia mpaka hapa)*. Oral histories from

[19] At this point, the Ndendeule became a sort of 'serf' population along with people previously captured by the Ngoni, according to Gulliver (1966). The name Ndendeule was applied to the entire subjugated population. Edwards (2003) presents an alternate interpretation wherein the Ndendeule strategically resisted and allowed themselves to be incorporated into the Ngoni sphere, while still acknowledging the Ndendeule were created by the conquering Ngoni. Either way, we should recognize the likely diversity of people who call themselves Ndendeule. Despite the problems of using 'Ndendeule' (Ndendeuli, Wandenauri, Wandendehule appear as alternate spellings) as if it delineates a homogenous group, I use the term to describe the people living in the area, regardless of where they originated. This term continues to be used by many living in the area, though there is not universal agreement that Ndendeule is a *kabila* (tribe/ethnic group). Across sub-Saharan Africa there are complex relationships between natural resources, property, and autochthony. Deciphering the relationship between newcomers and those who consider themselves from the area, in addition to their relationship with resources will be a major area of exploration of this study. However, this does not appear to bring into question the cohesiveness of Ndendeule as a group.

elders in the villages around the southwestern Selous provide further insight into the precolonial history, and counter narratives of an uninhabited, primordial wilderness which appears in some colonial archival material: 'Almost up to the coming of the Germans, Tunduru District was for all practical purposes, uninhabited' (Walden 1938, p.1).[20] Similarly, a 1936 population map claimed the area was uninhabited (Gillman 1936). Still, it seems clear that through the invasion of the Ngoni, and disturbances caused by the ongoing slave and ivory trade, at the turn of the twentieth century, the Ndendeule people were living in the southwestern part of Tanzania in an increasingly upset environment.

German Colonialism

In southern Tanzania, German colonial engagement with locals focused mainly on tax collection via *akidas* (district-level African colonial administrators) and missionary work.[21] Although brief, German rule left imprints specifically on southern Tanzania via the lasting devastation of the Maji Maji War. Tanzania's largest rebellion against German rule, the Maji Maji War concentrated in southern Tanzania from 1905-1907. More recent historical analysis points to the triggering role of frustration with newly introduced German forestry ordinances limiting access to forest resources (Sunseri 2003) in combination with an overall turning of the rural population against 'big men' who wielded control with German support (Becker 2004). These circumstances arose in the context of the Ngindo-speaking world, now seen as significant to the rapid spread of the uprising across the south of the colony (Larson 2010). German victory was cemented by a scorched earth campaign. The Germans estimated that there were 75,000 casualties resulting from the Maji Maji War, mostly resulting from disease

[20] From 1963-2002, Ruvuma Region was composed of three districts: Songea, Mbinga, and Tunduru. In 2002, Namtumbo District was split off from Tunduru.
[21] Edwards (2003) reviews the missionary work in the greater Songea area and the lack of success among the Ndendeule.

and famine (Iliffe 1967, p.495). The devastation, especially intense in what is now Ruvuma Region (Gulliver 1971), led people to flee to avoid arrest and execution.

In the villages around the southwestern part of the Selous, many people young and old knew the general history of the war. Most elders confirmed that they heard their parents and grandparents fled to the forests to hide, but denied knowing any other details of the history, or hearing any stories of their ancestors from this time.[22] One elder went as far as to say he and others would not speak further about the Maji Maji War for fear it might happen again (*wanaogopa historia itakuja tena)*. Another elder explained that the Ndendeule warriors would shout during raids 'water water water' in the Ndendeule language (*walisema 'mache mache mache'*) referring to the magic water they used as protection against German bullets. The elder said many people fled, but also that many people from the area went to kill the white man (*watu wengi kutoka sehemu hii… kuwenda kuamua mzungu).* In the battle of Lumecha, the Germans were shooting guns and the elder said, many people died there—12,000 lost their lives in the war (*Yule mjerumani alivyo piga na banduki. Walikuya nyuma. Watu wengi walikufa pale 12,000. Walipoteza uhai wao vita hii).* Father was still a small child (*Baba alikuwa bado mototo mdogo*), recalled the elder. Grandfather was still alive, he said. Grandfather and grandmother were there, he added, and uncle was lost in the war; he was shot *(Babu alikuwa yupo. Babu na bibi wapo na njomba alipoteze kwa vita hiyo. Alishiriki la vita hii. Alipigwa).*

Those who did not go to fight in the war fled and hid themselves in the wilderness (*walikimbia porini kujificha).* To keep hunger at bay, the elder explained, they ate roots and

[22] I approached the resident historian at the Maji Maji War Museum in Songea for consultation and advice regarding the relative difficulty I faced collecting oral histories prior to the 1940s. He proposed that because the Ndendeule lack written histories, the information has been lost. The Ngoni, on the contrary, have a richer oral and written history on topics including the Maji Maji War. The historian attributed this to the Ngoni receiving education through established mission schools, while the Ndendeule, who are majority Muslim, rejected mission schools in various instances and therefore received less education.

sought out honey (*Walikula mzizi. Kujaribu kuacha njaa. Walibakua nyuki kupata asali ya kula).* The *pori* (wild) was seen as a place of relative safety for adults to hide during the war. Children were thought to be better off in the villages at the mercy of the raiding German forces than in the forests. A 1938 history asserts '[j]ust after the Maji Maji … the Wandendeuli, driven by the famine caused by the Maji Maji [migrated] from Songea, to the upper Muhuwesi' (Walden 1938, p.1). Tying these sources together forms a consistent story of the hardship faced by the Ndendeule people during and immediately after the Maji Maji War and the likelihood of strong impacts on not only the population's size, but also its location.

World War I conflict in Tanzania (1914) followed shortly after the end of the Maji Maji War (1907). There are no estimates for casualties resulting from the years of World War I hostilities in southern Tanzania. It is estimated that 1.5 million people served as porters in Tanzania in the war, with extraordinarily high rates of mortality. Deserters returned to rural areas and brought Spanish influenza and smallpox. 50,000 people are thought to have died from influenza, and nearly half the country was infected. A 1929 history from a British colonial record provides specific history for the Ndendeule: that many fled to Portuguese East Africa during World War I and only returned following harsh treatment and a failed harvest in 1928 (Large 1928).

By 1922, the population seems to have started to shift back; the 1922 annual report for Songea District reports that the Ndendeule people, 'occupied practically the Eastern half of the District' (No author 1923, n.p.). The report also provides information on elephants in the area: 'Most common in the East … especially on the MBALANGANDU River [*sic*], large herds exist which during the last three months of the year are reported have increased, probably due to hunting in Tunduru area' (No author 1923, n.p.). Elephants existed in the area according to these records, but further questions arise: 'The Elephants all appear to be

comparatively young possibly due to the extermination of large tuskers during the war' (No author 1923, n.p.). The report suggests during the First World War, the hunting of older elephants in large quantities, leaving behind only the younger elephants in the 1920s. Mackenzie (1988) supports this, finding evidence that the Germans disregarded their game ordinances during the war to utilize game meat, especially that of elephant, to provision troops.

Oral histories examined in association with archival material from different perspectives present an alternative to a history of the area as a 'primordial wilderness'. We can see that long-distance trade networks connected southern Tanzania with the rest of the world before colonialism. The Ngoni, as well as ivory and slave traders, pillaged the area of the stateless Ndendeule. This in turn gave way to German colonialism and a period of population changes caused by the damages of the Maji Maji War. We followed the threads of human and elephant population changes over time. Transitioning to the era of British colonialism, which began after the defeat of the Germans in the First World War, we can consider the thoughts of Gulliver. A British colonial administrator and anthropologist, Gulliver conducted research in the 1950s with the Ndendeule and described southern Tanzania as the territory's 'Cinderella' (Gulliver 1971)—marginalized and neglected, or perhaps (also) underdeveloped and reserved as 'peripheral' to serve the 'core' in the northern and coastal areas. The next section begins with an examination of the ways in which British colonial activities directly dis-located people from the Selous.

British Colonialism and Post-Colonial Continuations

> The only lasting achievement of the Sleeping Sickness move has been the southward extension of the Selous Game Reserve. (Caunce 1959)

From the 1930s-1950s, during British colonization, 'Closer Settlement' moved people out of scattered homesteads and into larger settlements across the Territory. Ostensibly under a

public health project to limit the spread of human African trypanosomiasis (African sleeping sickness), Closer Settlement policy forced the movement of people from the area that is now the Selous. Sleeping sickness devastated parts of central and eastern Africa at the beginning of the twentieth century, uniting colonial scientists across disciplines and empires (Headrick 2014). Sleeping sickness remains poorly understood, but is associated with the expansion of bushland and forests, which are the habitat of the tsetse fly, that carries the disease (Maddox 1998). Closer Settlement put into action the British public health philosophy of separating people from bushland (and therefore tsetse flies), though later colonial and post-colonial thinking suggested that the key to limiting the spread of the disease might be the regulated contact between humans and livestock with tsetse, allowing infrequent infection and the acquisition of infection resistance (Ford 1971; Tilley 2004).

Surviving archives tell the story of Closer Settlement activities specifically in the Likuyu area in the 1940s. Assistant District Officer Tubbs writes of his first safari to the area relating to preparations for Closer Settlement relocations: 'I do not know whether it is Government's intention to add a substantial area to the Game Reserve in this region or merely to trim the corners by cutting off the tongue of this district that sticks out at the Liwale and Mahenge districts' (Tubbs n.d., p.1). He goes on to describe the farmland of the area: 'While quite prepared to submit to any Government order about moving, they are most upset at the idea of leaving their fertile valleys, their few coconut trees and the numerous mango trees' (Tubbs n.d., p.1), while noting the settlements were four days from the nearest shops at Namtumbo or Matemanga, three days from their court, and that there were problems with elephants damaging crops. Tubbs appears convinced of the arbitrary nature of the move: 'Although it is appreciated that the concentration of these people may be to their eventual advantage in the way of trade and social services, they are being ordered to move not on their

own account but in order to form a Game Sanctuary' (Tubbs 1944, p.1).[23] Tubbs also records that this same community was previously relocated from their homes during German colonization. The Acting Provincial Commissioner responds sharply to the colonial administrator's perceived insubordination:

> [Tubbs] infer[s] that the people from Liwale-Tunduru are being moved for the express purpose of creating a Game Sanctuary, this is not so and I cannot see that any of my letters or instructions have implied it. It is unfortunate that such a misinterpretation should have been put on this project and I regret I have not the time, nor the inclination to write a treatise on Closer Settlement.… The reason why this area which it is proposed to evacuate in order to prevent the spread of sleeping sickness and in order to improve the living conditions of the inhabitants is being put into a Game Sanctuary, is so that it shall not become a NO MAN'S LAND and remain unadministered. (1944, p.1, emphasis in original)

As early as 1925, British colonial authorities recorded a dispersed settlement pattern in the area.[24] A 1926 letter from the Director of Game Preservation and noted tsetse fly naturalist Swynnerton elaborates a position connecting elephant damage, tsetse fly presence, and scattered settlements in the area: '[e]very possible encouragement should be given to the natives in all these bush-covered southern areas to concentrate, not merely to protect them from elephants but to enable us to initiate tsetse control and really supervisable development of the country' (Swynnerton 1926b, p.3).

[23] Earlier archival evidence from the area also reflect an absence of sleeping sickness (No Author 1926), although a 1926 record of the area suggests tsetse flies were prevalent in parts of the area (Swynnerton 1926b).
[24] The Annual Report for Songea District recorded in 1925: 'The tendency is for the natives to leave the large villages of their fathers, and to seek a new home for themselves. As the country abounds in perennial streams a new site is not difficult to find. Wherever it is, it is carefully hidden away, remote from main or district roads, and if possible, from tribal authority.' (No author 1926, n.p.). In February 1926, the Director of Game Preservation, also notes the settlement pattern of '[t]hese hermits', may be the result of the desire to hide from historic porterage requirements (Swynnerton 1926a).



Figure 7 Sleeping Sickness Areas in German East Africa. (Map from Schnee (1920) republishing a map from the Wirtschafts-Atlas der deutschen Kolonien (Economic Atlas of the German colonies) published in 1912). Illustrates the general absence of tsetse flies (*Glossina*) from the area north of the Mbarang'andu and Luego Rivers that is now the southwestern Selous (approximately found between 8-10 degrees south and 36-38 degrees west).

Returning to the Tubbs correspondence, there is a ratcheting up of the level of concern about the low-ranking administrator's criticisms of the colonial project. This can be seen in a letter from the Provincial Commissioner to the District Commissioner, Tubbs's supervisor:

> … it would appear that Mr. Tubbs regards Closer Settlement as one of Government's whims to impose greater hardship on the African. This is not so, nor has it ever been the case.… As far as I can remember Closer Settlement began in 1928 or 1929 and up to date there have been no failure. I do not see why there should be any failures now unless these people get some wrong ideas put out into their minds. If you or Mr. Tubbs feel strongly about this scheme for closer settlement, I would rather be informed than that the proposed scheme should miscarry. (1945, pp.2-3)

In response to the harsh words from superiors, Tubbs attempts redress, perhaps with sincerity, in a personal letter from April 10, 1945:

> Please do not think I am an obstructionist because that would be far from the truth. I would rather plead guilty to being too impatient for action.… I have had no personal experience with any closer settlement scheme. I firmly believe that closer settlement will be the most important factor in the development of Tanganyika but in this particular case I must admit that I was anxious because we seemed to be rushing in and I could not see whither we were going…. I did not suggest that closer settlement was just one of Government's whims but that people who had been ordered once to move to the Kilowero and who are now ordered to move away from the Kilowero might well think so unless we gave them outward and visible signs to the contrary. ... I assure you that I shall do all I can to make the movement a success. (1945, p.1)

Reading 'along the grain' (Stoler 2009) of the archival evidence, even as Closer Settlement took place, criticisms and concerns abounded from within the ranks of the colonial administration. Some colonial administrators, in addition to Tubbs, recorded an awareness of the history of dispossession in the area of the southwestern Selous.[25] The colonial administration noted in the area the (uneven) presence of tsetse fly, the vector that carries the dreaded sleeping sickness. The devastation of the sickness seen in Northern Tanzania may have sparked a fear in colonial administrators which resulted in the anticipatory implementation of humanitarian efforts to limit the spread of the disease. However, the limited evidence of actual sleeping sickness in the area questions the benevolent basis for Closer Settlement. A close examination of the local dynamics of tsetse fly, human settlements, and forest changes would be necessary to further untangle the historical disease

[25] Correspondence from the Governor's Deputy notes: 'It has to be remembered that these areas lie across or adjacent to one of the great slave routes of East Africa, from the south end of Lake Nyasa ... to the southern ports of Tanganyika and especially to Kilwa Kisiwani; and that since the establishment of European administration they have suffered from operations connected with the rebellion against the Germans in 1905-06 and the protracted fighting in 1917 during the Great War. They have, therefore, a long history of insecurity' (Jardine 1933, pp.2-3).

ecology (Waller 1990). Still, the pervading colonial attitude of the 1940s was that Closer Settlement reflected the best interests of those being evicted, suggesting a self-assessed superiority of the colonial regime. This colonial mentality also allowed bureaucrats to forge ahead with forced relocations, even when sleeping sickness was not epidemic, and when people might be forced away from fertile lands.

Picard (2010) argues that this archival evidence demonstrates a colonial rationale aligning with an effort to make the sparsely settled area more 'legible' (Scott 1998). An estimated 40,000 people were evicted from the area that is now the Selous, many as a result of the Closer Settlement scheme (Picard 2010; Neumann 2001; Brockington, Duffy, et al. 2008; Brockington and Igoe 2006; Kjekshus 1977; Sunseri 2009). Although the expansion of the Selous is definitely a side effect of Closer Settlement (Neumann 2001), the colonial administrators remained adamant that this was not part of the rationale for the policy. The dislocations resulting from Closer Settlement policy took place in the 1940s, and the colonial record cannot be relied on as the only source of information on the events that transpired. Elders in the area recall their lives inside the Selous, the process of moving out of the Selous, and life after their expulsion.

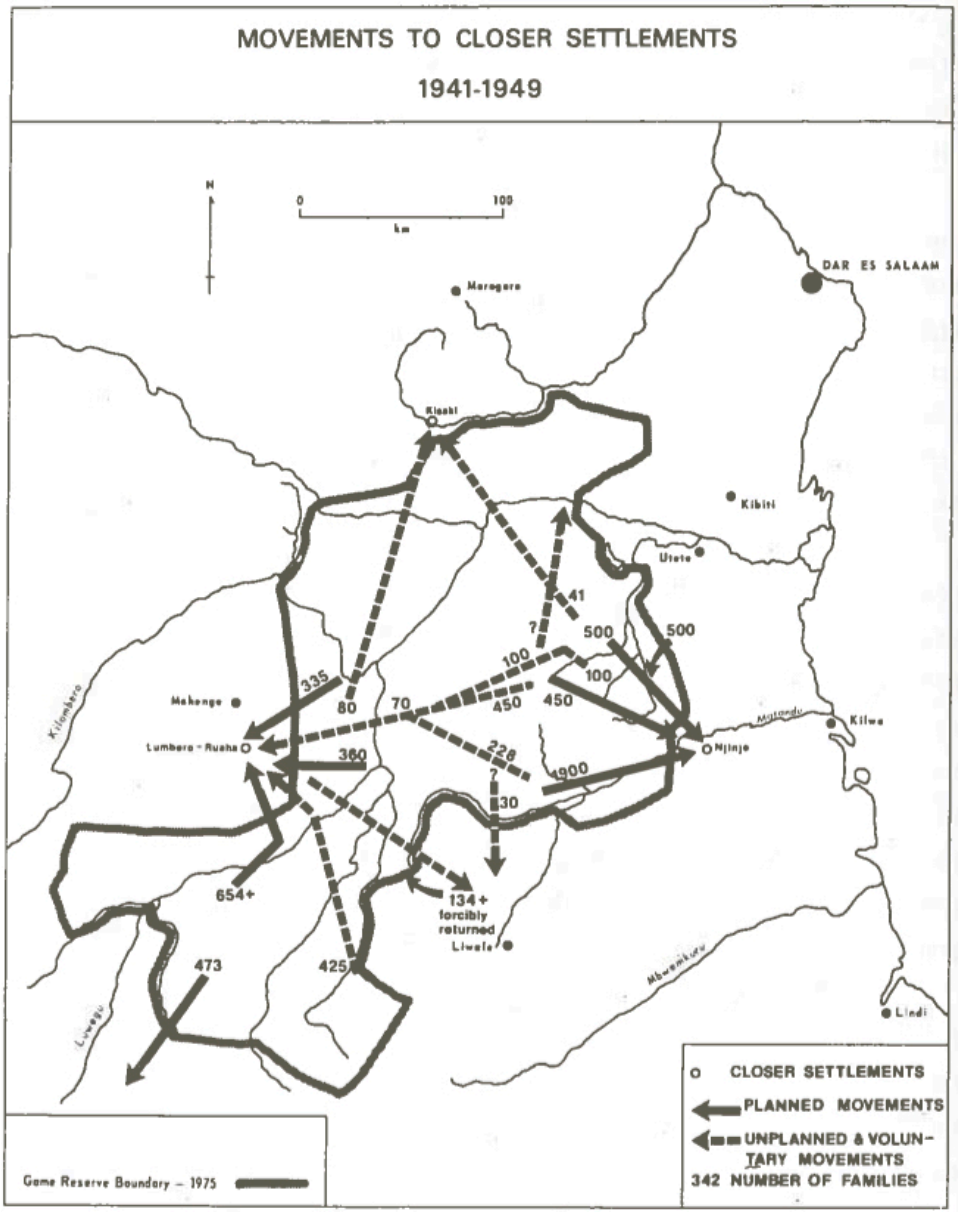


Figure 8 Closer Settlement moves from the Selous. The 473 families labelled in the bottom left would most likely be those evicted from the area in question. (Map by Gordon Matzke (1977), courtesy of the Maxwell School of Citizenship and Public Affairs).

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Under the corrugated tin roof of the kitchen house, Mpoyoyo sits on a wobbly wooden chair, listening to a young man reciting the Qur'an. The old man's head nods rhythmically to the words, his cloudy eyes focused far ahead, past the brick walls of the kitchen. The student stumbles over words and pronunciations and Mpoyoyo offers corrections, never glancing at the book. Mpoyoyo is an elder in the thatch-roofed mosque behind his house here in this village at the edge of the Selous. His adult daughter is blowing on the fire, stoking the flame cooking porridge for her family and whatever guests are stopping by to see her father. Her year-old son toddles around the kitchen, racing between his grandfather's knees and his mother's *kanga* until she shoos him away so she can add sugar to the now boiling porridge.

> I greet the *mzee* (elder), announcing myself so that he knows I am there. Recognizing my voice, the *mzee* welcomes me to join in breakfast. The Qur'an lesson is set aside as we greet each other, and everyone tucks into a mug each of porridge and steaming hot tea. Once everyone has eaten, we move under the thatch *banda*, escaping the sun, and resume our discussion of Mpoyoyo's life. He was born in 1928 in Horogwe, near the *madini* (mine*)*. Horogwe was not really a village then, he explains, it was more a collection of families living in the area. Since this was in the area that is now the Selous, I asked if there were disturbances from wild animals. He remembered that there were many monkeys, lions, leopards, and elephants. Farther away, there were *nyati, mbuju, na barapi* (buffalo, eland, and sable antelope). Because they did not have cash, they could not pay taxes. Mpoyoyo's father would walk to Namtumbo, two nights journey each way. In Namtumbo he would sell honey and beeswax he collected in the forest in order to buy salt. He would go three or four times each year, traveling alone. Many people left Horogwe to make this journey, going either to Namtumbo, to the west, or Liwale, to the east. There was no work in the area other than selling honey and wax. Now, there is uranium mining at Horogwe, Mpoyoyo tells me. In 1943, his family left Horogwe and arrived in Miwhewhe. All the people living in Horogwe had to leave. The colonial government did not give a reason, he says, and they were not given help to move to Miwhewhe. The *mzee* recalls Miwhewhe was also not really a village, but it had lots of people from all over. There, they farmed tobacco, sesame, and sunflower to sell in order to pay taxes.

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Like Mpoyoyo, many elders in villages around the Selous remembered life in the communities inside the Selous. They recalled the long distances to travel to markets to exchange forest products including honey and wax for products like salt and cloth, which would be otherwise unavailable. Similar stories recounted being forced to move from inside what is now the Selous to intermediary villages at the edges of the protected area including Miwhewhe, Mindo, Mfuate, and Mpiga Miti. No one was able to remember a reason they were asked to move. None remembered any instance of sleeping sickness in the area. They recalled the difficulties in paying taxes to the colonial government, relying on selling forest products in markets for cash, selling commercial crops, or acting as government messengers. Additionally, there is a rather counterintuitive connection in popular memory between the expulsions during Closer Settlement and more recent revelations of uranium deposits in the same areas of the Selous, which will be considered further in chapter three. Some elders recalled life in the intermediary villages fondly, despite greater control exercised by the colonial government. One elder recalled the colonial government forced them to move to Mpiga Miti, and how the forty-kilometre journey took two days. In Mpiga Miti, they had a

simple life but liked it more than their former home in Mbarang'andu: they had more salt and the land was fertile. The colonial government, run by Ngoni administrators from Songea, would whip them if there were problems.

Evictions and forced relocations also appear in the time of *Ujamaa*, the Tanzanian socialist experiment, described in the previous chapter. In the area near the southwestern Selous, people who were moved into villages at the edge of the Selous as part of British colonial policy were obliged to move again into *Ujamaa* villages along roads in 1974. People recounted the villagization collectivizations with less animosity than the 1940s moves from what is now inside the Selous. Still, one grandmother reported sadly that her family had a better life in Mpiga Miti, before coming to the *Ujamaa* village because they had meat (from the *pori*). Mpoyoyo regrets that they left good sources of water; Miwhewhe had a better environment, with many rivers, and more fertile soil. In his current village, Mpoyoyo complains that water is insufficient, and elephants and hippopotami damage their crops. Regardless, elders unanimously remembered that they were moved as a part of villagization to be closer to social services including the village dispensary, schools, and the village government. Economic conditions created by government policy moving people away from the Selous, may have simultaneously fuelled conditions favouring poaching. Picard (2010) argues that scholars overlook the continued impact of *Ujamaa* on conservation and land use trends. She connects the nose-diving Tanzanian economy following villagization in the 1970s, marked by the increasing inability of Tanzanians to meet their daily needs, with the rising price of ivory and the spike in elephant poaching (in the Selous), resulting in international outcry and the SCP in the 1980s.

Southern Tanzanian history tells of a series of interventions resulting in significant population movements. The precolonial slave and ivory trade moved people from the interior to slaving centres on the coast and impacted elephant and human populations while the Ngoni

invasion caused the Ndendeule people to move, in some cases, west toward Ngoni protection, or east away from Songea and Ngoni control to areas now in the Selous. Brief German colonial rule left lasting devastation from the Maji Maji War in addition to creating the foundation for conservation areas including game and forest reserves. Movements of British and German soldiers through what is now the Selous during World War I may have presented the opportunity for high levels of hunting of elephants, among other game. British colonial policy of Closer Settlement moved rural populations into larger collective villages, expelling people and paving the way for an expansion of the Selous. Independent Tanzania's socialist experiment and its programme of villagization caused one of history's largest forced relocations of a population in peacetime, and again moved people away from the southwestern part of the Selous.

This section connected disparate historical events and environmental changes into a more cohesive story of the area around the planned uranium mine. According to Walter Rodney, '… the "South" in Tanganyika acquired a significance comparable to the "South" in the USA or Italy - that is, one of backwardness. It actually became a place to which civil servants were posted as a form of demotion or punishment' (1979, pp.154–155). The history of dispossession and disruption in southern Tanzania gives context to these perceptions of marginality. More recent events, detailed in the next section, reinforce the sense of the marginalization and exploitation of southern Tanzania.

(Hidden) Post-Colonial Human Histories of the Selous

The extraction and destruction associated with conflicts before and during colonialism—the Ngoni invasion, the Maji Maji War, World War I, and Closer Settlement—are part of recorded, if not widely known history. The previous section drew connections between these events impacting the creation of the Selous as a 'wilderness'. The specific impact of these

large-scale interventions on the area of interest to this study only reveals itself through examining the historical record in association with oral histories. Looking at *Ujamaa* villagization policies we start to see more contemporary initiatives, but still on the national scale. This section examines state level interventions in the specific space of this study—the area in and around the planned uranium mine. Limited official historical information is publicly available. Regardless of the lack of official records, these interventions are key to piecing together the historical narrative of the southwestern Selous. This section presents and analyzes the sometimes-conflicting accounts of more recent historical events in this area. It suggests how the Selous may have been a place of military training, and further how the protection of both people and wildlife became a pretext to extract a valuable resource—land—from communities living outside the Reserve.

Liberation Training Camps

The human history of the Selous is not just limited to people who were forced to move out of the area. There is also evidence of people being moved into the area. In an off-the-cuff comment, a Western conservationist familiar with the area mentioned that the Selous was the site of military training for African liberation movements in the middle of the twentieth century. The first President of Tanzania, Julius Nyerere, earned a reputation as one of the strongest supporters of liberation movements across Africa. Tanzania became a hub for liberation leaders seeking safety to set up political organizations, as well as space for military training camps. Kongwa, in central Tanzania, became a major training facility for southern African liberation movements with Namibians, Mozambicans, South Africans, Zimbabweans, and Angolans (Williams 2011). However, the Selous is never described in the

literature as a site of military training, for Tanzanians or foreigners. Intrigued, I decided to investigate whether there was truth to the conservationist's story.[26]

Sharing its southern border with Portuguese East Africa, Tanzania became central to Mozambique Liberation Front (FRELIMO) activities. In addition to beginning its training in central Tanzania at Kongwa (1964-1966), FRELIMO made the coastal Tanzanian city of Bagamoyo its administrative headquarters (de Carvalho 2003; Williams 2011). Southern Tanzania became a restricted area to unauthorized aliens during the Mozambican struggle for independence and there was mandatory reporting of any non-local who appeared in a village (Temu and Tembe 2014). Reflecting a level of paranoia about the security of southern Tanzania and spying by Portuguese colonial sympathizers, newly independent Tanzanian citizens were tasked by their president with the protection of their villages from saboteurs and colonial influence.

Nachingwea, on the eastern side of the Selous, became a major FRELIMO military training camp from 1965 (Temu and Tembe 2014; de Carvalho 2003). Songea, to the west of the Selous, became an administrative hub for FRELIMO. Mbeya, northwest of the Selous, became a major node for supplies and soldiers to transit in and out of Tanzania. FRELIMO forces launched attacks from southern Tanzania across the border into Mozambique. Likuyu also stands out as a settlement area (see figure 9). However, FRELIMO training camps never appeared in oral histories I collected in Likuyu ward. Elders never recounted any incidents of state-encouraged suspicion of outsiders. I discussed this historical inconsistency with elders in Likuyu Sekamaganga. There was near universal agreement, denying the presence of FRELIMO in the area.

[26] Official historical information on Tanzania's role in the liberation struggles was only recently documented in a Southern African Development Community (SADC) anthology on this continental history (Temu and Tembe 2014). Internal Tanzanian military records are held at the Lugalo Military Archive in Dar es Salaam. I was not granted access to the military archives in time for this study.

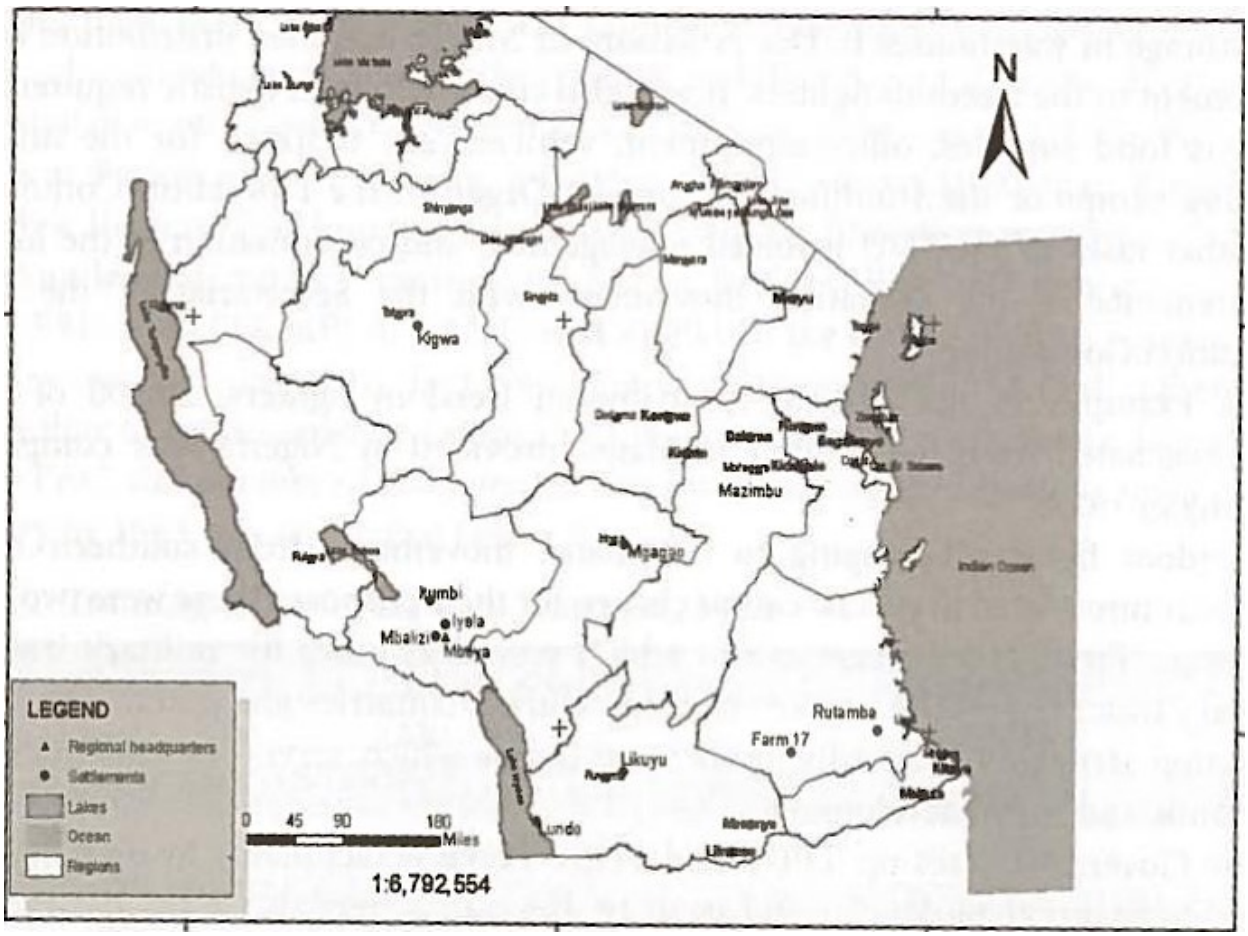


Figure 9 Liberation movement military camps and settlements in Tanzania, as portrayed in the SADC report. Likuyu in the bottom centre is labelled as a settlement (Temu and Tembe 2014).

In Mtonya village, which shares a border with Likuyu Sekamaganga, an elder discussed the history of his village. Sitting outside the home of one of his wives, with his great-grandchildren playing at his feet, the elder spoke at length about the history of the village from the Ngoni invasion through independence. He denied knowing anything about FRELIMO soldiers. He was confident that Tanganyika was at the forefront of helping other African countries seek liberation at the time (*Tanganyika alikuwa mbele kusaidia*). When I asked where FRELIMO trained, he said they trained in Morogoro and Dar es Salaam. As I pressed about the role of Likuyu, he remained steadfast. He was well-informed about the history and politics of the time, but said that if there was a training camp in existence in the area of his village it was a '*siri ya serikali*' (government secret); if that was the case, he

conceded that it is possible that FRELIMO was in the area (*Lakini inawezekana*). Since this conversation, I came to wonder if it is possible FRELIMO was in the area as the elder suggested: as a government secret.

After exhausting patience for my historical investigation into the ghosts of FRELIMO in Likuyu, I went to consult interlocutors in Songea. They shared the historical information they knew, confirming sites associated with FRELIMO surrounding the Selous. I shared my hypothesis that FRELIMO fighters may have come out from Mozambique and travelled north to the main base at Nachingwea on the eastern side of the Selous. High-level FRELIMO administrative activities were split between Nachingwea in the east and Songea to the west of the Selous. Additional sites for training activities to the southeast of the Selous took place in Tunduru, and to the southwest in Likuyu and Namtumbo. The Songea participants confirmed that there were FRELIMO training facilities near Likuyu and in Songea. They also told me more far-fetched stories of Likuyu hosting a FRELIMO cemetery; Likuyu as a second home for Mozambican soldiers, where second wives and children lived; and other accounts which directly contradicted the elders' stories. Despite the denials that I received from elders living in the villages of Likuyu Sekamaganga and Mtonya, it seemed that the conservationists' first hint rang true. I wondered why the elders told me that there were no FRELIMO soldiers in the area during the time of the independence war?

It seems possible that these people genuinely did not know what was happening around them. The Selous, the size of Switzerland, conveniently presents a relatively controlled environment devoid of civilians. Training for the guerrilla war they would wage in Mozambique, FRELIMO soldiers may have been well hidden in the woodlands of the Selous. A study participant in Songea cautioned me that, 'security during the time of Nyerere was different than today. You could have soldiers near you and not know. Outsiders were not welcome in southern Tanzania'. During a time of great suspicion and fear of outsiders, people

might have chosen to not notice foreign fighters in their midst. They may have chosen to either forget them entirely today, or to re-remember the past without them. However, this clashes with the assurances from village elders that they did not feel like there was intense suspicion of outsiders at the time. Another option is that the few surviving elders who might be able to remember could have forgotten this moment in history. Another possibility is that elders repeatedly and systematically lied; people may have been aware of the activities, perhaps cooperating or collaborating with the training programmes, but denied this to me. As one local historian suggested, these elders may plan to take their *kiapo* (oath) to the grave. It is also possible that many factors are coming together to erase the history of FRELIMO training on the southwestern side of the Selous.

From 1951-1967 and from 1951-1965, sections of land between Likuyu and the Selous were annexed into the Game Reserve. When Tanzania gained independence in 1961 and the Selous continued to exist, was there a vision at that time that there could be training conducted in that Game Reserve? Could a guerrilla military training programme take place in the Selous without the knowledge of game wardens or hunting companies? From the limited archival information available from the time, Game Wardens make no mention of military exercises in the Selous. By 1968 hunters continue to access parts of the Selous for safaris, coinciding with possible FRELIMO presence in the Reserve. Moving ahead to the 1970s and 1980s, can we connect the intrusion and departure of foreign fighters from the Selous with the spike in poaching there at that time? Is there a chance that ivory or meat from Selous elephants were part of what supported the trainings, as colonial records suggested took place during World War I hostilities inside the Selous?

In this recent history, the Selous again assumes the role of a place of camouflage and militancy, echoing the past history of the Maji Maji War and World War I. It is a place where foreign fighters train as if it was an international military base, despite its designation as a

Game Reserve. The repurposing of Game Reserve land for the training of foreign liberation fighters signals a de-nationalization of this area. Further research is necessary to clarify this history. This academic exercise examined a speculative history of foreign fighters accessing land from which ordinary Tanzanians were expelled and denied access. This adds another layer to the history of the Selous, and may be playing a role in the Tanzanian government's activities related to ongoing conservation and uranium mining in the area. Another recent historical incident presents an opposing circumstance. In the next section, I present circumstances in which citizens remember, and attempt to contest, the management of their land.

Refugees in the Bush

> The village of Likuyu Sekamaganga is meeting, as is usual for large assemblies, in the grassy area between the village office and the primary school, under the shade of a large tree. There are about one hundred villagers here, sitting in the grass; eleven are women. They are facing the head table, brought from inside the village office. Around the table and extending in a row beyond, twenty people are sitting, including village leadership and leadership from the Mbarang'andu WMA. The meeting was set to discuss the election of new village representatives to the WMA. It is agreed the election itself would be postponed, since the necessary paperwork had been forgotten in Namtumbo. As the meeting wraps up, a villager poses an interjection. He wants to discuss reducing the size of the Community Based Conservation Training Centre to give land back to the village. The *Diwani* (ward councillor) stands to provide support for the statement. He says that there were villagers who went near the border of Likuyu Sekamaganga village and the Selous sector campus to collect mushrooms and were caught (*kamatwa*) by Selous game rangers. The Ward Executive Officer changes the subject to conclude the meeting by announcing a free safety instruction class for motorcycle drivers and information regarding a missing elder from a neighbouring village.

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The Community Based Conservation Training Centre (CBCTC) sits at the edge of the Selous Game Reserve, on the road from the village of Likuyu Sekamaganga to the planned uranium mine. The training centre is part of the larger movement to increase community participation in conservation efforts, which in Tanzania took the form of Wildlife Management Areas (WMAs). The CBCTC attracts Tanzanian trainees who want to act as Village Game Scouts (VGS). These scouts are responsible for protecting the natural resources in WMAs. The

CBCTC stands as a brick and mortar testament to Tanzania's commitment to community-based natural resource management: part of the effort to change the hearts and minds of Tanzanians regarding the protection of forests and wildlife. The government-operated training centre opened in 1993 as a mobile facility, roaming the Selous. In 1995, they moved into their current location, just outside the Selous and the uranium mine. The training centre (often called *Cha Tatu*, referencing its erstwhile moniker *Kijiji Cha Tatu* or the 'third village' of the refugee camp complex), along with the Selous sector headquarters (similarly called *Cha Tano*, the abbreviation of *Kijiji Cha Tano* or the 'fifth village' of the refugee camp complex), and the ward secondary school sit on land provided to the government by the village of Likuyu Sekamaganga. The village gave the land to the Tanzanian government for use as a camp for refugees fleeing the Mozambican civil war. By 1994, when peace and democratic elections came to Mozambique, many of the refugees repatriated themselves and abandoned the refugee camps. At that time, the refugee agencies gave the land and buildings back to the Tanzanian government. The government did not return the land to the village.

The village of Likuyu Sekamaganga contests the annexation of this land. At nearly every village-level meeting with District officials, including the meeting described above, villagers voice complaints about the training centre and its occupation of village land. Villagers claim the land protected for wildlife in the CBCTC is fertile farmland perceived to be currently underutilized. Over the years, village leaders met on several occasions with staff of the training centre to discuss these grievances. On each occasion, the training centre Principal explained to me, the CBCTC informed the village leaders that they must produce the requisite records proving they are on village land, and that the land was never permanently relinquished to the national government. This written documentation of the land management agreements would be necessary for the centre to have further discussions about continuing to occupy the land. The training centre Principal believes that the village wants

the land so that they can be closer to the Selous to allow for easier access to wildlife for poaching.

The irony of a centre for training game scouts and village leaders on the tenants of community-based natural resource management that is, at best, ambivalently welcomed by its host community and, at worst, completely unwanted, highlights the ongoing tensions between communities and conservation initiatives. The incursion of foreign refugees and the way in which their presence was used to extract village land for government purposes seems to fit into the larger history of this wilderness area, and the conservation efforts around it. The villagers of Likuyu Sekamaganga continue to navigate the complexities of living in a conservation area by launching complaints at local leaders. However, this civil discourse appears to contrast with the violent, paramilitary aspects of conservation. Since the entry of refugees, the area increasingly became a place of discipline. The centre is a training camp for the paramilitary VGS, whose Prussian-style marching may be theatrical, but nonetheless evokes militancy. The area is also the base for the paramilitary Selous game rangers of the southwestern sector, who have shoot-on-sight permission to protect the wildlife of the Selous. Villagers of Likuyu Sekamaganga petition their local government officials, demanding justice for what they see as (the most recent case of) dispossession of local natural resources for state control.

Conclusion

This chapter wove together ethno-historical and archival information to highlight the common thread of control/discipline, violence, and extraction from the southwestern Selous. Arguing that the narrative of the Selous as a pristine wilderness is a misnomer, this chapter explored the human histories within this wilderness area. From precolonial history of Ngoni invasions and the ivory and slave trade to the devastation of the Maji Maji War and World

War I, the area experienced dramatic population changes. Colonial and post-colonial collectivization and resettlement schemes further dislocated people who were living in what is now known as the Selous. The area of the Selous reveals itself as the site of violence in the Maji Maji War, World War I, and of liberation-era FRELIMO military training. Ongoing hunting and poaching of wildlife in the Selous and Mbarang'andu WMA, along with the reactionary response of the paramilitary Selous game rangers and VGS with support from private conservation groups, appear as the current chapter of the history of the southwestern Selous and its environs.

Focusing on significant population changes, I identified their associated impact on the creation of the Selous as the largest wilderness area in Africa, devoid of a human population. I traced the evolution of the Selous and its governance with the repeating trends of extraction, de-nationalization of land, and violence. The eviction of people from the area created a space which largely benefited foreign hunters and private safari companies. The safari-related funds that enter the Tanzanian government coffers are steered toward funding the nation as a whole, rather than funnelling back to the source areas. The military training of Mozambican liberation fighters, taking place in the same areas denied to local people, demonstrates the paradox posed by a conservation policy based on an ideology of wilderness requiring the absence of certain humans. Further, the possibility of foreign liberation fighters training in the area points to a history of de-nationalization of the Selous. Combining this instance of foreigners accessing and controlling the Selous, we can add the history of Mozambican refugees placed in camps along the edge of the Selous, and the way in which their presence was used to extract village land for government use. The paramilitarization of poaching and the reactive anti-poaching via the Selous game rangers and VGS speak to an accepted level of violence. The approval of a mine within the Selous, by transferring control from the

Tanzanian government to the Russian mining company, appears to signal the next phase of the natural resource management of the Selous and is examined in detail in the next chapter.

Chapter 3 Tanzanian Uranium in a Nuclear World

Under the shade of a huge tree, I sit on the wood slab bench, balancing a binder full of letters on my lap. I arrived at this private home in Namtumbo town, the seat of Namtumbo District, to meet with Mr. Busi of the *Kikundi cha Kuza Uchumi Wa Namtumbo* (KUNA) (Association Promoting Economic Growth for Namtumbo).[27] When I introduced myself to the leader, he briefly greeted me and then hurried inside the house. While I sat on the bench waiting for him, the first of a series of women came to use the spigot in the yard, filling up buckets of water and hauling them away. When Mr. Busi returned, he presented me with the binder and suggested I read its contents before we discussed anything.

The binder contains dozens of copies of organizational documents and of letters of correspondence to and from his association. The letters trace a concerted effort to demand payment for a $12.5 million debt owed to this group of Ndendeule people by Mantra. The payment would serve as compensation for loss of property as a result of relocations conducted under British colonialism from 1940-1945 from the area that is now part of the concession for the uranium mine at the Mkuju River.

I puzzle over the claims made in the binder. I ask Mr. Busi if I could photograph the documents. He encourages me to do so, helping to hold the binder steady while I take the photos. As we leaf through the pages of the binder, he elaborates on the documents. He says that they started the association in 2007, as a group of elders who had limited funds and were able to do little work. They started a fish farming scheme, which failed, but they continue to collectively farm eight acres of *mbazi* (garbanzo beans), a relatively high-earning crop in the area. We do not have money to pool together (*hatuna fedha wa kujumla*), he says, so they want to collect money to expand the group (*kupata pesa kupanua kikundi chetu*). One way the group would use additional funds would be to get a large machine to pack maize to sell in various places (*mashine kubwa kusindika mahindi … kuuzia sehemu mbali mbali*). The group looks to the future with concern for the economy of Namtumbo District (*mawazo wa uchumi wa wilaya*). They maintain a list of suggested development projects for the Namtumbo area, to come from a $1 billion loan they will request from the World Bank: a hotel comparable to those in Tanzania's tourism capital, Arusha; an airport like in South Africa; paved roads; a soccer stadium; and aquaculture projects similar to those in the central Tanzanian city of Morogoro.

Starting in 2012, KUNA began to collect the names of those evicted from the area that is now the Mkuju River Project. A chart in the binder lists the full names of 111 people who were expelled at gunpoint (*waliohamishwa kwa mtutu wa bunduki*) from the area from 1940-1945. 614 descendants of those original 111 joined KUNA to demand compensation for their forebears' lost property, specifically: homes (111 homes estimated at $30,000 each), millet (200 bags each at $60), rice (4,400 bags each at $80), maize (6,105 bags each at $50), beans (2,220 bags each at $120), chickens (10,000 total each at $8), goats (80,000 total each at $65), and cattle (3,750 total each at $800). They total their estimates for the compensation they deserve at $12,548,850.

Mr. Busi says the Ndendeule people were in the area of the Mkuju River Project before the British, the Germans, and the Arabs. He says that the British wanted the area for its natural

[27] This is a pseudonym.

> wealth: ivory and minerals. He recounts how a local person called Kingule saw that wild animals in the area enjoyed eating certain soils, those containing uranium. Kingule informed the *wazungu* (white people) that the soil was *laini* (soft/smooth) and could be used to construct houses. Mr. Busi said they sent a soil sample to Europe and the test said that the sediment was uranium (*tualipeleka sampo ulaya… Jibu… inasema kwamba hii ni meshapo ya uranium*).
>
> The mining company, Mantra, responded to their claim suggesting that, since the mining concession is rented from the Tanzanian government, the government must adjudicate the decision. Letters from KUNA addressed to the President of Tanzania, the Prime Minister, and numerous ministries press for a decision on this claim. The letters go back and forth, with the government demanding evidence of land rights within what is now the Selous Game Reserve, and the group responding that this is not possible.
>
> Mr. Busi says the group would continue to seek payment.

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In this ethno-historical chapter, I connect the human history of dispossession from the supposedly pristine Selous with the uranium mine at the Mkuju River. I review the history of uranium, and then progressively train attention on uranium mining in Africa. Telling a familiar story of wealthy Western countries and companies profiting from African resources, this history situates African uranium in the global marketplace. The, often under-represented, history of African uranium exploration and exploitation will provide background to understand the trajectory of Tanzanian uranium exploration, and, ultimately, possible futures for the Mkuju River Project. This comes into focus when I present the history of Tanzanian uranium exploration as revealed by previously unpublished archival evidence from the Geological Survey of Tanzania. This chapter takes a broad view of that geological and geopolitical history in order to explore how the uranium cartels, colonial legacies, and health implications for miners and neighbours of uranium mines can together illustrate the paths of African uranium suppliers.

Continuing to trace the history, I investigate the ways in which the Selous repeatedly became the site of mineral exploration across Tanzanian colonial and post-colonial history, all while theoretically set aside for protection. Although uranium mining can be seen as unique due to its capacity to irradiate (sub)surface forms of life before, during, and after the

extraction process, it will be useful in this context to consider uranium mining as just another form of extraction. Foreign influences in the area, culminating in a foreign company's concessionary management of the Mkuju River Project inside the Reserve, tell of a history of de-territorialization of the Selous. The hunting, poaching, and now uranium mining in the Selous indicate a pattern of extraction from this peripheral area, furthering the argument presented earlier of the Selous as a 'sacrifice zone'.

The following explores the history of uranium mining, eventually focusing on Tanzania. Based on archival evidence, I create a chronology of uranium exploration in Tanzania. This places Tanzania's recent process of permitting uranium mining within a much longer history of interest in mining this particular mineral. By adding archival research and ethnographic material relating to mineral exploration in the Selous, I continue to treat on equal footing the archival record and the oral histories of people in the area of Tanzania's first uranium mine. This exposes the ways in which histories can be complementary and conflicting. Rather than searching for an official 'truth' or an unquestionable 'correct history', this chapter instead examines the seams between the various histories, actively seeking explanations for the political deployment of history in this nuclear space.

Local Histories of Uranium

Expressions of the history of uranium mining within the villages that are closest to the Mkuju River Project complement and situate the vision of the local community group, KUNA, introduced above. This section is grounded in the recollections of the history of uranium in the villages closest to the Mkuju River Project uranium mine, exploring how this history impacts local residents' views of the ongoing and planned development of uranium in the immediate area. From elders across several villages, the articulation of the experience of the incursion of mineral exploration teams highlights the complexity of these interactions, which

often fail to appear in colonial and scientific records. Confusion abounds: the exact timing for events, the identity of actors involved, the intentions of those actors, and more. In the context of this rural area, these mineral exploration activities take on prominent places in the memories of villagers in the area. As the Mkuju River Project develops alongside hopes for associated economic opportunities, these memories take on newfound importance.

Returning to the community-based organization from the beginning of the chapter, KUNA appears to be accessing the historical dispossession of land in the area to make a claim for past debts. The leader of the group brought up that there was recently a scheme in which the British repaid Tanzanian soldiers who fought for them in World War II and had not previously received compensation. He saw this instance of the British providing remuneration for long overdue debts to Tanzanians as precedent for their claim that the mining company should pay for their ancestors' compensation. The Tanzanian government appears superficially responsive to the claims, while simultaneously demanding documentation to meet high standards of proof of surface land rights in mining concessions. The historical component, a lack of a colonial land registry for the area, ensures the group faces a likely insurmountable standard of evidence with which to make claims to surface land rights at the Mkuju River. Although KUNA traces its members to land rights in the area of the proposed mine, the group does not attempt to claim ownership of the uranium itself, or of anticipated mining wealth. Rather, they focus their attention on claiming damages for lost land and property forfeited under the colonial regime, which they now conceive coveted the natural resources in the area.

The hundreds of people who signed on to the KUNA repayment initiative from the villages of the area may or may not have independently nurtured memories of their own dispossession. A former village chairman discussed his family history with me in the village office. He was born in the nearby Msawati area in 1952, and his parents were born in

Ligombe, which he said is now in the Selous. His parents left Ligombe in 1930. They were *fukuzwa* (expelled), he clarified, explaining that white people conducted a survey in 1930 and discovered uranium and chased people out of the area. He said they went from Ligombe, inside the Selous, to Msawati, a journey of over one hundred kilometres. Similarly, another elder recollected that his parents left Naikiga in 1945. He said the Germans surveyed (*utafiti*) the area and found uranium. Right after the survey, his family was told that the area was unfit for human habitation, and they had to leave quickly. He also said that in 1945, people from all over were sent to Mpiga Miti, where he was born.

In these cases, the forced relocations of the Closer Settlement policy seem to now be 're-remembered' by elders in the village. These histories integrate a narrative of dispossession with realizations that the British colonial government expelled their families once they knew there was uranium in the area, a claim that will be investigated in the second half of this chapter. There does not appear to be archival evidence to support the memory of British discovery of uranium at Mkuju River. However, those details can be temporarily set aside to further examine the ways in which villagers remember their history. The survey the elders recall may have been the surveys conducted as part of Closer Settlement by Tubbs and other officials mentioned in the previous chapter. The elders explained that the British only told them that the area was unfit to live in, but never explained why. From the Tubbs letters, it appears that the British officials may not have understood or supported the resettlement process. Colonial officials' articulation of the rationale for the expulsion may have been similarly opaque. Additionally, through indirect rule, the Ngoni administrators may not have been able to provide coherent explanations for the expulsions of the Ndendeule people. The interchangeable mention of European rulers, as seen in one of the elders' recollections, also warrants examination. The conflation of German and British colonial rulers may be a matter of old age, or it might reflect the limited role the European officials played in the lives of

ordinary Tanzanians, since indirect rule in the Namtumbo area meant Ngoni administrators were most immediately responsible. These stories illustrate how some people are re-orienting their version of history around what they see, in retrospect, as an effort to dispossess them of their land and the surface rights to the area that would become the Nyota uranium prospect in the Mkuju River area.

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> Nelson draws lines in the sandy, burnt orange soil, scratching out rectangles representing the trenches that he dug when working for the uranium exploration company in the area that is now the Mkuju River Project.[28] From when the white people came in 1976 until 2009, he was a field assistant for the mineral exploration project. They would dig six or seven trenches over a wide area, making seven sections within each trench, testing each section. Each sample they would make weighed about one kilogram. They sent the samples to Mahabara, in the northern region of Mwanza, Tanzania, for testing. Each trench study took one year to complete. They were only searching and testing for uranium, 'You never get gold over there' he clarified in English.
>
> Nelson recalled that in June 1976, white people arrived in this village at the edge of the Selous to study the soil. Since he was the only person in the village who could speak English and Kiswahili, the foreigners hired him as a translator. Of the white people, there were two Germans, one Australian, and one other, whose nationality Nelson could not remember. Over the years, there were about eleven white people working at the project. They stayed about fifty kilometres from the village of Likuyu Sekamaganga, inside the Selous Game Reserve, near the present-day site of Mantra's Mkuju River Project.
>
> The elderly Nelson is the chair of the local branch of the ruling political party, *Chama Cha Mapinduzi* (CCM - Party of the Revolution). He is right at the cusp between being wiry and frail, still vibrant, but also occasionally known to fall asleep in village government meetings. He remembers his working days fondly. The working schedule meant living at the work site for three weeks and spending one week away on rest. Some would be on rest at any given time, so there were always a few workers in the nearby villages on rotational breaks. There were about 300 Tanzanians who worked on the project over the years.
>
> Workers at the project mainly came from northern Tanzania, from Arusha and Mwanza, because they studied geology, according to the elder. Nelson recalled there were about thirty workers from Likuyu Sekamaganga, including himself. He thought there were only about five workers from the neighbouring villages farther from the site. He said that people from those villages said there was *hatari* (danger) in the work. The elder attributed the limited number of people working for the project from these villages to fear.[29]
>
> Nelson described the protective gear worn by workers, including glasses, overalls, and boots because of the dangerous nature of the work (*analeta hatari*). He explained that the workers learned of *mionzi* (radiation) from radiation detectors, which they used to discover the location of uranium and where to dig the trenches. The white people taught the workers about

[28] This is a pseudonym.
[29] In conversation with elders from other villages, they denied this; they said that if they had been offered an opportunity to work on the project in the early days, they would not have turned it down.

> *mionzi* at the mess hall. A different white person taught each lesson about environment, body/health, and safety (e.g. washing with water and soap to remove contaminated dirt). The food at the site was safe, Nelson assures me. The food came on planes from America and was fresh. Obama sent the food, he jokes.

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Nelson's story of nearly four decades of uranium exploration in the southern Selous is not singular. The son of another worker recounted his father's stories of those early days of uranium exploration. His father told him that a white American man came to the village of Likuyu Sekamaganga by helicopter, which landed on the primary school soccer field around 1978. His father and Nelson helped that man because they spoke English. They were the only English speakers in the village, having studied at the regional secondary school, Songea Boys School. His father cooked food at the white man's camp near the Likuyu River bridge. The white man stayed in the area for about six months to work. After he finished, the man brought a report to the village government about his research, before he departed from the area. The report described the minerals occurring locally, including tourmaline, uranium, and others. The white man left behind beacons to mark areas of geological importance, but no beacons remain in the area. After several years—in 2006—many Americans returned; he confirmed that this group was 'Mantra'.[30] These prospectors started looking at the beacons that were left by the first American. The exploration took place in the *porini* (wilderness), near Mkuju River, he said.

This man, himself, worked for the exploration effort. He worked for a company subcontracting for Mantra called Bambuloko, a Tanzanian-owned company run out of Dar es Salaam. He worked for six months for the company. The workers were picked up by car each morning from Likuyu Sekamaganga and returned home nightly. He did manual labour, improving the road to the mining site. In his opinion, it was not very hard work. The workers

[30] An Australian mineral exploration company, Mantra Resources Ltd, conducted a scoping study at the Nyota prospect. The company, and its stake at the prospect, was purchased by Uranium One.

were provided with breakfast and lunch, as is customary in Tanzania. For one day of work he said he was paid Tsh 5,000; a low wage, in his opinion.[31] Bambuloko only built the road, it was not contracted to do other tasks. The subcontractor employed fifty-six workers at the site, compared to an estimated twenty Mantra workers. After the six months, there was no more work with Bambuloko and he was made redundant. He knows that Mantra continues work at the site.

The unevenness of the distribution of the benefits (e.g. of employment) of association with the exploration project is clear in these oral histories. Those with greater education and English language abilities were better positioned for jobs. Similarly, those from Northern Tanzania, with its longer history of mineral extraction appear to be strongly represented in the workforce, although this project is on the opposite side of the country from their places of origin. Looking at a geographically smaller area, it seems that even among villages nearest to the project, few people heard about, or were able to access jobs since mineral exploration began in earnest in the 1970s. The irregularity of the distribution of benefits of past mining exploration projects, in association with the strong emphasis on white foreigners creating changes and abandoning the projects, provided a historical basis upon which to orient themselves toward the planned Mkuju River Project and other mining projects developing in the area.

The memories from the villages near the Mkuju River Project, about the possibility of uranium in the area, are intertwined with European colonialism. Closer Settlement expulsions appear at the heart of the stories of elders who now know the same area is the site of a planned uranium mine. The more recent memories of uranium exploration continue to focus on a white, Western incursion into the area; European, but also American and Australian.

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[31] £1 is worth approximately Tsh 2,990.74.

From this ethnographic touchstone, we can now investigate the broader history and relevance of Tanzanian uranium in the nuclear world. Attempting to challenge the intentional silence of Tanzanians from the colonial records, this section amplified the voices from the villages nearest the mine: their understandings of the historical trajectory of mineral exploration and exploitation in their villages and forests. These voices will all but disappear as we move to consider the archival record.

Unearthing the History of African Uranium

In the late eighteenth century, uranium was discovered in Bohemia and grew in use as a glass and ceramic glaze. From the discovery of radioactivity of uranium by Henri Becquerel in Europe, its use and popularity expanded as a medical treatment and as a luminescent glaze.[32] At the turn of the twentieth century, the research of Marie and Pierre Curie revealed the properties of radium and uranium and associated radiation. Research continued, marked by the 1939 publication of the calculations of energy released through uranium fission (Landa 1993). The Manhattan Project, the U.S. Army's effort to develop a nuclear weapon began soon after, spurred on by a letter from Albert Einstein warning of the risks of such a weapon in the hands of Nazi Germany (Reed 2014). The U.S. government launched a secret plan to identify, mine, or collect uranium for military use. The U.S. government acquired supplies of uranium, fuelling nuclear testing and eventually the atomic bombs used to attack the Japanese cities of Hiroshima and Nagasaki in August 1945.

In the wake of the devastating use of the new weapons at the close of the Second World War, fears of becoming second-class states along with the rise of the Cold War drove

[32] The risks of uranium were confirmed in the U.S. in the 1928 court case of the Radium Girls, women who sued the Radium Dial Company for workplace illness after applying uranium glaze to dials (Clark 1987).

fading empires. Possessing nuclear weapon capabilities, creating a secure source of uranium ore, and joining the market for nuclear technology became the markers of a super power at this time. The U.S. grew concerned of Soviet Union attempts to gain control of uranium and produce nuclear weapons that might be used against the U.S. The ensuing scramble for the resource revealed that uranium was rather common, resulting in a shift from uranium being a scarce, government-controlled, jealously hidden mineral to a commercially distributed, readily available commodity. By the mid 1950s, it was widely understood that low-grade uranium ores were broadly available and only the highest-grade ores were rare. Rather than identifying and securing source material, attention shifted to refining and enriching uranium for use in nuclear weapons, nuclear energy, and medical treatments. Via the 'Atoms for Peace' programme, the U.S. permitted the distribution of nuclear material and technology to other countries. The programme began in 1955 with the transfer of small amounts of enriched uranium for use as fuel in research reactors constructed in each cooperating country including Brazil, Turkey, and Colombia (Hall 1965). As part of their atomic policy, the Americans also sent subsidized nuclear reactors to cooperating countries, with twenty-five sent by the end of the 1950s. The Soviet Union followed a similar policy, providing reactors to countries in their sphere of influence, both ultimately widely dispersing nuclear technologies (Hall 1965).

Exploiting African Uranium

Although rarely considered in the history of nuclear power, African uranium played an important role in the production of the nuclear world as we know it. Concentrating on the three main actors in the nuclear market with historic involvement and interests in African uranium, we can examine the evolution of their strategies toward African uranium and the global uranium market. The U.S. played a major role in purchasing uranium from South Africa and Congo; the U.K. attempted to take advantage of its colonial ties to uranium-

producing South Africa and Namibia; and the French explored all of its colonies for uranium, essentially establishing uranium mining monopolies in Niger, Gabon, and Madagascar.

The U.S. uranium strategy initially focused on controlling the market, in which all uranium was managed as a state secret. In 1940, an initial shipment of over 1,250 tons of pitchblende, high-grade uranium, arrived in New York from the Shinkolobwe mine in the Belgian Congo (today the Democratic Republic of Congo) in an evasive move to avoid confiscation in Nazi occupied Belgium (Hecht 2012a; Dumett 1985; Williams 2016). Congolese uranium, in addition to uranium from Canada (Van Wyck 2010), fuelled the first atomic weapons. Immediately after World War II, the U.S. stemmed the flow of nuclear technology to allies Britain and Canada, while continuing to share raw mineral resources.[33] First satisfying its military demand for uranium, the U.S. ended use of foreign ore as reactor fuel. The diversion of foreign (including African) uranium away from American reactors, where patriotic secrecy of nuclear development programmes took priority, emphasized the marginality of African interests in the end products of the minerals sourced from African mines.

The U.K. nuclear strategy can be understood in the dual light of its diminishing colonial prestige and its special, and constricting, relationship with the U.S. Immediately after the war and well until the 1950s, both countries held the line that, in the face of a Soviet threat, uranium suppliers must patriotically produce uranium at low costs and under secret contracts (Hecht 2012a).[34] Increasingly pinched by the serial blows from the U.S. limiting

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[33] The McMahon Act (1946), committed all raw uranium found in the world to a cooperative group (Hecht 2012a). By the late 1950s, the U.S. secured enough uranium to satisfy its own military needs and set out to decrease foreign uranium imports. From the 1960s-1970s the U.S. Atomic Energy Commission embargoed enrichment of foreign uranium for use in U.S. reactors (Greenberg et al. 2014), diverting uranium from South Africa, Australia, and the Belgian Congo to military purposes (Butler 2008).

[34] With the dual purpose of hiding the amount of uranium extracted (and therefore the amount of weapons created) as well as capping costs, the partnership formed was called the Combined Development Trust (CDT). In light of the illegality of monopolies and trusts, the name became the Combined Development Agency (CDA) (Hecht 2012a). The CDA secured supply contracts with uranium mines across the world, including large contracts with African suppliers from the Shinkolobwe mine in Congo and South Africa (Hecht 2012a).

access to nuclear technology, and their complete dependence on American-controlled uranium, the British grew desperate for an unrestricted, independent source of uranium. The U.K. attempted to broker a deal for the U.S. to buy South African uranium (Asuelime 2014; Asuelime 2013). The U.K. also sought to establish its own source of uranium by way of a scheme to create the Central African Federation, thinking there were deposits of uranium in the Zambian Copperbelt (Butler 2008). By inserting itself between African uranium and the rising U.S., the U.K. demonstrated the post-war logics that marginalized African uranium, and also the colonial rationality of planning to extract African uranium as British uranium.

France used its colonies as a source of strategic minerals, especially uranium (Martin 1989). African uranium, therefore, became French uranium, tightly controlled by French companies. The French uranium prospecting company Frances Commisariat á l'énergie Atomique (CEA) began prospecting in France in 1945 and in the French overseas territory of Gabon in 1947, discovering uranium at a manganese mine in 1957 at Mounana (Hecht 2012a; Martin 1989). The CEA started to prospect in Niger in the mid 1950s. The French unsuccessfully explored the Central African Republic (CAR) in 1947 (Adeniji 2002).

Fearing American dominance in nuclear power via the Atoms for Peace reactor construction initiative, Russia and France developed their own programmes to export nuclear reactors (Holloway 2016). At the same time, African uranium began to assume new roles in light of the success of liberation movements in the 1960s, the end of colonialism, and the rise of anti-racism movements. In a global context, this related to shifts in world power reflecting the entrance of new states into existing Cold War dynamics. Among newly independent uranium-producing states, the tension between liberation ideology and ongoing relations with former colonizers reveals the complex realities these young states embodied.

Following decolonization, France continued to grant itself preferred prices and access to uranium in exchange for French military support and development aid in negotiations of

contracts with former colonies. Gabon agreed to the 1974 Accord de Défense et Coopération guaranteeing nearly all the ore mined was destined for France (Adeniji 2002). Niger, like Gabon, signed the Accord de Défense in 1961 regarding French right to strategic minerals such as uranium (Adeniji 2002). A 1977 agreement provided ongoing presence in the country of sixty military advisors (Martin 1989). Niger's shares of national uranium company SOMAIR (Société des Mines de l'Aïr) were financed with the French aid agency Caisse Central de Coopération Économique (C.C.C.E.), solidifying French control over uranium exploration and mining in the country.

The French were not alone in attempting to continue their dominance in the post-colonial world. The British relationship with former colony South Africa regarding uranium is further complicated by South Africa's apartheid policies and occupation of South West Africa (Namibia) (Hecht 2012a; Asuelime 2014; Asuelime 2013; van Wyk 2012). Knowledge of uranium in Namibia dates back to the 1920s with extensive surveying in the 1950s. In 1966, British company Rio Tinto Zinc secured the rights to the Rössing site, and the Namibian mine began producing uranium in 1976. Britain continued to purchase uranium from the mine throughout South African apartheid and Namibian occupation, in violation of U.N. resolutions and international resolutions preventing colonial powers from profiting from resources belonging to non-self-governing territories.[35]

The obscurity of the historical role of African uranium morphed into a fear of African uranium. The panic inspired by the prospect of non-nuclear states acquiring African uranium for military purposes came to a peak in 2002 when U.S. President Bush used the false allegation that Saddam Hussein sought uranium 'from Africa' for use in weapons of mass destruction as rationale for the second Iraq war (Hecht 2012a). Nonetheless, African uranium

[35] United Nations Council for Namibia (U.N.C.N.) Decree Number One (1974) banned extraction or distribution of Namibian resources without explicit council consent.

plays a major role in the international market. Since the discovery of uranium in 1915, the Shinkolobwe mine of Congo continues to be an area of intrigue. Following the fateful shipment of uranium from Congo to New York, flooding and labour shortages closed the mine from 1940-1944 (Dumett 1985). Mining resumed until independence in 1960, when the mine was shuttered and concrete poured down the mine shafts (Dasnois 2012). The mine remains officially closed but reports of artisanal uranium mining appear periodically. Niger and Namibia remain key uranium suppliers globally, and South Africa continues to produce uranium, though at less significant levels.

Uranium and African Bodies

Uranium mined in sub-Saharan Africa, for which workers physically extracted the raw material from the earth, was the point of interaction between uranium and the largest number of ordinary sub-Saharan Africans. However, uranium that went on to become fuel for nuclear research and power stations, material for nuclear weapons, and for use in medicine would, in Africa, also be points of contact—creating instances of physical experience and exposure to the nuclear life-cycle. This section examines the embodied African experience with uranium from processed, enriched uranium in reactors, to nuclear weapons testing, but also to the miners who extracted uranium from the earth.

In appreciation of Congo's assistance in the Second World War, the U.S. provided a research reactor to the University of Kinshasa in 1958. A new research reactor was installed in 1972, and a third reactor was built and put on hold in 1998. Other African countries followed a different nuclear trajectory from that of Congo. Following the independence of African countries, many African leaders voiced interest in nuclear power. The Ghana Atomic Energy Commission was established in 1963 by Kwame Nkrumah, who said the nation's desire for nuclear technology is: 'to enable Ghana to take every advantage of the decisive methods of research and development which mark our modern world' (Agyei 2007). The

Soviet Union supplied Ghana with a research reactor, which was never installed. In 1994-1995, China provided Ghana with a 30kilowatt (kW) research reactor (Adeniji 2002).[36] Similarly, Pan-Africanist and anti-apartheid sentiments drove Nigerian desire for peaceful and military nuclear technology. The Nigerian Atomic Energy Commission, created in 1976, cooperated with the Republic of Germany to purchase a 600megawatt (MW) nuclear power plant. The Obafemi Awolowo University acquired a Chinese research reactor in 2004 (Adeniji 2002).[37] The Africans who interacted directly with these research reactors and their associated nuclear material represent a small minority of elite scientists and support staff.[38] Nonetheless, research plants represent one point of physical interaction between sub-Saharan Africans and uranium.

Growing movements underpinned by anti-colonial and anti-racist sentiments found allies in the nuclear non-proliferation movement. In 1959, as the intentions of France to conduct nuclear tests in the Algerian Sahara Desert became increasingly evident, downwind countries, especially Ghana, became important voices of resistance and outrage among independent African states.[39] Speaking at the 1960 Positive Action Conference for Peace and Security in Africa, President Nkrumah lamented:

> Winds carried the poisonous debris from the explosion to various parts of Africa, including Ghana… From the point of view of genetics these atomic tests are extremely bad and can have the most disastrous effects. The French test last February resulted in a very substantial increase in radio-activity. This was proved by British and Canadian scientists who were manning our monitoring stations here in Ghana… I must emphasise that five eminent physicists — three Japanese, one American and one French, two of them Nobel-Prizewinners

[36] In 2012, the Ghanaian government signed a nuclear cooperation agreement with Russian company ROSATOM (parent company of Uranium One) to develop nuclear power in the country, fulfilling the dreams of Nkrumah.
[37] Searching for ways to diversify from and also conserve crude oil reserves, Nigeria continues to explore nuclear energy options. In 2015, Nigeria signed a nuclear cooperation deal with ROSATOM for as many as four nuclear power plants, with the first estimated to begin operation in 2025.
[38] The disposal of nuclear waste generated in sub-Saharan Africa has yet to become a topic of significant academic investigation in the social sciences.
[39] Capitalizing on Ghana's importance as a hub for anti-colonial activities, key activists from the American civil rights movement—Bill Sutherland and Bayard Rustin—created the most important action in the liberation-non-proliferation alliance. The two planned for an international delegation of pacifists to travel in protest from Accra, Ghana to the nuclear test site in Algeria (Allman 2008). Despite the failure of the delegation to reach their planned destination, the protest demonstrates the links fostered between disparate movements.

> [*sic*]— have announced that more than one million people will die as a result of such explosions. They stated also, among other things, that 'elementary calculation' showed that the fall-out from each 'superbomb' provoked the birth of fifteen thousand abnormal children. (1960, p.3)

Nkrumah's fears of the embodied consequences of exposure to the residual radioactive material of nuclear weapons testing sent into the upper atmosphere highlight the anxieties associated with African experiences with nuclear materials.[40] Later in the same speech, Nkrumah ties the French nuclear imperialism to colonial efforts to balkanize Africa by creating internal divisions in order to highlight the fallacy of national borders in the face of the spread of nuclear fallout dispersed in the atmosphere. This nuclear imperialism appears as another way of disciplining the African body, because of (fears of) re-organizing the body internally (genetic mutation) and externally/existentially (nuclear holocaust). French nuclear testing in the Sahara in 1960 spurred the original efforts to denuclearize Africa (Ogunbanwo 1996).[41]

South Africa's nuclear trajectory is different from the rest of independent sub-Saharan Africa because of the apartheid regime and, therefore, must be examined separately. Nuclear power and weapons programmes began soon after the 1948 creation of the Atomic Energy Board. South Africa supplied raw uranium for export and refinement, and under the Atoms for Peace programme, South Africa purchased a 20MW research reactor, which came online in 1965. Secret research on uranium enrichment began in 1961, and was revealed in the 1970 announcement of a unique enrichment process. In 1976, South Africa signed a contract with French company Framatorie, Alsthom and SPIE Batgnolles to construct two 922MW light

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[40] These anxieties are spread globally. Knowledge about and fear of nuclear materials and radioactivity will be considered further in later chapters.

[41] The roots of the liberation-non-proliferation alliance pre-date French weapons testing, going back to the first use of the atomic bomb. The 1958 Positive Action Conference for Peace and Security in Africa, hosted in Ghana, focused on preventing French nuclear tests on the continent. Similarly, the August 1959 Monrovia Conference on Algeria resulted in a resolution denouncing the French decision to go ahead with nuclear testing in Africa. The 1958 All-African Peoples' Conference (AAPC) steering committee met in Ghana, and Nkrumah took a clear non-proliferation stance against all nuclear weapons.

water reactors near Cape Town, which came online in 1984 and 1985 (Adeniji 2002).[42]

Despite support of the Organization for African Unity (OAU) declarations (on the denuclearization of Africa) from the U.N. General Assembly, the impetus waned to declare the continent a denuclearized zone. The cessation of French nuclear testing in the Sahara in 1966 removed the initial provocation. The 1977 revelation of a South African nuclear weapons testing site in the Kalahari Desert, and the 1979 suspected atmospheric nuclear test by South African and Israeli forces further complicated efforts to pass a regional treaty as originally envisaged (Masiza 1993).[43] However, the South African apartheid regime's nuclear programme was seen by African liberation leaders as deeply connected to nuclear imperialism of French nuclear weapons testing in Algeria. From its marginalization at the periphery of the nuclear world, left out of the overall history of nuclear energy, African experiences of nuclear weapons testing and research reactors highlight the impact of refined uranium on African bodies.[44]

Conventional mining of raw uranium presents a point of direct, intentional contact between ordinary Africans and nuclear material. Similarly, communities surrounding African uranium mines also come into contact with nuclear material, sometimes unintentionally. Uranium mining, by open pit mining and underground mining, [45] fits within the larger,

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[42] In 2014, South Africa signed a cooperation agreement with ROSATOM to replace aging nuclear reactors and expand the nuclear fleet. The Russians apparently won the tender over Chinese firm Guangdong Nuclear Power Holding Corp. and French giant AREVA.

[43] U.N. General Assembly Resolution 1652 (XVI) (1961) demanded member states not test nuclear weapons in Africa. The 1963 Conference of Heads of State and Government at Addis Ababa saw the passage of a Resolution on General Disarmament. In 1964, the Organization for African Unity (OAU) adopted the Declaration on the Denuclearization of Africa, committing to the creation of a treaty that would ban the creation or use of nuclear weapons (Organisation of African Unity 1964, p.29). The anti-colonial-non-proliferation nexus seen in these early summits would, decades later, result in the Pelindaba Treaty (African Nuclear Weapon Free Zone Treaty), which came into force in 2009.

[44] Nuclear medicine in sub-Saharan Africa, another point of contact with refined uranium, is the subject of scant attention from the social sciences, but such programmes are thought to be most well-developed in Namibia and South Africa.

[45] To present, in sub-Saharan Africa, uranium has never been mined using indirect methods, such as in situ leach mining.

complex story of occupational health in African mines.[46] Hecht considers the ways in which radiation hazards in South African uranium mines 'were rendered invisible' (2012b, p.94). Specifically, Hecht highlights that mining companies and the state worked to hide occupation-related lung diseases, prominent in the gold mines that later produced uranium as a by-product. Mines studied systems to limit their workers' radiation exposure rates. They made efforts to limit worker exposure, for instance, by reducing dust levels and encouraging workers to change out of mining clothing. In addition, they took steps to obscure their ability to know the levels of worker exposure (e.g. shorter contracts for migrant workers who could then have essentially no way of tracking cumulative radiation dosing). Processing plants separating uranium from gold and other materials strongly resisted regulations limiting workplace eating (to minimize the chance of ingesting radioactive material). This opposition was based on the allegation that the rules would force workers to take breaks, requiring the added financial burden of hiring additional workers to allow plants to operate continuously. Marked racial disparities became normalized, including in exposure to and protection from radiation in the workplace. Hecht found that South African mineworkers and migrant mineworkers 'have no way to correlate disease with work history' (Hecht 2012b, p.110), leaving them with limited ability to claim workplace injury and associated damages.

Bodily interactions in which Africans experienced uranium—especially through proximity to nuclear weapons testing and uranium mining—provide further nuance to the picture of Africa's place in the nuclear world. In addition to producing raw uranium, nuclear weapons testing on the continent illustrates the ways in which imperial, colonial mentalities continued to dominate the landscape, even after liberation. The occupational health effects of uranium mining impact Africans' experience of uranium more broadly than nuclear power or

[46] For additional information about African occupational health in the context of South African mines, please see McCulloch (2009).

other end uses of uranium. Racist workplace behaviours meant that black workers continued to be exposed to unsafe working conditions long after the negative consequences of exposure to radiation were well-documented. Chapter eight further accounts for fears associated with radiation, and the embodied experience of the nuclear world. The historic embrace of nuclear power by African countries, as a modernizing force for independent African states, illustrates the ambivalence toward nuclear power—at once, both desired and dreaded.

The Hunt for Tanzanian Uranium

Unlike South Africa, Niger, and Namibia, Tanzania does not have a prominent role in the history of uranium mining. This section explores the history of uranium prospecting in a territory considered to be of little strategic value to its colonizers. The historical record reveals the level of interest in mineral exploration in the territory and later newly independent nation, providing context to understand Tanzania's current status, on the cusp of opening its first uranium mine, and its future in the nuclear world.

Ambitions of utilizing colonies as sources of freely accessible natural resources sparked German colonial geological interest in Tanzania. However, the southern part of the colony remained relatively neglected. Scanty records included a 1894 geological study by Dr Leider, now lost to reference, the 1900 reports from geologist Bornhardt, and a report by Dantz from 1899. Following the transition of power from German to British, the Tanganyika Geological Survey produced annual reports on their activities. Maps from 1927 and 1928 do not note the presence of uranium, nor interest in studying the southern part of the protectorate (No author 1932). The 1931 report notes the presence of uranium on a 1931 map near Morogoro, in central Tanzania (No author 1932). This uranium came from pegmatites from the Uluguru Mountains (Sampson 1957; Williams and Skerl 1940).

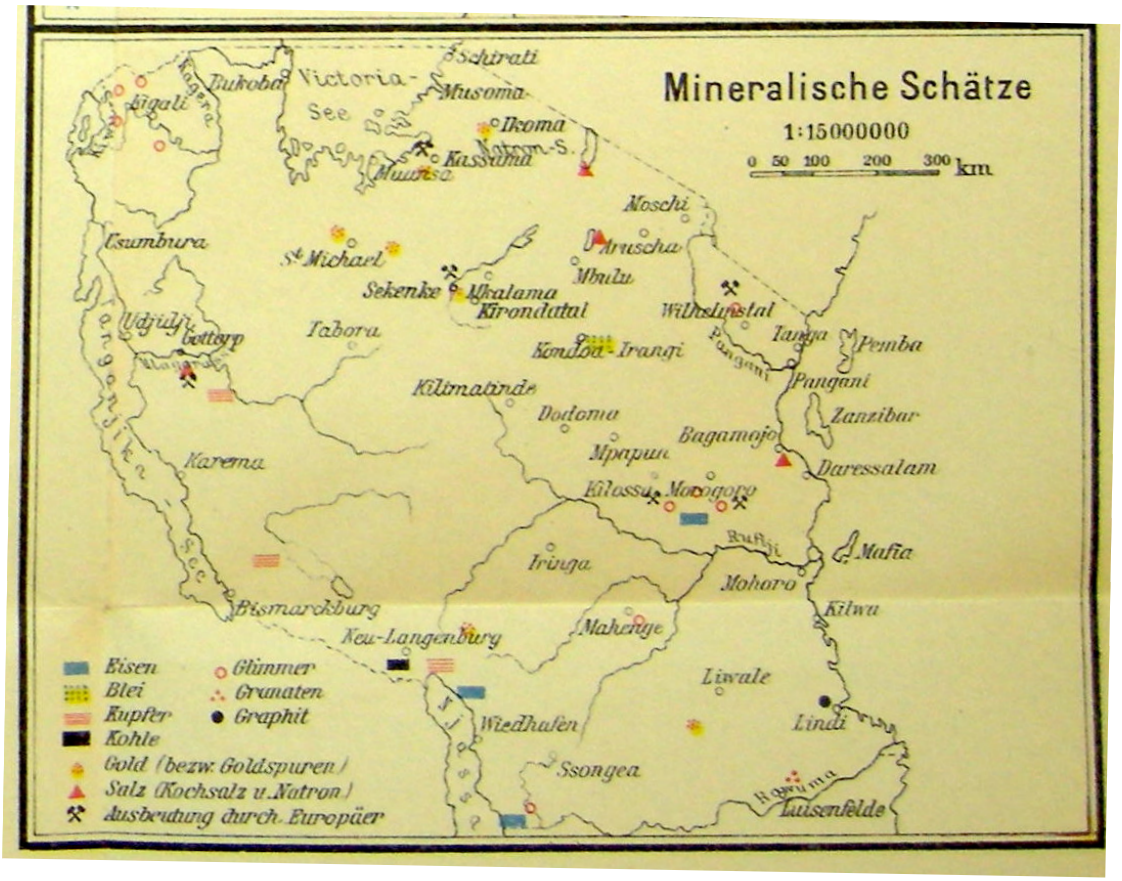


Figure 10 ‘Mineral Treasures’ of German East Africa. Map from Schnee (1920) republishing a map from the Wirtschafts-Atlas der deutschen Kolonien (Economic Atlas of the German colonies) published in 1912. Illustrates the widespread exploration of minerals under German colonization, including in southern Tanzania.

Following the American use of the first atomic weapons, British interest in uranium heightened, appearing in the archival record of Tanganyika, then a British mandated territory. The 1948 Bulletin of the Geological Survey of Tanganyika discusses ongoing interest in uranium and the decision to continue geological exploration in the territory (Stockley 1948). The Geological Survey and Atomic Energy Division conducted aerial prospecting for radioactive minerals in 1951 (Davidson 1951). In 1955, a consultant suggested searching half of Tanganyika Territory for uranium (Spalding 1955). By 1955, four private entities engaged in mineral search flights (Spalding 1955; Hunting Geophysics Ltd 1958b), illustrating the shift in British understanding that uranium was more broadly available than originally thought. Exploratory cores examined in 1957 revealed a single core of ‘economic interest’ from the site of Bahi Swamp in central Tanzania (Fawley 1958).

In 1956, a mineral exploration team examined known mineral deposits including radioactive minerals from each province (Fawley 1958). In 1956, a U.N. Technical Officer reports: 'No interesting radio-active minerals were found' (Czikan 1957, n.p.) in the study area of Masasi and Nachingwea in southern Tanzania. The 1956 Mineral Map for the Atlas of Tanganyika indicates, 'Uranium and thorium occur… None of the deposits containing thorium or uranium have been found to be commercially exploitable' (A.E.Q. 1956, p.2). By 1957, 'The pegmatites of the Ulugurus are widely known as the source of uraninite, much of which has found its way into museum and private collections' (Sampson 1957, p.1).[47]

As the sun began to set on colonial rule, the British continued to search for uranium in the territory. A 1957 contribution to the Annual Report of the Geological Survey described: 'A short trip to Ukinga … with an officer of the U.K.A.E.A. [U.K. Atomic Energy Authority], office at Dodoma in order to examine the radioactive possibilities in the area' (Harpum 1957, n.p.).[48] The same year, a preliminary expedition searched an area in central Tanzania for radioactivity based on anomalous indications from an airborne survey (Harris 1957). In 1958, the U.K. Atomic Energy Authority commissioned an airborne radiometric survey of three areas in Kenya and Tanganyika (Hunting Geophysics Ltd 1958a). The following year, the British conducted a study of radioactive beach sands in Zanzibar (McKinlay 1960). Despite concerted exploratory efforts, archival material repeatedly suggests a total lack of knowledge of the deposit to be mined at Mkuju River.

Independence in December 1961 did not mark an end to the flurry of interest in uranium. Tanzania's first president Julius Nyerere, a major force for nuclear non-proliferation, joined other liberation leaders including Kwame Nkrumah of Ghana who

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[47] The 1961 retrospective report on Economic Geology records £146 from Tanganyikan uranium ore (Harris 1961), likely from those sources.

[48] In 1956, the United Kingdom Atomic Energy authority set up an office in the territory and offered technical assistance to uranium prospectors and incentives for the discovery of uranium (International Atomic Energy Agency 1963).

tempered beliefs against nuclear weapons with ambitions for nuclear power generation in Africa. In a 1962 mission, the International Atomic Energy Agency reports 'The geology of the country suggests favourable conditions which would warrant detailed study' (1963, p.10) as well as the optimistic consideration of the prospect of nuclear power generation in the country. Reports of pitchblende were investigated in 1965 and revealed to be un-saleable (Clark 1965) and to be falsely reported in 1973 (Nanyaro 1973). In 1966, the newly independent country followed up with the Anglo American Company in regard to their 1955 airborne search for uranium (Guest 1955).[49] Tanzania launched its socialist experiment in 1967, and its interest in uranium remained un-flagged. By 1968, 'Many enquiries from overseas were received, particularly as regards oil, iron ore, soda, gemstones, rare earths and uranium' (Commissioner for Mineral Resources 1970, p.7).[50] Private company Geomin designed a survey for uranium in the central area of Bahi during a 1969 visit to Tanzania (Geomin 1969). Prospecting for uranium continued in western Tanzania in 1971 in light of the rising price of uranium as nuclear power generating technology spread (McKinlay 1971).

From 1977-1979 GeoSurvey International GmbH conducted low-resolution geophysical surveys. In a classified document, the survey company reports in December 1977 that, 'a large uranium anomaly [was] recorded by the spectrometer' (GeoSurvey c.1977, p.2). Preliminary ground truthing into the findings from the nationwide study, suggested in 1978 further exploration by drilling in an area of radiometric high in Tabora Region in western Tanzania (Mcharo 1978). In 1982, the same company completed a preliminary interpretation of the airborne radiation survey, indicating 'Fourteen radiometric radiometric [*sic*] anomalies were given "A" priority for ground investigation' (Slade n.d., p.16). GeoSurvey International

[49] The company responded that the reports were lost, but informed the government that the maps were produced using inadequate equipment operated by an inexperienced crew, and were, therefore, of poor quality.
[50] This included a special research trip by a Chinese government delegation in 1966, as well as assistance with geologically mapping the whole of Tanzania from a team of eighty experts from the Soviet Union from 1970-1974 (Commissioner for Mineral Resources 1970; Luena 1972).

also published the Geophysical and Mineral Atlas of Tanzania (1982-1983) which, for the first time, put uranium on the map in the area of the Mkuju River, while noting it was not thought to have economic potential.

From 1979-1980, German company Uranerzbergbau-GmbH successfully explored radiological anomalies under prospecting licenses across southern Tanzania (Kögler 1982; Gautier 1981; Gross 1982). A report associated with the Uranerzbergbau exploration in the northern part of the Selous from 1981 found: 'The potential of locating an economic uranium deposit in the Madaba area is considered to be excellent' (Gautier 1981, p.28). A 1982 follow-up report on prospecting in the same northern part of the Selous, states: 'the favourability of the Madaba River Area as a potentially new uranium district. The potential to locate an economic sandstone deposit is considered to be good' (Gross 1982, p.27). The U.N. published the discovery of uranium in a report on mineral exploration in Northern Tanzania in 1982 (United Nations 1982; Alpan 1987).[51] In 1985, Tanzania ended its socialist *Ujamaa* policy. Still, in 1988, the Tanzanian Ministry of Minerals set up a plan to study the forty-nine anomalies, including one in the Karoo Formation of southern Tanzania, which would go on to become known as the Nyota Prospect at the Mkuju River.

The archival record goes silent in the late 1980s.[52] Nuclear scientists at the Tanzania Atomic Energy Commission (TAEC) report that there was an internal decision to not carry out additional investigations of anomalies at that time, but the policy was 'not written anywhere'. Positing why the explorations apparently halted, the scientists suggested that

[51] 'The major achievements were: the discovery of a new type of rift-related uranium mineralization of potential economic interest in Lake sediments at Lake Manyara and Late Natron, and in linear zones at Kinyandiri village, north of Singida' (United Nations 1982, p.iii). Radiological anomalies in the Tanga area received further investigation (United Nations n.d.), as did anomalies in Singida and Monduli (Krs and Pondaga 1982), and at Galapo (Garson et al. 1982).

[52] Tanzania places an embargo on government files containing information related to ongoing activities or activities taking place in the last thirty years.

perhaps the price of uranium at the time was too low.[53] The climate around uranium in Tanzania changed around 2006-2007, when the Tanzanian Ministry of Energy and Minerals registered around sixty uranium exploration companies. Officials at TAEC did not explain the rationale for the change.[54]

Mineral Exploration in Protected Areas

From the above history of uranium, it is clear there was extensive exploration for minerals inside the Selous. Yet, mining inside the Selous Game Reserve, as indicated by international outcry against the Mkuju River Project, is a 'major blow' and 'devastating' to the Selous, according to a 2012 opposition petition (Gunter 2012). This section challenges that assumption, instead illustrating how the uranium mine fits within a longer debate in the archival record over permission for, and support of mining in protected areas of Tanzania. This section continues to delve into the archival record to reveal how the government(s) shaped the ideologies that influence Tanzanian resource policy today. However, the voices of ordinary Tanzanians impacted by these policy decisions, are notably absent. Yet, the history of dispossession of Tanzanians, for protected areas, for public health, and for improved governance, underlies these natural resource management rationales.

British colonial officials extensively discussed pre-existing German colonial gold concessions in the Serengeti through the 1930s. The record reflects views that continue today: that there are conflicting aspects of legislation regarding mining and conservation. The Mine Ordinance (1929), allowed for mining in Game Reserves, while the Game Reserve

[53] The price of uranium dropped from a high of around $140/lb in the late 1970s, to less than $20/lb in the early 1990s.
[54] On the global market, uranium prices in 2006 appeared on a steadily increasing trend from $40/lb to $80/lb at the beginning of 2007, peaking at just under $140/lb before dropping in 2008.

Ordinance, created mining-free zones in 'closed reserves' or 'complete reserves'. This resulted in confusion, which allowed for a concession to be granted inside the Serengeti even though it became a complete reserve in 1933. Mining officials promoted mineral surveying prior to closing areas to prospecting for the creation of game reserves. Game officials protested that valuable wildlife breeding grounds should be preserved in an 'undisturbed' state (Game, Banagi 1934). The Territory Chief Secretary clarifies the colonial government stance, placing priority on mineral exploration over the creation and maintenance of game reserves, in a response to the Game Warden: '… the discovery of mineral wealth is of such great potential economic importance to the Territory that no area of possible mineral value can be allowed to remain unexplored geologically' (Chief Secretary 1934). The Mwanza Provincial Commissioner voices a similar opinion, 'if payable minerals were to be found it is inconceivable that game considerations could be allowed to interfere with the mining activities which would follow' (Mwanza Provincial Commissioner 1934). The commissioner adds that a small number of reputable companies could mine while following rules to minimize the disturbance of game in the area.

In a 1938 letter, the Game Warden concludes his opposition to prospecting and mining in the Serengeti by bringing in global forces, saying:

> ... intense interest in the future of the Serengeti is being displayed not only by premintent [*sic*] people and the Press at home, but by game lovers all over the world, and it is sincerely hoped that the Tanganyika Government will bear this in mind and not expose to permanent injury and possible ruination such an invaluable asset to the Territory and to the world. (1938, p.5)

The Warden highlights the value of game, as an 'asset' both to Tanganyika, but also to 'the world', which is presumably a broader community of 'game lovers'. The Game Warden, Arusha, lodges protests against prospecting and mining in the Serengeti reserve (at the time, proposed to become a national park) (Game Warden, Arusha 1938). Chief Secretary Sayers responds to the Game Warden: '… it is my personal view, a view which is shared by other authorities, that if minerals on a really large scale were discovered in the Serengeti, even after

it had been declared to be a national park, pressure of public opinion in favour of mineral development would be irresistible' (Chief Secretary 1938, p.2). Over time, the debate over mining in protected areas evolved in Tanzania, with the creation of a new form of protected area, National Parks, within which prospecting is proscribed. However, the various perspectives on mining, as seen in the Serengeti gold mining debate, resonate around the country, from colonial times to present.

In a 1930 wire from the Game Warden in Kilosa to the Chief Secretary, concerns about illegal prospecting in Selous appear: '…informed two Europeans prospecting for Coal in Selous Reserve aaa two scouts already left follow movements aaa grateful wire instructions' (Game Warden, Kilosa 1930; notations in the original) A response on the issue states: 'So long as they confine themselves strictly to prospecting I do not think that we can interfere. Coal in the Selous Reserve could be worked without exterminating the game that may be within the [illegible], and would be a most valuable find in that locality' (Chief Secretary 1930). The response emphasizes the protection of fauna, but not flora in the Reserve. Additionally, there is no mention of the impact on Tanzanians living in the area, though there were settlements scattered throughout the area at the time before Closer Settlement relocations.

The question of whether to permit mining in game reserves remained unresolved through the 1940s. National Parks became a different category of protected area under the National Parks Bill. Game Ordinance No. 20 (1940) Section 7 (1), permitted prospecting in National Parks and other protected areas with licenses issued by the Board of Trustees. In a note from July 15, 1948, the Chief Inspector of Mines writes:

> The Game Dept. has always been somewhat inclined, no doubt quite naturally, to exaggerate the evils likely to arise from prospecting and mining in Game Reserves. In 1938 there were similar representations to those at F(1) by the Game Warden (on p. 63 of Vol. I) in connection with the Serengetti [*sic*] area. But in spite of the fact that Kilimafeza Gold Mine, a mile or two from Banagi Hill [Serengeti], has been worked since German times, and there are two other mines (and much prospecting in the past) in the vicinity, the lions still roar just as loudly round Banagi. (Hockim 1948a)

Here, the Chief Inspector, polemically representing the mining perspective, continues to see minimal impact of mining on wildlife. The idea of lions still roaring in the Serengeti, with lions as a sign of wilderness, implies that nature in the area is still healthy despite mining. The 1948 consensus on the problem with prospecting in game reserves coalesced around the idea that each prospecting permit would be judged on a case-by-case basis. Again, the Chief Inspector of Mines took the opinion that: 'The root cause of the trouble is the declaration in the past, when the Territory was not so mineral-conscious, of large areas as game reserves, without regard being had to possible mineral potentialities' (Hockim 1948b, p.1). This idea of the government of the Territory shifting toward greater interest in minerals is based on an understanding that, 'One of the fundamentals of economic progress is the development of mineral resources; but it is only right and proper that the existence of resources capable of development should first be established before the game is "pressed to retire"' (Hockim 1948b, p.1). In contrast, the Game Warden, who had recently denied permission for asbestos mining in the soda ash lake Natron, wrote in 1948: 'If Dick, Tom and Harry are to be allowed in for prospecting and mining then in due course the Natron Game Reserve will be entirely ruined' (Game Warden 1948, p.1). The theme of determining who is allowed to prospect and mine in reserves, and how the colonial government might know the impact of mining activities is at the heart of this disagreement.

In March 1950, the Provincial Commissioner of the Southern Province, home to the Selous, wrote to the Territory's Chief Secretary with concerns about the development of the Selous and the possibility of minerals.

> In a recent conversation with the Director of Geological Survey, he pointed out that certain areas in the new extensions [of the Selous] might prove to be of economic interest for minerals. In particular, he suggested that the proposed extensions East of Meridian 38 [degrees] Long, was such an area. Another area but not so important is area along the Luhombero River to the north and south of Rupias in the Ulanga District. I do not wish to reopen the question of the extensions to the Selous Game Reserve at present, but I would like to suggest that the mineral possibilities of the area should be kept in mind and the Director of Geological Survey asked for his views before any final decision is made. (1950, n.p.)

The commissioner highlights the relationship between the size and shape of the Selous and the intense emphasis and priority on mineral exploration. At this point he seems aware that mineral exploration might be restricted within the bounds of a reserve, prompting concerns about loss of access to mineral wealth. Impact on people living nearby does not appear to be a consideration. The conversation resumes later that year, as the British colonial government continues to develop its policy for natural resource management inside the Selous. The representative for agriculture and natural resources wrote to the Provincial Commissioner of the Southern Province, laying out specific ideologies relating to the natural resource management of the Selous. In April 1950, he wrote:

> … the matter of possible mineral areas inside the new boundaries of the Selous Game Reserve will not be overlooked. 2. Since Game Reserves are set up for the purpose of protecting game animals and not for the inhibiting mineral development [*sic*], there would seem to be no reason why those interested in prospecting for minerals should not conduct their operations inside the Game Reserves unarmed. 3. In this connection it is relevant that the existence of the Parc National Albert has not precluded the development of a valuable fishing industry, the Headquarters of which, complete with labour lines, dispensary, factory, etc. are situated within the Park. (Member for Agricultural and Natural Resources 1950, n.p.; emphasis in the original)

This letter illustrates a mentality according to which game reserves were never meant to stop mineral prospecting. Further, this letter gives an example of industry in a protected area of a contemporaneous Belgian colony, Congo. The reference across colonial borders to what is now Virunga National Park in the Democratic Republic of Congo highlights how similar issues were dealt with outside the British Empire.

At the dawn of Tanzanian independence, a group of Tanzanians asked for permission to prospect for gold in the Serengeti. In 1962, these prospectors said they knew there was gold in that part of the Serengeti because their grandfathers saw it during World War I. The Commissioner for Mines is familiar with this claim, but refuted it. In the archival record, the miners are told that they do not have the correct prospecting agent or business name registration to be considered. However, this launches the government into renewed debate about mineral prospecting in national parks. The outcome of which appears to be an

agreement that the government must balance tourism potential against geological potential. The response to the miners themselves is a formality, but the internal communication says that the application is unlikely to be looked on favourably because there are places outside the Serengeti where they can mine (National Parks – Prospecting Rights Tanganyika African Mines n.d.).

In the 1970s, prospecting in the Selous reappears in the archival record. In 1973, a Dutch manager describes planned cooperation with the Mineral Resources Division on a geological mapping project in Tanzania, a 'technical aid project… both partially situated in the SW. Selous' (Helners 1974). In 1974, Williamson Diamonds Ltd communicated with the Selous administration in regard to its January 1974 mineral survey and that the Ministry of Defence permitted them to return for an additional six-month exploration period starting in July 1974. In September 1974, the Selous Project Manager received notice of a private individual receiving a mining prospecting license in the Selous (Maimu 1974).

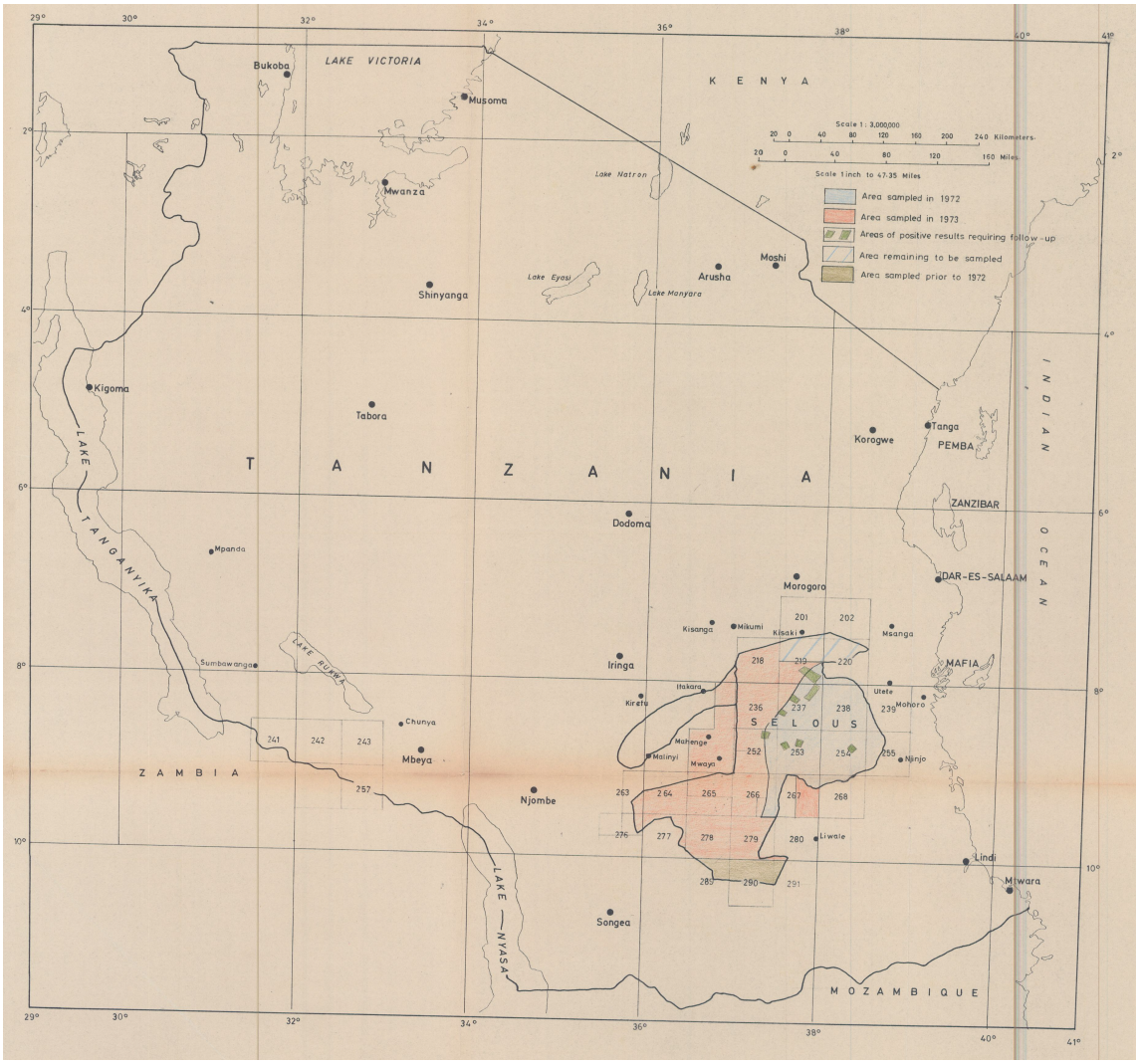


Figure 11 The Selous and the diamond prospecting that took place in the reserve feature on this map made by Williamson Diamonds Ltd throughout the 1970s. (Williamson Diamonds Limited 1974).

In 1981, the Director of Wildlife set out the conditions under which Shell Petroleum Development (T) Ltd could conduct exploration in the Selous (Lwezaula 1981). Having achieved their 1982 target for initial investigations in the Selous, Shell indicated they hoped to continue exploratory drilling in 1984. Uranerzbergbau entered an additional season of uranium exploratory drilling in the Selous in 1982, asking the Game Department to supply scouts with ammunition to protect the exploration team and agreeing to terms restricting the number of game to be killed to feed the workers. That same year, the Chair of the Board of Directors for the Tanzania Wildlife Corporation effusively thanked Uranerzbergbau for their 'exceptional gesture in securing ammunition for the Corporation' (Lwezaula 1982). The

mining company appears to have imported ammunition into Tanzania and donated it to the agency responsible for regulating its presence in the Selous, an agency that might otherwise not have been able to supply ammunition to its wildlife guards. Close cooperation between mining companies exploring in the reserve and the reserve administration continues through 1985 in the archival record.

In July 2015, David Kanyatta, then the Assistant Director of Wildlife Development, Wildlife Division, Ministry of Natural Resources and Tourism, explained that there are three types of minerals allowed, by law, to be extracted from the Selous: oil, gas, and uranium. From his office on the fourth floor of Mpingo House, the headquarters of the Ministry of Natural Resources and Tourism, we look out over Dar es Salaam with its skyline studded by construction cranes. Although they have the uranium project in the Selous now, they do not expect to add another. Of the Mkuju River Project, Kanyatta says, 'It's a challenge… this is a trial.' The government gave the mining company the concession and then it will be returned to the Game Reserve. 'The deposit will take thirteen years to mine. Then it will be reclaimed.' Kanyatta explained that there was research on oil, but no projects planned. If they wanted to start a project, they would have to apply first. Similarly, there are no gas projects planned. The mining of gold, diamonds, and other minerals is illegal.

When asked how the mining project would be coordinated across the ministries involved, Kanyatta said the Wildlife Division created a procedure for mining in the Reserve but the Ministry of Energy and Minerals has said they have not been consulted sufficiently. Wildlife Division, 'says the document is ready'. So, the ministries will need to reach consensus on the 'grey area' and, per official procedure, the Ministry of Justice must approve the plan. Meanwhile, mining companies continue to receive permits to conduct exploration in the Selous from the Ministry of Energy and Minerals. To begin exploration, the companies need permission to enter the Selous, and a series of Selous Project Managers have defied the

mineral agency to deny access to the Reserve for additional mineral exploration. The fissures between the mining agency and the wildlife agency today seem parallel to, or as a continuation of, disputes seen in the archival record.

A year later, Mr. Kanyatta prepared to transition from working in Wildlife Division in the Dar es Salaam headquarters of the Ministry of Natural Resources, to working for the new parastatal agency responsible for game reserves, Tanzania Wildlife Authority (TaWA), based in Morogoro. I asked how the situation with the Mkuju River project stood, at that point in May 2016. He said the mine has a life span of ten to twelve years. The company will then rehabilitate the mine and then hunting and tourism will resume. 'When there is no uranium there', the company will return the area to 'the way it was before [mining]'. The mining project will not go beyond fifteen years. 'The sooner they kick off, we count fifteen years. We are sure the area will turn back to the Selous and we can return to our normal activities.' As soon as they complete the mine, 'they must restore the area. It's an obligation', Kanyatta responded to the possibility that the area might not be the same after mining.

From colonial times to present, the role of game reserves in Tanzania has been negotiated. The idea of game reserves as pristine, untouched areas contrasts with the historical record of discussions of whether there should be mining within game reserves and other protected areas. Two key voices emerge, with those supporting the indivisible integrity of reserves for the sake of protecting wildlife and tourism potentials standing in opposition to mining and mineral exploration. Meanwhile, mining supporters see the exploration and extraction of minerals as necessary activities which do not necessarily disrupt wildlife, and that are more valuable than whatever proceeds wildlife can garner. The general consensus in the archival record suggested that mining in reserves would be unavoidable if the resource is considered valuable enough. Even in the 1930s, the 'sides' representing mining and conservation are clear, and we can see how these divisions live on to this day in many ways.

The absent voices and opinions of people living near the game reserves and mining areas should remain as apparent as those voiced so uncompromisingly by others.

Conclusion

Tanzania's history of uranium exploration fits into the larger narrative of African uranium in the nuclear world. The slow progress toward the creation of Tanzania's first uranium mine represents by no means the first time the Selous became targeted as a 'source' for extraction. Rather, it appears to be another phase in the long history of extraction from the Reserve. Even in the archival record, the idea is contested that wildlife areas are sites of conservation to the exclusion of extraction. The trade in elephant ivory and slaves before the twentieth century gave way to extensive hunting and mineral exploration under German and then British colonialism. Since Tanzanian independence, oil and gas exploration in the Selous proliferated in addition to decades-long feasibility studies for hydropower projects on major rivers traversing the Selous. The idea of the Selous as a wilderness untouched by resource exploration and extraction is incompatible with this history, and the history of those living closest to the proposed uranium mine.

This chapter also focuses on the lived experiences of people in the villages outside the Mkuju River Project. The claims that KUNA continues to make, of the losses of their ancestors evicted from the area that is now set aside for the mine, depend on the sacrifices made in the past, but capitalize on a vision of wealth to come. The ways in which this community is attempting to activate memories of past sacrifice, or the sacrifice of others, for their own fiscal benefit further complicates the ways in which this 'sacrifice zone' is navigated by poor, marginalized farmers, often thought to be passive recipients or resisters of development. This does not follow a pattern, seen elsewhere, of local people staking claims

on minerals in areas from which they were displaced. The KUNA claims rest exclusively on history.

As KUNA makes historical claims, they are also projecting their expectations of the future. The uncertainty of what is yet to come in the area around the planned mine raises additional questions about this space as a possible 'sacrifice zone'. To what extent will the hopes of local people for economic opportunities negate the sacrifice zone framework? Or is the mining of uranium, and potential associated risks, another instance of the sacrifice made by this area? It seems that the nature of sacrifice zones is that they are ambivalent—beneficial to some and exploitative of others. This duality is a component of the nature of sacrifice. Regardless, the concept of the sacrifice zone should not be deployed to homogenize a complex situation.

This marks a transition in the thesis, which begins to turn attention from the past to the present and, eventually, to the future. The next chapter attends to the relationships developing between various agents representing seemingly contrasting value systems vying for control of the valuable resources and narrative of the Selous. The UNESCO label, bestowed on the Selous as an honour and as a strategy to improve tourism potential, affirms only the history of a pristine wilderness, erasing the human history of the Selous. Commanding that the space now is of 'universal' value and of 'world' heritage, the UNESCO label further removes the Selous from local control. The historical construction of the Selous, considered up to this point, will be foundational to accounting for the value(s) of wilderness, UNESCO status, and the role of the UNESCO label as a technology of heritage.

Chapter 4 Natural Heritage

The rider's signature reflective sunglasses glint in the afternoon sun as the motorcycle crests the hill on its way toward us. My seat on the bench faces the road, but also two *wazee* (elders) who are recounting the history of their sub-village in Likuyu Ward. We watch the smiling motorcycle driver, a former Mantra employee, who carries a load on the back of the motorcycle. A single hoof juts perhaps three feet off to the left of the motorcycle seat, attached to a leg covered in light brown fur. I ask the *wazee* if they know what it is, and they say they are not sure. So, when the driver comes to a stop in front of a nearby building, I go over to investigate along with about a dozen children. One man holds the cycle steady while the driver holds the limb vertically, hoof to the sky. A third man peels back the sackcloth used to cover for transport the butchered part of the hindquarter. The crowd is growing; adults drift over to see what is happening. The driver tells me this is a *mbunju* (eland) before he carries the leg inside.[55]

I return to the *wazee* and share the news—this is the eland I heard about yesterday. The Community Based Conservation Training Centre teachers, along with their truck, were enlisted to help pick up an eland on behalf of the village Natural Resources Committee. The eland had been eating crops and, through the Natural Resources Committee, they were given permission to hunt down the problematic eland; the meat would be sold in the village at a discounted price. Apparently, the hunt was successful.

Earlier that morning, the village chairman explained to me that the village Natural Resources Committee sells private game hunting licenses to individuals. The hunters agree to bring the meat to a butcher in the village. Together with the leaders of the village, they agree to where the meat will be sold. In the past, the chairman said the price was Tsh 3,500/kg for meat, but the price rose this year, in 2015, to Tsh 4,000/kg.[56]

In the sub-village, a line forms, eventually snaking out the front door of the house of the chair of the leading local political party. A crowd of thirty-five or forty men, women, and children wait to purchase meat. A village game scout, in his green uniform, helps to manage the crowd. Inside the house, they butcher the meat with an axe, then weigh each piece on a scale. The *wazee* remain seated, telling me they cannot afford to buy any meat.

By now, a small group of young men have joined our conversation. The consensus among the multi-generational group is that bushmeat normally goes to the village leader's house to be sold, not to a regular butcher. This happens maybe once annually. They agree the price for the meat is pretty affordable. Still, one young man complains that only people who were in the village centre found out about the sale; those villagers working on farms or farther from the centre of the village had not heard about it and are missing their chance to purchase the meat. Others in the group counter, saying many villagers would be coming today to pray at Friday services at the mosque, so they would hear about the sale on the way.

Another young man bitterly says the meat distribution process is corrupt: that leaders who distribute meat give choice cuts to people with jobs while the poor farmers were told to wait

[55] The term *mbunju* was disputed throughout the course of my research. Most people who were not from the area agreed that *mbunju* (in the Ndendeule language) was the same as *pofu* (Kiswahili), which means eland, the largest type of antelope. Others seemed think *mbunju* referred to another similar antelope, but not an eland. For the rest of this thesis, I refer to *mbunju* and *pofu* as eland.

[56] Butchers normally sell meat in the village for Tsh 6,000/kg. Bushmeat, including hippopotamus, sells for Tsh 5,000/kg.

longer and given less desirable selections. He says he heard some people complain the meat was rotten. This is different than the game meat that the head of Game Frontiers of Tanzania (GFT) gives to village leaders to give to families of elders and disabled children twice yearly. He clarifies that this only happens in Mchomoro and Likuyu Sekamaganga villages, not in their sub-village. I ask more about their connection with GFT, the sole hunting tourism outfitter in Mbarang'andu WMA. The younger man says that no one from their sub-village works for the hunting company, though they beg for work. He tells me all the workers come from Likuyu Sekamaganga. The tourists do not pass through their village to the hunting camps; he says they come by plane.

Later that day, back in the main part of the village, I see a hunk of meat still on the bone as it is taken away by motorcycle; on to a private home for cooking soup, I am told. A woman walks past carrying in both arms a pile of skin, brown fur still attached. Mohammed, the young man sitting with me, scowls when I ask if that is a desirable part of the animal. He says that it is edible, but he had never tasted it. It is far less expensive to buy the skin of an animal; he elaborates that you would only buy such a piece if you cannot afford something better.

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This portrait of the village and the arrival of a butchered eland illustrates some of the ways in which people living immediately outside the UNESCO World Heritage Site Selous Game Reserve, and its buffer zone, the Mbarang'andu Wildlife Management Area (WMA), interact with and understand the value(s) of wildlife from protected areas. They do not refer to the Selous as a literal site of UNESCO World Heritage. Nonetheless, from the sedimentation of historical events and trends previously discussed, we can now connect (Western) ideals of biodiversity conservation, with the creation, maintenance, and protection of a site of 'natural heritage'. The eland, governed by Tanzania's wildlife policies that generally produce protected areas that are not fenced, in this case becomes a mobile, roaming heritage artefact, in addition to a (once) living being. The animal's value as a living embodiment of wilderness in this heritage site contrasts with the worth of the eland as meat, and the cost of the eland's damage inflicted on crops in fields belonging to these villages. Moving beyond dualisms, this chapter engages with the financial, ecological, social, and existential value(s) of the Selous, via the heritagization of the Reserve. Proposed mineral extraction from a biodiversity conservation area and heritage site cannot be adequately appreciated without acknowledging the ways in which the Tanzanian government continues to deny compensation for damage in border villages caused by wildlife leaving the UNESCO site, the Game Reserve, and the

adjacent WMA, which acts as a buffer. I argue that the plurality of ways in which the UNESCO label acts as a 'technology of heritage' (De Jong and Rowlands 2007) influencing the Selous, its governance and its stakeholders, reveal not only the value(s) of heritage, but also of wilderness.

Although it may seem counterintuitive, I consider how natural heritage can be an artefact, a synecdoche for (a certain version of) the past, while also heritage can influence the present to try to create (a specific vision of) the future. Recent studies suggest that extractive industries increasingly deploy the language of heritage and attempt to influence heritage legislation (Baird 2017). We can see that the robust literature on critical heritage studies, which critiques UNESCO's romanticized version of culture and diversity (Eriksen 2001) and the ways in which Global North and South heritage are treated differently (Winter 2014), is often primarily focused on cultural, rather than natural, heritage. Yet, questions of cultural heritage share much in common with natural heritage. Within UNESCO, sites of natural heritage are among other types of listings, which include UNESCO Biosphere Reserves (Pollock 2009), UNESCO World Heritage Cultural Landscapes (Ranger 1989), in addition to UNESCO Cultural Heritage Sites, and the UNESCO Lists of Intangible Cultural Heritage.

One question is inescapable: what exactly is 'world' heritage? The concept rests on a single system for deciding the criteria and validity of cultural and natural heritage. The 'outstanding universal value' required to create sites (and items, practices, etc.) of UNESCO World Heritage serves as the standard applied to archaeological and cultural sites, yet is still difficult to define and apply in terms of natural heritage. A robust literature on heritage sites created a variety of typologies of heritage value (Fredheim and Khalaf 2016; Carver 1996; Labadi 2005). However, in addition to the limitations of typologies, which often cement boundaries in ways that may not be applicable to the constantly evolving understanding of heritage, a general theory of value of heritage may be too broad to address the specificities of

sites of natural heritage. The UNESCO 1972 Convention concerning the Protection of World Cultural and Natural Heritage is significant for its integration of natural and cultural conservation (Meskell 2013). The 2002 Budapest Declaration elaborates on the connection between nature, culture, conservation, and development, serving as one of the first UNESCO policies linking sustainable development and the heritage process. Nonetheless, the UNESCO criteria for listing cultural or natural sites remain distinct, though sites can consist of both cultural and natural criteria, as is the case in Cultural Landscapes.

The literature extensively interrogates the value of natural heritage tourism. Much of the focus is on the degradation of sites as a result of tourism (Bianchi 2002), where tourism is seen as a threat to the worthiness of sites of natural heritage (Thorsell and Sigaty 2001; Timothy and Boyd 2006). These studies of non-consumptive tourism highlight a bias, failing to account for trophy hunting. Ongoing controversies relating to hunting as a tool for conservation provide an opportunity to examine how local and international value systems align and clash in the context of a site of world heritage. The value of natural heritage tourism, in terms of hunting tourism, begs the question of who natural heritage is 'for', when wildlife is consumed.

With both biodiversity conservation for poverty alleviation and mineral extraction as a low-income country's prerogative to develop as they see fit, the Selous provides opportunities to re-assess the relationship between heritage and value(s). As applied to sites of natural heritage, the many forms of development unsettle simplistic categorizations of values. Research highlights how UNESCO status can, and some suggest should, lead to sustainable development beyond site borders (Conradin and Hammer 2016; Breen 2007). However, it is clear that the acceptability of development near sites of natural heritage often becomes a political question for sites located in the Global South (Conradin and Hammer 2016; Conradin and Wiesmann 2015; Lu et al. 2013). The negative impacts of wildlife

leaving sites of natural heritage and damaging crops in neighbouring villages, as in the case of the Selous, does not appear to have been accounted for in the academic literature. The firm bounds imagined by UNESCO are complicated by the reality of mapping inaccuracies and other boundary-blurring processes taking place in the Selous and elsewhere, which serve to further question the construction of a bounded site of world heritage (Bluwstein and Lund 2018).

The overarching conceptual framework of time, discussed in the introduction, is relevant again as we accept the ambiguity of the definition of heritage as foundational to understanding it as a 'technology'. Heritage may often invoke the past and the present when it is regarded as a 'process' (Harvey 2010). The conservation of heritage objects and places demanded by UNESCO inscription alters and acts upon their continued existence (Del Mármol et al. 2016). Recent studies indicate ways in which cultural heritage can be used to resist limitations of conservation of natural heritage in the present (Chhatre et al. 2017), and how heritage (cultural and natural) can be involved in the construction of specific futures (Zetterstrom-Sharp 2015; Mathur 2016).

Heritage, seen as a set of discourses and practices (Del Mármol et al. 2016) enacted through UNESCO, is deeply political (Scholze 2008). Eurocentrism which served as a founding political orientation for decision-making in the World Heritage Commission (Winter 2014) may continue, but joins other political factors and factions. Brazil, Russia, India, China, and South Africa have become increasingly vocal in their participation on the Committee. These countries are also more likely to act in ways identified by scholars as political. For instance, they more frequently nominate their own sites during their committee tenure, which had been frowned upon in the past for its appearance to ensure the success of sites in the inscription process (Bertacchini et al. 2017). Similarly, former colonizers sitting on the committee tend to support nominations from their former colonies (Bertacchini et al.

2016). In addition to these kinds of political coalitions, the Committee also has become a place where states party to the World Heritage Convention may solicit international support for their agendas in advance or pay for delegates to travel in support of their initiatives. Further, corporate officials have been known to join the official state party delegation when industrial investments are dependent on World Heritage Committee approval (Meskell 2014; Jørgensen and Hønneland 2006). The demands for conservation of UNESCO World Heritage Sites, especially when a site is 'at risk', puts pressure on areas in ways that influence conservation strategies, whether the conservation is for archaeological sites, biodiversity, or cultural practices (Lu et al. 2013).

The chapter demonstrates the flexibility of values and value systems. I connect my argument from chapters two and three, that the history of the Selous is not the history projected by the World Heritage Site, with the industrial activities that are in motion, and possibly coming to the area in the near future. In doing so, I argue that it is the 'heritagization' (Harvey 2010) that works to re-imagine, and therefore re-create, the past, but also that it projects particular ambitions ahead: an imagined pristine wilderness of past and future. First, I consider UNESCO status as a 'technology of heritage' which created a specific past of the Selous Game Reserve, intervenes in the present, and influences the future of the Selous. Next, focus turns to problematic wildlife that destroy livelihoods in the area, speaking to the value of wildlife and heritage in the villages surrounding the site of heritage. Finally, the chapter reviews the role of hunters in a heritage site, which, in the case of the Selous, refers to licensed tourists, a small number of licensed local hunters, and illegal poachers.

UNESCO Label as a Technology of Heritage

Sites of World Heritage depend on static versions of the past but are also actively protected for the future. The World Heritage Committee, the political decision-making body, and its

bureaucratic arm, the World Heritage Commission, have historically intervened and negotiated their vision of what heritage is, and how it should be preserved for the present and the future. This section reviews the history of UNESCO intervention in the Selous Game Reserve, to examine how UNESCO status is employed as a 'technology of heritage' (De Jong and Rowlands 2007), acting both to create a specific version of the past, but also to project that into the future.

> In 1982 the Selous became a UNESCO World Heritage site because it is:
>
> > one of the largest remaining wilderness areas in Africa, with relatively undisturbed ecological and biological processes, including a diverse range of wildlife with significant predator/prey relationships. ... has a higher density and diversity of species than any other Miombo woodland area ... [and] the property protects an impressive large mammal fauna … (UNESCO World Heritage Centre 2017a)

African elephant, black rhinoceros, and wild hunting dog as well as hippopotamus, buffalo, ungulates including sable antelope, Lichtenstein's hartebeest, greater kudu, Nyassa wildebeest, and eland are among the large mammals considered of outstanding universal value. This is in addition to Nile crocodiles and hundreds of species of birds, including some endemic species.[57] In 2014, the UNESCO World Heritage Committee voted to add the Selous to the list of World Heritage Sites in Danger in response to the spike in elephant poaching (UNESCO World Heritage Committee 2014). Joining this watch list entitles the UNESCO World Heritage Centre to make 'requests' to the Tanzanian government to demonstrate conservation successes. Since being added to the list, the range of these requests for the Tanzanian government are as follows: to implement its National Anti-Poaching Strategy; to carry out recommendations of reactive monitoring missions; to follow through with the SECAD plan; to ensure disaster preparedness and water monitoring related to the Mkuju

[57] The Selous meets UNESCO criteria ix: 'to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;' and x: 'to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation' (UNESCO World Heritage Centre 2018).

River Project; among other non-poaching relating suggestions. The consequence for breaching or inadequately responding to such recommendations would be the possibility that the site could be removed from the World Heritage List.[58]

In addition to the threat of de-listing sites, the World Heritage Centre has a number of tools with which it advises and attempts to influence the management of inscribed places, items, and practices. These tools have been deployed unevenly with regard to the Selous Game Reserve since its inscription in 1982. Aside from adding the Selous to the list of Sites in Danger, UNESCO can attempt to influence states party by including 'requests' in their annual report on the state of conservation of the site and they can deploy reactive monitoring missions to independently investigate sites. We can see how these tools were used in the context of the Selous with regard to extraction projects, an animal husbandry initiative, and with regard to dams.

Oil concessions within the Selous Game Reserve were explored throughout the 1980s, even after the Selous became a UNESCO site. Similarly, mining exploration took place in the Selous throughout the 1980s.[59] However, these activities did not draw UNESCO attention until 2006, when it was noted by UNESCO with concern. In 2006, the Committee 'Requests that the State party to commission independent EIAs [environmental impact assessments] of all proposed mineral mining and dam development' (UNESCO World Heritage Committee 2006; emphasis in original). The language toward mining in the Selous grows in strength: the 2008 decision 'Expresses its utmost concern' about uranium prospecting, it 'reiterates its position that mining is incompatible with the World Heritage status of the property', and then

[58] This sort of intervention in the running of the Selous Game Reserve, by threatening its ability to remain a listed site is not an empty threat. In 2009, the city of Dresden was removed from the World Heritage List, as was the Arabian Oryx Sanctuary in Oman (Meskell 2011).
[59] Guy Debonnet, former UNESCO Commission official and UNESCO consultant, explained the seismic testing activities for oil and gas inside the Selous likely contributed to the wave of poaching that decimated elephant herds in the 1980s.

also ‘Urges the State Party to halt any prospecting or other mining developments within the property’ (UNESCO World Heritage Committee 2008; emphasis in original). The UNESCO Commission conducted reactive monitoring missions in 2007, 2008, 2013, and 2017 to the Selous Game Reserve. Each mission reported on concerns and made recommendations related to Reserve administration, poaching, mineral exploration, oil and gas prospecting, and proposed dam projects.

Regarding the uneven approach to extraction, it was not until the 1990s that the Committee took a clear position against mining. However, while the World Heritage Convention discourages mining and exploration within the Selous, other UNESCO sites experience extraction.[60] The South African government allows mining within UNESCO-inscribed Mapungubwe Cultural Landscape (listed in 2003). These extractive activities take place against the recommendation of the UNESCO World Heritage Commission, however the site has yet to be de-listed. Kakadu National Park, a Cultural Landscape inscribed in 1981, bears UNESCO boundaries drawn specifically to bypass the active Ranger Uranium Mine; the borders were modified in 2011 as mining areas encroached on the site (Meskell 2011). The decision to allow the Kakadu World Heritage Site in Australia to be set up surrounding the Ranger Uranium Mine was traumatic to the strength of the convention and its ability to demand sites of natural heritage be free from mining and exploration, and their associated effects.

Extractive activities in sites are not the only target for UNESCO reproach. In 1991, the UNESCO World Heritage Commission published a decision recommending against a proposed route for driving cattle from the north to the south of Tanzania, which would have

[60] The UNESCO discouragement may be toothless, but the International Council on Mining and Metals (ICMM) also commits that member companies should not explore or mine inside UNESCO World Heritage Sites (see: International Council on Mining and Metals (ICMM) 2018). While major mining companies are members of ICMM, Mantra and Uranium One are not.

crossed the Selous (UNESCO World Heritage Centre 1991). The Tanzanian government did not move forward with plans for the cattle route. It is unclear if this could be seen as a response to opposition from UNESCO, or if the project did not advance as a result of other factors. As can be seen in the case with dam projects, considered next, Tanzania made several other attempts to develop infrastructure within the Selous over the years.

From the initial advisory body evaluation conducted by the International Union for Conservation of Nature (IUCN) of the Selous in 1982, UNESCO knew that the Tanzanian government was preparing plans to construct dams inside the Reserve.[61] Plans for the Stiegler's Gorge Dam have been revived periodically. In 1982, the IUCN suggested that the hydroelectric dam 'would affect only a relatively small part of the Reserve and should not be a matter of serious concern unless the reservoir draws in large numbers of settlers' (International Union for Conservation of Nature and Natural Resources (IUCN) 1982). Another project, the Kidunda Dam, also received uneven reactions from UNESCO. The 2013 reactive monitoring mission to the Selous suggested the project 'does not appear to raise fundamental concerns about the overall future of the SGR' (Jaeger et al. 2013, p.3). Nonetheless, plans for both dams have been resuscitated and, through 2017, World Heritage Commission officials continue to raise serious concerns about the impact of the dams based on the projected location and size of the flood zones (UNESCO World Heritage Committee 2017). Dams, in addition to the Mkuju River Project, appear as threats to the outstanding universal value of the Selous.

Although UNESCO forbids oil and gas exploitation as well as mineral exploration and mining, in practice the acceptability of each of these projects are negotiated. This negotiation can be examined through the process of modifying the boundary of the UNESCO

[61] IUCN acts as a consultant for the World Heritage Committee, providing technical evaluations and reports on sites.

World Heritage Site of the Selous. The boundary change, in and of itself, is not seen as a threat to the site: the habitat lost is not considered very valuable; and the area represents less than one percent of the Reserve.[62] Since the mining concession and buffer zone is at the edge of the protected area, its excision does not break up the site geographically. The question in the reactive monitoring mission reports appears to be whether the company can mine without impacting the UNESCO site, regardless of the boundary. The Commission emphasizes in reports that proof of this can only come by way of a thorough environmental impact assessment. Rather than focus on the specifics of the boundary sought, we can examine the ways in which the World Heritage Commission attempted to influence the Tanzanian government in this case, and the ways in which this was (and was not) successful.

The Tanzanian government refused the initial advice from the World Heritage Commission to apply for a major boundary modification, and in 2011, at the Paris meeting of the World Heritage Committee, they applied for a minor boundary modification. The Tanzanians also offered what the Commission thought to be an unacceptable environmental impact assessment in their application. In light of this, the World Heritage Commission officially opposed the 2011 request. That year, the Tanzanian government took their application to a politically high level, going to embassies to discuss how they would vote on the boundary modification. Despite these bureaucratic and political tactics, this attempt to obtain a minor boundary modification failed. In the wake of their unsuccessful attempt to change the boundary, the Tanzanians went back and modified the environmental impact assessment based on recommendations from IUCN.

A second attempt by the Tanzanians also requested a minor boundary modification. In 2012, the World Heritage Committee approved a minor boundary change to the World

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[62] There is also an agreement that the Tanzanian government will compensate for the area lost by adding to the site an area of equal size and equal or greater biodiversity value.

Heritage Site, to annex the Mkuju River Project and a buffer area, allowing for the mine to operate outside the site and, therefore, not threaten its outstanding universal value (UNESCO World Heritage Committee 2012).[63] This decision occurred at the annual meeting that year convened in St. Petersburg, Russia, while Russia sat on the World Heritage Committee and chaired the Committee. Although chairing the committee usually prohibits that country from participating in the debates, ROSATOM (parent company to Mantra) representatives joined the official Russian delegation to the summit. Such a tactic, intertwining industry representatives with government delegations, would be repeated in the 2013 UNESCO session in Cambodia. In 2013, executives from Norberto Odebretch would join the Panamanian government delegation, as their highway project and its implications for a site of heritage came under consideration (Meskell 2014).

The 2012 boundary modification represents the culmination of years of Tanzanian government political activity behind the scene, despite attempts by the German mission to UNESCO to block the boundary change. The boundary modification was also vigorously opposed by Western environmental and anti-nuclear groups, with several petitions in opposition gaining 20,000 signatures. The Russian environmental lobby (mainly through Greenpeace) did not publicly oppose the boundary modification, even though it is active on issues of anti-atomic energy as well as in nominating sites of natural world heritage.[64] Ultimately, the text of the decision to alter the boundaries of the heritage site reflects German involvement in brokering the decision and demanding the inclusion of references specifically

[63] The ripples of decisions made by the World Heritage Committee are felt around the world. Based on the unorthodox Selous model of pursuing a minor boundary modification for major mining projects, Congo is discussing a minor boundary modification to allow oil and gas extraction from Virunga National Park. In a 2017 report, D.R.C. requested an IUCN advisory mission to discuss the question of petroleum exploitation in the park (INSTITUT CONGOLAIS POUR LA CONSERVATION DE LA NATURE 2017; UNESCO World Heritage Centre 2017b).

[64] Greenpeace established its first office in Russia in 1989 and officially began to call itself Greenpeace Russia in 1992. It claims five thousand supporters and opened a Saint Petersburg branch in 2001. In 1994, Greenpeace Russia began a project to identify natural areas in Russia to be nominated for the UNESCO World Heritage List; they remain active on Russian natural heritage issues.

to the mining activities. The decision urges Tanzania to ensure: 'the mining activity and processing of the uranium is carried out corresponding to state of the art international standards in adherence to International Atomic Energy Agency (IAEA) rules governing the processing of uranium materials' (UNESCO World Heritage Committee 2012).[65]

Outside the meetings of the World Heritage Committee, the Selous' inclusion on the list of sites of World Heritage is wielded as a tool to influence the Tanzanian government. German funding for Sustainable Conservation and Development of the Selous Niassa Ecosystem (SECAD) is hedged with conditions, including that the Selous maintain its status on the list of sites of heritage and the Tanzanian government abide by recommendations from the World Heritage Commission. Therefore, the millions of Euros committed by KfW for activities in and around the Selous hinge on UNESCO status. Conversely, the U.S. government does not plan to tie its (relatively limited) funding of the Selous to Tanzania's ability to keep the site inscribed on the list. Rather, the Americans see that the Selous is too ecologically important to stop funding, even if it is delisted. In this case, it is clear that foreign governments see how heritage can be used as a tool to influence the conservation agenda for the Selous. In this way, the site's ability to stay a listed site of heritage in the future is both tied to and indicative of a commitment to a future of 'pristine wilderness'.

The politicking of the UNESCO World Heritage summits from Russia to France to Germany is not heard directly in the villages next to the Selous. Regardless, the political construction of heritage at the supra-national level can have impacts on the local level. The pressure exerted by donor countries that condition aid to continued UNESCO status, the alteration of borders to allow mining, and the international community's emphasis on the

[65] Tanzania has a domestic environmental protection agency responsible for vetting major development projects to confirm they abide by Tanzanian law, the National Environmental Management Commission (NEMC). NEMC approved the domestic Environmental and Social Impact Assessment (ESIA) for the Mkuju River Project in November 2012, after UNESCO approval of the boundary modification.

value of elephants, are examples of heritage acting on the Selous in a variety of ways.[66] The UNESCO version of heritage is implemented, negotiated, and even contested at the local level in the ways in which people interact with valued wildlife. The next section turns to the ways in which people living at the edge of the Selous contend with problematic wildlife that does not adhere to the boundaries of the heritage site.

Consumed by Heritage: Wildlife Damage and Compensation

To examine the links between wildlife and villagers, this section considers wildlife damage in villages bordering the Selous and the buffering Mbarang'andu WMA. The eland that I saw enter the village disassembled was reportedly killed because it problematically engaged with its human neighbours in the village. It left the protected area and entered village fields, where it ate crops. For the damage it caused to crops, it was hunted and killed. As the villagers noted, the distribution of the meat of problematic wildlife was not a common occurrence; meat from such animals might be distributed once annually. In contrast with the distribution of the eland meat, this section attends to the more common experience of wildlife damage: annual damage that does not receive compensation, where the problematic wildlife is not hunted and distributed as meat to the affected villages. Without permission to hunt, or capacity to finance the permits and ammunition for hunting or agricultural guards, wildlife are able to graze on crops, often with impunity. Incremental damage to individual farms around the southwestern corner of the Selous is a common occurrence, so much so that this section can detail the unsuccessful efforts of a village to seek government compensation for years of wildlife damages.

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[66] In 2016, WWF began a campaign highlighting the need to preserve UNESCO World Heritage Sites, foregrounding the Selous among a small group of other flagship sites (World Wildlife Fund 2017).

Since the 1967 Arusha Declaration by President Julius Nyerere, Tanzanian policy dictates natural resources belong collectively to the nation, and wildlife conservation efforts are designed to meet the dual purpose of both protecting the environment and alleviating poverty. The Wildlife Conservation Act (2009) requires the Tanzanian Minister of Natural Resources and Tourism to make regulations regarding financial compensation for citizens and property who are harmed by wildlife, spelled out in the 2011 Dangerous Animals Damage Consolation Regulations. Thinking about the wildlife of the Selous Game Reserve (and contiguous Mbarang'andu WMA) as an element of the Selous as a UNESCO World Heritage Site, when wildlife causes damage to surrounding communities, and communities seek financial compensation, how are we to think about the 'universal' value of the site?

Villagers living close to the borders of the Selous and the Mbarang'andu continue to deal with problematic wildlife, and some suggest the depredation has increased in recent years. Damage from wildlife continues to be a major anxiety in the area on the southwestern border of the Selous. In the village of Likuyu Sekamaganga, one hundred farmers, representing their families, came together in June 2015 to fill out forms documenting the crop loss caused by wildlife, which was to be submitted as part of an effort to obtain compensatory damages. To seek compensation, each farmer who had crops damaged by wildlife would fill out a form. The village government would submit the forms to the District Wildlife Officer, who would send the forms to the wildlife headquarters of the Ministry of Natural Resources and Tourism for review. The head of the Natural Resources Committee expected a response to be sent to the village within one month, and that they should be successful in seeking compensation for damages. In contrast, the village Chairman, who took office six months prior, was not sure why they were filling out the forms on that day. The Chairman thought the Chair of the Natural Resources Committee may have organized the farmers who sustained damages to come to the office as a group. The village had never submitted forms like these to

claim compensation for damages caused by wildlife. The day of the meeting, the village Chairman thought the form was new in 2015, which is why they were allowed to report damages from the two most recent planting seasons.

The meeting itself starts late. At least fifty people wait outside the village office before the Village Executive Officer arrives to officially start the meeting. The group is predominantly male, as is the case for most village government meetings, but more women arrive. While the group waits, the Chair of the Natural Resources Committee reviews the list of people who had already reported damages and marked all of those present; names were corrected as necessary. The group consists of farmers who planned to report damages over the course of two years, mainly caused by elephants and hippopotami. The group of villagers, which grew throughout the morning, crowds into the village administration building's largest meeting room once it seems the meeting can begin. The Village Executive Officer arrives and, together with the Village Chairman, and Natural Resources Committee Chair, the meeting officially opens. The Village Chairman explains the process to the group: each person would fill out a form. The farming season (for these purposes) starts in July and ends in June, and, therefore, the forms can cover two seasons: July 2013-June 2014 as well as July 2014-June 2015. He explains that the forms will be sent to the District government in Namtumbo. An elder stands up to interject that elephants start eating in one area and when *wameshiba* (they are satisfied/full) they move into another area. The Chairman brings the group back to the task at hand and explains that they have seventy-four forms and there are ninety-seven people on the claimants list. He explains that each copy of the form costs Tsh 500 and that they get a better price to make additional copies in Namtumbo. So, he proposes asking some people to return to the village office the following day to fill out their forms. In the meantime, village officials would go to Namtumbo to make the additional copies. The group agreed to this suggestion.

Another village officer begins reading names off the list, and each individual receives a blank form. The crowded room grows stifling as the morning drags into the afternoon. People cannot hear their names over the chatter of the crowd. Trying to help, people are telling the officer to 'tick' the names of people they know to be present. But when those individuals cannot hear their names called, they do not get up and did not get forms. As they realized their mistake, attempting to correct the misunderstanding about not receiving a form makes it even more difficult to hear the next names called. At first, people are told to leave the room with their forms and come back with completed forms. Then, they are told not to leave. People are told not to damage the forms. An elder suggested that each person should receive the form and have it filled out right then so the forms are not damaged or lost. Another elder suggests that the people at the end of the list be told to come back later or tomorrow to fill out forms so they do not have to waste the whole day waiting. Another elder says that everyone is capable of caring for their own forms, to which the Chairman, in a tone bordering between patronizing and joking, suggests that the villagers should not use the forms as rolling paper for tobacco. The officer continues to read the names. She starts checking off names without waiting to hear if they are present or if they received a form.

The meeting is coming to an end as people holding forms begin to encircle the Village Executive Officer, awaiting his assistance to fill out the paperwork. Those who missed their names being called bunch around the officer with the list of names, trying to procure their blank form. In this region, adult literacy levels in Kiswahili are thought to be near eighty percent, but lower for English. Villagers ask me to fill out the form for them. The Village Executive Officer and the village accountant are completely surrounded by people waiting for their help to fill in the forms. They ask me for a Kiswahili translation of the document, which is in English, after having filled out a few forms already. Confusion arises over the English translation of crops names that needed to be recorded. Then questions surface of whether

villagers understand that they should report the amount of land that was damaged, rather than the entire amount of land that they farm. The crowds waiting for their forms to be filled out are, unsurprisingly, frustrated. Each person presents their newly-minted biometric national identity card, and their full name and voter identity number are recorded on the form, along with their cell phone numbers, when available. Since there are no addresses in the village, each form records the village mail box in Namtumbo as the home address. Forging ahead into the afternoon, I start to help the officials to fill in parts of the forms, but only sections that could not be disputed: name, phone number, address, voter identification number.

The next day, with the Village Chairman, we review fifty-three completed forms; approximately half of the total official claims. The forms are missing information, including the date of damage. Information is occasionally recorded in the wrong places, for instance, under the type of damage, there may be a list of names of crops. In addition, the village game scout listed as witnessing the damage signed and dated the form for the previous day, rather than the day of the damage. Answers appear in a mix of Kiswahili and English. Throughout the day, people continue to fill out forms, but, in the moment, I cannot help feeling sceptical of the success of these applications. The village chairman, now armed with more information, explains that the compensation project is, in fact, not new. The Ministry of Natural Resources and Tourism has a division that manages compensation claims. That division receives and processes these forms, which do not list a monetary claim, but instead just a qualitative description of the damage. Rather than being a new initiative, the chairman thinks that the village had not submitted forms previously because of *uzembe* (negligence). He is not sure if other villages in Namtumbo District submitted forms, because they do not share this information. However, he is certain that there were villages in the neighbouring Tunduru District which recently successfully completed the process and received compensation. He attributes this to leadership from those villages, the district, and their member of parliament

who were more accountable to their citizens than the leaders they have in Namtumbo District. When I ask what changed to make the Namtumbo District leaders act on this issue at this time, the chairman says he is unsure.

By July 2016, the village had not received a response to their requests for compensation. The unsuccessful efforts of Likuyu Sekamaganga villagers to stake claims for compensation from wildlife damages reveal a number of rifts between the wildlife policies of Tanzania and their implementation. The bureaucratic process for claiming compensation may have been delineated in the regulatory framework, but it did not, in practice, reflect a true commitment to disbursing such compensation. The form itself became an obstacle to seeking damages. The form, only provided by the Tanzanian government to the village in English, could not be read by any of the villagers, and the village leaders were also not able to effectively fill out the forms on their behalf. Adding to the difficulties posed by the language barrier, there were grammatical mistakes in the document which made sections difficult for even a native speaker to comprehend. Formatting issues in the form made it difficult to complete. Parts of the form were difficult to read, perhaps due to a poor-quality photocopy.

The village meeting, frustrating in its inefficiency, highlighted how village government officials had an uneven understanding of the relevant policies and regulations. It also demonstrated that village officials were not fully equipped to meet the needs of their constituents as they tried to serve as the link between village experiences of wildlife damage, and the literal translation of those experiences into the language of government bureaucracy. The aspirational efforts to convene a meeting, document claims, and submit forms on behalf of the hundred aggrieved farmers is a testament to a village-level commitment to attempting to follow bureaucratic processes to seek compensation on behalf of villagers. Practicalities did not seem to be paramount considerations at the time. At no point did anyone question

how the compensation payments would be made to people without bank accounts.[67] Timing for compensation either went unsaid or was rather optimistic. This bullishness belied local experiences with government compensation schemes. The compensation promised in the same village to those living in houses that were condemned due to the widening of the road to the mine was already months late at the time the crop damage forms were filled out.[68]

The compensation forms, invoking their official status as government documents and using English language, held power to instil hope in this village for compensation for wildlife damages. Simultaneously, the forms and the chaotic effort to make claims for compensation under existing natural resource management regulations suggest a disconnection from the national bureaucracy. Wildlife may be of 'outstanding universal value' to UNESCO when inside the Selous but hold a different type of value upon exiting the protected areas. For the villagers, animals enter the villages as potential sources of sustenance or as vermin that (could) cause destruction. The claims that villagers make for damages are sent to the Tanzanian Ministry of Natural Resources and Tourism, not to the UNESCO World Heritage Centre. The links between people, wildlife, and paper do not end with compensation claims. People in villages around the Selous generally do not hunt legally—they cannot afford bullets and cannot afford to pay for the permits to legally hunt in the area. The next section examines legal hunting, in the context of a UNESCO World Heritage Site and an ongoing poaching crisis.

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[67] Compensation payments for repossessing homes and land are complex in Tanzania, as seen in road building projects that require relocating people (Magembe-Mushi 2011). Tanzanians have well protected (and well known) rights to compensation. However, most people in this village did not have enough money to open a bank account. That meant that they could not be given their compensation by check. Therefore, cash payments would have to be made. Government officials dislike carrying large amounts of cash with which to make compensation payments, as they fear they may be targeted for robbery.

[68] Please see chapter six for details on the homes condemned as a result of the road project.

Consuming Heritage: Hunting, Poaching, and Healing

The persistent focus in the literature on who heritage is 'for' has yet to account for the plurality of ways in which heritage is consumed. The perception that World Natural Heritage status shifted to be a tool used by states to promote tourism (Conradin and Wiesmann 2015), therefore suggests tourists are key consumers of heritage with tourism as the key method of consumption. In this framework, local people are thought to be dependent on tourists, which can be seen in the Selous through the budgetary reliance on consumptive tourism (hunting). Trophy hunting revenue from Tanzanian game reserves represents more than seventy percent of the revenue of the Tanzania Wildlife Authority (TaWA) (Debonnet 2017). Photographic tourism takes place in approximately five percent of the Selous while hunting tourism occurs in the rest of the Reserve. The area surrounding the concession of the Mkuju River Project consists exclusively of hunting concessions, operated by private companies that lease the land from the Ministry of Natural Resources and Tourism.[69] This section reviews how different types of consumption of wildlife operate in and around the Selous. To do this, I place within the frame of analysis hunting tourists along with villages next to the Mkuju River Project in order to appreciate their complex relationship with elephants, a key species associated with the 'outstanding' status of the Selous as a site of World Heritage, and other wildlife. The connections between wealthy foreign tourists' consumption of heritage (wildlife) and the lives of people living near protected areas requires the examination of different types of consumption.

At this site of pristine wilderness, tourists are able to pay to hunt 'exotic' wildlife, at least in part, living out dreams of conquering an African wilderness. 'When the thrill of

[69] Different hunting blocks are allocated specific numbers of possible trophies broken down by species. These quotas are not publicly available.

Africa's wild places calls, come and join us in the heart of the Selous' (Tanganyika Game Safaris 2017) appeals the website of a Selous hunting company. Similarly reflecting the ongoing resonance of colonial era themes, introduced in chapter two of the present thesis, Game Trackers Africa says of its hunting packages in the Selous: 'This is Africa if you ever dreamt about it' (2018). These hunters come to the Selous because of, and in the process, affirm, a version of the past of the Selous as a wilderness. At the same time, many companies also discuss a commitment to preservation of the wilderness for the future:

> Africa's magnificent wilderness is entrusted to us, and it is our obligation to ensure that we conduct our sport in an ethical and responsible manner with a strong commitment to uphold Tanzania's wildlife hunting regulations at all times. Your professional hunter will guide you through the experience of a lifetime, always striving to exceed your expectations, while being aware and respectful of the delicate social structure of the herds and prides alike. (Tanyanyika Game Safaris 2017)

Another safari outfitter includes a statement on conservation on their website, concluding that 'One thing we can all agree on is that we do not want our children and grand children [*sic*] to live in a world that does not include these magnificent creatures' (Williams Fieldsports 2017). This specific vision of the Selous and its wilderness from the past is projected into the future. Additionally, the language, in some ways, homogenizes 'Africa's' wilderness, in order to serve as part of the company's business strategy.

While the Selous may be a site of 'universal' value and contain wilderness and wildlife that deserves to continue to exist in the future, it is nonetheless illiberally auctioned off in concessions. The opacity of the politics of hunting regulation in the Selous, considered in detail in chapter two of the present thesis is a premise of the Reserve's administration. Hunting companies that purchase rights to operate in hunting blocks have never paid market value for the concessions. Wildlife trophy fees are set arbitrarily, and the quotas for 'sustainable harvest' of wildlife which are imposed across the Selous are hotly contested, with allegations that they are both too high (indicating wildlife populations are much lower than imagined) or too low (indicating wildlife populations are higher). Recently, the

Tanzanian government revoked the license of a hunting company operating in the Selous, which they found to be hunting illegally: hunting female and young animals, hunting with weapons fitted with silencers, and using vehicles to pursue wildlife (Mtweve and Ubwani 2014). Setting aside outstanding cases of illegal behaviour by hunting companies, the practices making the Selous wildlife accessible for consumption to privileged bidders following a certain system (while local hunters are prohibited from undertaking the same hunting activities) create additional caveats to the universality of the value of the heritage at the Selous. Permits making hunting tourism legal separate tourist engagement with wildlife from that of local poachers, though the means result in the same ends. Further questioning the idea of the heritage of the Selous being of universal value are larger questions of whether hunting should take place at all.

Animal rights activists insist hunting is reprehensible and push to end the practice of tourist hunting in general. According to Andre Roux, a professional hunter and director of Gerard Pasanisi Safari Corporation, these groups are making it increasingly difficult for hunting companies to operate, which the hunter perceives as a threat to the future of protected areas.[70] U.S. laws and regulations currently impact Tanzanian tourism in a variety of ways. American regulations on hunting stem from the 1936 Lacey Act, which determines that illegal hunting outside the U.S. can be prosecuted in the U.S. without a statute of limitation if the trophy is imported into the country. Lacey Act violations come with a minimum five-year jail sentence or a $250,000 fine, and anyone who assisted in illegal hunting can be arrested upon arrival in the U.S. (U.S. Fish and Wildlife Service 1981). In 2016, the U.S. Fish and Wildlife Service's addition of two subspecies of lion under the Endangered Species Act came into effect. This decision labelled *Panthera leo melanochaita* (which includes the lions of

[70] From the 2016 leak of the Panama Papers, it became apparent that the Pasanisi family holds shares in at least four offshore companies set up by the now-discredited firm Mossack Fonseca, although lawyers for the family claim their companies meet all Tanzanian tax obligations (Fitzgibbon 2016).

Tanzania) a ‘threatened’ sub-species, an action which prescribes permitting mechanisms for sport hunted lion trophies, to ensure they originate from countries with lion management programmes which contribute to the species’ survival. A recent study of lions in the Selous suggests trophy hunting has harmed lion populations since the late 1990s, and that hunting blocks under short-term leases hunt an unsustainable number of lions (Brink et al. 2016). With American hunters representing a significant portion of hunting tourists to the Selous, the hunting companies see that the decisions of the U.S. government can impact Tanzanian hunting (Baldus and Cauldwell 2004). Some observers suggest evidence of this can be seen in the decrease in hunting bookings since the decision (The Guardian Reporter 2017).

Roux contends that the Selous cannot be protected from development without hunting companies. The hunting companies, by self-interested need to protect their investment in the wildlife of their concession, engage in anti-poaching activities. Additionally, hunting companies occupy space in a way that cannot be replaced by photographic tourism in much of the scrubby miombo woodland of the Selous, which is not ideal for non-consumptive tourism. This argument of hunting for conservation extends that the enormity of the wilderness, deemed one element of the outstanding universal value of the Selous as a site of world heritage, is preserved by hunting companies, which dismantle their camps annually at the end of the hunting season. At the same time, this kind of hunting relies on flying tourists from across the world to a remote camp stocked with amenities to meet the demands of an elite lifestyle. The carbon footprint and ecological impact of this kind of tourism is infinitely greater than that of local hunters (or poachers) who travel much shorter distances to hunt, and whose lives (often without electricity) likely have a more minimal ecological impact. In a less visible, less immediate sense, the hunting tourists, though perhaps they finance the preservation of the vastness of the Reserve, may be more substantial contributors to the

longer-term threat of global warming to ecosystems across the world. The calculus of the value of the Reserve overwhelms the limited binary of legal hunters and illegal poachers.

In June 2016, seventy elephants followed the Luego River from the Selous Game Reserve and then entered the village of Mtonya.[71] Selous game rangers came to try to move the elephants back into the Selous and limit damage to the village, an episode first mentioned in chapter two of the present thesis. This incident exposes some of the ways in which local people, as opposed to foreign tourists, experience wildlife and interact with domestic natural resource management bureaucracies. As the elephants strayed into the village, the Village Executive Officer, a middle-aged woman from a town several driving hours away, called the Namtumbo District Wildlife Officer when she heard about the situation. The District Wildlife Officer notified the Likuyu Sector Game Warden, and the game rangers were dispatched. Over the course of the week-long pachyderm foray, trucks of replacement rangers came through the village, receiving encouragement and directions to the last known location of the animals, who eventually split into two groups. By the third day of the elephants' visit to the village, at least ten acres of crops were destroyed.[72] The village government made numerous announcements to villagers to warn of the elephants, and they did not cause physical injury to any villagers. People were too afraid to go to their farms, despite the demands of the harvest season.

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[71] Elephant group dynamics are the subject of extensive study. Briefly, elephant sociality is hierarchical and kinship-based (matrilineal). Recent studies suggest a four-tiered social structure: 1) mother-calf units; 2) core groups or kinship groups of mother-calf units that regularly associate; 3) bond groups that are clusters of core groups; 4) gatherings of bond groups or clans (Wittemyer et al. 2009). Size of groups depends on a number of factors, including habitat (savannah elephants are known to congregate in larger groups), season (and availability of food), and human interference. There are few studies of elephants in this area, and the group was not known to villagers or Game Reserve staff, so it was not possible at the time to ascertain the type of social group of this particular gathering. Reserve staff and instructors at the Community Based Conservation Training Centre suggest that elephants in hunting areas are more likely to behave furtively, hiding themselves among more wooded areas.

[72] In this area, it is common for a single villager to cultivate between three to five acres of crops at one time.

As the elephants lingered in the village, the village Chairman, a scion of a politically active family in the area, discussed plans to seek compensation from the government for damaged crops, though he was unsure if his efforts would be successful. He knew that villagers in nearby Likuyu Mandela were not compensated for damages since a man was killed defending his crops from an elephant a month prior. Nonetheless, each neighbourhood leader was sent to see the areas in their jurisdiction that were damaged by the elephants. That way they would be able to testify to witnessing the damage on the compensation forms that come from the District government. The Village Executive Officer supported the Chairman's plans to seek compensation, confident that the government would compensate farmers for the damages to their crops, although unsure of the schedule for receiving compensation.

The financial compensation sought in Likuyu Sekamaganga and discussed in Mtonya, wherein invading elephants of 'outstanding universal value' trampled crops and left villagers uncertain of whether they would find their year's livelihood intact or destroyed, reflects just one dimension of the elephant-village relationship. In Mtonya, as the elephants overstayed their welcome, women collected and dried elephant dung, separating it into even layers across wide, flat woven baskets (*kipara*). Once the dung dried, the women explained they would mix it with garlic and then use it as medicine for cerebral malaria (*dawa la dege dege*). In a discussion with another elder about this medicine, I asked if he would use the medicine. He explained he would not use the remedy because it is *haram*: it is from an elephant, and it is excrement. The distinction he drew, marking the elephant and elephant products as unacceptable, represents only one interpretation: one of his wives prepared the medicine. Further, in discussion with the elder, he asked if I wanted any elephant meat, and if I ate elephant meat. Although it violates the dietary principals (*haram*) of the local Islamic majority, and was likely hunted illegally, elephant meat was known to be sold and consumed in the area. The elephants may come to the area to eat the crops, but people still find value in

their dung, and in their meat, regardless of any religious or legal restrictions on those types of consumption.

The concessionary politics (Hardin 2011) of the licensed hunting inside the Selous and in the neighbouring WMAs must be part of conceptualizing heritagization acting as a technology in the 'pristine wilderness' of the Selous. Tourist hunting extracts a certain type of value from wildlife in the Selous, allowing hunters to both feel connected to a certain past, and engaged in conservation of wild spaces for future generations. This contrasts with the experience of villagers with Selous wildlife, in terms of crop damage, but also in terms of consuming wildlife in the form of bushmeat and medicines. The illegal hunting that was carefully not discussed in the villages may have been rife, but it is symptomatic of one of many facets of the clashing types of time. The relatively short-term damage caused by wildlife (e.g. to a single harvest season), and the short-term nutritional benefits of bushmeat consumption are in some ways similarly aligned with a luxury hunting expedition which may finance anti-poaching for several years, at the cost of the lives of the trophy animals. This contrasts with the vision of the international conservation community, which envisions the existence for posterity of vast wild spaces and wildlife, but also longer-term consequences of wildlife damage (e.g. destruction of houses, physical injury, or perhaps chronic malnutrition).

The Selous as a heritage site appears to be inviolable on paper, where licenses regulate the consumption of wildlife, but wildlife cannot be contained within the mapped boundaries of the Reserve. The Selous appears to be plastic; its internal activities, conservation activities, and even the borders are negotiated to preserve the outstanding universal value of the site. The UNESCO label acts on local and foreign hunters in different ways, tacitly assenting to the permits provided to tourist hunters while protesting in official decisions and reactive reports against the illegal poaching activities taking place in the same spaces with the same species. The Selous may be on the UNESCO list of sites in danger

because of elephant poaching, while tourist elephant hunting can continue, unabated. There are unavoidable contradictions in the ways in which elephants, as mobile artefacts of heritage, interact with these two different groups of people: tourist hunters seeking a 'dream' of Africa and adjacent villagers. This raises a key question of whether hunting, legal or illegal, is, in fact, an unwritten element of the Selous' heritage.

Conclusion

The absence of voices of the Selous' human neighbours in constructing the Reserve as a site of (their) heritage may suggest a disconnect between international and local concepts of heritage. Still, the UNESCO status of the site, in practice, connects the people living at the edge of the Selous Game Reserve to heritage in a plurality of ways, even if they may not directly refer to it as part of their heritage. Heritage as a 'technology' acts on people, places, and wildlife in contradictory ways based on geographic and temporal proximity to the site. The cementing of pasts and futures (Zetterstrom-Sharp 2015; Harrison 2013) characteristic of inscription on the list of UNESCO World Heritage contrasts with other, more flexible, aspects of heritage. Rather than a rapid process of the present slipping into the past (Nora 1989), what we see in the Selous is something different.

In the Selous, we see the ways in which the UNESCO status, emphasizing the large size of the protected area and specific types of wildlife (elephant and eland, among others), acts to intervene in the wildlife conservation and development projects of the Tanzanian state. This, in effect, re-makes the past, to reimagine it as a pristine wilderness. In turn, the political pressure exercised by the World Heritage Commission, through its reactive monitoring missions and reports, and the World Heritage Committee, by voting to add the Selous to the list of sites in danger, acts to encourage the projection of their particular vision of the Selous (as a primeval wilderness) into the future. These bureaucratic and political actions emphasize

the value of the Selous, and its elephants in particular, for global elephant conservation not just for the present, but for posterity. In various ways, this show of political power is juxtaposed with the heterogeneous diplomatic manoeuvring and pacting influencing the decisions of the U.N. body, (Western) donor countries, and the Tanzanian government.

The conventions, reports, and hallway politics of the UNESCO world acknowledge the communities flanking the Selous so much as to insist on buffer zones to ensure the 'integrity' of the UNESCO site. In the villages, people may enter the protected areas to hunt illegally, but they also experience wildlife exiting the heritage site (and the patchwork of buffer zones) and entering their villages. Human incursion, by unlicensed hunters, is met with a 'shoot on sight' policy in the Selous. The reverse boundary transgression, by valued species embodying natural heritage, receives different treatment. Game officers have responded to exiting wildlife by attempting to herd the them back into the protected area, despite the possible economic consequences and bodily harm for nearby humans, for which the Tanzanian government provides the suggestion of remedy by way of financial compensation.

In the Tanzanian framework of wildlife conservation as a vehicle for poverty alleviation, wildlife is controlled for licensed tourists, and the Selous depends on hunting tourism for its fiscal survival as well as, arguably, its ability to occupy such a vast area, prohibiting some types of development. The impetus for the Selous to continue its current existence as a wilderness area into the future appears temporally distinct from the more immediate timeframes emphasized by its human neighbours. As in the case of the problematic eland, the demand for meat (eland) and the protection of livelihoods from damage by wildlife simmers in the context of urgent needs to feed and provide for families in this agriculturally-dependent area. The seasonal predation, in which wildlife damage crops with each year's planting and harvesting seasons, and the equally regular failure by the Tanzanian government to provide compensation seem foundational to the current chapter of

human-wildlife relations in this area. Perhaps this could be thought of as an extension of the relationship elders recalled from their childhoods inside the Selous, reviewed previously.

The UNESCO status of the Selous is political, from the World Heritage Committee to the domestic natural resource management regimes. Regardless, thinking of the UNESCO site as a 'paper elephant', along the lines of Nayanika Mathur's (2016) work on Indian bureaucracy and tiger conservation, provides purchase for thinking not only about the mismatched temporalities, but also about how, through the technology of 'heritage' via UNESCO, supra-national political and bureaucratic processes influence domestic natural resource management strategies. Even though local people do not describe the Selous as a site of heritage, they interact on a daily basis with the site and its boundary-ignorant wildlife. People living on the border experience the Selous not as a space for them to enter, and not that heritage (wildlife) is being preserved for them, but rather that it causes a certain, yet unpredictable, degree of damage. Aside from the deficiencies of the Selous, the Tanzanian government, and the UNESCO World Heritage Committee appear as 'paper elephants', these paper-based entities make and implement decisions that have a plurality of impacts on the ground at present and into the future. The paper production of policies and the paper chase for compensation from wildlife damages are intimately linked to the hunting of game in and out of this 'primordial wilderness'. The next chapter highlights the perhaps surprising relationship between wildlife conservation and mineral extraction.

Chapter 5 Entanglements of Conservation and Extraction

'I hate anthropologists', the conservationist announces from across the blue plastic table. I grin back, thinking this is a joke. We are meeting at an outdoor canteen, drinking sodas, and discussing my research. The conversation has not hit a lull; it does not feel like it is over, like this is a deal-breaker in the preliminary interview. Instead, I accept the comment as an invitation. I take the bait and ask: why?

Throughout fieldwork, I found out that this conservationist is in good company. Numerous conservationists refused to fully participate in my study. Some conservationists refused explicitly because I was an anthropologist, others for less specifically discipline-oriented reasons. The answer to this initial question of why anthropologists could be so disliked would linger and re-emerge periodically.

Conservationists in Tanzania have been on the receiving end of some of the most extensive anthropological (and, more generally, social science) research on conservation practices around the world. Anthropologists and others have highlighted unsavoury conservation practices (West et al. 2006; Fairhead et al. 2012), revealing the imperial and colonial underpinnings of conservation ideology (Garland 2008), the human rights violations associated with past and present conservation activities (Brockington and Igoe 2006), not to mention the general critique of conservation practices that place human well-being beneath that of wildlife (Turton 2011; Brosius 1999). In often-complex natural resource management situations—where anthropologists tend to urge caution, nuance, and the importance of listening to local people—the project of conservation is questioned to such an extent that the relationship between practitioners of the respective disciplines has, in some instances, become untenable. Further, participant observation, and the associated recording, analyzing, and publishing of off-hand comments by conservationists, turns anthropologists into actors who are perceived to not play by the rules; academics willing to take an informal comment and turn it into an explanation of everything that is wrong with conservation practices and conservationists themselves. Conservationists perceive this as a personal, humiliating, and unfair attack.

To be written off as an anthropologist, was surprising. Although I was aware of the differences in opinion between conservationists and some anthropologists, I did not realize that suspicion of the discipline had so permeated conservationist attitudes. Starting from what I felt was an imbalance in trust, building relationships with conservationists required thick skin and persistence. I approached these sceptical interlocutors with flexibility about the way they could participate in my research, and they often agreed to participate in various capacities, but some would not sign a participation waiver. Reflecting these preferences, this chapter honours the spirit of those agreements for participation while maintaining openness to critical engagement with their actions and discourses.

Nonetheless, most conservationists were interested in my study. If some conservationists are antagonistic toward anthropologists, this begs the question of why they would participate in any capacity? Why spend time meeting in the first place? Despite the differences between anthropologists and conservationists, the conservationists seemed generally eager for answers and help. In places like southern Tanzania, where poaching is rampant and conservation activities do not appear to be working, conservationists want to know how to make people value wildlife more (or differently), how to stop poaching, and how to get people to stop thinking of wildlife as walking 'bags of money', as one conservationist put it.

> Conservationists see a role for anthropologists to play in answering these questions, finding ways to change the hearts and minds of those who do not protect wildlife and ecosystems in the way they see fit, with the end goal of being able to make their projects actually work.

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This chapter examines the ongoing entanglements of extraction and conservation in and around the Mkuju River Project uranium mine in the southern part of the Selous Game Reserve. At this nexus between conservation and extraction, I explore how Tanzanian protected areas interact with international actors in ways that upend static understandings of the value of these social and economic activities and the value systems supporting the two. The following reviews how conservationists (government and otherwise) and mining companies have formed connections as a result of the Mkuju River Project. In this heavily poached area, home to wildlife populations of global importance and a key watershed, where wildlife conservation remains part of a poverty alleviation mechanism via hunting and tourism otherwise, odd bedfellows—conservation and extraction—at times align, and, in the process, reveal the intricacies of the value systems underpinning both.

This analysis builds upon the growing body of literature on the 'ecotourism-extraction nexus' (Büscher and Davidov 2013). At this nexus, seemingly incompatible forces for ecotourism and extraction find themselves as unlikely allies, resulting in alignments that may appear surprising for those who see forces of conservation and consumptive resource exploitation as antithetical. Building on previous arguments that ecotourism itself can be extractive, Büscher and Davidov argue that extraction need not be limited to cases of de-territorialization, but that extraction can take place when resources are re-framed to limit various kinds of access or use.

Relationships between extraction companies and ecotourism initiatives may be connected to 'greenwashing', or the strategic deployment of corporate funds in support of 'green', environmentally-oriented activities. Such corporate social responsibility efforts may

not have one single purpose: they may be designed to diffuse public or investor opposition to extractive or environmentally polluting projects; to secure a 'social license to operate'; to attract employees; to innovate through stakeholder engagement; or to earn government trust to facilitate less stringent regulation (Hilson 2012). The image-focused mentality of these activities, meant to illustrate a project's and/or company's commitment to environmental stewardship, is inseparable from recent changes in the extractive industries. In these industries, managerial tools, such as environmental and social impact assessments (ESIAs) and impact benefit agreements, along with voluntary international agreements on industry standards, are increasingly the norm for publicly traded, investor-oriented multinational companies.

From the historical origins of the Selous as a space controlled by the state, which moulded it into the wilderness it is perceived to be today, the present chapter adds another actor: a private company. Previous chapters reviewed how the colonial governments carved out the Selous, and how the independent Tanzanian government not only carried forward the protected area demarcation that they inherited, but also expanded the protected area. Corresponding with evictions of communities living inside the expanding boundaries, this process made the space within the Selous more amenable to extraction. Hunting, in addition to mineral and hydrocarbon exploration, could be carried out uninhibited once local populations were already displaced. Looking ahead to a uranium mine, unlike in other Tanzanian localities, there may not be need for a military perimeter outside the Mkuju River Project: the Selous is already a militarized zone (and perhaps, a sacrifice zone), with fortified borders.[73]

[73] In Tanzania, the commercial gold mine at North Mara has a militarized perimeter. In Mtwara, Tanzanian military deployed in response to 2013 protests of local exclusion from a planned gas pipeline project.

This chapter explores the ways in which this ecotourism-extraction relationship is made visible at the Mkuju River Project, but also attempts to discern the extent to which we can expand from thinking about ecotourism to thinking about conservation more generally. The first nexus point will be the tactical anti-poaching unit funded by the mining company operating inside the mining concession. Composed of specially selected Selous game rangers from the nearby Likuyu Sector, the achievements and the obstacles facing the paramilitary unit highlight the seemingly unlikely support of a mining company for conservation efforts. The second nexus point will be made apparent by a group called 'Friends of Mbarang'andu'. A collaborative effort between extractive companies and hunting companies operating in the Selous and neighbouring Mbarang'andu WMA, the 'Friends' funnel money and supplies into the WMA and its member villages. The Friends group provides another perspective on this conservation-extraction nexus and how it operates in the context of community-based natural resource management. Before concluding, I consider the possibility that conservationists could support uranium mining in a protected area. Western conservation attitudes, which often view extraction as incongruous with wildlife conservation, may initially suggest this is a theoretical impossibility. Applying the conservation-extraction nexus framework via a speculation of an imagined life after mining, I trace some of the possible futures around the Mkuju River Project.

Nexus Point: the Mantra Anti-Poaching Unit (Extracting Uranium and Preserving the Elephant)

> The group huddles around a laminated map laid out on a table. Raised above the sandy soil on a cement foundation, the sturdy canvas tent casts a slight shadow on this cloudy day, hinting to the approach of the December rains in southern Tanzania. The trainer stands at the edge of the group, occasionally commenting as the Tanzanians, dressed in dark green uniforms, plan their next patrol. These are Selous game rangers, part of the paramilitary force tasked with protecting the Selous Game Reserve. These top-performers have been specially selected from the nearby Likuyu Sector to come here, to the Mkuju River Project uranium mining concession, nestled wholly within the bounds of the Selous Game Reserve. They make up the

Anti-Poaching Unit (APU) and are responsible for ensuring that within the mining concession, the Tanzanian laws and regulations for game reserves are respected by the company, and anyone else who enters. I have only been given permission to listen to this exchange under the guarantee that I will not share any of the details of the patrol that could compromise the safety of the game rangers or give those illegally accessing the Selous Game Reserve any advance information that could allow them to know where to expect the patrol.

The rangers live at this campsite on rotation, with one group on duty at the site while a second group is relieved at home, and a third group is on field patrol in the uranium mining concession. The rangers' campsite sits separate from the general mining camp. The camp does not have the full gym facilities located at the main camp site, but does have pull-up bars in a high traffic area. Still, its amenities are similar: running water, electricity, and heavy canvas sleeping tents. Yellow and blue recycling bins and dark green trash bins seem to leap out from their strategic locations along the tidily maintained dirt roads and paths. A fire extinguisher sits just outside the mess tent, where the patrol planning meeting is taking place.

The main difference between the camps is the converted shipping container, now used as a store for the rangers' gear. A nearby announcement board displays the schedule for the week 'STAGE 3 – TACTICAL SKILLS'. Another sign lists the parts of an AK-47 assault rifle and depicts those disassembled pieces and how they fit together. The breakdown of who is on what team, and the schedule for being in the field, on break, or in training is color-coded. Armed stick figures demonstrate bush patrol adapted military hand signals on another sign. 'Don't let this happen to you!!' appears on a laminated print off of four pictures showing the exploded muzzles of three rifles and a pistol. To the right of this poster is a seven-step guide to clearing a weapon to ensure it is safely disarmed, as would be applied in the case of confiscating an unfamiliar weapon and attempting to avoid the explosions warned against. The last sign lists the alphabet and the associated American radio calls: 'A-Alpha B-Bravo C-Charlie D-Delta', and the last line of the chart suggests in Kiswahili: '*Daima–Sema taratibu na uwazi*' (speak clearly and slowly).

Inside the converted shipping container, plywood shelves stacked with supplies are organized but not exactly with military efficiency. Sleeping pads are rolled up and squished into one cubby, sleeping bags are in another. Metal cooking pots, metal bowls, plastic mugs, and water canteens share one shelf. The shelf below is crammed with packs; straps are everywhere. On the other wall, a shelf holds small cooking gas canisters and matches. Headlamps are laid out in a customized plywood organizer, with black marker numbering the individual square sections, each just smaller than a business card.

The planning meeting ends and the men line up in front of the window of the storage facility, waiting to collect the items assigned to them by the trainer. There's a trace of frantic energy. The packs are just big enough to squeeze in all the supplies. If your sleeping roll is not wound tightly enough, it will not fit. Before leaving, each checks to make sure they have all of their gear. They planned to leave the next day, to go on spider patrols with one of the trainers. To do this, however, they need four rangers to return, and one ranger from that group has not shown up to camp recently, so they are not sure if he will arrive in time. Four is the minimum number for going on walking patrols according to the Tanzanian Wildlife Division. If they are only three, the group will conduct driving patrols instead.

They end up going for driving patrols.

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In 2013, Mantra began to fund the Anti-Poaching Unit (APU), but Selous game rangers have been posted at the Mkuju River Project since 2009. The mining company agreed to a

memorandum of understanding (MOU) with the Ministry of Natural Resources and Tourism to set the project in motion. Since the wave of poaching in the early 2010s, poaching is increasingly well-understood, and the response from Tanzania, with support from foreign donors, has concentrated on law enforcement through militarization (Lunstrum 2014; Duffy et al. 2015; Dressler and Guieb III 2015; Büscher and Ramutsindela 2016). Studies within Tanzania (Environmental Investigation Agency 2010; Environmental Investigation Agency 2014; Kyando 2014; INTERPOL Environmental Security Sub-Directorate 2014) and on wildlife trafficking around the world (Ayling 2013; Warchol 2004; Von Essen et al. 2014) highlight that there are different kinds of actors who participate in poaching and wildlife trade in different ways. In Tanzania, there have long been allegations of state actors involved in poaching. This is disaggregated from state-sponsored opacity in hunting regulations, which allows for poaching through leasing of hunting concessions at below-market rate, or allowing the sub-leasing of concessions. It is clear that there are small-scale poachers, local actors who poach fish or small numbers of wildlife and timber for local consumption. Recent studies highlighted the coordinated criminal networks that integrate local hunters and hunting operations into transnational networks capable of trafficking wildlife products out of Tanzania through the port of Dar es Salaam, or through Mozambique or Kenya. This is the context out of which arose the APU.

Under the MOU, the Selous game rangers are still entirely under the control of the Tanzanian government while they are acting as the APU. The Ministry of Natural Resources and Tourism controls ‘operational zones’ as they define them for the Selous. Under the programme, the mining company hires trainers who have backgrounds in military and paramilitary conservation to oversee the project, manage the anti-poaching operations by the unit, and provide supplementary training and supplies for the Tanzanian game rangers. As noted above, the rangers in the APU patrol the mining concession to prevent poaching. A

separate contingent of rangers is stationed at the mining camp itself, responsible for monitoring the camp and their compliance with Selous regulations.

The APU trainers, generally foreign white men, are hired by the mining company on a temporary contract basis. Under the agreement with the Tanzanian government, the trainers cannot run the patrols completely separate from the Selous administration, even if they are, in practice, patrols conducted by Selous game rangers. The trainers are not sanctioned to touch the official gear, including weapons; this is the case notwithstanding the trainers' knowledge that some rangers may not know how to safely disarm some of the weapons they might confiscate from poachers. The Mantra contractors can train the APU, but are not permitted to discipline rangers.

The APU meets equipment and training needs not fulfilled by the Selous administration. Most of the gear distributed to the APU rangers is not available to them at their usual base at Likuyu Sector. Even though these are considered to be the best rangers from the Selous force, they needed to be taught skills seen by the trainers as basic: how to use a radio and refreshing their understanding of how to use a satellite phone. The Tanzanian rangers' limited skills were known by those who set up the APU. The contractors hired by the mining company knew in advance that they would have to do this basic training.

Testing the strength of the MOU and the practicalities of involving a private company in a government anti-poaching patrol, there was a minor mutiny in the weeks before my December 2014 visit to the site. The APU game rangers did not want to work. The Likuyu Sector Warden came to the mining concession to diffuse the situation. The mutineers were put on leave at Likuyu Sector. The trainers saw this incident as highlighting their main frustrations with the project: lack of discipline and arrogance among the rangers, and their own lack of control over the operation.

Among other issues, payment of the APU rangers became a major point of contention for the mutineers. Non-payment of ranger salaries occurred periodically in the history of the Selous Game Reserve, but the involvement of the APU and the private mining company set up new dynamics. Under the MOU, Mantra provides rations and transport for the APU. Mantra also pays the rangers their usual salary (Tsh 25,000/day or Tsh 35,000/day for a senior ranger). In addition, the rangers are paid a top-up allowance (before receiving additional training this was worth Tsh 6,000/day and after successful training, Tsh 25,000/day). However, Mantra would only pay the rangers upon receipt of an invoice for their salaries from the Ministry of Natural Resources and Tourism. When Mantra did not receive the invoices, the rangers did not get paid. Furthermore, each ranger was eligible for a Tsh 25,000 daily bonus for successful training, but by December 2014, not a single ranger qualified for the bonus. None had passed the training courses offered.

Where payment is being used as a performance incentive in place of the ability to discipline and control the rangers operating as part of the APU, the rangers appeared to try to take control back from the mining company. By denying their labour to protest their lack of payment and unacceptable working conditions, the mutineers attempted to exert some control over the APU and its trainers. The non-payment of the daily bonus implies the financial dynamics were not entirely straightforward. The trainers were critical of the rangers' skills in general, yet they attributed this complete failure to attain the bonus more to a general resignation among the forces. The trainers saw the rangers had no confidence in the Ministry's ability to file the invoices to allow them to receive their salaries.[74]

The power struggle seen within the privately funded, publicly operated APU extends beyond the financial elements. There were activities on the part of the Selous Game Reserve

[74] Due to strict adherence to the hierarchical structure of command, no rangers commented on this disagreement as part of the present study.

leadership that created tension for the APU. Some rangers would be recalled to Likuyu Sector seemingly without reason. Rangers assigned to the APU might be recalled to Dar es Salaam, Ministry headquarters, for extended periods. Based on the agreement with the Ministry, the trainers could only 'advise', as the programme is voluntary. These manpower displacements might speak to the overall dysfunction within the administration of the Selous, but perhaps could be seen as more strategic. APU weekly records suggest that rangers from Likuyu Sector regularly visited the APU to access supplies, perhaps dispatched (or at least not stopped) by the Likuyu Sector Warden:

> Another incident was logged of SGR scouts visiting camp and taking supplies (Anti Poaching Unit Weekly Report W10; reporting period Monday to Sunday)[75]

> SGR scouts continue to stop by camp and take supplies. On Wednesday night a group camped at the APU camp, took breakfast at the mess in the morning, played games of pool, then took a load of bottled water (Anti Poaching Unit Weekly Report W12; reporting period Monday to Sunday)

High and low ranking Selous Game Reserve officers appeared to play complex roles in these situations. Passing along information about the location of APU patrols was an element of this. The trainers were critical of game rangers for having 'no concept of operational security'. By this, the trainers referred to rangers who would tell other people where they were going on patrol or where they currently were located while on patrol. This was perceived to be part of the mentality of the rangers, and similarly seen in instances where, once rangers on patrol arrived to make their camp, they would go to the tops of hills to get cell phone signal and send a message. Other similar examples included rangers choosing to set up camp in areas where cell phone signal allows for messaging. In privately run protected areas, the trainers reported, phones are not allowed once rangers receive operational details. A note in the APU weekly record highlights the leaking of operational details and the intervention of the Likuyu Sector Warden in patrol decisions:

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[75] Specific details of the APU log are redacted to protect anonymity and operational details here and throughout.

> A phone call was received … Within an hour of briefing the scouts on their upcoming patrol various people in Likuyu were aware of the intended area. [By phone, the trainer was ordered] not to patrol this area (known for its frequency of carcasses) and instead direct the patrol to take place in the opposite direction, 80km north. (Anti Poaching Unit Weekly Report W09 Reporting period Monday to Sunday)

In addition to this interference in the location of patrols, the Likuyu Sector Warden would also, at times, prohibit the trainers from accompanying their unit on field patrols.

As the power struggle continued between the APU trainers, the rangers, and the Selous administration, the APU developed connections with the hunting companies operating in the area. These relationships were thought to enhance the APU's ability to investigate and stop poaching within the bounds of the mining concession. The most significant group of hunting companies in the Selous are tied to the aforementioned Frenchman Gerard Pasanisi and his son Eric, with their subsidiary companies operating in concessions alongside the Mkuju River Project. Similarly, as also previously mentioned, private hunting safari company Game Frontiers of Tanzania (GFT) operates in the neighbouring Mbarang'andu WMA. Hunting company vehicles sometimes passed along the roads in the mining camp on their way to their concessions, but the relationships ran deeper. The professional hunters operating in the nearby hunting concessions would pass on information to the Mantra APU. Some reports from the hunting companies were vetted and regarded as false, others inaccurate, others true. The APU identified professional hunters as key actors in the area: they were responsible for guiding high-end hunting tourists to their trophies, but also ensured their company's investment in the wildlife of the concession was not damaged by poaching. Their penchant for giving more information than necessary or dumping larger amounts of vague information with the APU was perceived to be linked to fears of being reprimanded for under-reporting. The APU would combine this intelligence with information provided by the Tanzanian Wildlife Division; the information provided by the government was also often considered general or vague, without GPS coordinates for carcasses or arrests.

Despite the politics of operating the APU, the trainers perceived their work to be impacting the poaching situation in the mining concession. The trainers noted changes in the mode of operation for poachers. Formerly, groups of four to six people would come into the Selous to poach on longer trips. The APU noted an uptick in poachers using poisoned food (e.g. watermelons) in locations nearer to villages to kill elephants. They also increasingly perceived poachers to be entering the Selous in small groups and shooting as many animals as possible and leaving quickly. The decrease in the amount of time spent in the Selous was thought to be the result of increased APU patrols. The APU also noted what they believed to be changes in elephant behaviour. They recorded elephants were moving away from their normal habitat proximate to larger rivers and moving into denser forests, which the trainers surmised afforded the animals greater protection. The APU trainers said, in contrast, the elephants seemed to know that they are 'safe' at the mining camp site. Elephants walked through the rows of tents at the mining camp on several occasions. From the APU records:

> Increasing elephant herd sizes and frequency are being reported within 50km of Mantra. This is believed due to the expanded APU operations within the last 2 months (Anti Poaching Unit Weekly Report W21; reporting period Monday to Sunday)

Reflecting on their position in the context of the mining company, the trainers know the mining company wants positive publicity out of the APU. However, the trainers also see that the $1.5 million the mining company committed to anti-poaching by 2014 far exceeded the amount originally pledged. They also appreciate that the funds appear to have reduced the amount of poaching in the mining concession, effectively achieving their goals.

The trainers also take a nuanced view with regard to tourism: that tourism in the area would greatly benefit from the development of infrastructure while privately lamenting the loss of such a wilderness area to mining. The trainers generally regarded the mining concession and surrounding areas as a good place for elephant hunting, but noted that relatively few elephants remained. Still, they suggested that there are better places in sub-

Saharan Africa for other kinds of hunting tourism. The area of the Mkuju River project is generally not viewed as prime habitat for photo-safaris, due to the dense miombo woodland. This reserved, partial-endorsement of hunting tourism in the area, in addition to the value the trainers placed on the Selous as a special place because of its wilderness, might be seen as contrasting with their suggestion of the need for increased infrastructure. The trainers' interest in decreasing elephant poaching, and ready references to academic studies, appeared to be diametrically opposed to their position on elephant hunting. Among illegal hunters, the trainers sought to understand how to make people care about elephants and other wildlife beyond the monetary value for their parts. Their acceptance of legal hunting while condemning poaching was matched by their ability to rationalize the value of the APU when industrial mining was planned for the same area.

For a mining company to entangle itself, through a memorandum of understanding, with the Tanzanian Ministry of Natural Resources and Tourism deserves additional attention. A rumour circulated among conservationists about the origins of the APU. The whispers suggested that a member of the parent company's Russian leadership was an avid sport hunter, frequenting the Selous annually. The supposedly ex-Soviet security agent's personal interest in ending poaching was said to drive the development of the APU, although his original aspirations were said to have been to hire a private army to protect the elephants of the mining concession. Without assessing the validity of the rumour, the hiring of private armies at the disposal of private companies would not be unique (Ferguson 2005). Rather, it is the MOU which seems more unlikely. The MOU could suggest that the Tanzanian government, to some extent, effectively militarized the mining concession. Creating a second paramilitary force at the mine might then be seen as wastefully duplicative of, or even seen as an unacceptable challenge to, this control. Perhaps the APU could serve as a way to bolster this command without bringing into doubt the appearance of the Selous as a paramilitarized

zone. In either case, given the pre-existing paramilitarization of the Selous, perhaps the mining company decided it could focus its finances elsewhere. The funds for paramilitarization could have been re-directed with reference to the current investment climate, wherein corporate social responsibility projects are the norm and are intimately intertwined with what the company described as their 'social license to operate'.

At the intersection between the protection of elephants in the Selous and large-scale mining, the Anti-Poaching Unit challenges the simplistic dualism that pits extraction against conservation initiatives. The APU boasts successes in reducing poaching in the mining concession, but hardly represents a perfect match; the relationship between the APU and other stakeholders is fraught with struggles over control from rangers on the ground to sector wardens to the ministry at the top of the hierarchy. In order to grapple with these unlikely confederates, an analysis of the role of the APU in shielding the Mantra brand through its association with this environmentally-focused initiative, may be valid. With a small number of subcontracted trainers, while maintaining and reinforcing the existing force of Selous game rangers, the mining company drives anti-poaching activities in the area. Yet, such an emphasis on corporate social responsibility ignores other, pressing dimensions of the liaison. This nexus also highlights a shared stake in control over access to the Selous—for its wildlife and mineral riches—which functions to align the concerns of the mining company and Ministry of Natural Resources and Tourism. Better armed, trained, and supervised game rangers serve the interests of both the mining company and the Selous Game Reserve. The success of both operations depends on the complete control of access to the same space and set of resources. However, this is not the only instance in which the mining company challenges ideas of what wildlife conservation can and should look like.

Nexus Point: Friends of Mbarang'andu

Mantra is also part of a collaboration with hunting companies and mining companies to support the local Mbarang'andu WMA. Calling themselves the 'Friends of Mbarang'andu' the group works directly with the WMA administration to support the organization. The Friends of Mbarang'andu is dominated by the hunting company that is the sole operator in the WMA: GFT,[76] but acts as a group together with mining companies Mantra, Western Metals, and URANEX.[77] The 'Friends' are among of the most powerful actors in the area. This section concentrates on the group and some of its internal politics in order to delve further into the interconnections between mining and conservation.[78]

Under the auspices of the Friends group, Mantra donated a commercial-sized, diesel electricity generator to the Likuyu Sector headquarters of the Selous. A Mantra logo is painted on, marking the generator as a charitable donation from the mining company. The generator attracted local attention. Other parties, specifically GFT, were rumoured to have attempted to control the distribution of the generator and claim responsibility for the donation. Such squabbles over the right to label a donation and the traceability of contributions highlight political snags for the group of Friends. Furthermore, the placement of the generator at the Selous sector headquarters closest to the mine, rather than at a site connected to the WMA affiliated with the funding group, speaks to, perhaps, a greater need at the sector office, desire for political headway among leaders at the sector, a preference to

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[76] Despite numerous attempts, I was not able to meet with GFT.
[77] Western Metals is a uranium exploration company with drilling activities in the nearby Mtonya area from 2007 to present as part of a joint venture with Uranium Resource Plc. URANEX NL, which became Magnus Resources Ltd in 2014, is a uranium exploration company active in the Likuyu North concession from 2011 to present. These companies have been sporadically active in the group of Friends.
[78] Noe (2013) suggests that since the government licensed the Mbarang'andu hunting block to GFT while simultaneously issuing uranium prospecting licenses for the same areas, the concessions are incompatible and in conflict. Noe alleges that in 2007 mineral prospecting companies paid GFT to access the concession and provided upfront compensation for any business lost due to mineral exploration; Noe says this deal also promised compensatory payments for local communities to be distributed annually via the Friends of Mbarang'andu.

physically place the gift closer to the sphere of operation of the donor, or, most likely, a combination of these factors.

The WMA chairman, who has led the group since its inception, said that by 2014, the Friends gave their community organization a tractor, food rations, and motorcycles to support their efforts to guard the resources of the protected area. The Friends were set to meet with the WMA in July 2016 to discuss their support. In 2015, the patron group had not provided any funding, which the WMA chairman attributed to interference from the national election. The Chairman hoped that in 2016, the Friends would decide to give two years-worth of funding, to account for the absence the previous year.

Triangulating the relationship between the community-based conservation group, hunting companies, and mining companies, we can also consider the role of the neighbouring Selous Game Reserve. In 2014, the Likuyu Sector Warden of the Selous said he collaborated with the Friends group, even though it is largely affiliated with the WMA. The Warden described the activities of the Friends as: helping the WMA with village game scout patrols, transport, scout allowances and equipment, but also that they financed bore wells in the villages.

In conversations with the Mantra public relations manager, the company is openly part of the Friends group together with the nearby hunting companies. The manager situated the company's involvement with the Friends in the context of their relationship with other local actors including the conservation organization PAMS Foundation, the Likuyu Ward Development Committee, and the Roman Catholic Archdioceses of Songea and Mbinga. The manager said the company was not involved with other faith-based initiatives but was on 'peaceful' terms with the Muslim community near the mine. The company claims to have representatives who attend local, village-level meetings, and they saw their involvement with the Friends as another dimension of their community-oriented engagement. Other

conservationists suggested that Mantra, in some ways, found itself obliged to join the group because it represents the most powerful hunting and mining interests in the area. The rationale being, that to be relevant with the other major players, Mantra was all but required to be involved in the initiative.

Providing another perspective, professional hunter with the Pasanisi group of companies Andre Roux saw the Friends as an example of how the mining project can result in positive benefits for all stakeholders. He saw that the Tanzanian government could benefit from the financial inputs from the mining company, and the mining company can provide funding for the local community organizations through this existing initiative. Roux, suggested that the Friends initiative allows the mining company to be open, in a way, to the local community, while keeping those same individuals out of their mining site. He saw this as the consummate way to satisfy investors.

Compared to the fairly consistent views of these elite actors, nearby villages do not have a uniform understanding of the Friends of Mbarang'andu. Villagers understood a local maternity ward donated to the village of Likuyu Sekamaganga came from the WMA itself, not from the Friends. A Friends-supported programme to bring improved water wells to each of the WMA member villages was seen in Likuyu Sekamaganga to have been an activity solely sponsored by Mantra, because they placed their logo on the wells they paid for. Leaders in nearby Mchomoro village knew the WMA paid for schools and were building offices for each member village. The leaders said that they were receiving information on the mining companies' exploration activities in the area through the Friends organization, which they knew to be a group of hunting and mining companies.

Aside from the initiatives undertaken on behalf of the Friends, each of the group members also seemed to have separate community development projects. Mantra's corporate social responsibility portfolio ranged from funding the construction of libraries in local

secondary schools, to supporting the Tanzanian women's national golf team, though their primary focus remained the Anti-Poaching Unit. GFT, the hunting operation in the Mbarang'andu WMA, constructed a mosque in one of the WMA villages and in the town that hosts the WMA headquarters. Villagers also knew that GFT would provide game meat to people in the villages known to be vulnerable, including orphans, the elderly, and the infirmed. These other charitable activities serve as the background from which the Friends group emerged, and, perhaps, why there was confusion about their activities. This is especially relevant in the context of the mainstays of the private companies' activities, mining and hunting, which essentially operate in areas closed off to the villagers. The Mantra office closest to the mine site is located in the nearby town of Namtumbo. The office is signposted, but has only intermittently opened since 2014, when the full-time community engagement officer was made redundant. The company's head office is tucked away on a privileged peninsula in Dar es Salaam on the other side of the country. None of the mine-site activities are visible to ordinary people living in the area. Labelled and unlabelled mining vehicles lumber down the road from Namtumbo past villages before they disappear into the Selous Game Reserve. The company's presence beyond the villages is entirely obscured to all except the few who work at the site. So, seeing the Mantra trucks on the road may represent villagers' main interactions with the company, unless they know any of the few villagers who are employed at the site.

This mix of directly funding conservation activities (e.g. game scout allowances) and community development projects (bore wells) is aligned with the outlook defined by poverty alleviation by way of community-based natural resource management. In addition, the Friends programme illustrates the ways in which information is unevenly distributed among villagers regarding which initiatives were funded by the WMA itself and through the group of Friends. It also appears to represent a coordinated effort among conservation and mining

groups to collaborate to mutual benefit, allegedly while defrauding the community they claim to patronize. Regardless, it also seems as though the private companies, mining and hunting, are acting through the group of Friends and stepping in to provide some funding for activities and functions that might otherwise be the responsibility of the Tanzanian government. The uncomfortable composition and definition of civil society, which could include a mining company in this situation, underscores the artificial opposition of the state with civil society (Gupta and Ferguson 2002).

This sort of corporate social responsibility on the part of extractive mining and hunting companies is seen as a welcome presence in the villages, where their programmes bringing closed wells meet longstanding needs. Regardless, there are distinctions in the ways people understand the role of the Friends of Mbarang'andu. Those who are elite actors, on the local or national level, seem to have a different view than those who are not. Local people in the villages around the mine have limited knowledge with which to distinguish between the efforts of the Friends of Mbarang'andu and the actions taken by the WMA itself. The confusion that abounds, sometimes resulting from internal struggles among the component organizations in the Friends group, means that in the nearby villages there is no straightforward way of knowing who is responsible for which actions. It also means that villages may not be able to hold organizations accountable for their actions or promises.

Radiant Ivory and the End of Poaching?

Counterfactual

> It is 2060 and commercial extraction at the Mkuju River Project ended ten years ago. The decommissioning team completed their work eight years ago and now there are few visible signs of the uranium mine which operated in the concession inside the Selous Game Reserve. The tented camps that housed hundreds of workers are gone. The senior and junior mess halls where a team of chefs brought both Tanzanian and European cuisine to the staff are gone. The shops where broken equipment was repaired, and the yellowcake processing plant are also no more. The roads crisscrossing the site are all that remain, saved according to an agreement

with the Ministry of Natural Resources and Tourism for the purpose of facilitating anti-poaching patrols through the area.

Elephants ranging in the area, who grew accustomed to the twenty-four-hour daily operation of the mine, root around for salt at the site of the old mess halls. The herds that range here have had nearly forty years without hunting: few poachers, because of the work of the Anti-Poaching Unit operating in the mining concession; private hunters also stayed away, since they could not enter the area until mining ended. The elder matriarchs who once knew how to avoid being prey have passed away. Young males in the area have longer tusks than their fathers.

The villagers just outside the mining area contend that elephants are raiding their villages more than ever. *Before mining, I thought I planted crops for the elephants*, a local might say, *but that was nothing compared to now*. Likuyu Mandela village has been deserted; elephants destroyed crops for too many years. Many residents repatriated themselves to Mozambique or went to find brighter futures in Songea town or Dar es Salaam. Likuyu Sekamaganga residents lament that the fields they felt were safe from elephants in the first twenty years of the 2000s are now under constant attack from raiding herds who have a taste for rice, maize, and other crops. Few villagers were employed at the mine long-term, but those who were bought houses in Songea and are able to afford to pay agricultural workers employed at their farms in Likuyu Ward. The rest of the villagers, who only found temporary employment during the mine construction and decommissioning phases, are lobbying their member of parliament to get someone to do something about the elephants.

The Selous was removed from the list of UNESCO World Heritage Sites in Danger in 2030. International conservation organizations hail the return of robust elephant populations in the Selous. Since the mid 2020s, yearly press releases congratulate Tanzania on its successful protection of elephant populations, led by a dramatic drop in poaching in the southern part of the Selous. The Selous is a poster child for wildlife recovery in an otherwise bleak landscape of extinctions across sub-Saharan Africa. Around the world, the Frankfurt Zoological Society presents their work under the title, ‘Best Practices in Elephant Conservation: Selous Case Study’. WWF raises more money in a single year, to continue its community-based elephant conservation programmes piloted around the Selous, than Tanzania earned in royalties from the uranium mine.

Although elephants had always been feared in this area, they have taken on new levels of monstrosity. People who whispered about the contamination of workers’ bodies now say that elephants are not just *haram* (forbidden), but they are poisoned. The people who used to go into the Selous by bicycle or motorcycle to hunt elephants no longer do so. Amidst the post-mine landscape, they see the traces of uranium, radiating. The fishermen say the streams are not the same as before. There are dead fish now. The mushroom hunters say the fungi are different—softer than before. The hunters say they saw hippos wading in a pond in the Selous, covered in sores. Some birds that fly in and out of the area are visibly disfigured, sometimes with eyes milky with cataracts. The *homa* (fever) thought to have afflicted mineworkers cannot be remediated and is thought to cling to everything in the area, from the thinnest grasses to the tusks of the largest elephant.

In the surrounding villages, the younger men who worked at the mine are nowhere to be seen. Since rumours spread that men who worked at the mine are infertile, men who wanted to marry moved to other cities where they could start their lives again. Women who worked at the mine who were not able to leave the village find their lives essentially the same as before. They farm and hope the elephants do not destroy their crops.

The *mchawi* (witchdoctor) in the village, after a scandal revealed he was healing one of the mineworkers, agreed to never again work with those contaminated people. Those not

connected to the mine grew concerned that his medicines and healing treatments, once used on mineworkers, would contaminate them as well.

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This speculation on life in southern Tanzania after the mine begins and ends operation draws from pieces of information currently available, projected into the future. The fictitious future presented above is not intended as a prediction; instead, it is offered as a way to think through the situation at present. This extrapolation draws from the conceptualization of tracing elements from the present that speak to the perception of the future (Geissler et al. 2016), and the need for anthropologists to engage with these traces in order to appreciate the non-linear temporalities at play in all fieldwork. Through this counterfactual, I follow the threads seen in the present in order to illustrate a version of what may appear to be a surprising overlap of interests: one in which uranium mining inside the Selous Game Reserve benefits wildlife conservation activities. In an imagined world in which international conservation organizations are able to claim success in the area around a mining project in part because of the mine, we can think through the possibilities of living in ruined worlds (Hell and Steinmetz 2014; Tsing et al. 2017; Stoler 2008) that some scholars already see as laboratories for understanding life in the Anthropocene.[79]

Although the circumstances presented here, of uranium mining in a wilderness area, may appear unique, they harken back to the histories examined in previous chapters. Since the early twentieth century, the antecedents of today's conservationists opposed mining in protected areas. The earlier generations of conservationists, the colonial game wardens, opposed mining in what were then game reserves in Tanganyika. Still, mining was permitted, and arguments for the economic necessity of extraction and development that were promulgated a century ago are in the same vein as the defence of extraction at present. The

[79] The concept of the Anthropocene suggests that human interference is the marker of the present geological epoch, though the value of a rigid definition of the term remains debatable (Veland and Lynch 2016).

key difference, the independence of the Tanzanian state, provides a critical facet of the tension today; denial of the right for African countries to extract natural resources could be seen as neo-colonial, or even racist.

In the case of the Mkuju River Project, international conservation organizations make calculated decisions in their strategy to attempt to influence the Tanzanian government and advance their conservation goals. WWF-Tanzania echoed the concerns posted in an open letter to President Magufuli in 2016 from Tanzanian journalist Kiondo Mshana (2016) warning of the possible health and environmental consequences of uranium mining. WWF-UK also launched a petition against 'harmful industrial activities' and 'rampant poaching' in the Selous, active through 2018.[80] WWF published a report in 2016 calling for 'collective global action' to save the elephants of the Selous (Dalberg for WWF 2016), which it identifies as threatened by poaching and industrial activities, with minimal explicit reference to uranium mining. The Tanzanian government vociferously denied WWF's allegation that the Selous could be devoid of elephants by 2022 (Athumani 2016). Within WWF, the approach to the uranium mine in the Selous has not been unified. Expanding on its Ruvuma Landscape Programme and its bioregional approach to conservation, WWF developed two projects to assist the Tanzanian government: one created the Southern Tanzania Sustainable Development Forum; another undertook the drafting of a strategic environmental assessment, which could be used by the government to support sustainable large-scale infrastructure and development planning in southern Tanzania. The unpublished assessment did not account for the Mkuju River Project or any other major industrial project planned for southern Tanzania.

[80] The customizable petition addressed to President Magufuli regarding the Selous as 'our shared heritage' allows petitioners to ask the president to 'save': the environment, local livelihoods, rare wildlife, and/or economic value. WWF-UK says that their petition drive generated 502,433 emails by February 8, 2018. The petition is available here: https://makeyourmark.panda.org/uk/selous.

The purpose of a strategic environmental assessment that does not integrate any industrial activities remains unclear.

The nuance with which WWF approaches the Selous and the planned uranium mine is hardly unique. A 2014 press release from Frankfurt Zoological Society describes elephant poaching in the Selous as 'epidemic', and ending poaching is 'crucial for conservation efforts, as well as Tanzania's economy and natural heritage', while making no mention of the uranium mine (Frankfurt Zoological Society 2014). Further illustrating the ambivalence with which large conservation organizations face the mining company and its presence in the Selous, PAMS Foundation, an anti-poaching organization, is part of the Friends of Mbarang'andu. Similarly, a large conservation organization was reportedly contacted by Mantra before 2014 with a proposal to collaborate on conservation activities. Although the earlier approach was rebuffed, conversations may continue with regards to community-based natural resource management projects for the villages near the mining area.[81]

Large international conservation organizations with (or without) a coherent strategy regarding mining in protected areas are not the only conservationists engaged with the Mkuju River Project. The Friends of Mbarang'andu are supporting the conservationists and their activities within the Mbarang'andu WMA. The Selous game rangers are the paramilitary conservation force of the Selous. The hunting companies operating in the Selous and cooperating with the mining company generally see themselves as the most robust defence of the Selous wilderness, as they protect their investment in their hunting concessions. The diversity of these supporters of consumptive wildlife tourism, wilderness, and ecosystems

[81] Other organizations lobbied against the mining project. Rainforest Rescue campaigned to reverse the UNESCO decision to change the Selous World Heritage Site borders in a petition which gained 59,816 supporters, ending on May 22, 2014. The archived petition is available here: https://www.rainforest-rescue.org/petitions/883/unesco-sacrifices-wildlife-preserve-for-uranium-mine. A petition from Beyond Nuclear to the UNESCO World Heritage Centre to stop the Mkuju River Project gained 2,660 signatories in 2012. The petition is available here: https://www.change.org/p/beyond-nuclear-uranium-network-stop-the-mkuju-river-uranium-project-at-selous-game-reserve-tanzania.

resists the application of the categorisation of ‘conservationist’; nevertheless, it may remain a useful category at present. Conservationists’ responses to the mining project are similarly heterogeneous.

A similarly motley group of conservationists finds itself entangled in episodes of resource exploration and mining in protected areas, as is the case for more than twenty-five percent of all UNESCO sites of natural world heritage (Osti et al. 2011). Baird (2017) also notes the recent co-construction, by industry and the state, of sites of heritage. It is apparent that industry impacts the human and non-human world through its exploitation of resources, and simultaneously influences the management and modification of sites of ‘heritage’. As such, the pasts and futures of industrial sites have become the subject of research by biologists and ecologists. This research highlights what happens in spaces labelled ‘no-go’ zones, where humans are no longer permitted. Thinking through the Mkuju River Project at present, these possible futures seem close enough to warrant reflection.

In places where human activity has been deterred, we are increasingly seeing alternate futures. In some areas, humans are orchestrating the return of certain spaces to ‘wilderness’ by way of a strategic effort to ‘rewild’ places and species (Lorimer and Driessen 2016). Rewilding has multiple meanings and is enacted in different ways, but generally emphasizes a type of conservation tied to historic baselines of species thought to have been present in a particular landscape, requiring the reintroduction of any extinct or absent species. This is in some ways analogous to the kinds of industrial contamination that create zones of exclusion, which appear to unintentionally create spaces where rewilding is possible. In these places where scientists, politicians, and/or society see the risks to humans to be too high, we find this intriguing opposite effect wherein flora and fauna seem to be surviving despite evidence

of genetic modification and/or 'non-targeted effects'.[82] For instance, around the Chernobyl Nuclear Power Plant, the Ukrainian site which was home to the 1986 nuclear meltdown called the most catastrophic nuclear disaster in history, ecologists studying the changes taking place in the exclusion zone see radiation has multiple impacts on parasite-host relations in wild animals (Morley 2012). Initially, impacts of radiation were most severe in the areas of greatest contamination, populations of small mammals declined, and radiation damage was observed in domestic animals not evacuated from the exclusion zone; but there is conflicting evidence on the long-term impacts of low dose radiation in the exclusion zone (Beresford et al. 2016). Scientists now find wildlife populations in abundance in the exclusion zone (Deryabina et al. 2015). This, perhaps surprising, flourishing of wildlife is generally regarded by scientists to represent the benefit of the exclusion of humans outweighing the costs of radiation contamination (Baker and Chesser 2000), although these (irradiated) individuals may continue to carry markers of genetic damage. However, there remains active scientific debate over whether birds (as well as other species) show lower abundance and population density in areas with the highest radiation levels in Chernobyl and Fukushima (Mousseau and Møller 2014; Møller and Mousseau 2007; Smith 2008; Strand et al. 2014).[83]

From the ruins within the exclusion zone around Chernobyl, which in many ways was an exceptional industrial disaster, we can turn attention to more common sites of

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[82] 'Non-targeted effects' (NTE) refer to the effects (on cells, tissues, etc.) not caused by the direct receipt of ionising radiation. For instance, 'genomic instability/delayed lethal mutations where radiation damage is detected in distant progeny of cells which survived the initial exposure and appeared healthy for multiple generations and bystander effects where effects are seen in neighbours which did not receive any direct dose' (Mothersill et al. 2017, p.485). The U.N. Scientific Committee on the Effects of Atomic Radiation only considers direct effects relevant to the study of radiation since there is no clear link between NTE and negative health effects.

[83] Where the forests around Chernobyl became part of an exclusion zone buffer area, including the most contaminated spaces, following the Japanese nuclear disaster at the Fukushima-Daiichi Nuclear Power Station, the Japanese government has taken a different strategy: to remove the contamination from the forests that are interspersed with villages (Bird and Little 2013). Geography and topography are two factors in this difference, as well as much higher population density and the economic dependence in the Fukushima area on agriculture and timber production (Morris-Suzuki 2015).

environmental destruction: military facilities. U.S. military installations have a complex, not necessarily antithetical, relationship with wildlife (Davis 2007; Kuletz 1998). At U.S. military installations, there is increasing evidence for a kind of 'radiant rewilding'. The securitization of these military spaces made them sites of forced human exclusion (Meierotto 2014). However, the weapons testing and military drills which took place in these spaces left their own history. The chemical traces of weapons and the impact of (un)exploded ammunition seems to last much longer than the digging in of boots scrambling over hills or foxholes haphazardly dug in simulations of battlefields. The fear of undetonated ordinances or residues from the testing of weapons combines to add a level of fear of these spaces that is on top of the more prosaic fear of being caught trespassing on military property. Yet, as was the case in Chernobyl, these fears are not passed along in the same way to the non-human inhabitants of the area. Rocky Flats, a U.S. military plutonium plant which closed in the 1980s, left behind over 6,000 acres including contaminated buildings, water, and soil, but went on to become the Rocky Flats National Wildlife Refuge in 2007 (Krupar 2011). This is in addition to the conversion of nearly two dozen major U.S. military installations into national wildlife refuges, all shaped by their onetime military activities (Havlick 2011). Active military bases also have programmes to manage the wildlife populations with which they share space (Kesling 2013).

Nuclear disasters and military facilities provide stark examples to think through possible futures for the area around the Mkuju River Project. However, other sites of post-extractive activity may provide more mundane examples. More specifically tied to extraction, we can attend to the ecosystems created by mine tailings dams or ponds, where mine waste is deposited and flooded to prevent oxidation and dust. These wet tailings installations have been found to be unlikely homes for plant life, which, though studies show the flora have higher rates of chemical contamination (Khozhina and Sherriff 2008), challenge ideas about

what ‘waste’ disposal and wetlands can and/or should look like. Similarly, brownfield developments, sites of previous (industrial) activity targeted for renewal and reuse, illustrate the ways these ‘ruined’ spaces are assigned new futures. Brownfield developments raise questions about health impacts of chemical exposure, social justice (for those people who move to or from these spaces), and the aesthetic and physical changes in connection to (in)visible traces of the past that render these sites exceptional (Lee and Mohai 2012).

A future ‘radiant rewilding’ at the Mkuju River Project could impact the wildlife populations in the Selous Game Reserve in ways that could unintentionally demonstrate how certain conservation activities can be supported by extractive activities. Regardless, the key issue here is that the degradation of the environment needs to be of the sort that creates a space so taboo, humans will avoid it while wildlife can continue to use it. Chernobyl and Fukushima demonstrate that even when contamination and environmental degradation are high, these ruined habitats do not seem to entirely drive wildlife away, although they may alter ecosystems in unpredictable ways. Destroyed areas may be inhospitable temporarily, for certain species, or for some activities (breeding, rearing young, etc.), but wildlife may be able to enter and exit from otherwise inhospitable areas. Other industrial activities, such as depleting dry season water sources, cutting down vegetation thus eliminating sources of food for herbivores, and creating impassable topographic features could also limit or reduce species abundance and density. The ecological possibility for a radiant rewilding relies upon a long-term, continually affirmed taboo against human access to that space, and all that came from that space. Under those circumstances, decreased poaching may come to pass, but the (possible) resulting increase in wildlife population could require increased hunting or culling to maintain a ‘healthy’ ecosystem (van Aarde et al. 1999).

The hunting companies with rights in the area of the Mkuju River Project no longer operate inside the mining concession, but they do continue to operate in the area and continue

to plan for their futures there. Through May 2016, mining activities remained delayed. To that point, Tanganyika Wildlife Safaris, part of the Pasanisi group of companies, did not feel their hunting activities were negatively affected by the mining project and did not foresee impacts in the future. Perhaps, like in the alleged case of GFT, they have a financial agreement from the mining company to compensate them directly. Or, they simply saw mutual benefits. The Tanzanian Ministry of Natural Resources and Tourism anticipates that after the fifteen years of mining and decommissioning, the rehabilitated sites of extraction will return to the Selous and tourism and conservation activities in the area will resume unimpeded. The agreement between the company and the Selous is to leave no infrastructure after decommissioning, aside from roads, which are thought to benefit the administration of the Selous. If this is the case, hunting tourism will resume. Thinking about how a taboo on the area will be negotiated by hunting tourism, we must consider who is involved in these activities. The hunting tourism in the Selous is dominated by foreign hunters, rather than Tanzanians. The staff of the camps are often Tanzanian. Who will be impacted by a possible fear of contamination in the area? Will hunting tourists be interested in coming to a 'radiant' area? Will the former mine become a tourist attraction in and of itself (Pretes 2002)? Will hunting tourists still regard the area to be 'wild' when it has recently been subject to commercial extraction? Where there are fears of 'contamination', will Tanzanian staff be willing to spend extended periods of time—the July-December hunting season—in the area?

The Selous Game Reserve is already a type of exclusionary area, where the resources within are preserved under the auspices of the Tanzanian government for the betterment of the nation by way of conservation and tourism activities. That a fear of the nuclearity and contamination of the Selous could further keep people away from wildlife and wilderness, allowing for a radiant rewilding, raises questions that continue to challenge what it means to be 'wild' and the role of 'wild' animals in our world. An end to elephant poaching in the

Selous is a goal of the Tanzanian government and an elusive project for international conservation organizations. The counter-intuitive role in which widespread chemical contamination could unintentionally lend support to those initiatives by creating a zone of exclusion is unlikely. The extreme exclusion on one end of the spectrum is tempered by more moderate intermediate examples. As seen from ongoing artisanal mining of uranium at Shinkolobwe mine in the Democratic Republic of Congo, perhaps uranium mining will not create a space of such abhorrence as is seen at Chernobyl and U.S. military testing sites. Only time will tell the extent to which the area experiences pollution or is perceived to be contaminated, and taboo.

Conclusion

This chapter began with an acknowledgement of the sensitivity conservationists exhibit toward anthropologists, and how anthropologists are homogenized in the process. When the value systems of conservation are revealed to be somewhat inconsistent, for instance in the case of the Ministry of Natural Resources and Tourism accepting support from the mining company to conduct anti-poaching activities when the same company may go on to inflict environmental damages, the foundation of conservation ideology appears to be attacked. In response, conservationists may assume a defensive posture. However, the construction of conservationists as a category of like-minded individuals is as inaccurate as that of the despised anthropologist. Conservationists have different motivations and strategies, as illustrated in and around the Selous Game Reserve and Mkuju River Project. Into the milieu of conservationists and their diverse initiatives in and around the Selous, the mining company injects itself and its capital in ways that deserve an examination that also does not artificially assign regularity.

This chapter challenges the representation of conservation and extraction as forces inherently at odds. In the context of the rise of corporate social responsibility, changing behaviours of mining corporations, the political UNESCO World Heritage system, and powerful international conservation organizations, this chapter analyzed two instances where conservation and extraction interests and activities aligned. Via the mining company-funded Anti-Poaching Unit (APU), we can see the ever-shifting balance of power negotiated among the extraction company and the Tanzanian government. The mining company's participation in the Friends of Mbarang'andu organization allows it to continue to disarm environmental critics, and also collaborate with the powerful hunting companies operating in neighbouring concessions and villages.

An immediate explanation of this alignment—the 'greenwashing' of extractive projects in an increasingly capitalist-oriented Tanzania—receives support from the mining company's continued financing of corporate social responsibility projects despite the delay of commercial uranium mining. The mining company may be opportunistic in the programmes it chooses to support, which seems to be demonstrated by its consideration of its image in the local, national, and international context. This intentionality may best be understood in the international economic climate which is growing critical of extraction amidst a downturn in the commodities market in the second decade of the twenty-first century. This resulted in the simultaneous weakening of international mining companies and growing strength of consumer pressure tactics, which we saw in this case through intense opposition to the project voiced in numerous petitions. Mantra's enactment of managerial strategies, such as corporate social responsibility, are increasingly part of the accepted, even required, practice of major international mining companies. Mining conglomerates see these activities as part of their 'social license to operate'. Proceeding through different 'levels' for securing the 'social license', perhaps we can see, for instance, the mining company support of the Tanzanian

women's national golf team to be of 'national interest'. Directed to the regional level, the mining company supports the gender desk at the regional police office. The small community projects, supporting agriculture, silviculture, and animal husbandry in the villages around the mine, may be strategically aimed at ensuring the continued validity of this 'social license' from the perspective of people living closest to the project. The participation in the APU and the Friends of Mbarang'andu cannot be so easily categorized.

If we think of the APU as a strategic effort to ensure the safe receipt and maintenance of this social license, we must figure out who this programme is geared to appease. People living in villages around the mine have long been involved in hunting in the Selous. The APU stands in (violent) opposition to those activities. Based on the mining company's investment in anti-poaching, outpacing that of other projects, the associated stakeholder—the international community of conservationists—might be the most important constituency to mollify in order to maintain this social license. Alternatively, this initiative could merely reflect the interest of a single high-ranking company official rumoured to enjoy hunting in the Selous. Or, perhaps the APU resulted from the zealousness of a few company employees who saw a chance to use this money toward the pet project of elephant conservation.

Corporate social responsibility is often seen as part of an effort to co-opt critics by incorporating them or their ideologies (Kirsch 2007). Elephant poaching, which largely feeds a non-Western customer base hungry for ivory and bushmeat, stands as antithetical to Western conservation value systems. The 'charismatic' elephant (Barua 2011), admired for its intelligence, memory, and emotional range, in addition to aesthetically pleasing today's Western-influenced conservationists, stands as a living, breathing being that the mining company can save and thereby appease Western conservationists who might otherwise oppose the project. Without internal conflict, the APU demonstrated a willingness to work

alongside hunting safari outfitters in the group of Friends, who also kill or facilitate the killing of the same animals.

The APU also exemplifies the limitations of homogenizing the Tanzanian government as if it was a monolithic entity with universally pursued interests and goals (Gupta and Ferguson 2002). Tanzanian government employees operate dissimilarly at different levels and locations across the hierarchy. At the individual level proximate to the mine, government employees (APU rangers) push for more accountability (e.g. to receive payment) from the mining company. When APU rangers are suddenly pulled from the programme and re-assigned to other posts (by the sector warden or by administrators in Dar es Salaam), we see either the interference of high-level, more distant management attempting to push back against the power of the mining company to control those rangers, or we see the dysfunction of the Selous administration. The mining company, in signing a memorandum of understanding with the Ministry of Natural Resources and Tourism, contractually linked conservation and extraction interests at the highest levels. The balance of power between the Tanzanian government and the mining company appears dynamic based on location and rank, where the Tanzanian government emerges as a heterogeneous entity.

Additionally, the activities of the APU confirm that seemingly unrelated values can intersect with financial value. In this case, we can see how the values supporting conservation and against elephant poaching can be harnessed in support of efforts to protect the financial investment in the mining operation. Looking at the mining company as an entity entirely focused on protecting its financial interests in the mining concession, we see the activities it undertakes can be traced back on a path that fulfils that obligation.

The anti-poaching force and the group of Friends, regardless of the (perhaps) varied intentions of those supporting both, illustrate the existence of not just an ecotourism-extraction nexus, but an expanded conservation-extraction nexus. The mining company, in its

quest to protect its investment, can focus its corporate social responsibility budget around a muscular, paramilitary conservation initiative, which acts to further militarize its concession, increasing its monopolistic control over the space, without conflict with the possibility that they will cause ecosystem-wide environmental damage if/when commercial extraction begins. The Tanzanian government, in its search for funding for the Selous Game Reserve, has its own interest in securing control over the vast space, and has no elephant conservation-based reason to decline the memorandum of understanding (though they appear to engage in a power struggle over the 'soul' of the APU). Through the APU, the mining company and the Tanzanian government were able to meet and invent, in a way, one reality in which extraction and conservation can coexist, placating opposition, protecting the 'social license to operate' from international-level criticism, and meeting a shared desire to control space and human bodies. Into this space of improbable alignment, we can appreciate the alternative futures presented by ruined landscapes. There looms the spectre of brownfield conservation: remediated spaces of industrial devastation, which challenge simplistic definitions and values of that which is 'wild'.

Returning to the social license, there remain important questions: who issues this imagined license? Who can revoke it? The mining company may fully fund the APU, but the APU rangers continue to wear Tanzanian military uniforms, outwardly only betraying their connection to the government, not to the private company. Villagers living nearby may see the APU rangers continuing their normal activities as Tanzanian government officials. The contrast is stark between these villagers and the foreign-backed mining company, part of one of the world's largest uranium mining conglomerates. Coming into this marginalized area of Tanzania, Mantra is widely known but simultaneously invisible. Lurking behind the APU and the Friends of Mbarang'andu, the company reaps the rewards of earning international respectability while maintaining relatively limited visibility on the ground. 'Mantra' is a

slogan for industrial efficiency when involved in (successful) community projects but is not regarded by locals as an arbiter of natural resource regulations, despite their prominent role in the APU. This does not conclude our examination of the mining company's activities to affirm and solidify its social license to operate in the area. This chapter forms the foundation on which I will later build connections to hopes and anxieties about the uncertain future around the mine. To delve further into the company's entanglement in communities around the mine, the next chapter examines the value of land in the area.

Chapter 6 Land as a Resource

The chair of the village land planning committee leads the way down the dirt road from the village office, eventually turning left into a wooded area. Hamisi, the chair of the committee, is responsible for allocating plots of land for people who want to purchase land from the village.[84] Another villager and myself follow as he identifies the border of Zeituni Seremani's property.[85] Seremani is a District Executive in a western region of Tanzania, though she has ties to this village and returns periodically. By August 2015, she has not yet started building, but she first requested the land in 2011. Village records indicated she purchased 100 acres in 2012. In 2013, the village government reduced the size of the property to fifty acres. On this plot of land, she plans to build a trade school and a tourist hotel. Hamisi knows she paid for fifty acres, but he is not sure if the previous village land committee gave her a plot of that size. In return for allowing me to join on the walk to review the land, the chairman of the village and Hamisi asked that I GPS map the border of the property and share the total area with them.

When we set off that morning, I thought we would return within an hour, maybe two if we take our time. As we walk, we come across a man and woman who are cutting down trees. We pause briefly, and the chairman speaks with them. The man acknowledges that he does not have permission to be in the area. He says he knows the nearby border of Seremani's plot, despite an absence of signage, and was staying out of it. He says he asked his *kitongoji* (neighbourhood leader) to add him to a list of those requesting land, but the leader failed to do so. The man knew he was not supposed to work on the land before receiving village permission, but the chairman does not ask him to stop, and we continue on our walk. Along the way, we pass a property belonging to a village group that has an agreement with Mantra to start a tree nursery for the eventual remediation of the Mkuju River Project after its completion. As we pass the third hour of steadily walking the property's border through the woodland, Hamisi points out to me a sign marking property belonging to a local road building company. Still following the unmarked border of the Seremani land, we pass a plot that Hamisi says was proposed to be the new location for the ward-level court. The court is crumbling and is also condemned for being too close to the planned upgraded road to the mine.

Once I upload the GPS track we made walking the border, I calculate the area within the perimeter. The next week, I speak to the village chairman and chair of the land committee to share my findings: that the plot is nearly seven times the size that Seremani paid for according to the revised agreement with the village. The chairman and Hamisi are surprised to hear this, however, they knew that their method of pacing out the borders was not precise. It went without saying that this kind of inaccuracy suggests there was purposeful misallocation of land in the village.

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From the mapping of the property belonging to absentee landowner Zeituni Seremani, we can start to develop an idea of how land intersects, as a resource, with other valuable resources in

[84] This is a pseudonym.
[85] This is a pseudonym.

this rural village in southern Tanzania. The bureaucratic presence of the village land planning committee chair belies a lack of technical equipment or political will that might be used to accurately measure parcels of land. Outsiders with distant connections to the village, like Seremani, are able to command space in the village and exercise their rights to land in ways that might not always involve the immediate commencement of occupation, construction, or activity. Seremani's land purchase could be linked, through the trade school, to expectations of what might be profitable near a planned uranium mine. The plot set aside for the village court connects the village government with the improvement project planned for the road to the mine, while the property belonging to the forestry remediation group also optimistically awaits the eventual commencement (and then conclusion) of mining, both serving to link land with uranium. While bureaucratic shortcomings around village-level land rights are revealed, through the seemingly irresponsible *kitongoji* to the oversized plot allocation, in contrast, the willingness and ability of individual people to respect property boundaries, as did the two people working near the unmarked border, speaks to dissonant relationships with land at the individual level versus at the bureaucratic level.

Uranium mining and conservation, two activities that regulate the extraction and exploitation of valuable resources in the area under consideration, have been the focus of the thesis thus far. The long-delayed uranium mining project and the conservation initiatives garner international attention and represent large foreign investments. This chapter shifts attention to a resource more immediately required by and accessible to local people who are predominantly economically dependent on their small-scale farms. It engages with the recent history of a village in the Mbarang'andu WMA, analyzing what may be its most valuable resource at the current moment: land. In doing so, the chapter contextualizes dynamics influencing conservation and mining trends amidst recent or ongoing village-level land disputes. The chapter goes on to connect the historical experiences of land dispossession with

current incidents exemplifying the types of pressure on land. In order to study land as a resource, I highlight a series of disputes over land. Through existing maps and mapping efforts I undertook as part of the study, I expose pressure points in the village marking the importance of land as a resource. The value of land is interrelated with various natural resources and their management, and land issues appear to be just as dynamic and political as other natural resources in the study area, with ties to knowledge and infrastructural development. The politics of land in this rural village can also be seen as part of the larger postsocialist moment in Tanzania.

A classically anthropological preoccupation, land and its role in rural sociality serves as a conceptual foundation for this chapter. The relationship between people and land drew the attention of early colonial anthropologists and, in the 1950s, came to the forefront with the study of the complexity of changes in the territory of ethnic groups (Bohannan 1954); later this faced criticism for presenting identities in an unproblematic light. In the 1970s and 1980s, a focus on frontiers and margins emerged; in particular, the study of these spaces and their potentiality drew attention of scholars interested in examining the connections between social change over time and space (Kopytoff 1987; James 2015). More recent efforts to connect belonging to a place with identity, by way of the study of autochthony in sub-Saharan Africa (Geschiere and Jackson 2006), echo of much older studies of the role of the 'stranger' in Africa. The political links between land and belonging, raising key questions of who is allowed to belong, when are they allowed to belong, and how identities are maintained, modified, policed, and legitimated are among the key theoretical themes still under exploration. Legitimacy and authority in social struggles over land in southern Tanzania, as illustrated in the case of the Seremani property, underlie the rest of the chapter.

The broad study of land, including rights to land and the heterogeneous meanings of land, continues to be a major anthropological concern (Peters 2009; Li 2014b). In the African

context, land tenure is complex and diverse, and is often challenging to decipher. 'Customary' forms of land tenure, thought to pre-exist colonial intervention in African land tenure, have been proven to be influenced, extended, and created by colonial as well as post-colonial governments, though those institutions might not control the so-called traditional systems (Shipton and Goheen 1992). 'Customary' land tenure forms can come into conflict, and can be influenced by external factors, for instance, religious laws about inheritance. Still, a distinction continues between 'customary' forms of land tenure and statutory/private land rights. Where 'customary' land tenure may refer to patrilineal or matrilineal forms of land control and inheritance, often held in plurality, the term has been criticized for being an invention by outsiders: a static, unrealistic theoretical construct.

The capitalistic notions of individual ownership of private land as extended via titles can be, in effect, similarly homogenizing to the uneven extension of statutory rights to land. Land rights can be layered, with multiple claims of different kinds over the same space. Major changes in land tenure, resulting from war to resettlement, from land nationalizations and from natural disasters all can impact localized land dynamics. Land titling, regarded as a 'secure' type of tenure, has been proven in Kenya and elsewhere to disenfranchise women and pastoralists, in particular (Shipton 1994).[86] Ecosystemic influences on land tenure have more recently joined the theoretical frameworks for thinking about African land tenure systems. Anthropology and geography have forged important theoretical contributions which acknowledge that the meaning of land (Li 2014b) is dynamic in ways that can similarly define mineral resource reserves (Bridge 2004), and, at the same time, appreciate that land, and its governance, are key to resource extraction (Bridge 2014); upon these premises we can begin to consider how land is 'made' into a resource (Richardson and Weszkalnys 2014).

[86] Shipton suggests this bias against pastoralists is the result of a combination of factors: African governments being predominantly made up of people from farming societies and herders being more likely to need to cross international borders to secure their livelihood.

Land in southern Tanzania

The theories developed for making sense of land tenure around the world can be applied to the context at hand in a variety of ways. Key themes for Tanzania include the legacy of (post)colonialism and (post)socialism on land rights. For southern Tanzania, different types of 'customary' land tenure, resettlement, and ecological aspects of land tenure diversity are of most immediate relevance.

From the historical overview provided in chapter two, there is a history of changes in population that impacted land tenure in the area around the Selous Game Reserve and the Mkuju River Project. Southern Tanzanian ethnic groups, including Yao, Mwera, and Makonde are all matrilineal (Seppälä and Koda 1998), while Ndendeule sociality has been described as a kinship network that does not emphasize lineages (Gulliver 1971). Traders from across the Indian Ocean, especially Arab merchants, were thought to have founded the southern coastal town of Lindi in the eleventh century, bringing with them Islam, which was regarded as compatible with matrilineal groups. In the middle nineteenth century, the incursion of Ngoni people, who are patrilineal, may have been a factor causing friction between different types of 'customary' land tenure and inheritance systems.

German colonialism inserted itself on coastal southern Tanzania at the turn of the twentieth century and brought Christianity, which favours patrilineal descent and inheritance, as well as cash crops, including cashews, a tree crop. In areas around missions, during German and British colonialism, Christianity dominated, while in other parts of southern Tanzania, particularly the land of the Ndendeule people, people resisted Christianity in favour of Islam. While coastal southern Tanzania was ecologically suited for cashew cultivation, further inland, tobacco became the key cash crop. Tree crops, such as cashew, often come with layered types of land tenure, where land may be owned by someone different than the owner of the tree, which may be different from who has the right to harvest the tree fruit, or

plant in its shade. Tobacco, an annually planted crop, does not have the same lengthy life span, and therefore, is not planted as a way of staking a claim to land.

Agriculture is not the only industry responsible for large scale displacements. Mining (in terms of exploration, claims, large and small-scale extraction) is connected with land alienation (Bridge 2014). The brief German colonial tenure encouraged mineral prospecting without providing infrastructure to support large-scale eviction of residents to support larger mining projects. Through the early 1920s, British colonial policy was similarly disinterested in industrial mineral extraction. This shifted, as a 1927 commission recommended the colonial government encourage large-scale mining, becoming part of the 1929 Mining Ordinance. The world recession of the 1930s meant large companies either left or suspended work until the mid 1930s (Gibbon 1995).

Major government interventions in southern Tanzania had varied impacts, but are generally noted for not accounting for previous land claims. The massive loss of life and exodus from southern Tanzania caused by the Maji Maji War and the brutal response from the German government undoubtedly impacted land tenure. The Tanzanian government (colonial and post-colonial) changed the boundary of the Selous Game Reserve numerous times, but most significantly in the 1940s with the Closer Settlement scheme which moved villagers out of the Selous. The colonial records do not indicate how land was allocated to those who were expelled, nor do the records explain how people living in the areas targeted for resettlement were compensated for their loss of land, or how their land rights were impacted at all (Seppälä and Koda 1998). While land titling was a major component of the 'East African Royal Commission' in Kenya in the 1950s, it was not adopted in British-controlled Tanganyika (Shivji 2009).

Ujamaa brought about lasting impacts on land rights in post-colonial Tanzania, yet, applying the term 'socialist' to the Tanzanian case is problematic. As with Closer Settlement,

the forced relocations of Tanzanian collectivization created ambiguity in land tenure across different land tenure systems. Despite villagization, some villagers owned permanent crops (trees) in their former villages until 1980. This was the result of the 1975 Village Act, which left loopholes for villagers to use both customary and religious law in regard to land rights, effectively allowing their continued ownership of farms in and out of their resettled villages (Seppälä and Koda 1998). Act 21 of the 1975 Villages and Ujamaa Villages Act made villages legal entities, meaning a 'village council' along with an executive, judiciary, and ruling party all had overlapping jurisdiction over land tenure.

The transition out of socialism gained much attention in the post-Soviet context (Rogers 2010, among many others), but there is relatively little written about African postsocialisms (Pitcher and Askew 2006; Tadesse 2003). The National Agricultural Policy of 1983 emphasized cash crops and land privatization, opening land to acquisition by outsiders. In addition, efforts to revise the 1975 Villages law reduced the power of village governments over land tenure, transferring this power to district land officers and district councils. This took place contemporaneously to the introduction of village titling, where village councils could survey and demarcate the boundaries of properties and issue certificates of occupancy; this was heavily criticized for being a cumbersome, expensive process that did not take into account pre-existing claims to the land. New regulations passed in 1986 were already considered insufficient by 1987, when Government Notice No. 88 of 1987 repealed customary land rights in districts notorious for serious land disputes. The Presidential Commission of Inquiry into Land Matters, established in 1991, submitted a report in 1992. The Commission's recommendations were never seriously acknowledged, and land reform has been implemented unevenly and at a slow pace (Pedersen 2012). To this day, the Tanzanian Constitution retains socialist language, in which all land is vested in the President, however, land can now be titled (Askew 2006).



Figure 12 A village leader reviews a map of the Mbarang'andu Wildlife Management Area. (Photo by the author).

As signalled with the opening vignette regarding the Seremani property, the rest of this chapter focuses on conflicts over land involving the government, rather than 'customary' tenure. This includes private investments in the area in some cases tied to the uranium mining project and infrastructural development in advance of commercial extraction, which could be seen as speculative. Fear of outside investors buying up land in the area hints to the value of the area immediately outside the mining site. The planned construction of a road routed through the villages and on to the mining site also became a flash point for disagreements and distrust among villagers. Villagers living in homes condemned for being in the planned roadway waited years for promised compensation. Ultimately, while these incidents highlight anxieties about land, they also present a window through which to examine the politics of speculation (about land and otherwise) in rural villages in postsocialist Tanzania. This chapter highlights how people lobby, exchange loyalties, engage in corrupt behaviours, and take direct action to advance their causes in connection with land rights. Few appear to be resigned to accept unwanted changes. Knowledge both about the land deals and their politics

is a key issue. Even though land is tangible, these conflicts highlight how there may remain an element of the unknown or unknowability of land as a resource.

Land in Likuyu Ward

Land tenure practices in Likuyu Sekamaganga village and in Ndendeule land more broadly have been documented over time. Historical, macro-level changes in land governance and their implementation in the area in some ways still loom large in the context of present-day village land issues. This section reviews some of the historical record on land in this particular area, clarifying gaps and raising evidence of change or earlier inaccuracy based on findings from the present study. To this historical record, I provide updated information about current land rights and uses in the area.

The works of P.H. Gulliver provide an in-depth historical ethnographic record of the Ndendeule people and their land practices. As East Africanist readers may remember, he argues Ndendeule sociality exists as that of a network, without a central political system. Unlike neighbouring groups, Gulliver reports the Ndendeule of the 1950s not as matrilineal, but as having 'a very minor bias to patrilaterality. They had not corporate groups' (1971, p.5). Gulliver (ibid.) describes the land use system before the 1950s: annually, farmers would clear wooded areas on which to cultivate maize. This system of shifting cultivation resulted in continuous movement of households to maintain access to fertile land. A hamlet would be established by a small number of 'pioneers' and their families and fields would be cleared nearby; eventually, fields shifted farther away as the closer fields lost fertility. Communities consisted of households scattered over approximately four miles. Gulliver assesses that, due to the plentiful woodland and lack of corporate groups restraining movement, 'there were no valued land rights' (1971, p.49; 1954). By the twentieth century, Gulliver records the life span of these cyclical settlements as between fifteen to twenty-five years, with fields rarely

cultivated with maize for more than three consecutive seasons. Gulliver also finds that newcomers are accepted, since communities do not 'mobilize nor delegate authority to deal with these matters' (1971, p.68). Gulliver reports the Ndendeule adopted tobacco as a cash crop in the late 1930s, but that regardless of this agricultural, and therefore economic, success the area, 'was one of the areas of that District least touched by the colonial Administration, missions, and trade. Politically it had turned inwards upon itself in the struggle to be free of Ngoni suzerainty and to consolidate its identity and autonomy' (ibid., p.38).

Edwards (2003) picks up on this historical analysis of the Ndendeule and found that customary land rights eroded in the area since villagization. Postsocialist land reform efforts served to consolidate power with the village government. Edwards highlights how, in the Ndendeule area, this operated differently than in nearby Ngoni land; among the Ndendeule, there was historically weaker customary and government control over land. Edwards links Ndendeule scattered settlement with desire for political autonomy, an effort to resist the Ngoni, the indirect rulers co-opted by the Germans and British. Edwards argues this resistance by dispersed settlement was weakened by the resettlement programmes of the Germans, British, and independent Tanzanian government. He connects settlement, agriculture, and environment by exploring how, in the Ndendeule areas where more tobacco was cultivated, people emphasized concern for their environment.[87] Edwards contends that the history of the repeated resettlements of the Ndendeule resulted in instability of local economic and social institutions. His implicit argument is that, when villagization collectivized tobacco growers, this created untenable situations hemming in Ndendeule farmers who needed to move to continually access fertile land and plentiful forests. While

[87] Tobacco curing, along with making charcoal, requires smoking the raw materials. The enormous amount of timber needed to fuel these processes can lead to deforestation, threatening not only access to fuel (firewood), but also with the possibility of impacting water sources, in addition to loss of wild foods, wildlife, and sacred spaces.

‘[c]ontrol and stability in Njelu [Ngoni land] have become institutionalized by the social and physical structures of the state and Catholic Church… Islam and the social organisation of tobacco help to ensure that the Ngoni frontier [Ndendeule land] remains fluid, and from a metropolitan perspective “out of control”’ (ibid., p.195).

More recent events impacted the land tenure situation in Likuyu Ward and have been described in detail elsewhere. The arrival in southern Tanzania of vast numbers of Mozambican refugees fleeing their country’s civil war from the 1970s demanded a humanitarian intervention. The annexation by the Tanzanian government of land from the village of Likuyu Sekamaganga, discussed in chapter two, for use as temporary refugee camps administered by NGOs, impacted land tenure in ways that remain relevant. The annexed area was never returned to the village, and continues to be used by the national government, now for wildlife conservation purposes, as home to the Community Based Conservation Training Centre, and the headquarters of the Likuyu Sector of the Selous Game Reserve. Another example can be found in the creation of Likuyu Mandela village in the 2000s, which was directly excised out of land from Likuyu Sekamaganga. This would probably not have been physically possible had Likuyu Sekamaganga been a village with a small amount of land. Still, the creation of an independent village landlocked within another village reduced the amount of land available to Likuyu Sekamaganga residents.

Likuyu Sekamaganga underwent village-level planning schemes conducted as a requirement of joining the Mbarang’andu Wildlife Management Area in the late 1990s to early 2000s. Presently, walking through the village, the white signs designating spaces and their uses are noteworthy reminders of the physical implications of these planning programmes. Villagers contest the continued presence of the training centre. The existence of Likuyu Mandela is generally not contested, though Mandela villagers complain about limited access to land that is free from wildlife depredation. Yet, individual conflicts over land,

considered throughout this chapter, indicate land issues continue to cause anxiety among locals.



Figure 13 Map of the village of Likuyu Sekamaganga. (Used with the permission). The map labels borders with protected areas, designated agriculture and husbandry areas, as well as the village conservation areas.

In the study area, people are identified either as *mwenyeji* (indigenous, local person) or *mgeni* (guest, immigrant) and pay for land on a sliding scale wherein local people pay a lower price than outsiders.[88] This bureaucratic system, informed by concepts of autochthony,

[88] In 2015, one acre cost Tsh 40,000 for outsiders or Tsh 5,000 for locals.

is seen across Tanzania, and generally favours *mwenyeji* or outsiders who are farmers, rather than herders (Odgaard 2002).[89] The local government land distribution system tends to exclude women. Women are thought to be in stronger positions for land rights in local or family settings, following 'customary' tenure rules (ibid.), although it is clear from the Seremani example that women, even absent women, are able to purchase and maintain control over land in this part of Tanzania.

A typical husband and wife in the area who farm tend to cultivate around five to seven acres. A single adult farmer generally cultivates fewer than four acres. Farms in Likuyu Ward rarely reach greater than ten or twenty acres, since farms of this size require machinery (tractors) and greater amounts of fertilizer. Farmers generally cultivate by hand—there are virtually no draught animals—a variety of crops (for sale and personal consumption), with fields in multiple places.[90] The elderly and infirmed may only cultivate the food they need to eat. Families will sometimes have a *bustani* (garden) where they grow food for their own household's consumption, including leafy greens and pumpkins. Those with more resources in the villages may hire local people to work in their fields or may hire people from other parts of Tanzania.

Local women explained their farming system as being split into *miraba* (rows) of one-quarter acre in size. Each farmer is responsible for their own *mraba* (i.e. a family may split an acre into four *miraba* with parents and adult children farming a row each). When crops are sold, the profits of the *mraba* belong only to their owner. In this area, most people will start their own farm at eighteen years old with their own *mraba*. Most young people go into a

[89] Odgaard (2002) suggests that in some areas of Tanzania there is a strategic decision to restrict legal access to land for Maasai people (who are pastoralists).
[90] In the case of lowland rice cultivation, farmers will have sections of a larger area of paddies in addition to upland fields elsewhere. In areas closest to the Selous Game Reserve, multiple, dispersed fields decrease the risk of crop destruction by wildlife. Multiple fields can also be part of the rotational system of leaving certain fields fallow once they decrease in productivity.

marriage with one *mraba* and expand their land one *mraba* at a time approximately every two years until they reach about five acres. Children usually receive their *mraba* for free from their parents. If the parents do not have land to give, it can be purchased from the village. Some young people may ask to farm their parents land for a certain amount of time.

Women say they are able to inherit land from their parents. In the case of the death of a parent, the land is split evenly among the children. Land does not pass directly to grandchildren. In the case of spousal death, wives can keep their land if they are able to continue farming. If the wife is not able to farm, the land is split among her children and the widow can stay with her children, helping with the farm if she is able. If the husband dies young, the land stays with the wife. The *miraba* brought to the family by the wife always stay with her, even in the case of the death of the husband.[91] Women said they did not need to be married to inherit or receive land.

Borders with nearly every village are contested in this area, and across Tanzania. Mapping in the study area, a major part of the British resettlement process, as well as a goal of many of the conservation initiatives, has proven to create confusion over borders (Bluwstein and Lund 2018). Likuyu Sekamaganga village, mapped by several organizations, is estimated to have a population of more than 7,000 and 228,732.77 total acres, with 123,464.41 acres under the protection of the Mbarang'andu WMA. Likuyu Mandela, as mentioned previously, has not officially been mapped or registered, but the May 2015 village census reported 602 households with a total population of 3,175. Mtonya village is not part of the WMA and from 2015-2016 did not have any maps of their village to indicate its size. The village has a total population of 4,544 according to their 2015 census. Maps and borders are of great importance in this area. I use maps and mapping in this chapter to tie together

[91] In neighbouring villages, this right was a point of contention. Elsewhere in Namtumbo District, a community group of disenfranchised widows was attempting to regain land from which they had been evicted, circumstances described elsewhere in Tanzania (Sikira and Kashaigili 2016).

disparate land-based issues taking place contemporarily. Maps, as artefacts and mapping as a methodology, facilitate certain ways of knowing and controlling land (Scott 1998), and, therefore, the examination of the value of land and the value systems making land increasingly desirable in the villages. 'Official' maps can also create or foster opacity (ibid.) whereas 'counter-mapping' (Peluso 1995), counter-hegemonic, community, or alternative forms of mapping (Sletto 2002) can reveal types of knowledge not included in official cartography, including conceptualizations of space, tenure systems, and resources. As the vignette at the beginning of the chapter illustrated, the GPS mapping exercises that I undertook revealed some of the political tensions about land in the area.

Land and Politics

The Mkuju River Project uranium mine lies wholly within the Selous Game Reserve. Since no permanent settlements are allowed inside the Reserve, the mine concession itself will not displace any Tanzanians from their homes or land. However, this is not to say that the mine has no impact on land in the area. Land has become a central concern in Likuyu Sekamaganga village in particular, despite a complete absence of extraction from within the village boundaries. As the last village on the road that leads into the Selous Game Reserve and then on to the mine, this village experiences the most direct and many of the tangential impacts of the project. In this area of farmers, land is a real and valuable dimension of local livelihoods, and also reflects the specific political history of the Ndendeule people. This section reviews how land conflicts can both illustrate political frictions and cause political struggles in the lead-up to commercial uranium mining.

In the October 2014 primary elections for village chairman, land issues arose in the open debates with the candidates. Villagers sat on the ground, listening to each candidate's platform in a gathering outside the village CCM building. After the completion of the initial

speeches, villagers were invited to ask each candidate three questions about how the candidates would respond to village issues. Among the questions asked, villagers queried about plans to increase access to water, improve primary and secondary education, add to the economy, and develop a good relationship with the mine so that villagers can obtain construction and driving jobs. Regarding land, villagers concentrated specifically on whether the candidates would be willing to try to recover land sold to outsiders, whether they would continue to sell land from the village periphery to people from Namtumbo town, and how they would protect existing land rights.[92] The candidate who won the election emphasized recovering the land sold to outsiders as a part of his platform. The vignette about Zeituni Seremani's land, which opened this chapter, speaks to the complex layers of interest in land in the village, including the fears about outsiders taking land. The Seremani property was one of several large plots of land purchased under the previous village chairman's administration which became the subject of extensive scrutiny by villagers and their representatives in the village government. Of greater concern was another property, one owned by a man from northern Tanzania who worked intermittently for Mantra.

Giles Bakari became well-known in the village for his periodic visits over the course of several years as the community relations officer for the mining company, but was made redundant when the project failed to progress around 2014.[93] In 2010, he purchased 150 acres of land that was formerly part of the Likuyu Sekamaganga village forest. Bakari bought the maximum amount of land possible for a non-village resident without court approval, fifty acres, and he did so in his name, as well as in the name of his wife and child. Many people in the village and in the nearby town saw this major land purchase as a sign that investors were coming to the village nearest the mine to purchase land to start farms and other businesses to

[92] The concern about people from nearby Namtumbo moving to their villages reflected a belief that these (rather local) people were forced to leave their home villages because there was not enough land there for agriculture.
[93] This is a pseudonym.

support the mine and mineworkers. A Ndendeule lawyer from a Namtumbo town community organization thought the issue was so critical that he came to Likuyu Sekamaganga to educate villagers about land rights and specifically to recommend they rent, not sell, land to outside investors who may come to the area.

By early 2015, Bakari's employees were working to clear land in preparation for planting. Two weeks after the mapping of Zeituni Seremani's land, in August 2015, Hamisi, the land committee chair, indicated that he needed to make an official visit to Bakari's property. He said there was someone who was clearing neighbouring land without permission, and that he would pay a visit to investigate. Since he would be in the area, he said he requested and received permission from the Bakari farm foreman for me to map the perimeter of the farm, as I had for the Seremani property. Because the Bakari farm was already under scrutiny by the villagers, I accepted the offer to join.

After making a stop and not finding the farmer accused of illegally clearing land, we continued on to Bakari's farm. No one was at the foreman's house when we arrived. Hamisi confirmed we were given permission to do the mapping and said that the foreman would be back soon. While I waited, Hamisi walked away, into denser wood farther from the house. He came back in a few minutes with another man, the foreman of the farm. I introduced myself to the foreman. He went into the house and retrieved a guest registry, not uncommon in Tanzanian government offices, but unheard of for visiting an individual's farm. Starting to feel unsure of the situation, I explained that I wanted to map the farm. The foreman refused the request. He asked me to provide a letter from the village, asserting that I had permission from the village government to map the area. I explained that I had mapped hundreds of points in and around the village up to that day and had a research permit with national, regional, district, and village level support. I noted that I was visiting with the chair of the village land committee, Hamisi. I also explained that I had permission from the village

chairman, and that, although he had never written any such letter in any other case, that I would call the chairman and they could discuss this directly. The foreman was unmoved.

After a consultation with several trusted interlocutors, I decided to bring this incident to the attention of the village chairman. In the meeting, the motorcycle driver who drove me to Bakari's farm explained to the chairman that he heard Hamisi meet the foreman in the woods back at the house. He recalled how he heard Hamisi recommend that the foreman deny me permission to map. Thinking back to our walk around Seremani's property, I realized that it was possible Hamisi thought the Bakari farm might also be 'mistakenly' over-sized. If that is what happened, doing this favour for the wealthy outside investor could be useful for Hamisi in the future. The chairman suggested I speak directly with Bakari about mapping his land, since he was coming to the village that afternoon for a meeting.

Bakari arrived by private car shortly after. He rushed by me into the meeting with village representatives, leaving me without time to introduce myself. We had never previously met, though I was the unmistakably unfamiliar (and white) face at the meeting. The meeting would discuss an environmental monitoring plan, required of the mining company by Tanzanian law. After everyone introduced themselves, but before the meeting was underway, Bakari insinuated to the village representatives that I had ulterior motives for being in the meeting. His implication erased the precedent of the half dozen meetings between the mining company and the village that I attended up to this point. His allusion prompted the ward executive officer to throw me out of the meeting. *Nenda!* (Go!) she shouted at me, while the village chairman sat silently.

Entering this village, positioned at the periphery of a major mineral deposit, where mineral exploration companies surveyed and mapped nearly every year, my efforts to attempt to map the natural resources other than minerals, perhaps unsurprisingly, struck a chord. By identifying and mapping pieces of land that were considered to have conflicts over their

rightful owner, the original objective was to try to 'see' the land in question and therefore better understand land as a natural resource (Hetherington 2012) in this village where uranium and wildlife seemed to be of greatest importance. Mapping Seremani's land may have produced a numerical quantification of acreage corresponding with the village politics, but the threat of mapping Bakari's property was sufficient to elicit a reaction that revealed some of the previously obscure politics (Bear 2015b) and practices protecting Bakari's interests in the village. The methodology of mapping the properties that were considered questionable in the village may have been seen to smear the Bakari property with the allegations facing the over-sized Seremani property; perhaps in this way, (the denial of) mapping acted to hide the exact size of the Bakari plot, further illustrating the ambivalence that is characteristic of mapping efforts (Li 2014b; Scott 1998). Rather than mapping the Bakari property, in a sense, I mapped another facet of the value of land in the village. Regardless of the size of the Bakari plot, it is the sensitivity of landholders, and the political manoeuvring they undertake to protect their investments, that began to come into focus. The land conflicts highlighted in this chapter influenced the voting decisions of villagers and therefore the election of village leaders, but also seemed to entangle appointed officials as well. The unevenness of the opportunities to benefit from the incoming investors, and the villagers' desired recourse—to take the land back—suggests some of the tensions and changes that caused this postsocialist moment. While widely known, there were aspects (other than the size) of the Bakari plot that remained unknown. The next section continues to examine ways in which land becomes known and unknown in the village nearest the mine.

(Un)Knowing Land

The borders defined by the few hard-copy maps available in the area and imagined in my methodology of GPS mapping speak to a conceptualization of land and property as

something firmly demarcated, and entirely knowable. This section considers the ways in which land became an unknown quantity in Likuyu Sekamaganga village. Village land records, the traces of a 'transparent' bureaucracy, became variously contested, missing, and investigated. This section interrogates the ways in which conflict over land created and also was caused by ambiguity and uncertainty not only in measurement, as in the Seremani property, but also in terms of bureaucracy and record keeping.

After taking office in January 2015, the newly elected village chairman began inquiring into the land deals that were the source of so much resentment in the village. The village government land committee and other related committees were informed of their roles in their new positions, and how they would be part of these inquests. In April 2015, the chairman met with the village planning committee to review land purchases made during the tenure of the previous village chairman, including those of Seremani and Bakari. The chairman found that the documentation of the Bakari land deal was missing from the village records. He seemed to have the only file on the purchase; it was given to him, personally, shortly after he won the election. The committee as a group reviewed the documents relating to the land Bakari purchased from the village in 2010. In May 2015, the village chairman continued to probe the Bakari land purchase in particular. The chairman met with another member of the local government and individually reviewed the signatures on the various documents associated with the purchase. They both agreed a signature appearing on one document looked different on another document. The inference they were making was that the signature was falsified, or the names of signatories were not really villagers, and that perhaps the entire document was fraudulent.

Another 2015 meeting brought together the current village governing officials with their predecessors from the administration that approved the Bakari land purchase. This summit was described as an effort to review the land bought from the village government

during the previous administration so that the new administration could confirm 1) the village financial records, and therefore create the new budget; and 2) current land boundaries, so they could accommodate new land requests. The chairman told the group that while these two aspects of the government transition remained unclear to his administration, this inhibited their ability to execute their duties. The chairman highlighted the attendance of non-elected officials in the meeting, to serve as additional witnesses: the village executive officer and the village agricultural extension officer. He noted the absence of his predecessor, the outgoing chairman. The headmaster of a primary school in a peripheral sub-village, another unelected witness, compared the situation of the new administration and their need for these transition details to the information needed to accurately and safely steer a car. The village CCM chair then spoke, and referred to the situation as one where those present had the opportunity to act in order to uphold the Tanzanian Constitution. The village executive officer expounded on the importance of openness in this meeting, and the danger of secrets. After these speeches, the chairman re-took the floor, and he acknowledged that if the old government officials wanted to leave because the chairman from their administration was not present, that they were welcome to do so. At that time, nearly the entire previous administration took the opportunity to leave the meeting room. The meeting ended without the usual closing formalities.

The previous administration would not, or perhaps could not, divulge information to clarify the ongoing land governance issues. Without the cooperation of the previous chairman, the current administration made no progress. Leaders who gathered after the meeting to informally debrief said that they would go about their responsibilities to the best of their abilities. They would make a new budget and continue to sell land belonging to the village, despite the limitations of what they thought was their incomplete knowledge of

village landholdings. The officers said they would try to reschedule the meeting, but it never took place.

The investigation into the Bakari land deal appeared complete by July 2015. At that point, the chairman assured me that the land deal for Bakari's farm followed the law. They had not found any evidence that the land purchase documents were illegal in any way. In late August of that year, I was denied permission to map the area. As a result, the size of the property allocated to Bakari remains unconfirmed. While the legality of Bakari's property garnered a great deal of attention, it was not the only Mantra-related property in the village. Another Mantra employee requested twenty acres of village land to build a hostel, presumably geared towards future mineworkers. Other current or former employees built individual houses on village land to live in when they were off-duty from the mine. A further Mantra-related purchase proved to be the most elusive of land deals to study. There were no records of the transaction under the previous village chairman's administration. The exact size or location of the plot were unknown, as was the assertion that this plot belonged to the company at all.

To try to learn more about the mystery Mantra property, I arranged to visit a privately-owned plot of land said to share a border with the property in question. The landowner, Mustapha, was away from the village, and left a neighbour, Tatu, responsible for his property in the meantime.[94] Mustapha bought the property in 2013, and had not yet started to clear the land or build on it by 2015. The two-acre plot, located near one of the village cemeteries, was like most in the area in that it was completely unmarked. Tatu searched the area and spotted a tree that he assured me was at the edge of the plot. I marked the corner with a GPS point and a photo. Tatu walked us along the imaginary perimeter to a second,

[94] Both names are pseudonyms.

third, and fourth corner all with similarly anonymous trees. Tatu said the Mantra property bordered on one side of his friend Mustapha's property. No one had any further information on the exact location or size of the plot of land. The property was unmarked. No one in or out of government knew who owned the plot; still, all were sure it belonged to Mantra.

From these properties, we can see the ways in which investments by outsiders in land that could be used to cultivate crops to provision the proposed mine represent an effort to integrate into the supply chain for a commercial project that does not yet exist. Plans to build worker hostels suggest an investment predicated upon an impending influx of outsiders into the area. The Seremani trade school also suggests an investment geared toward preparing workers to enter into mining-related work. The Bakari land scheme converted an area demarcated as the village forest into privately owned and managed agricultural space.

The concerns about outsiders buying up land in the village, voiced at the village primary election, link with other anxieties. The conflicts over land represent overlapping claims to space, resources, and possibility. Ordinary villagers and leaders alike articulate their rights to land and equal treatment under the constitution, while landowners manoeuvre through or around the bureaucratic systems in place. Confusion and tension created by missing records and unmarked properties remains even when the paperwork is fully in order. Being right under the law seems important, but not always the same as being fair in the eyes of the villagers. It is clear that '[i]nscription devices, ways of seeing, counting, classifying and rendering some things visible while occluding others exceed the motives, interests and intensions of the actors that produce them' (Li 2014b, p.594). While bureaucratic records seemed unable to clarify aspects of land deals, in contrast, the Bakari and Seremani properties highlight how mapping can produce new information about parcels of land. Above-ground, visible economic endeavours stand in contrast to the subterranean, distant, and currently

invisible project of extraction at Mkuju River, but both appear to have elements of unknowability.

Land and Infrastructure

Most directly, the mine will impact proximate villages by the infrastructure developed to transport supplies, uranium, and an estimated 1,600 workers at peak periods (of construction and deconstruction) and approximately 800 workers during regular operation over the planned twelve to fifteen-year life of the project. The current road to the mine starts in Namtumbo, leaves the scattered settlements at the edge of town, then goes through Mtonya village, then to Likuyu Sekamaganga village, before crossing the Likuyu River to go on to the Selous Sector Headquarters, past the Selous Secondary School, and then into the Selous. The thirty-five-kilometre dirt road from Namtumbo to Likuyu Sekamaganga, dusty in the dry season and riven by deep mud ruts during the rainy season, will be tarmacked by TanRoads, a government agency which oversees a competitive bidding process for the contracting of road construction projects. TanRoads will compensate those individuals who lose property condemned to be part of the road zone. For the portion of the road running from the Selous Game Reserve gate until the mine, Mantra will be responsible for the project, according to both TanRoads and the mining company. A senior representative from Mantra confirmed that equipment for the construction of the mining site will be brought in by truck, so the roads will need to be completed before any extraction or processing facility construction can begin.

These delineations of responsibility grow less clear in the village. In August 2014, TanRoads came to the area to condemn houses that are in the path of the new road. Houses lining the existing road from Namtumbo to Likuyu Sekamaganga were then marked; red X's painted from floor to ceiling, across the front walls of each condemned house. The tenants and owners of these buildings recalled that TanRoads told them they would be compensated

approximately six months after the visit. By August 2016, they still awaited this compensation. Few relocated from their condemned homes, most instead decided to live in those houses until they have the compensation funds and are able to relocate. Those living in the condemned houses are generally not willing to add to or refurbish the houses, knowing they will not be compensated further than what was assessed during the August 2014 survey. As a result, many complain of the hardship of living in houses made of disintegrating clay bricks, some of thatch roofing that are falling down around them. Some people attributed the delay to a failure by Mantra to pay the villagers. Others thought the funds were coming from Mantra to the Tanzanian government which would disperse the compensation to them. There was no consensus over whether the slow-down was caused by the mining company or their own government.



Figure 14 A condemned house along the road to the Mkuju River Project. (Photo by the author).

In May 2015, out of frustration from continued lack of payment, over thirty villagers met to consider how they could pressure the government in order to receive compensation for

their condemned houses. The group leader, Mohammed, explained how he lobbied on behalf of the group to get their rightful compensation.[95] He said that he recently travelled to the regional capital in Songea to discuss the matter with the regional office of TanRoads. From there, he said he went with a group to visit the Tanzanian national parliament in Dodoma, to meet with their elected representatives as well as the legislative committees that oversee national infrastructural projects. Upon his return to the village, the leader felt their only recourse was direct action.

Mohammed was orchestrating a road block from Namtumbo town to the mine, in which villagers would block mining company vehicles from passing, while allowing safety vehicles, Selous Game Reserve vehicles, and Community Based Conservation Training Centre vehicles to pass. As a group, they planned to send a final letter to the authorities and then, if they did not receive compensation payments, they planned to begin the road block on June 2, 2015. Mohammed referenced the recent, violently suppressed protests in Mtwara, where local people demanded inclusion in natural gas extraction plans, as evidence of Tanzanian direct action forcing the government to meet citizens' demands.[96] He felt that since Ruvuma Region has few police officers, citizens would not be afraid to protest, and they would be strong as a unified group. He was convinced they would not receive their compensation payments until they protested.

The mobilization of villagers took place on two other occasions in recent memory in this village. In 2011, a village executive officer (an appointed official) was locked in an office by a crowd and only released when Namtumbo police arrived on the scene. The executive, from the neighbouring village of Mgombasi, was accused of stealing ten five-

[95] This is a pseudonym.
[96] At the time, no extraction was taking place in Mtwara so the inclusion of local people was not confirmed, but the riots have been examined as a case study wherein planned natural resource extraction triggered conflict when grievances and feelings of injustice were mobilized and framed by leaders in the context of a sub-national identity group (Must 2018).

kilogram bags of fertilizer. When his case in the district court did not take place (villagers recalled that the police were paid off), the executive returned to the village only to be locked in the office a second time, after which he left the village. Then, in 2013, the chairman of the village illegally accepted Tsh 350,000 from a cell phone company in exchange for permission to construct a cell phone tower on private land in the village. The Chairman was locked in an office by a crowd. As part of the protest, the District Commissioner, police officers, and other officials were invited to the village. The District Commissioner decided the chairman should not be allowed to run for re-election, and a case against the chairman was brought in the Namtumbo court. The case remains unresolved, and the village government claims the cell phone company owes back fees for operating the tower in the village. Elders in the village suggested that there were few, if any, protests before 2011, and attributed the increase in protests to more people receiving education or knowing their rights.[97]

In the end, the community did not take direct action that June over the missing compensatory payments. Still, the design of the plan speaks to the interconnectedness of land rights and the incoming mine. The road block was targeting Mantra vehicles, and therefore targeting the mining project. The villagers were aware that the money, the capital behind this effort, lies with the multinational company backing the mine. Still, confusion surrounds the role of the mining company in this context. Will Mantra directly pay villagers to compensate for lost property? Or will they pay TanRoads on a national level, which will then disburse the funds to the TanRoads Ruvuma regional office, which will then make the compensation payments on the ground? Alternatively, Mantra may be paying into a larger fund held in the national government coffers, in the form of taxes that are still in the process of being agreed upon. In the final case, this would mean the funds that go to compensation for these

[97] This interpretation contrasts with Gulliver's (1954) assertion that the Ndendeule were 'nationalists' who were in a near constant struggle for political autonomy from Ngoni rule under German and British indirect rule.

communities would come without any trace from Mantra itself. Yet, the targeting of the mining company illustrates the links that villagers are drawing to the mining company, even though Mantra is not responsible for the portion of the road that runs through the villages. Folks in these villages, living in condemned houses, felt that they would not be rushed out of their house or totally denied compensation. Their concern was more about the timeliness of the disbursement, or of the Tanzanian agency's ability to live up to the promises they made in the villages.

Within the Tanzanian government's decentralized make up, the TanRoads regional office in Songea, which is most immediately responsible for the project, is separate from the national headquarters, where the money for compensation will be deposited and then transferred to the regional office. This bureaucratic structure fosters opacity; the villagers then cannot know where the money is held—at the national level, or the local level. Further, until August 2016, TanRoads Ruvuma regional office did not have confirmation on the final design of the road. Although the officials assessing homes and marking those as condemned acted as if they knew exactly which houses would be demolished, they had no way of knowing if that would be the case since the road design, including its path to the mine, was (supposedly) not finalized.

The decentralization of the Tanzanian government seems, in a way, to limit their exposure to blame from the villages. Villagers appear to find a way to subsume nearly everything related to the Mkuju River Project within 'Mantra'. In name, Mantra is a common refrain in the area. All who work for the mine work for 'Mantra', 'Mantra' would be paying them compensation, and all vehicles that belong to 'Mantra' were to be stopped by the road block. In totalizing the mine, all who are connected with the project appear to be part of a wealthy world of mineral extraction. Subcontractors, consultants, and subsidiaries may be known to elites in the village, but the overarching entity of 'Mantra' seems to become a

monolith, and, as a result, an easier target for direct action. Mantra may not be a Kiswahili word, but even without knowledge of its meaning, the word locally remains evocative, perhaps even as a holy name, not in the Hindu sense, but rather in the capitalist one. As with all mantras, it acts as a charm, in this case resonating of the possibilities of the (radiant) future.

Conclusion

In October 2015, the village chairman who led the investigations into questionable land deals *alisimamishwa* (was stopped/removed from his position) and another villager assumed the role of acting village chairman. The story emerged that the village chairman was sacked for allegedly selling land illegally. The new village leadership accused him of making a deal to sell a 400-acre parcel of land to a Namtumbo District government official, who apparently intended to use the land for agricultural purposes, having already planted cashew tree seeds by May 2016.[98] When the deal was uncovered, the village convened a general assembly to discuss how to proceed. They agreed to press charges against the village chairman for illegally selling village land. They decided not to pursue a case against the district officer, who eventually sent a letter to the village, in the usual fashion, to request (*kuomba*) a plot of land. The village agreed that the officer could pay an annual rent of Tsh 4 million to the village for the right to farm that plot of land.

The village neither recouped the money paid by the officer to the former chairman, nor did they ever find out exactly how much money was exchanged. The village agreed to hold a special election to replace the chairman, who had four years remaining in his term. The acting chairman filled in to manage day-to-day operation of the village affairs throughout

[98] As mentioned previously, cashew trees, since they require five years in this area before they bear fruit, are an investment typically seen on land that is owned, not rented.

2015-2016. The events surrounding the chairman's fall from power meant land remained an issue at the forefront of concerns in the village. The chairman's perceived corrupt actions also revived questions over the legality of the major land deals that took place in the village in recent years. In particular remained the question as to whether the Bakari property was larger than the amount for which the owner paid. The new village leadership maintained that if mismeasurement or misallocation of land was found to be the case, that the village can take away the extra land; if the owner wants to contest the village decision, they have to appeal to the Namtumbo District government to do so.

Considering as a group the land deals of Seremani, Bakari, and the district official, we could see this influx of outside investors as speculative in a number of ways, perhaps most immediately in terms of land that they may re-sell at profit (Li 2014b). Alternatively, we might see these investors as acting in response to the construction by the mining company of an 'economy of appearances' (Tsing 2000) or 'speculative planning' (Bear 2015b) which was designed to promote the mining project's status (in terms of financial, political, and public support), resulting in this ancillary investor interest in village land. Or perhaps these outside investors could be seen as having access to a type of speculative knowledge (magic or divinatory) that allows them to see the future of the billion-dollar mining project (Bear 2015a), suggesting their investment in mine-related ventures will be profitable.

The speculation(s) of the outside investors can be seen in contrast with that of villagers, but both rely on a potent mix of what is (un)known. The resulting opacity is key to speculation because it keeps possibilities alive (Bear, Birla, and Puri 2015; Weszkalnys 2015). On the other side of the world, Tania Li (2014a) found in Indonesia that highlanders too were worried, not about their neighbours enclosing parcels of land amidst the rise of cacao, but that the supply of land itself was running out for these people dependent on small-scale agriculture. Li (ibid.) places this ethnographic evidence within a wider context, that of

agrarian transitions which could turn into diverse rural economies marked by a decrease in poverty or that could result in increased inequality and poverty when people lose their land in the face of jobless growth. The narrowing of possibilities in the Indonesian context of the loss of land on the local level (through conservation and land enclosure) along with forces creating jobless growth on a national or international level, is instructive. Returning focus to southwestern Tanzania, aside from small-scale agriculture, the major industry is wildlife conservation which, as the first half of this thesis highlighted, has engendered limited economic benefits, created few jobs for locals, and extracted land that might otherwise have been used for small-scale agriculture. Villagers find themselves hemmed in against the militarized but porous border of the Selous, the increasingly demarcated land resulting from the creation of the WMA, and also faced with mounting pressures from local people seeking small parcels of land. Into this context villagers see outside investors acquiring sometimes hundreds of times the amount of land an ordinary villager might have. In chapters seven and eight, I review the ways the job prospects at the mine, if/when it ever begins operation, will likely be limited (in terms of number of jobs and length of employment) for local people and how many in Likuyu Ward already feel excluded from mining work. In this context, villagers appear to be looking to the future concerned about land as linked to security for their agrarian livelihoods in the face of the uncertain prospect of uranium mining and its associated (likely limited) job opportunities. Perhaps we can see, through land conflicts in this village, an 'economy of anticipation' (Cross 2015), full of diverse, entangled orientations to the future. While uranium remains hidden, inaccessible, and largely out of conversation, land appears, in some ways, as a proxy. Through conflicts over land, rather than uranium, we can start to see how insiders and outsiders, government officials and lay people, wealthy and poor are scrambling to secure their livelihoods and futures in this moment before mining begins.

The conflicts over land described in this chapter can be contextualized within larger debates of autochthony. The idea of people from 'outside' coming to take land that belongs to the village, appears, at first glance, to provide striking relevance to these cases. At the 2014 primary debate for a new chairman, villagers questioned candidates on how they would manage the issue of land, as a whole, but with several sub-categories: selling land from the peripheral sub-villages to people from their own district, and possibly their own ethnicity; and selling much larger pieces of land for commercial agricultural investment. The us/them dichotomy is not the same in both cases.

Villagers were concerned, not just about people coming from far away, or people who were not Ndendeule, like they are. They were aware that some of these land seekers might be coming from neighbouring villages. People who are from the general area, across Namtumbo District, all might be descendants of those who were displaced over the course of several generations first by the Ngoni invasion, then German colonialism and the Maji Maji War, again by Closer Settlement, and most recently by *Ujamaa* villagization. So, the critiques of autochthony also seem to apply in this case: that there is no clear distinction between someone who is one of 'us', with connection to the land and associated rights, and the stranger who is one of 'them', without such rights. A more flexible interpretation of ethnicity and belonging, of newcomers versus newer-comers, recognizing those holding multiple identities, and aware of the political and historical roots of claims to identity might be more relevant (Monga 2000; Marshall-Fratani 2006). In this particular marginalized area of the increasingly capitalist Tanzania, it remains to be seen whether these critiques can fully reflect the identity politics at play when people with distant ties to the villages come back to purchase land with an eye to the future economic possibilities which the mine might bring. These landowners, through kinship and employment relations with the village, blur the lines

between who is *mgeni* and who is *mwenyeji*, with strong enough ties to make and defend land claims.

Viewing land as a valuable resource in this Tanzanian village based on conflicts over property highlights some politically charged, perhaps corrupt, decisions at various levels. This may falsely insinuate that this village falls in line with simplistic depictions of African leadership as driven by greed, African governance as inherently degenerate, and marred by institutions so weak they damage the people they are designed to protect or empower. These representations of African political systems have been critiqued for espousing essentializing, perhaps even racist views, as well as paternalistic attitudes toward Africans. In the wake of these criticisms, a new crop of terms and theories attempts to take into account the reality of imperfect state administration without an over-determination of African governance as inherently flimsy or failing and therefore bad; for example, 'good enough governance' (Evans 2012). The evolution of the study of African politics suggests that we should consider governance to be multifaceted, rather than monolithic. In that spirit, rather than attempt to assess the (im)morality of those elected and appointed to govern in the village, it seems more valuable to attend to the flexible ways in which this village has disciplined its leaders for land mismanagement in a time of economic uncertainty as conservation and mineral extraction continue to wield overwhelming economic and political influence.

In tying together questions of land, tenure, and autochthony, it seems relevant to revisit the construction of legitimate power in postsocialist Tanzania. Lawyers and educators who came into the village, both as district officials or as non-governmental activists, provided civic education for the village leadership and villagers. Education about land rights, among other topics, emphasized the various types of land categorized by Tanzanian legislation. Land belonging to the village as a whole was contrasted with privately owned land, as well as land that belongs to the government. These lectures clarified that sub-surface resources belonged

to the government, regardless of surface-level land rights. The explanation of this multi-layered land management system transmitted knowledge from outside actors to leaders and ordinary villagers. Perhaps this can be seen as evidence of the lingering commitment to adult education and equalizing forces prominent in the socialist-leaning days of *Ujamaa*. Or, it could be seen as an effort to educate (discipline?) the rural populace about the new (capitalist) regime of land management, which emphasizes private ownership of large plots of land, and empowers a decentralized governing structure in which village governments control land allocation. Regardless of the background forces which may have brought about these civic education initiatives, the resultant spreading of information legitimizes not only the local government's authority, but also the ability of landowners (from near and far) to make major land deals by adhering to increasingly complex systems of bureaucracy and legislation. The use of rights-based language by villagers to frame their grievances, along with the readiness to organize and take direct action against government officials appears to signify that land is a key indicator of ideological and material frictions in this postsocialist, pre-industrial extraction moment. My interventions into the village, through the mapping methodology, undoubtedly impacted the ways the villagers and their local government officials knew their land and its politics while simultaneously producing, perhaps, novel opacities (Li 2014a; Li 2014b).

Although conservation and mining are dominating points of reference in this area, this chapter argues that, on the ground, concerns revolve around issues of land. Land is considered a highly valuable resource, contrary to Gulliver's earlier assertion. The study's methodology integrating mapping highlights connections between concerns about land, space, and opportunities. Mapping produced new information and revealed some of the invisible forces at work in the village that, together with socio-economic and historical factors, are making land into a resource and an object of speculation. It remains to be seen

what this will mean for the mine in the future. It is unclear how people integrate these recent experiences with past experiences of resettlement and the local history of dispossession. The anxieties about the expansion of the road and compensation for those whose houses are condemned remain unresolved. The politics and unknowability of land suggest that the current uncertainty may continue into the future, which will be the focus of the following two chapters.

Chapter 7 Excavating Futures: Labour and Rumour

A dozen members of the *Kikundi Cha Umoja ya Muhagiliaji* (Group for Togetherness of Irrigation/ Irrigation Association) assemble in a semicircle. The men are sitting on a log propped up by two smaller branches, forming a bench. The women sit on the ground, on overturned grinding mortars, or on footstools. An elderly man arrives late and finds a spot on a low stool in the middle of the group. We are meeting outside the house of one of the group members. Children peer at the group from inside the house, hiding when they see me look over at them.

The irrigation project in this village started with the first *Bwana Shamba* (Agricultural Extension Officer) in 1974. At that time, much of rural Tanzania, including this area, was collectivized from scattered settlements into condensed villages like Mtonya, this village. Nearly every village was assigned a *Bwana Shamba*. In this village, the extension officer saw there was a good valley and a good water source and recommended to the government that they finance an irrigation scheme in the area. All other irrigation then, and to this day, is rain fed, except for on a limited number of private farms where wells are dug to allow for bucket-based irrigation. In the early years of the initiative, the ten irrigated acres became seed farms, exclusively growing hybrid varieties of maize. In 1978, heavier than normal rains destroyed the irrigation system.

The fields remained unused, due to the lack of water in the broken intake canals, until 1990. That year, the government returned and repaired the pre-existing works, restoring the system from the 1970s. Despite these efforts, water running in the canal did not reach the agricultural site, and farming was still not possible. In 2006, the government resumed construction on the system. By 2008 enough water ran through the canals to irrigate twenty acres for cultivation. Work on the system continued until 2014. 2015 brought heavy rains, washing out a section of the upper part of the channel. Local efforts to repair the damage have been minimally successful, and now only a trickle of water reaches the nearest fields.

The Luego River still runs strong: the amount of water available for the irrigation system is not the problem. In addition to the break in the channel, the works have not been completed. By 2016, when the group gave me a tour of the site, one and a half kilometres of the irrigation canal are complete, with more than six kilometres remaining unfinished. 380 acres of designated agricultural land do not receive water in order to be cultivated.

No one knows when the government will return to continue to work on the canals. There is no estimated time for when the entire irrigation project will be completed. Further, there is no guarantee that if the system is damaged (again) there will be funds for repairs.

Thirty-four members of the *Kikundi* each cultivate one-half acre of the land. The current *Bwana Shamba* cultivates one acre as a test plot, receiving free seeds to demonstrate for the farmers. Rice, vegetables, and some fruit are currently farmed on the section of land irrigated by the system. Hippopotami come from the Luego River and eat crops. Despite complaints to the government, there is little done to stop problematic wildlife, and so far, no compensation has been dispensed for damages. All cultivation is currently completed by hand. Farmers manage their half-acre plots independently, buying their own seeds, fertilizers, and pesticides and carrying their harvested crops back to the village to sell or eat. Prices in 2016 were particularly low. But still, the *Kikundi* has plans for the future. They hope to add to the area of land under irrigation. That would allow for more farmers to join and for each farmer to

> expand to cultivate up to three acres. They hope to have areas of the irrigation system set aside for cultivation of specific crops, with a section for rice, a section for vegetables, and a section for fruit. Mantra approached the *Kikundi* to set up a company to supply fresh produce. Under this agreement, the *Kikundi* would sell vegetables to supply the uranium mine mess. Once the Mantra supply agreement is set up, the *Kikundi* sees that their crops could travel beyond the village: to coastal Tanzanian markets at Lindi, Mtwara, and Dar es Salaam; leaving the country and going to Somalia and Kenya; exporting to the researcher's home, in the U.S.

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The forty-year-long track record of the irrigation system introduces new dimensions of the history of this area. Collectivized farming along with investment in agricultural commercialization resulted in a series of failed infrastructural initiatives and the general stagnation of agricultural opportunities. The collectivization that marked the initial investment in agriculture in the 1970s has shifted today to become an association made up of a small portion of the larger population of the village, a heterogeneous group of men and women ranging from the (once) well-connected to the doggedly persistent. With the most recent damage to the water intake channel, essentially no one benefits from this initiative. This history of failed development efforts now intersects with the newest investment in the area, the Mkuju River Project. The promise of the irrigation association to cultivate produce for the mine workers stands in contrast with the history of the irrigation system. Uncertainty appears to be the norm for these large-scale projects, and ongoing maintenance comes, seemingly, at the whim of a distant government. In what ways does this village and its past experience with failed and semi-failed initiatives shape the way its inhabitants think about the future and about large-scale development plans?

This history of the irrigation effort, with its abysmal record of achievement, benefitting a negligible segment of a village rather equally burdened by rural poverty, bears little to no influence on the aspirations of the farmers. Large projects are known to be essentially unpredictable: defined by delays, budget problems, the inability to be sustainably maintained over time; they may serve small groups of people and not necessarily to provide

benefits to the general population. Nonetheless, the irrigation system's record does not limit the hopes the farmers hold for the future of their association. This is the first of two chapters engaging with perceptions of the future. More specifically, what follows attends to the ways in which people expect the uranium mine to impact them, especially in terms of jobs. Overwhelming local support for the mine pins hopes for economic development on commercial extraction, assuming it will bring jobs, corporate social responsibility programmes from the mining company, and improved infrastructure. These hopes for the mine, however, do not serve to limit the ways in which local actors around the mine are navigating the slow progress toward a potential mining boom. These imagined futures are tempered by frustration at a lack of information about the mine in general, and endlessly circulating rumours about the status of the project.

This chapter addresses questions of expectations in relation to the proposed uranium mine. It connects these expectations with notions of value of uranium by looking across scales from villages around the mine to national and international actors. Rather than attempting to assess expectations for the future as purely optimistic in terms of hopeful imagined futures, I instead use rumours about the mine as a method with which to consider uncertainty through the lens of work. The hopes, plans, and concerns of sixty men and women over the age of eighteen interviewed in three villages are reflected in the content of this chapter and the one which follows. In conversations exploring how people planned for their futures, essentially no one volunteered that they specifically planned for a job at the mine when asked an open-ended question about their plans for their future in the next year, five years, or ten years. Only when asked about their expectations for the mine in particular, did people start to reveal their thoughts about the project. In general, people were keen for jobs, but already resigned to the fact that they did not know much about the project. Many, in fact, felt they were already being excluded from existing work opportunities.

In the postsocialist, post structural adjustment climate of present-day Tanzania, the shifting meaning of work deserves attention. Despite a dearth of research specifically on attitudes about work, from recent studies of the labour market and informal aspects of Tanzania's economy, we can glean some relevant information. From 2014 to 2015, mainland Tanzania added an estimated 193,618 formal sector jobs (National Bureau of Statistics 2016) compared to an estimated one million youth (aged fifteen to thirty-five) who entered the job market in 2014. The recent growth in the Tanzanian economy is not correlating to job creation rates, and this in turn is not matching the 'youth bulge' seen in Tanzania. In this context, youth attitudes toward employment may be shifting. A study by the East African Institute suggests that half of all youth aspire to entrepreneurship in comparison to twenty percent of youth favouring agriculture, although agriculture has been a main employment sector in Tanzania. The same study found youth with an undergraduate education strongly associated hard work with success (nearly ninety percent), in contrast with those with postgraduate education (fifty percent). A majority of youth in the study felt unemployment was their most serious concern, and one they wanted the government to address (Awiti 2016). The categorical distinctions of 'self-employment' and 'wage employment' appear to be inadequate for capturing the employment relations of the heterogeneous informal economy of Tanzania (Rizzo 2017). Despite a small number of studies, fundamental gaps remain in the literature regarding the (changing) meaning(s) of work in postsocialist Tanzania. The shift in focus away from agricultural labour, the impact of the decrease in the amount of public-sector employment, and the rise of the neoliberalized ideal of the private sector entrepreneur all remain relatively unexamined. These issues all lie within the larger constellation of the ways in which people are variously attached to wage work (e.g. as a source of inclusion or progression), also not yet thoroughly interrogated in the Tanzanian context (Ferguson 2015).

To try to tell a story of anticipation of a future where the Mkuju River Project creates new linkages from the margins of this rural corner of Tanzania with infrastructural development, capital investment, and mineral extraction without taking into account agricultural and conservation histories and ongoing activities would misrepresent the circumstances. The present chapter reviews the ways in which villagers see agriculture as the most pressing and important factor in their life plans. From the 1950s until the early 2000s, the Ndendeule people in this area were reported to be 'progressive', willing to adopt new agricultural techniques (Gulliver 1966), leading them to be successful in growing tobacco. This appears to have abruptly changed with a crash in the tobacco market in the early 2000s, leaving farmers with crops that the tobacco cooperative would not buy, and therefore defaulting on loans from banks for the fertilizers used to grow the previous year's crops. Debt-stricken farmers in the area all but gave up on growing tobacco by 2014 and have not found a profitable alternative in the meantime; garbanzo beans, soy, and sesame are seen as possible alternative cash crops.

As mentioned above, when asked about plans for the future, the mine was not at the front of anyone's mind, or none were willing to mention it unprompted. Hopes for mining jobs were only spelled out after specific prodding. This chapter probes the conservative way in which the farmers hope for jobs at the mine while planning their economic futures based on a continued emphasis on agriculture. In turn, this demands an intersectional approach to examining the expectations for the future in the shadow of the Mkuju River Project: conservation, agriculture, and mineral futures must be part of the same analysis.

The Rumours

> *Mgodi inasumbua. Ajira wanapata na watu wa* [hesitates] *Mwanza. Hatujapata hata moja. Wanapata watu wa Mwanza* – Young man, Likuyu Ward, 2016. (The mine is disruptive. Jobs

> are given to people from [hesitates] Mwanza. They haven't given us a single job yet. They give [jobs] to people from Mwanza*)*.

This chapter revolves around expectations for the future, but these expectations are not formed in a vacuum. The historical chapters in the first half of this thesis serve as the basis for the intersectional approach described above, which aims to integrate multiple types of resources as dimensions which individuals in the area are simultaneously navigating. In this chapter I add an additional factor to the consideration of futures—the rumours circulating in the villages. Throughout nearly every conversation about the mine and its potential impact on the area, confusion arose over the status of the mine. Before 2016, many people assumed that extraction already started. In 2016, a few people started to speak of the scheme being delayed by the incoming president, Magufuli, as if he personally put a halt to its development. Ancillary rumours abounded—that there was theft happening at the mine, that there were Americans mining at the site, and that there were Australians mining at the site. Despite these rumours, most villagers thought mining already started, and desired jobs at the mine. They also spoke of fears of outsiders taking jobs. The rest of this chapter explores how we might scrutinize the production and management of emotions (internally and in others) within the local economy of delayed uranium extraction based on a 'resource affect' perspective (Weszkalnys 2016). Before moving to that, I want to further appraise the rumours of activity at the Mkuju River, and that mining had already started inside the Selous.

The rumour that mining was underway seemed initially like a misunderstanding that could, and should, be clarified by government officials or the mining company. While this may be true, I suggest that this rumour represents a foundational belief about the project, and it should be examined for its potential to clarify how people in the area think and feel about the commercial initiative and its potential to impact their lives. The rumours were persistent, across age groups and villages, so it was not a misunderstanding limited to a small group. When I introduced any hesitation, by saying that I was told the mining had not started yet,

people were often resistant, fully convinced the project was proceeding and that I was misinformed. Although I visited the mining site in late 2014, and saw that no mining was taking place, I was not permitted by the mining company to access the site again. Unlike the villagers, I met with the subcontractor hired to drill at the site from May to August 2015 to collect additional information about the deposit. While the subcontractor said his work was exploratory, I still could not guarantee that mining had not started. Until October 2015, no current village leaders or villagers (unless they were employed by the mining company) had been to the mining site. Therefore, few people were able to confirm what was happening inside the Selous at the Mkuju River. In June 2016, a select group of village leaders and villagers were brought to the mining site to learn about water contamination, which will be investigated in detail in the following chapter. However, other than these rare visits, no one from the area could see what was happening at the mine. In July 2017, the mining company publicly announced that they came to an agreement with the Tanzanian government to delay the start of commercial mining by at least three years (World Nuclear News 2017).

In contrast with news publicized by the mining company, the story that the mine had already started seemed like a simple case of confusion caused by incorrect information. An analysis of rumours provides a nuanced way in which to think about these stories. Where rumour 'is unsubstantiated information, true or untrue, that passes by word of mouth, often in wider networks than gossip' (Stewart and Strathern 2004, pp.38–39), anthropological literature provides examples of the ways rumours can be utilized in order to consider the ethnographic reality in and around the Mkuju River Project. Gluckman's (1963) functionalist interpretation, which stressed the capacity for rumours (and gossip) to reinforce the norms of a community or society, has since been critiqued based on evidence that not all rumours and gossip unify groups, and that gossip and rumours can be used to stir trouble. Wilson (1974) divides the theory of rumour into two camps, which he tries to dissolve: one with Gluckman

and other anthropologists focusing on group dynamics of control and sociality, and the other of psychologists who emphasize the individual serving their own interests. Rumour can function as a form of resistance toward a dominant group (Turner 1993). Rumour can be a type of news, often traveling when the information is ambiguous or lacking (Allport and Postman 1947). It is in contexts of uncertainty where rumours are pervasive.

This chapter and the following reflect on the work of Luise White (2008) in particular. White concentrates on rumours about vampires in colonial East and Central Africa beyond their superficial appearance of anxiety, superstition, ignorance, or even the disorder the rumours caused. Rather, White sees rumours as a way in which to understand the rumour-teller's view of the world, and to see the value of any inaccuracies the stories might contain. For White, the stories of colonial bloodsuckers offer 'a vision of colonial worlds replete with all the messy categories and meandering epistemologies many Africans used to describe the extractions and invasions with which they lived' (2008, p.5). In the extractive nature of the bloodsucking vampires in the colonial rumours, White sees a metaphor for the extractions, sponsored by colonial states, of people for bodies of labourers, soldiers, and city dwellers, which rapidly changed sociality in a way that seemed impossible and illegible to those left behind.

Hiring Practices

In January 2015, a Vice President from the mining company came to the area to meet with the newly elected chairmen of the three villages closest to the mine. This was the first time she was meeting these leaders because the company had recently made redundant their Community Relations Manager as they dealt with the limited budget of their stalled mine. I joined the three chairmen, the agricultural extension officers for the ward, one Village Executive Officer, the mining company public relations officer, and the Ward Executive

Officer in the meeting in the Ward Executive's office in a crumbling block building in the village. Everyone introduced themselves, including myself and the representative from the mining company. She explained the history of the project to the group. Eventually, she asked rhetorically what uranium will bring to Tanzania. She answered her question saying, in English: 'it's a win-win situation', before returning to Kiswahili. Toward the end of the presentation, she started to read from a glossy handout about the mine. She warned that the mine would not be around for very long—only about twelve years. She said that, once construction on the site begins, it will bring 1,200 jobs, that they will advertise for jobs locally, and three-quarters of jobs would be filled by locals. She mentioned some of the risks of uranium mining and handed out a dozen glossy copies of an English and Kiswahili document on radiation. She told the village leaders that children could not come to the mine, that they should stay in school and develop the skills needed to work. The village leaders discussed a list of villagers who were interested in work at the mine, which they kept on-hand for the meeting. One of the village leaders said that the youth in his village needed jobs. Another village leader said that they wanted more education on uranium. A final leader asked about the distribution of the mining wealth. The Ward Executive Officer asked about roads, and the public relations officer explained that the roads inside the Selous would be maintained by the company, and the roads in the village would be maintained by the Tanzanian government. At the close of the meeting, the public relations officer gave cash to the Ward Executive Officer, who distributed Tsh 10,000 to each village leader to cover their transportation costs.

Six months later, at a meeting of the main political party in the villages, CCM, held outside the same crumbling building, villagers challenged their leaders to explain why the company was not hiring people based on the employment lists. Why were they hiring people who seemed to come to the village from other parts of Tanzania? The village chairman

explained that the local government was in the process of launching a complaint against Mantra on those very grounds. They were writing a letter to the Ward Executive Officer, explaining that they needed her to press the mining company for answers. Had the mining company lied when they promised to employ locals in the meeting in January? Where were their jobs?

The exchanges between the mining company and the village leaders, and then the village leaders and their constituents highlight many logistical questions about employment. Villagers want to know if they will be hired preferentially due to their proximity to the project. They felt the mining company agreed to this. The mining company wanted to clarify for the villagers that employment would be short-term—potentially less than twelve years, especially if they were only employed during phases of construction and decommissioning. The public relations officer later described this as an effort to 'manage expectations' of villagers. The following section considers the ways in which expectations for the future are and are not being managed.

It seems useful to start with, arguably, the most foundational question: how many people will work at the project? Despite the basic nature of this question, the number of people to be employed at the varying stages of the mine's development remains unclear. The Mkuju River Project is currently slated to be an open-pit mine. The Russian parent company, ROSATOM, is known for its use of another type of mining—in situ leach mining (ISL)—in Kazakhstan and the U.S., as well as in protected areas, according to a lawyer from the mining company. ISL mining (also called in situ recovery mining) is a method of extraction in which a solution is pumped underground, where it chemically binds with the mineral in demand, and then the mineral-laden solution is sucked up through another well (International Atomic Energy Agency 2016). The World Nuclear Association (2017) estimated that nearly half of all uranium worldwide was extracted by ISL operations in 2016; ISL is regarded as a

standard method of uranium mining. The company said that four people are able to run an ISL plant. The company conducted exploratory testing for ISL mining at Mkuju River and increasingly appears to prepare for this radically different type of mining. The company lawyer acknowledged that they would need to apply for a new round of mining licenses and undertake another Environmental and Social Impact Assessment (ESIA) for this type of mining in order to comply with Tanzanian law. This process is predicted to take at least one year for ISL mining, which has never been done in Tanzania or sub-Saharan Africa. Industry experts increasingly suggest mining at the Mkuju River is likely to begin as open pit and then transition to ISL mining. A conversion of extraction in whole or part to ISL mining would likely have a significant impact on the number of workers employed for the mining phase. The impact of ISL mining on the number of workers estimated to be needed for the construction phase and the decommissioning phase are unknown. Additionally, the mining company has since announced that it was not likely to begin mining until 2020 or later. This means there is uncertainty in the number of workers needed, along what timeline, and the duration of their employment.

Discussion of ISL mining, is not part of the conversations about employment at the mine in the villages, despite its likelihood of impacting all workers in the case that it is implemented.[99] In 2015, the mining company posted a call for applications to the job board in the three villages. The job announcement, written in English, for a 'Camp Administrator – Fixed Term Contract' required 'knowledge of Geological Programmes such as – Data shed, Micro mine, ArcGIS' in addition to English and Kiswahili fluency, Microsoft Office proficiency, and a valid Tanzanian driver's license. Across the bottom of the last page, *JIPYA*

[99] There could be several explanations for this. Villagers may be unaware of the possibility of this type of mining. Since ISL mining is unprecedented in Tanzania and in sub-Saharan Africa, people in the area might not know of it. The specific terminology for ISL mining does not appear to have been translated into Kiswahili, which may limit the ways people can speak about (or learn about) this type of mining.

(new) is scrawled in Kiswahili in navy marker. A few young people were looking at the job posting, and I looked along with them. Later that day, a young man came into the office to speak with the Ward Executive Officer about the job. The executive asked if he had a resume, explaining that he would need it in order to apply. The young man asked about mailing in his resume, and she explained that he would have to email the application to the address listed on the posting. He sat quietly and did not respond, and the Ward Executive Officer continued. She explained that if he wanted to use email, he should go to the nearest town, and enquire at the internet café. As he left the room, I asked the officer if she thought there was anyone who lived in the village who met the criteria for the job posting. She had the impression there was no one qualified. So, while the mining company may have met its obligation to advertise job opportunities in the village, it remained unclear to what extent the company felt compelled to hire local people in order to fulfil their promises regarding employment.

The frustration about the lack of employment, and the rumour that outsiders are taking jobs could be interpreted as a response to several local and national triggers. Many people described seeing young men arrive in the village aboard the daily bus, stay one night or two in one of the two guest houses in the village, and then be picked up by mining company cars. Most villagers were sure these men were kin or friends of workers at the mine, and that they were able to use their connections to secure preferential access to jobs. People who lived in the nearest villages, though geographically close to the project, felt they were passed over in favour of these men from other parts of Tanzania, but with contacts at the mine. In particular, locals accused job-seekers from northern Tanzania, Arusha, Mwanza, and Kilimanjaro of taking mine-related jobs. Northern Tanzania has a history of commercial mining (such as gold, diamonds, and tanzanite), and is home to the majority of the commercial mining investment, infrastructure, and training in the country. While an autochthony lens may be relevant to situating this sensitivity to outsiders, there are other

factors to take into account. The differences between northern Tanzania and southern are many, with southerners often stereotyped as lazy and backward (Seppälä and Koda 1998), also in terms of religion (the north is thought to be majority Christian and the south majority Muslim[100]), and infrastructure (the North tends to have more developed infrastructure and more major cities), all of which may add to or exacerbate this perception of outsiders taking jobs at the mine.

From the frustration over lack of job opportunities, there was also awareness that local people would be limited to certain types of jobs. One man who owned a small shop said that he felt that as an individual there was '*[s]ina faidha*' (no advantage to him [from the mine]). He said that: '*Kwa sababu wafanyakazi kule ni watu wa kule kule kwenu … Ngozi hii* [points to his skin] ... *nyeusi… walinzi tu. Kazi yetu kulinda*' (Because workers there [at the mine] are people from your home [USA]. This skin [points to his skin] … black... security guards only. Our job is to protect). This man's frustration with limited job prospects cannot be isolated from the Ward Executive Officer's doubtfulness that anyone in the village could fill the rare non-manual labour jobs the mining company posted. The overlap between skin colour, education, and job placement, was apparent. Despite this conversation, I asked if he would want to work at the mine, and he affirmed '*Nitapenda sana kufanya kazi pale. Siyo kidogo.*' (I will like very much to work there. Not just a little).

Another man explained that he came to the area to grow tobacco. After the tobacco market crash in the early 2000s, he now farms other crops and makes bricks. He said that there was an airstrip in the village where small planes landed until 2010. After that, the villagers stopped getting work, and stopped getting paid. '*Watu wa nje*' (People from outside)

[100] Since 1967, Tanzania has not registered its population by ethnicity or religion, so there are no official figures of the size of religious groups.

found jobs with the mine. '*Sisi tunaangalia magari ameenda, amerudi. Wanachukua nini?*' (We watch the cars go and return [on the road to the mine]. What are they taking?)

The mine is out of sight of the nearest villages, fifty kilometres down the road past the guarded gate of the Selous and a second gate at the mine. Like the man quoted earlier, people see trucks passing through their villages and heading perhaps into the Selous and on to the mine. The invisibility (Scott 1998) of the mine and the extraction has started to foster rumours circulating the neighbouring villages about what is really happening at the mining site, and whether mining has already started without them. Villagers spoke of expecting a paved road connecting the mine to the nearest town, through their villages, which would make their transportation much easier than the existing dirt roads. Others imagined that, because of the mine, they would finally be connected to the national electricity grid, receive piped water, or even become a location for national sporting events.

These indirect benefits hoped for in the future overlap somewhat with how people imagined they might benefit specifically from having a job at the mine. One man said he thought that if more villagers had jobs at the mine, they would be able to build houses with tin roofs, instead of thatch. Jobs would allow them to build improved wells that are sealed and have hand pumps. Still, most people seemed to imagine their futures completely without the mine. Many hope to improve their agricultural output. Many wanted to be able to put their children through school, or perhaps return to school themselves. Several hoped to start new businesses or expand existing business.

People generally said that, given the opportunity, they would take a job at the mine. Their anticipation of exclusion from the opportunity to work at the mine remained, even as they still voiced hope to work there one day. Seeing a man sitting in one of the villages in a mining company uniform, I asked him about his work. After he described his agricultural activities, I pressed on to find out if he worked at the mine. Only then did he confirm he

works for the company, doing odd jobs like weeding. He started in 2015, when the employer came to Mtonya asking for workers. Three workers were hired from the village, with others coming from a neighbouring village, closer to the mine. He described their work schedule: they rest in the village for six days. Then they go to the site to work for one week and then return to the village. Effectively, they work two weeks per month on rotation with the other workers. He was on break at the time we met. He said he earns Tsh 25,000 per month, but he was concerned about the rising cost of products at the local shop. He saw his wage as being low, and worried about his family's financial future as the profits from selling crops were also slim.

If the pay is so poor, and the mining company workers are complaining that they cannot afford to live in these villages, why do people still want to work at the site? Why are they so frustrated about being left behind by low-paying jobs? What kind of 'work' do these claims based on a language of exclusion and frustration do to (or attempt to) re-configure the power structures surrounding the distribution of anticipated uranium wealth in the area? How does this relate to the nearly universal response of villagers, when asked about their future plans, to focus on agricultural output, education, or small business endeavours, rather than mining work?

Contracts and Subcontracts: Precarious Labour Inclusions

In all rumours there are seeds of truth: in stories of mining beginning, in allegations of outsiders being hired for work, and in locals being passed over for employment. Like all the villagers, I too watched mining equipment loaded onto huge trucks travelling through the villages on the road to the mine. These machines were used by a subcontracted drilling company to further explore the deposit at the Nyota Prospect. Although the mining company would not admit to undertaking any new work at the site, they did conduct exploration. What

counts as mining to a mining company or a national regulator might not be the same as mining for villagers in the area. They see the equipment travelling by them, and cannot see what is happening at the site. So, the idea that mining might be taking place is not as far-fetched a rumour as it might initially seem. Additionally, the mining company agreed to hire via the village worker lists and the job boards, and it appears they attempted to follow through on this. However, several of the jobs needed at the site during the lag until mining starts, including maintenance, catering, cleaning, guarding the site, and testing, are the responsibility of subcontracted companies. These companies hire as necessary, and, it would seem, were not obligated to recruit under the same terms as the mining company. The company with the contract for security for the site might hire a few local people, but might also hire relatives of people who already work for or own the company. For example, the company with the contract to provide the mining site with fresh fruit and vegetables hired another company to grow the produce. The company happens to be owned and operated in the village closest to the mine, but a previous contractor bought produce from a different supplier, not located in the immediate area. The short-term contracts and the subcontracting of portions of the operation of the Mkuju River Project may be standard practice in commercial extraction, but create precarious employment structures, which are (mis)interpreted by villagers in various ways.

Trying to understand how people in this area are incorporating a new regime of natural resource management centred around uranium mining into their current perception of their exclusion from the existing scheme of natural resource management (of conservation), I turn to a parable I was told several times in the villages. In the story, a man was working at the Mkuju River Project during the exploration phase. He knew his contract was ending, and at some point, he snuck into the site. There, he filled a fifty-kilogram rice sack full of sand and, with it, he returned to his home in the village. He stored the sack of sand in his house,

waiting to sell it, until he was convinced by village leaders that this was not a safe or acceptable plan.

This story illustrates the intersection of expectations, imagined futures, and rumours all bound up in the context of the desire for villagers living next to the mine to benefit from the project. Perhaps we can read into this story about the desperate state of economic affairs when one is hoarding a sack that may be laden with radiation-emitting uranium sands. Or, alternatively, that this man was so poorly educated that he thought it was a good idea to keep such a bag in his house. Instead, it seems useful to attend directly to the ways this man tried to extract the uranium, and how he conceived he could extract value from it. The idea of someone secretly entering the site, extracting resources, and exiting the site, can be seen, perhaps, as a translation of the elephant poaching that this area is well known for. Circumstances in which valuable commodities (ivory or uranium) might be exclusively obtained by companies with permits or foreigners who fly in are challenged by the democratizing forces of illicit extraction, moralizing arguments aside. Another aspect which demands attention is the reference to the villager attempting to sell a bag of sand, containing unknown amounts of raw uranium. This attempt to access the perceived wealth of the larger market for uranium seems ignorant of the characteristics of uranium as radioactive, or that raw ores are low-grade and essentially valueless until refined, and that making a visual calculation of the amount of uranium in any given plot of soil would be very difficult. Further, the idea of bringing a bag of sand from a house in a village in rural Tanzania into the global commodity chain for uranium—an intricate, multi-step supply chain spanning different countries and companies, not to mention end products—is difficult to imagine. Or, perhaps the idea of a Tanzanian villager selling a bag of sand to the highest bidder is all too easy to imagine for an international community anxious to ensure that even raw resources do not fall into the hands of so-called ‘rogue’ actors.

We can also draw out, from the telling of the story, the ways in which some people see themselves in relation to the wringing of value from this natural resource. The story teller, perhaps asserting superiority in comparison with the villager in the story, who is framed as ignorant, desperate, or maybe resourceful. Extracting uranium, legally or illegally, is the prizing of value from soil. The yellow sandy soil of the southern Selous, once uranium was discovered, transformed from being dirt in an area only good for the habitat of elephants, to the home of a billion-dollar enterprise and a sought-after and deeply-feared resource. The (illegal) effort of a neighbour to take a few grains of the golden sand for personal gain stands in contrast with what appears to be the more common avenues for villagers to try to extract value from the mine: via wage labour and indirect benefits. In addition, the precarity of the uranium poacher's exclusion, hardly the punchline of the story, in some ways is the most important underlying factor to understand how and why this story may have happened, and why it is still being told. A man with minimal inclusion in the mining effort found that his relationship to the project would change imminently, so that he would no longer be able to be physically close to the site and its mineral assets. Faced with these circumstances, he tried to remove that mineral wealth and take it with him, so that he might continue to extract value even after his inclusion in the project ended. The precarity of his inclusion and his awareness of the exclusion he would face are the unspoken truths of this story, and ultimately become part of nearly every story related to the Mkuju River Project. The complexities of the supply chain serve as another mediator of inclusion in the world of commercial extraction.

Exclusion and inclusion are not clearly defined, and rather might appear along a scale: precarious inclusion, peripheral inclusion, short-term inclusion/exclusion, anticipatory inclusion. Like the uranium poacher, people move along the gradient as the terms of their association with the mine change. Across this spectrum, we can see a connection between inclusion in employment and inclusion in (or exclusion from) the project as a whole. The

precarity of employment spans the range of jobs, from low-pay, manual labour jobs, to highly paid, specialist, corporate-level positions. The community relations officer, a Tanzanian from a northern region of the country, was hired on a contract basis. He was laid off from his position in 2014, only to be re-hired on a monthly contract in mid 2015. By 2016, he was no longer working for the company, and had moved on to work for another commercial mining company. Throughout his precarious employment, village leaders knew of his contract situation, but still saw him as the singular representative of the mining company. The sporadic appearance of another mining company employee from the Dar es Salaam head office, a Tanzanian who happens to be from a local family of national prominence, did not fill the role in the same way as the community relations officer. The village leaders never felt able to contact her directly, rarely received prior notice of her appearance in the villages, and often did not know in advance the topics of their meetings. The precarity of the employment of the community relations manager impacted the distribution of knowledge about the mine in the area, resulting in an unpredictable, uneven distribution of information from the mining company itself.

The Mkuju River Project's current practice for food acquisition can serve as a case study. Mantra ran a competitive bidding process to secure a food provisioning contractor for the inactive mine. ATS, a Tanzanian company, won the recent two-year contract to provision the mine with fresh produce. This contractor, in turn, set up a subcontract with a grower to provide them with food. The food grower knew when ATS had to renew its bid for the contract with the mining company. When asked what would happen if ATS lost the contract, the subcontractor did not think this was likely, but when pressed, said she would talk to the company who won. Despite the precarity of her contract through its biennial renewal and her investment in a farm cultivated specifically to provision the mine, she did not seem to feel overly concerned. The business owner went on to explain that she receives phone calls fairly

frequently from people offering to help her fulfil her contract with ATS. She said that for the present, she would not accept their help. Since she sells the crops from her farm, and relies on her family in a nearby town to supply the items she does not cultivate, she said she would not want to share the contract with anyone or her crops (and investment) might go to waste.

The contracts that make the corporate level and business level actors in the supply chain precarious have a trickle-down impact on individually hired labourers. A man who worked at the project in previous years of exploration spoke of the complex hiring structure with fluency. He was hired by a subcontractor, a Tanzanian company called Bambuloko. He knew that the company still had a contract with the mining company, but only kept on a few employees. The company was hired to do manual labour improving the quality of the dirt road to the mine. He hoped to be hired again in the future and envisioned that his neighbours' material wealth would improve if they also worked at the Mkuju River Project, regardless of whether they worked for Bambuloko or another subcontractor.

Beyond employment, the mining company began community development initiatives that, like the employment opportunities, were often unpredictable in form and duration. The mining company cultivated relationships with three community development groups in three different villages as part of its corporate social responsibility portfolio. A programme to raise hens to provide eggs for the mine comes from one village. Another village has plans to grow native trees in a nursery in preparation for the re-forestation that is anticipated to take place after the decommissioning of the mine. The third village group planned to provision the mine with fresh produce from the irrigated farm mentioned at the beginning of the chapter. Planning with these village groups began before 2014, but, through 2016, none of the groups had started their projects. All await an initial capital investment from the mining company so that they can make purchases to start their activities. Villagers rarely have the capital to make investments in new ventures, and few have access to bank loans. In 2016, the mining

company hired a consultant to work directly with the community groups in order to help them 'establish business linkages' so they were not reliant on the mining company for investments or as the sole client. The mining company officer was wary of villagers, perceived to be lazy and waiting on a hand-out from the mining company. This was another step in a broader effort by the company to 'manage expectations' of villagers as to what the mine, and the mining company, would provide. The introduction of the consultant between the mining company and the community groups serve to discipline the community groups, to behave in ways the company demands, but also to disconnect these community groups from any notion of entitlement to the mining company, or claim to dependency on the company.

In what ways can we think of the precariously included individuals and entities of the Mkuju River Project supply chain as intermediaries or mediators (Tsing 2009)? The morally ambiguous mediators and brokers of mid twentieth century political anthropology seem to be an increasingly relevant framework for emergent forms of state and market intervention (James 2011). At the Mkuju River Project, as short-term contract labourers are constantly positioning themselves to be re-hired, so too are subcontracted companies. Individual workers and subcontracted companies are not fully included in the project, nor are they seen to be completely excluded; the state of their 'adverse incorporation' (Meagher et al. 2016) into the broader sphere of the mine is in flux. Short-term contract workers may not interface with the mining company, but rather with their contractor, which acts to pass along its own precarity to its workers. Where the contractors serve to translate between workers and the mining company, from the list of workers given by the village leadership to Mantra, the village government also serves as an intermediary. In either case, despite the promise of employment opportunities, the mining company's decisions in contracting serve to discipline the villagers as part of their anticipated future labour pool. Keeping a distance from neighbouring villagers, with short-term contracts and via the use of subcontractors, the

mining company appears to be attempting to insulate itself from any of the rumours and demands of the villagers. The mining company's goal of expectations management, openly practiced and shared with the village leaders, appears to align with a strategy to attempt to keep local people at bay in order to minimize or contain any threats to the company's 'social license' to operate.

Conclusion

The contradictory effects of capital appear to lurk underneath many of the topics discussed in this chapter. The hope of the villagers for employment at the mine and the ways they predict the mine will improve their lives reverberates in the frustration and resignation people vented at the prospect of being excluded from the (manual labour) jobs. The initial indifference of villagers who described their futures with limited emphasis on mine-related employment illustrates the complexity (and caution) with which these individuals integrate the mine into their current construction of expectations for the future. As shown, the pervasive rumours that mining already started and that outsiders are taking mining jobs not only highlight these tensions but also uncover the affective aspects of uranium (mining) labour.

These marginalized villagers are clamouring for inclusion in commercial activities but are already anticipating (and experiencing) their exclusion. They know that they cannot mine uranium artisanally and sell it, as they might with gold or diamonds, more commonly mined in Tanzania. So, they see their exclusion from the mineral wealth in that sense, like the uranium poacher. Their current focus on mine employment represents another route with which to extract value from the mining project, but their awareness of and frustration at their exclusion requires additional explanation. Trying to understand this experience, it seems useful to fit this into the context of the other opportunities these people have. There are, essentially, no other job opportunities in the area other than conservation, which has already

proven to be unprofitable for most people. There have been very few wage-earners originally from the area since the days of colonialism and the migration of male workers to large plantations to the north and on the coast to the east (Gulliver 1955). While each village has a primary school, test scores are low; achievement in secondary schools is similarly bleak. The relative economic security financed by successful tobacco cultivation and marketing has become an increasingly distant memory for aging farmers and a booming cohort of young people. Major initiatives led by the national government to increase commercial agriculture in southern Tanzania have so far excluded the region home to the mine[101] or have not materialized into any commercial agricultural activity in the area.[102] Therefore, the cash earned from manual labour jobs associated with the project may be low, but the prospect of a meagre cash wage is still meaningful on some level, since being passed over for employment opportunities has led to near universal condemnation. When those who work for the mine do not seem to nail their hopes on these jobs to ensure their futures, while others still have such high hopes, perhaps it is not just about the financial value of the cash wage. What kind of social capital is also at stake with the possibility of these jobs?

Pinning down the social worth of employment is impossible in circumstances where the job already exists, since the depiction of value(s) as static rarely proves accurate. In this case, the work is hypothetical—it may never come into existence if the mine is delayed indefinitely; if the mine operates by way of ISL, there could be fewer and different employment opportunities—hindering an objective valuation of a job. Acknowledging the dynamic nature of expectations of the value of future employment opportunities provides space to consider the diverse ways in which the associated affects can be political and impacting sociality in a plurality of ways (Ahmed 2014).

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[101] The Southern Agricultural Growth Corridor of Tanzania (SAGCOT), launched in April 2015, for example.
[102] The Mtwara Development Corridor, designed to spur international trade across Malawi, Mozambique, Tanzania, and Zambia via the Indian Ocean port of Mtwara.

Although affect theory receives criticism for individualizing or minimizing experiences, it is possible to see affective labour operating in and around the Mkuju River Project amidst the various stakeholders who are positioning themselves, and each other, politically and economically. Corporate strategies, responding to a global context of local and international resistance to extraction, aim to cultivate a type of affective anticipation deemed 'appropriate' (Weszkalnys 2016). This can be seen where the mining company is specifically setting out to manage the expectations of villagers, in a sense, to make local people have more 'realistic' attitudes toward the mine and its possibilities for improving their individual lives.

Another kind of affective labour is at play in the sharing of rumours that outsiders are taking mine-related employment opportunities. The rumour transmits the statement of employment exclusion, but it also seems to inform or remind the listener of their own missed job opportunity, possibly imparting a sense of disappointment or grievance alongside hope for the future. Along these lines, rumours suggesting the hopelessness of inclusion by employment elicit a sense of abjection, not just for lost employment, but for lost connection to the development and modernity optimistically envisioned in a mining-oriented future. Abjection, as considered by Kristeva, focuses on the disruption of 'identity, system, order' (1982, p.4) at the individual level, and suggests an ambivalence, considered in the context of labour (Tyler 2011), the body (Sanabria 2011), spaces (McGregor 2008), and groups of people (Butler 2011; Nyers 2003). James Ferguson adapted Kristeva's concept to explore the 'expulsion but also debasement and humiliation' (1999, p.236) experienced by former Zambian Copperbelt mineworkers who found their fortunes turned as they were forced into a different, undesirable category by the 1990s: that of the '"Second Class"' (ibid., p.242) African. Ferguson sees the abjection of Africa (and Africans) as part of the system of capitalism, working as a process he calls disconnection, which Bush (2009) explores in the

context of the banning of artisanal mining in Ghana. According to Ferguson: 'Just as being hung up on is not the same thing as never having had a phone, the economic and social disconnection that Zambians experience today is quite distinct from a simple lack of connection' (1999, p.238), which might suggest this concept could not apply to the would-be workers around the Mkuju River, who had never worked at the mine. However, that these people never had a job to lose in the first place does not seem to mitigate the sense they have of loss. Perhaps instead, we can focus on the violation of rules (that promised jobs should turn into actual jobs), identity (signing up to a list of volunteer workers makes you a worker), and even order (that once a mine is opened, mining should begin) ambivalently combine with the relentless hope for mine-related work, continually drawing people back to the source of their initial loss, much like in Kristeva's (1982) conceptual framing of abjection. If the value of the uranium mine to these villagers is connected to modernity and possibility, then these, in turn, may be imagined to radiate from the Mkuju River Project into the neighbouring areas and the workers, regardless of the financial value of uranium as a mineral. Perhaps like the uranium poacher in the story, people are trying to reposition themselves from being excluded from the nuclear world and the national project of development, to at least adjacent to it, if not fully included.

Perhaps the frustration voiced by villagers who felt excluded from the activities at the Mkuju River can be considered in the context of claim-making (Ferguson 2015). The rumours of the mine already starting, evoking anger and resentment, may be a kind of early demarcation by villagers of damage or neglect they already perceive to have been perpetrated by the mining company. Even before the environmental contamination, ecological destruction, or social ills of rapid urbanization common to mining boom towns, these villagers may be establishing the basis for complaints about economic exclusion from an initiative billed to be part of the engine of Tanzania's economic development. In this sense,

perhaps we can see the rumours as the basis of legalistic tort claims to wrongful unemployment, which is, in turn, an effort to establish an entirely separate avenue for people to make a (legal) claim on the economic value of the project and redistribute its wealth.

The mix of hope and frustration may be a type of affective dissonance not uncommon at sites of extraction or anticipated extraction (Weszkalnys 2016; as seen in other contexts: Hemmings 2012; Marshall 1980). The affective encounters (Archambault 2016) between villagers and the not-yet-mined uranium of the Mkuju River Project illustrate the ways in which resource affects seep out from a mine before mining even begins. Around the Mkuju River, where many people believe mining has already started, this cannot be understood strictly as an ambivalent anticipation of uranium. By contending with affect in the context of employment it seems the uranium itself is just one aspect of the larger constellation of local resource politics. As the delays continue, these affective relations cannot be regarded as permanent, but may at some point link to the capacity to act (Adams et al. 2009). The next chapter examines the embodied relationship between villagers and the Mkuju River Project. Via rumours of contamination, it becomes possible to consider the ways the mine is predicted to impact individual bodies; through a peripheral glance, these rumours speak to the distribution of information on the project.

Chapter 8 Bodies, Uranium, and Uncertainty

A woman, sitting on the swept ground outside her house with four of her children, grows exasperated as I ask her about the damage to her crops. With each question, she becomes increasingly unwilling to reply. Her children respond to a few questions after she stops answering altogether. The interview ends abruptly.

In conversations with one family after another, I ask about their life history and how they came to live in the village. Then, I ask about their agricultural activities: how many acres they cultivate, whether the fields are located in one place or scattered, and whether they experience disruptions caused by elephants or other wildlife. Like this woman, most people in this village in Likuyu Ward indicate that in the last five years, sometimes half of their fields were destroyed, mainly by elephants. The damage they report dramatically exceeds that mentioned in the other two villages of this ward. When they speak of their fear of hunger, what also comes through is their anger, frustration, and sometimes resignation at the situation.[103] That sense hangs heavily in the air during the conversation that follows, about expectations and plans for the future.

This is not my first visit to the village of Likuyu Mandela. By the time of this visit, I had known the chairman of the village for nearly two years. He is busy building a house and asks another man, Rajabu, to help introduce me to villagers.[104] Rajabu holds an unofficial leadership role in the village. The village has been unable to fill the district-appointed position of Village Executive Officer, so Rajabu assists the Village Chairman and the Agricultural Extension Officer with village affairs. Being assigned a minder in Mandela was unsurprising, and, as with other villages, I take the opportunity of this accompaniment to see if there is anyone I am not allowed to speak with; there does not seem to be. I see this auxiliary as someone to whom I can demonstrate what I am doing in the village so that I can eventually move around independently without incurring suspicion from residents. The minder participates in the first few conversations.

When I ask about elephants, Rajabu often 'helps' to translate the question into KiYao, the language of the Yao ethnic group.[105] Most uniformly, people hope for a way to stop the wildlife from destroying their fields. Nearly all report that they have filled out government compensation forms each year that they experienced crop damage, but no one ever received

[103] One month before the above conversation, a tragedy struck: an elephant killed a villager as he tried to defend his crops. The elephant attack (*kushambuliwa na tembo*) made national and international news (Anon 2016). By the time of the described exchanges, the Minister of Natural Resources and Tourism made an appearance in the village, invited by the villagers to listen to their grievances about the wildlife and the neighbouring Selous Game Reserve. A researcher studying human-elephant conflicts also visited the village for a day to study the incident.
[104] This name is a pseudonym.
[105] Unlike the other two villages in Likuyu Ward, Mandela is mostly populated by Yao people. As mentioned previously, people fled north across the Ruvuma River into Tanzania from the late 1970s as civil war spread in Mozambique. The refugees were predominantly Yao, an ethnic group spanning northern Mozambique, Malawi, and southern Tanzania. Refugees living in the temporary camps in the area who wanted to remain in Tanzania mostly coalesced in the village of Mandela. As in the other two villages in the ward, a majority of villagers are Muslim, however, a Catholic order of nuns from northern Mozambique who also fled to Tanzania decided to resettle in Mandela.

government compensation. All agree the elephants come from the Selous Game Reserve, though baboons, hippopotami, and bush pigs also receive blame for some of the crop damage.

When I ask about opinions, plans, and concerns for the future, the minder again translates the question into KiYao, this time specifically adding mention of the uranium mine, something I never do when I ask questions in Kiswahili. '*Wanataka ajira madini … kuleta pesa kusomesha watoto*' (They [the young men] want employment at the mine ... to bring money in order to educate the children), participants say, at house after house.

One young woman explains that in the future, she wants her children to continue to study, that youth in the village should find employment (without specifically mentioning the mine), and that the price of crops should increase. A middle-aged woman, without prompting from the minder, explains that she thinks that young people from the village are upset that they are not being chosen for jobs at the mining project. Others say they hope for piped water and higher prices for crops. It becomes increasingly difficult for me to tell the extent to which the minder is steering the conversations to specifically include the mine.

Walking between houses, down a dirt path by the soccer field where Mantra donated a set of goal posts, I ask Rajabu about his life and his expectations for the future. He says that, '*Kwanza tunaochungu watoto zetu apate elimu*' (First we want our children to get an education). He adds that they do not have piped water, a decent hospital, or sufficient teacher training programmes, but also that, '*mgodi hatufiki sisi*' (the mine does not reach us). He adds that the government should bring wire fencing to keep the elephants out of the farming areas. After we conclude our discussion, I ask if he would allow the villagers to speak for themselves in our conversations, now that I heard and wrote down his thoughts on these topics.

Rajabu occasionally continues to interrupt. An *mzee*, a now elderly village leader who represented his neighbourhood for twenty years in village government, says ironically, '*Tunalima chakula, chakula ya ndovu*' (We grow food, food for elephants). I ask him for his opinion about the project, and he says, '*Hatuitwi … Tunakaa tu. Tunasikia madini… sijui ikiwa Christo au Islamu*' (We are not called [to work at the mine]. We just sit. We hear about the mine/religion… I do not know if it is Christian or Muslim).[106] To this, Rajabu replies with exasperation, '*Hajui! Anasikio jina la madini … hajui faida lake*' (He doesn't know! He hears the name of the mine … he does not know its benefit). Not letting the conversation end there, the *mzee* challenges the minder, '*Mafanikiwa itakuwa nini? Itakuwepo? Au…*' (What will the success/benefits be? Will it be? Or…)

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The following continues with the examination of expectations and, in particular, the ways in which people navigate the uncertainty surrounding the future of the uranium mine at Mkuju River. The vectors of wildlife conflicts, uranium mine prospects, and agricultural development (or lack thereof), prominent in the opening vignette, each differently influence the incalculability of the current situation and planning for the future. All intersect with

[106] *Madini* can mean mine or religion in Kiswahili, so the *mzee* is making a pun about how little they know about the activities (not?) taking place at the Mkuju River.

people in the area physically, highlighting a connection to bodily permeability. I previously highlighted rumours about the status of the project, specifically relating to whether mining already started and explanations of why people from neighbouring villages had yet to find employment at the mine. Building on those anxieties about labour, this chapter considers rumours of a different sort. Rather than being based on economic exclusion from the project, these stories link expectations, natural resources, and pollution. In the context of the uncertain future of the Mkuju River Project, young and old hear the whispers of polluted water as a result of the mine, and associated allegations about the contamination of the bodies of local men. Through these rumours, I connect ways of knowing to prospects of what is to come to Likuyu Ward.

The intervention of the minder in the vignette presents itself as a methodological challenge, and also leads to an unmitigated uncertainty regarding the data: to what extent does the minder impact discussions of wildlife damage, the uranium mine, and expectations of future life in the village? Although people seem familiar with plans for extraction, and hope for jobs, they do not know much about the activities at the Mkuju River, and few have found mine-related employment. The main anxiety is not about the mine, but about the damage caused by insatiable wandering Selous elephants, as threats to their right to live in that place, but also as physical threats to their personal safety and as a factor in their economic and nutritional precarity. Between the possibility of elephant invasions (with ramifications for physical, existential, and economic security) and uranium extraction, with each interjection, the minder unpredictably tips the scale of reliability of responses. Rather than discard these interactions as 'invalid data', instead it seems to be an opportunity to methodologically engage with uncertainty. The 'epistemic murk' permeating the oil and gas industries described by Appel (2015), wherein, despite the expertise and sophistication of hydrocarbon extraction, there is a dearth of basic information, also appears to be an apt

metaphor for the atmosphere in and around the Mkuju River. Embracing the incalculability of (aspects of) resource extraction, this chapter focuses on how people in the immediate area around the mine come to know about uranium and the development of the project.

Since Mary Douglas (1966) revived the assertion that 'dirt is matter out of place', waste has become more central to anthropological concerns about materiality and the body. While pollution took on new meaning during the rise of the Western environmental movement, the social and physical entanglements of waste and the body, by way of contamination, exposure, and toxicity mean Douglas's analysis remains relevant. Particularly apropos is Douglas's key argument that in social relations, the body can act as a symbol, where any breach of bodily surface mirrors societal feelings of vulnerability. Challenging the contention that waste is merely a 'symptom' of sociality, Reno (2015) clarifies waste as particular, never general, and also inherently relational. Waste embedded in ruined landscapes reveals expectations of ordering, with ruination as disruptive to materiality (Edensor 2005). The 'slow violence' (Nixon 2011) of the pollution resulting from industrial activity receives academic attention in varied circumstances from post-disaster Bhopal (Fortun 2001) to American IBM towns (Little 2012) to the unequal burden of this violence borne by minority communities (Bullard 2000).

There has been a nearly parallel shift in the anthropological literature to an appreciation of the body, which is recognized to be historically situated and imbued with social meaning (Lock 1993). More recent theoretical examinations of the body draw attention to its permeability, malleability, and ambivalence. The body is a site of (re)production, but also a site of objectification, commodification, and fragmentation. The body is not bounded, particularly in light of new medical technologies that blur edges previously thought to be well-defined (Sharp 2000). The body is not only porously attached to the environment

(Sanabria 2011), but where 'the environment that we are constantly remaking is in the driver's seat' of bodily construction and change (Lock 2017, p.3).

In addition to epigenetics and microbiomes connecting bodies with the environment, we can consider pollutants and their impacts on the environment and the body. The mingling of pollutants among and within bodies, highlighted in the literature in terms of toxicity and contamination, stems from 'popular epidemiology', where sickness seen in the self, and then in others nearby, lends to the extrapolation of an environmental cause to ailments. Knowledge of toxicity is socially constructed, inherently confusing, and contradictory (Auyero and Swistun 2008). Complicating the study of toxins, the incidence of the physical interaction of multiple industrial chemicals within a site ('toxic layering'), creates obstacles to scientifically establishing causality of illnesses, and perhaps allowing the papering over of vague environmental claims with simpler, more proximate explanations for damage (Goldstein and Hall 2015).

The interrogation of rumours, and of particles or essences permeating the body (sensed or not), must continually be brought back to other, more concrete and often immediate, concerns in the village. As the villagers in the portrait at the beginning of the section indicate, they see agriculture as the most pressing and important factor in, and possibly determinant of, their own wellbeing. As in other villages in the area, most farmers gave up on tobacco by 2014. This village, in particular, is known for dedicated farmers, who have found success in growing *simsim* (sesame) for sale, cultivating the crop more intensively than in the other villages in the ward. Local government officials complain Mandela denizens rarely attend village meetings, which the farmers see as taking time away from agricultural activities. In 2016, Mandela did not receive the full shipment of government subsidized fertilizer, and their maize crop, generally cultivated for personal consumption, suffered tremendously.

Ways of knowing life in the villages just outside the Mkuju River Project, while produced by individual villagers and by sociality within the villages, do not function in a vacuum. The perspectives of different actors connected to the mining effort from the micro to the macro level, though present throughout this thesis, receive specific attention in what follows. Inside the villages, village leadership and those connected to the mine seem to have different concerns and may have different interpretations of the same information. Outside the villages, the concerns are different. Local, district, regional, and national government officials present a diversity of views and therefore cannot be homogenized into a monolithic 'Government'. Local leaders, unsurprisingly, present themselves as better informed than ordinary villagers, while villagers with links to the mining company position themselves as better informed than their unconnected neighbours. Financial and political factors influence strategies of governmental and non-governmental organizations as well as Tanzanian and foreign actors, all of which serve as sources of knowledge. Mantra, with its tiers of permanent, contracted, and subcontracted employees, speaks to the villages generally urging the 'management' of expectations, but through the varied voices of a changing cast of employees. These actors manufacture information and variously disburse streams of content into the villages, where villagers unevenly receive, make sense of, and reproduce the knowledge. This chapter seeks to understand the entanglement of this uneven distribution of information, the spread of rumours, and the texture of uncertainty about the future.

Homa and Water

Collecting water in the villages closest to the mine is overwhelmingly a woman's task, as in many other places. Women and children collect water from rivers, open wells, and closed wells. Sections of streams are known to be used for washing clothing, bodies, and other items, while other sections are reserved for collecting drinking water in one to five-gallon

plastic buckets and jerry cans. Open wells are monitored by each of the village's committees on water. Each of the villages in the ward closest to the mine, home to between 4,000-7,000 inhabitants, have fewer than ten closed, hand pump operated wells, all in various states of (dis)repair. Use of these wells may be free to inhabitants or may require a monthly payment to a maintenance budget.

Women and some men in all three villages nearest to the mine agree that, while there is enough water for rain-fed irrigation of crops, there is not sufficient clean water for drinking in the villages. In response to this dearth of water, as part of its community development initiatives, the Mbarang'andu WMA paid for hand pump wells to be dug in all its member villages. In Likuyu Sekamaganga, Mantra provided funding for the well, as part of its larger role in the 'Friends of Mbarang'andu'. The strongly voiced need for more water is foundational for this section in the context of other concerns about water: that water is rumoured to be contaminated by Mantra's activities and that the Mkuju River Project, and its associated work force, may drain the area of the little water that it does have.

Hamidu, a twenty-two-year-old farmer sitting with his back against the burnt orange mud wall of his house, explains that despite cultivating six acres, he struggles to get ahead.[107] Elephants and baboons destroyed three acres of his garbanzo bean crop in 2015 and 2016, even though his farms are not all in the same area. Hamidu is married and has one small child. His parents fled Mozambique's civil war and he was born in Tanzania in this refugee camp-turned village. Hamidu says the soil is increasingly depleted, but there is enough water and forest to meet their current needs. He tries to push ahead, he explains, but always ends up getting shoved behind. Asked about the Mkuju River Project, he says '*Tungependa kuwenda… Tunashindwa kuwenda. Tunasikia homa inakuja na inapungua nguvu mwili*' (We

[107] This is a pseudonym.

would like to go [to work at the site]. We are losing out on going [to the mine]. We hear there is a *homa* (fever, see below) that comes and reduces the strength of the body). He explains that he heard about the *homa* from other people in the village, where young and old discuss it. He clarifies that the *homa* '*pungua nguvu za kiume*' (reduces male strength*).* Despite the threat of this illness, he confirms he still would accept an opportunity to work at the mine.

In the same village, a twenty-four-year-old discusses how he cultivates three acres in a single farm. In 2016, elephants ate nearly one and a half acres of his crop, an increase from destroying an acre of his crop in 2015 and 2014 respectively. He filled out a form to request compensation for the damages from the government that year, in 2016, but has not yet received payment. He knows it will be hard to expand his farm, since there is little available land as the village presses up against the border of the Selous Game Reserve. Asked about the possibility of the mine, he explains that the working-age people in his village have not received employment opportunities there. He would want to work at the mine, but he also acknowledges the rumours of the *homa*. He feels that, '*[K]una wengine wanaogopa wengine wasiogopi. Mi siogopi*' (There are some that are scared and others that are not scared. Me, I'm not afraid).

The minder and unofficial village leader, Rajabu, describes this *homa*. He says that the *homa* is tied to water: that people think the water reduces overall strength in men's bodies, and by that, he means that it reduces male fertility.[108] Rajabu never 'helped' the young men speak to me about the *homa*, but clearly, he is familiar with it. *Homa* is generally translated as 'fever' but has wider connotations in this area and throughout the Kiswahili-speaking world. *Homa* can be an illness itself or may be used to describe an array of illnesses, not just an above-average body temperature, as perceived in Western medicine (Winch et al.

[108] Young Tanzanian men discussing threats to, potentially their own, fertility with a young, unmarried, white, female researcher raises some difficult intersectional questions that are unlikely to be resolved in this thesis.

1996). Rather than offer a translation, this chapter describes the illness as the villagers do when speaking in Kiswahili.



Figure 15 Women in Likuyu Ward pump water at a well sponsored by Mantra. (Photo by the author).

Rajabu went to the Mkuju River Project the previous day, he says in a meeting with the chairman of the village and myself.[109] '*Mantra kizuri, kizuri sana*' (Mantra is a nice place, a very nice place). He says that because they have not cut down trees in the area, he thinks it is a place that is good for tourism. He went to the site as the acting Village Executive Officer, the appointed civil servant position that has not been filled in his village. On his visit, he and a few others from Likuyu Ward reviewed the environment at the mine, focusing on water and wells. On the road to the mine, their truck drove over a big snake, killing it. '*Pana geti, tulianza kupima*' (At the gate, we started to measure/test). He says they were measuring

[109] Although the mining company knew I was in the area at the time, I was not informed of this visit, nor was I invited. I was officially denied permission to visit the mine in 2016, when I was notified verbally that I did not have 'sufficient purpose' to warrant a visit and that there was 'no activity' at the site. My written requests to visit the site in 2016 never received a written response.

for uranium.[110] '*Tuliokai vizuri tu. Tulizunguti… maliasili mbali mbali. Kuangalia tanki ya maji—900L*' (We just sat nicely. We wandered around…. various natural resources. We looked at a 900L water tank). He says the tank was for drinking water. The village chairman asks where the water came from and he explains, '*Wanatoa kwenye mto, wanasema mto Horogwe*' (They took the water from a river, they say the Horogwe River). He continues, '*pale ele maji wanakuwa wanapima—gram—zinaitwa 'Akril' zikifika zili 0.1 maji inatumika nzuri kwa sisi*' (that water was measured—gram—it is called 'Akril' and if it reaches 0.1 the water is good for us to use). I ask him what he means by Akril, and he reiterates that it is used to clean the water.

He goes on to describe the rest of the day, '*Na tulipewa funza moja. Maji ya mvua—tunaweza kutumia hati ya mwezi tatu kwa kutia mafuto ya kula kama una dawa. Basi kutoa mafuta kutia kwenye majij haya unaweza kutumia kwa mieze mitatu*' (And they gave us one educational training. Water from rain—we can use it up to three months with application of oil [Akril] to treat it like using a medicine. Essentially you put the oil [Akril] into the water and there you can use it for three months). He continues, '*Hayo iliokuwepo vile vile tuliambiwa tukirudi nyumbani tubaye na wananchi tujadiliane. Tutachota maji ya mito mbali mbali. Halafu ya pimwe ya maji—[I asked who] wale watakuja hapa [Mantra]. Kama ele maji inaathirika maji inabidi maji mionzi*' (It was just as we were told when we return home and we should talk with the people about it. We will draw water from different rivers. Then the measurement of water—[I asked who] the ones who will come here [Mantra]. If the water is damaged/affected, the water has to be radiation water [irradiated water?]). The schedule is that Mantra will come on July 5, 2016 to see the water in the village. They will test the water for radiation. '*[H]alafu watarudi Mantra. Hata chukuza pale pale [Mantra]. Wakiona maji*

[110] During my visit to the Mkuju River Project in 2014, the vehicle I rode in was stopped at the gate. The driver was breathalyzed for alcohol by the gate guard.

athirika watajibu, ikiwa maji safi watajibu' (Then they will return to Mantra. They will test the samples there at Mantra. [I had asked where their laboratory was located]. If they see the water is impacted they will respond, if the water is clean they will respond).

The village chairman confirms that there were young men in the village who were afraid to go work at Mantra because they fear the water is unclean. Rajabu says that was the reason why Mantra did the water testing. He says I could talk to them about it further. Rajabu adds that, '*Mgodi bado hawajafunguliwa*' (The mine has not yet been opened). Then he says that Mantra would do a seminar for leaders of the villages. '*Watarudi kuwamasisha vijana—kikao*' (They will return [to the villages] to calm the youth—[about the *homa* by holding] a forum). The village leader confirms that water experts taught them at the site, and that they were Tanzanian. He says that there were white people—French—at the mine. As our conversation draws to a close, both the chairman and the leader try to convince me that the mining company is American: '*wenye wa mgodi walisema kompuni Marekani*' (they at the mine said the company was American). '*Wanakuja Obama. Ameshawahikuja Tanzania*' (They came Obama [Obama and his Administration came]. He has already come to Tanzania). We all agree that Obama came to Tanzania on other business and did not come to this area. On a final note, I mention that I do not think it is an American initiative, but that it is Russian. Both men remain unconvinced, still thinking it is an American mine.

The previous afternoon, I discussed the same issues with another leader who was part of the group brought to the mining site. She thought her village was in desperate need of integration with outsiders who could introduce new ideas: '*nina imani itabadilika. Especially because of mgodi wa Mantra. Watu wengi watafika*' (I have faith it [the village] will change. Especially because of the Mantra mine. Many people will come). In her opinion, people still want to keep to themselves in this area and that is holding back development. Of her visit to the Mkuju River site that day, she said they were measuring ground water. Mantra said they

study the groundwater before extraction starts because they want to know about the water quality. She said people in the ward are worried they will have dirty water in the villages because of the mine: dirty with uranium in it or dirty from other contaminants.

In response to these concerns, she said someone from Likuyu Mandela village, two people from Likuyu Sekamaganga, and another person from Mtonya village were brought to the mine along with the Ward Executive Officer and herself. There were no Tanzanian government officials present for the test. She recounted that Mantra said they will start measuring water quality at rivers in the villages. She said the mining company Vice President (again, acting as the community relations officer) and another man spoke to them and informed them of what was happening in the test. Mantra will send the water daily to the Ruvuma regional lab for testing. '*Mitambo ya yapo safi. Tumekunywa safi tu hakuna shida*' (The machinery there [at Mkuju River] is nice. We drank clean [water] there is no problem). She did not speak individually with the mining company. She said, '*Bado utafiti. Hawajaanza kuchimba*' (Still research. They have not begun to dig). '*Wanapima udongo, wanyama, maji*' (They are testing/measuring soil, wildlife, water).

People in this ward are difficult, she explained: they think they know things, but they do not. They talk a lot, but they say nothing, she added. Mantra said there will be future education and employment opportunities for the villages. The company told the visiting group that they will have cameras in the bush to see which animals came before mining and after 'phase two', she recalled, not explaining the meaning of the phase system. During 'phase three' of mining, the company said there will be dust; therefore, before and after 'phase four' the company will be measuring the soil. When the mining company makes these measurements, they will bring representatives from each village. This will not be limited only to village leaders, it will also include regular villagers. The village leader said the mining company did not expect the day's visitors to go back to their villages and educate people or

share information on what they did at the site. The purpose of the visit, she twice said, was so that regular villagers could be taken to the mining site so that in the future, people cannot complain about their water quality.

The connection, and perhaps even causal relationship, between rumours of contaminated bodies and water in the villages and the mining company's effort to bring villagers to the site to drink the water, are initially apparent.[111] Rajabu and the other village leader both felt it was clear that their trip to the mine site was part of the mining company's response to the village rumours of the *homa*. However, a closer examination highlights the varied interpretations of the mining company's attempted intervention into the village rumour mill. Rajabu had a different view of his visit to the site than his female colleague from another village. From the visit, Rajabu took away a positive assessment of the mining company's care to maintain a clean, safe, beautiful environment, while others acquired an awareness of the attempt by the mining company to delegitimize any future complaints from villagers about water. Both agreed in the moment that the water they drank tasted clean, which appeared to be the most openly broadcast goal of the mining company's water-testing field trip.

The mining company's efforts in bringing ordinary villagers and not just village leaders were scuttled, in part by the participation of Rajabu. As an unofficial leader, Rajabu saw himself as standing in for an appointed leader but was likely seen by the mining company as a regular villager. The effort to bring 'average citizens' in addition to village leaders appears as a strategic calculation on the part of the mining company, thinking ahead to what kinds of complications they could face in the future if they are confronted by villagers who feel no ordinary people had access to information about water quality in the

[111] The Mining Director of Mantra refused to discuss any of their activities with me in a meeting the following month at their Dar es Salaam head office.

area. The mining company's activities, starting this educational programme before mining began, gave them an opportunity to show the villagers that no mining had started at the site. However, there did appear to be confusion or conflation surrounding the meaning of testing water at the site at that point, and the decision that the water was safe to drink that day. In addition, Rajabu, whose interventions with respondents injected a certainty and consistency to responses, in this instance becomes a conduit for the mining company's information about water. The assuredness with which Rajabu details the intent of his visit contrasts with that of the other attendee; the situation is hardly certain, from the quality of the water, to the purpose of the visit, to whether the mine is American or Russian.

How might water quality prior to mining activities relate to water quality at different phases of mining? The mining company seemed to explain that they would be doing periodic testing of the water at the site and in the villages. This temporal aspect of water quality is further compounded by geographic location of the water testing. Taking villagers to the site of the mine would seem to be an effort to dispel rumours directly related to fears that people may be harbouring about going to work at the site in the future. However, the company's decision that they would test water quality in the villages indicates that they are aware that people are or may be sceptical of the safety of their domestic water sources. Testing water in rivers running through the villages seems a hollow gesture when it is not clear that the villages, and their above and below ground water resources, are downstream from the mining sites, since only minimal hydrological research has been completed and made public through the ESIA. Rivers are only one source of water in the villages. Wells, another important source of drinking water, were not mentioned as part of the mining company's testing scheme. Perhaps that was an oversight on the part of the village leaders' recollections of the visit, or perhaps the mining company did not mention it to them. It is clear that the same information about water quality and contamination is, unsurprisingly, spreading through the villages

unevenly and unreliably. The same incident is recounted in different ways by those individuals who participated in the visit. As a result, the ways this information will be shared and interpreted amidst other sources of information coming from outside the villages, are not yet known.

Bodies (of Knowledge)

The movement of information in the villages beside the planned Mkuju River Project must be contextualized by their sources when known. Since mining has not yet started, and this area is remote to begin with, aside from the (fickle) popular media, outsiders infusing knowledge into the area are relatively few. The mining company actively communicates with the villages, as mentioned above, including about how groundwater would be measured before mining and periodically throughout, since there are risks of groundwater contamination. The mining company also distributed to village leaders a limited number of Kiswahili-English pamphlets providing details about radiation.[112] In addition, the Tanzanian government provides outreach to the villages through several regulating agencies, which are considered in this section. Finally, a small civil society coalition has begun programming with the villagers on uranium mining related issues. This section presents these fonts and the knowledge they introduced, annotating those sources to attempt to paint a nuanced picture of some of those producing information for villagers.

[112] The gesture of handing out fewer than fifty pamphlets to village leaders representing nearly 20,000 people who generally do not have access to internet or other sources of information should be noted. In discussions with village leaders about the brochure, there was reluctant admission that the scientific language used in the packets would probably not be comprehensible to the adult population in the area, most of whom did not have an education beyond secondary school. Regardless of the translation, scientific Kiswahili words may appear as phonemic adoptions, fully adopted foreign words, various kinds of adaptations (loanblends, loanshifts/coinages), or newly created words or phrases, all suggesting that this kind of language is not likely to be part of the ordinary Tanzanian's vocabulary (Petzell 2005).

Civil Society

Civil society in this rural area of Tanzania is not as robust as in other parts of the country. Much of the civil society activity concentrates on wildlife conservation, and generally includes minimal contact with ordinary villagers not engaged in natural resource management. As such, there was consensus that the only non-governmental organization with activities on the ground in the area was a German group referred to as 'ADAP', that worked on a beekeeping initiative meant to provide microbusiness opportunities for villagers to sell the honey they collect. There were some who said that ADAP left around 2014 because they were concerned that collecting honey in areas near a uranium mine would be unsafe, however, others rationalized that the Germans left because their funding ran out. CARITAS, the anti-poverty organization of the Songea Roman Catholic Archdiocese, began pilot programmes in the area encouraging the cultivation of soybeans and the use of improved crop storage between 2015-2016, in addition to a small savings and loans group. A small number of health-related charities intervened in the area on issues related to family planning and malaria prevention, but none had permanent projects or representatives stationed in the Likuyu Ward. Otherwise, there were no other external NGOs active in the area that did not work on wildlife conservation issues.

Tanzania Uranium Awareness Mission (TUAM) is the umbrella organization encompassing the only civil society groups working on uranium mining issues in Tanzania. TUAM is the only mining advocacy group with any type of ongoing presence in the area. Civil society organizations based in Dodoma and Songea, the capital of Ruvuma Region, participate in TUAM. Tanzania Mining Minerals Trust Fund, once an artisanal mining company, by 2014 reformulated itself to fit into a role of engaging with communities on a wide portfolio of issues, including organic farming, land rights, and HIV/AIDs prevention in addition to 'uranium awareness'. They joined CARITAS, and the Songea chapter of

MVIWATA, the national small-scale farmers advocacy group, together with Dodoma-based CESOPE (Civil Education is the Solution for Poverty and Environmental Management) to form TUAM. Since 2013, they also worked with Tanzania's most prominent human rights organization, the Legal and Human Rights Centre.

Together, the group organized an international conference bringing together sub-Saharan African organizations working with communities living near uranium mines to discuss the possible impacts of uranium mining on health. The 2013 conference, held in Dar es Salaam, and the subsequent activities of the group received funding from the Dar es Salaam office of the Rosa Luxemburg Foundation.[113] From the conference, the group produced an information booklet on uranium and health published in English. The main concentration of the conference was to raise awareness. The organizers felt that, because journalists in Tanzania, like in many countries, are often paid to write their articles, the mining company would be able to pay for positive attention on their activities. This drove the conference organizers' decision to help educate decision makers and journalists so that if they decide to write articles independently, they are able to write accurately. The District Commissioner of Namtumbo was invited to the conference; he later banned TUAM from entering the district to conduct advocacy initiatives, a decision thought to be in response to a perceived slight that the costs of the commissioner's private car were not reimbursed by the conference organizers.

The Rosa Luxemburg Foundation has a staunch anti-uranium stance, but they are aware that the organizations they fund might not have precisely the same posture. Regardless, they financially support the activities of TUAM in the area near the Mkuju River Project, and

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[113] The Rosa Luxemburg Foundation (*Rosa-Luxemburg-Stiftung*, German) is one of the Federal Republic of Germany's six political foundations. It is affiliated with the German Left Party, emphasizing an international focus and democratic socialism, historically tied to worker's and women's movements in addition to anti-fascist and anti-racist traditions. They are categorically against mining uranium. This stance comes from a conviction that there is no safe way to process, transport, or extract uranium or deal with uranium waste.

another community organization based in central Tanzania, around the site of the ongoing uranium exploration at the Bahi Swamp and Manyoni. In Ruvuma Region, TUAM has trained journalists to be better able to write independently on natural resource issues, including, but not limited to, uranium mining. In addition, they hosted a two-day training on uranium mining and community activism for a small number of citizens from the villages closest to the Mkuju River Project. TUAM's two-day training of select villagers, who they call 'focal people', on uranium mining issues, was the main effort to share information with the villages and the only non-governmental effort outside the mining company to provide villagers with information on uranium mining. Another initiative, to share uranium information with a local radio station for broadcasting was of limited success since the station's range did not include Likuyu Ward. Rosa Luxemburg also funded TUAM activists to travel to South Africa for conferences related to nuclear power, and to visit Kayelekera Mine, Australian company Paladin Energy's mothballed uranium mine in Malawi, where the group was arrested on charges of illegal trespassing and accused of espionage in December 2016 and detained until early April 2017.[114]

Wildlife conservation organizations abound in the area. With recent German funding, discussed in detail in chapter two, Frankfurt Zoological Society operates inside the Selous Game Reserve and WWF operates in the WMAs just outside the Selous. Funding for these programmes depends on the maintenance of the Selous Game Reserve as a UNESCO World Heritage Site. Mantra's concession was annexed out of the UNESCO site but not the Game Reserve and the organizations do not publicly oppose the mine.[115] However, the

[114] Tanzania and Malawi are currently embroiled in a dispute over their shared border at Lake Nyasa/Lake Malawi. Both countries have engaged in tit-for-tat arrests of each other's citizens. It is possible the eight Tanzanian activists were caught up in this international dispute.
[115] The Frankfurt Zoological Society was chastened by the Tanzanian government after it was unofficially reprimanded for its strong opposition to the proposal for the construction of a road across the Serengeti National Park, in northern Tanzania (Hooker 2014).

organizations are aware that if the mine undertakes ISL mining, there may be an impact on groundwater throughout the entire Selous Game Reserve and the environs, and have considered setting up baseline groundwater testing.[116] Conservation organizations know the mining company has an interest in safeguarding its public image by protecting elephants in the concession but also that, with increased human activity in the area, there may be an increase in poaching. Meanwhile, the mining company actively invests in anti-poaching activities with local organizations and hunting companies, as detailed in chapter five.

Conservation and development organizations have raised questions about the hydrology of the area in connection with planned mining activities. By Tanzanian law, the Mkuju River Project underwent an ESIA, which was reviewed and approved by the National Environmental Management Commission (NEMC). ESIAs, by Tanzanian law, are meant to be public documents. However, numerous failed attempts by civil society have proved access to the document is limited. The document was only publicly available in hard copy in the Dar es Salaam office of NEMC, it is not publicly available close in proximity to the people of Likuyu Ward, and it is only available in English, making the multiple volumes of the ESIA exceedingly difficult to review in full.[117] The ESIA completed for the Mkuju River Project was a study based on open pit mining, and did not contain the hydrological research germane to an assessment of ISL mining. WWF, seeing the increasing industrial activities across Ruvuma, Mtwara, and Lindi Regions of Tanzania funded a Strategic Environmental Assessment (SEA) for southern Tanzania. At every turn, the effort was hamstrung: the regional actors only permitted the SEA to move forward if the study did not account for the Mkuju River Project. The consultants designed SEA to leave commercial industrial activities

[116] Concerns about the impact on water quality during and after extraction persist with regard to ISL mining. Research continues on the impact of ISL on groundwater and the efficacy of post-extraction groundwater remediation efforts (Borch et al. 2012; Saunders et al. 2016; Ruedig and Johnson 2015; Gallegos et al. 2015).
[117] In 2017, the Magufuli Administration attempted to end what was described as 'rampant' corruption in the ESIA certificate issuing process at NEMC (The Citizen Correspondent 2017).

entirely outside of the scope of the study. Additionally, key employees from the Vice President's office, the ultimate environmental regulator, refused to meet to review the draft SEA, conditioning their participation on hosting the meeting in the city of Morogoro, thought to be an attempt by the Dar es Salaam-based officials to collect a travel allowance to supplement their base salary.

Tanzanian government

The Tanzanian government speaks through a wide array of voices from different ministries, providing conflicting information about the project. The Tanzania Atomic Energy Commission (TAEC) is the entity empowered to regulate uranium mining, and all atomic activities in the country including for scientific research and medical treatment. After the visit of a mission of the International Atomic Energy Agency and an independent audit of its regulations, laws, and procedures, the agency is poised to be the front line of the enforcement of Tanzanian regulations at the Mkuju River Project from exploration to decommissioning. TAEC is responsible for visiting the site at least annually to ensure that the company is following procedure, and that they have not yet started mining. TAEC will coordinate with other offices to regulate the mine: the Ministry of Energy and Minerals, Geological Survey of Tanzania, Tanzania Mineral Audit Agency, NEMC, Treasury, Water Ministry, and the Ministry of Natural Resources and Tourism. TAEC knows the mine conducted a push-pull test in 2016, pushing an acidic solution into the ground and making sure they are able to pull (recover) all of the solution, in a cost-effective way, but also so it does not contaminate the Rufiji River groundwater system. This is a necessary test in the process of studying the possibility of ISL mining. A TAEC nuclear scientist explained: 'Western European countries spend millions of Euros on remediation,' but he saw his position as a realistic regulator in the

Tanzanian context, '[s]o, I want to make sure we are strict and follow best practices or we will need to use tax money to pay for remediation'.

The Tanzanian Ministry for Energy and Minerals provides licenses to mining companies to explore and mine. Ally Samaje, Assistant Commissioner of Mines, affirmed that this would be the first ISL mine in Tanzania. He saw this as a normal type of mining but noted that the water agency visited the site to learn about the method. The Ministry of Energy and Minerals and NEMC were also learning about ISL mining. Together, they created an inter-ministry committee; such coordination is not required by law, but for the Mkuju River Project there are multiple permits and permitting agencies, so there was consensus that the permitting process would be made easier by creating an inter-ministerial body. As such, teams of experts from each of the involved departments go to the site together, rather than independently. Samaje expected his office would concentrate on mining uranium and exporting yellowcake, but that Mantra has said they are ready to assist up to the level of producing nuclear power. Samaje added, 'but we don't need to jump to that level'. He said there was not a clear plan to move toward nuclear power, and instead they were focusing on building the regulatory and legal system carefully for uranium mining.

Engineer Nkini, from her office at the Ministry of Water in Dar es Salaam, explained that the agency runs the policy, planning, and regulation strategies for water. Potable and safe water is the goal of the ministry, and they set water safety goals and monitor water during and after projects end. They have their own water laboratory to test samples. In every ESIA there is a guideline for possible impacts of industrial activities and a plan for how they are to be mitigated. The department measures compliance against national water quality standards. Water management is decentralized through nine water basins which each have their own laboratory, with the main laboratory used on a referral basis. Within the agency there are three core departments: rural water supply, urban water supply, and water resources. Rural

water supply is decentralized to the district level and the larger regional level. Each water basin has a board, which meets to discuss water allocation and permitting. The engineer explained the Water Resources Management Act II of 2009 mentions the mining industry, stating that no one can discharge waste into the environment. This gives the Water Ministry jurisdiction to monitor mining activities.

Nkini sits on the mine closure team in Tanzania, working with the Ministry of Energy and Minerals and a number of other agencies. Water is a key issue, especially relating to tailings dams. There is a quarterly monitoring mission to ensure tailings dams are maintained properly and that embankments do not exhibit signs of seepage. The team has dealt with cases where heavy rain broke tailings embankments and waste leaked. She recounted that, in these cases, the companies would be penalized and might possibly be forced to close. Normally, all waste within the mine is checked against the procedures set up in the Environmental Management Plan. According to Tanzanian law, discharge permits are required to ensure waste meets standards before it is released. Asked about water consumption, she said the mining industry consumes a lot of water, but most mines in Tanzania do not have water shortage problems. Many projects recycle water, collecting water and returning it back into the process, reusing both water and cyanide used to process the minerals. Water consumption by industrial actors is managed through a decentralized system, where Basin Authorities allocate permits and levy fees according to the amount of water consumed (surface or groundwater).

In 2016 and 2014 Engineer Nkini said she visited the Mkuju River Project. When asked about the ISL mining, she said that they will not process the uranium at the site but that, ‘they make cakes’. She went on, ‘When I went there, [there were] so many allegations… [of] pollution, radiation’. She said she saw that in the area the local people still grow food and eat the food and did not seem to be impacted. She went on to say that she never saw anyone

in the area who looked like they were made ill from radiation. She asked me if I had been to the area and if I had seen anyone sickened by radiation. I told her that I was not a medical doctor able to diagnose the symptoms, and so I did not know. She said that at the mine, 'in reality they don't process there. They make cakes…' She continued to say that if the mine was 'processing', she understood that there would be 'decaying… radiation and impact', but since the processing of uranium was not taking place at the site, 'I don't think there's any impact'. She went on to say that if the company processes the uranium they will follow international regulations. 'I saw many people. They are so healthy. I didn't see anyone impacted [by radiation]'.

Nkini said that in 2014, she went to the area of the planned mine to present a paper. She initially explained that her paper discussed the 'impacts' of yellowcake on health, but she later clarified that she did not mean yellowcake, but instead meant the impacts of the (2014) activities of the Mkuju River Project. She confirmed that she dispelled rumours about 'impacts'. The visit was organized by the Ministry of Energy and Minerals as part of their normal process of providing awareness training to communities near planned mines to 'avoid violence and negative things' according to Nkini. She said the government wants to offer the area 'development' but 'some are against it'. She saw that the government needed to give the community information on the planned activities and how the country and the community will benefit from the project. The government officials wanted all to understand that it is a 'win-win situation', as Nkini put it. She declined to share the paper with me, and then we moved on to discuss the types of mining. She said that she is an environmental engineer and she is an expert in all types of mining. Each type of mining, she said, has its own type of chemicals and minerals have their own type of discharge. Engineers must know the chemicals used in processing and their impact on living organisms, she explained. Asked if the ministry

would need any additional training to be able to regulate the new type of mining, ISL, Nkini said no. She claimed the ministry already has the expertise to monitor ISL mining.

Different elements of the Tanzanian government articulate issues related to the Mkuju River Project in various ways. The ministries had differing views on their internal capacities to regulate the mine. TAEC referred to the international community's involvement in educating their regulators to bring them up to world-wide standards and harmonize Tanzanian law and regulation with global best practices. The Ministry of Energy and Minerals acknowledged it had never regulated ISL mining, but that this type of extraction would not be regarded differently than any other type. Both those agencies were sure mining had not yet begun at the site. The Water Ministry spoke about the project as if mining had already started, and of the impacts of industrial activities as if they might already be visible in human health. The engineer asserted that, since she did not see any impacts on health, there must not be any impacts. The certainty with which the engineer spoke contrasts with the other, more cautious positions of different divisions of the Tanzanian government, and serves to undermine her (agency's) credibility. Villagers recollect the engineer's visit to the villages to speak about the benefits of the mine and the lack of impact, but this message of certainty is inconsistent with the other ministries and their openness about the possible impacts of any extractive activity, however, the external relations of the other agencies with the villages have been negligible. Combining the various voices with which the Tanzanian government 'speaks' to the people in the villages closest to the mine with the non-governmental sources of information (from the mining company and a small community awareness effort), the proliferation of rumours about the possible impacts on human health are hardly surprising, and maybe even should be seen as inevitable.

Mining and Urbanization

People in the villages closest to the mine integrate information coming to them from a variety of external sources with their knowledge of how the locality functions currently. Threats to male fertility and the contamination of bodies through water and mining-related activities are not the only concerns that people in the villages closest to the mine identified. This section accounts for the rumours about the project among other concerns locals raise as they considered the future of their villages in relation to impending large-scale extraction.

Villagers generally lived in the same village or within the same ward or district as their extended families. Young adults would often spend short periods of time in other parts of Tanzania, generally working and occasionally pursuing education at the secondary level. Locals complained when the clinic in the village ran out of medicine, a frequent occurrence. Women privately discussed the preferred nurse for delivering their babies and whispered of avoiding the health worker generally known to be less supportive. Parents were concerned that teachers at the school would leave because they could not provide the standard accommodation allocated to teachers working in Tanzanian government-funded schools. Villagers were frustrated at the lack of water in the area for drinking and cooking, and that the few water pumps in each village were frequently out of service for long periods of time while waiting for funds and the attention of skilled maintenance crews. As detailed in chapter six, local people were increasingly concerned about having access to sufficient land for agriculture in the near future.

Along these lines, the Ward Executive Officer gave a great deal of consideration to his ideals for the future in the village. He first hoped that, in terms of health, every villager would have health insurance. He went on to say he hoped in the future: '*Dawa zakutosha katika zahanati. Watumishi ya kutosha. Wananchi—tutahakikisha wanapata elimu ya afya—kwa maana ya chakula bora, usafi wa mazingira, kunywa maji aliyochemshwa, na kuwa na*

choo bora' (To have enough medicine in the clinic. To have enough clinic employees. For citizens to be certain to receive health education—such as nutrition, keeping a clean environment, drinking boiled water, and using an improved toilet). Pregnant women should go to the clinic and give birth at the hospital, not at home, he added.

In discussing concerns about life in the village at present, most people did not mention that the area has no electricity. For celebrations, people rely on portable diesel generators moved on motorcycles to power large electronics like speakers. Individuals have solar products that range from palm-sized panels used to charge a battery for a single light bulb to roof-mounted photo-voltaic panels connected to a battery used to charge cell phone batteries and several lightbulbs. In July 2016, the nearby town of Namtumbo began the process of receiving utility poles along the road connecting it to the city of Songea. Southern Tanzania is not currently connected to the national electricity grid. A substation at Makambako, commissioned in 2015 and funded by the Swiss International Development Cooperation Agency (Sida), and a 330kV transmission line would connect southern Tanzania to the national electricity grid. These infrastructural hurdles stand in the way of creating an electrical grid that covers the entire country and would allow the construction and operation of some of the planned power plants located in the southern part of the country: a natural gas turbine combined power plant at Mtwara (300MW, intended to be online in 2021), Mchuchuma coal power station (300MW, intended to be online in 2020), Ngaka coal power station (200MW, intended to be online in 2019), and a hydropower plant at Stiegler's Gorge (2,100MW) (Tanzania Electric Supply Company Limited 2017). Tanzania's development plan predicts installed power capacity must increase to at least 10,000MW by 2025, from the existing 1,583MW (as of April 2014). Meanwhile, Tanzania's energy sector has been plagued by corruption scandals (Kenny and Soreide 2008), at the construction and management

phases of projects, perhaps leaving Tanzanians with jaded hopes for the power of electrification (Degani 2015).

As people looked to the future, villagers, and village officials in particular, raised concerns that are broadly associated with rapid urbanization. From across Tanzania, problems arising in the areas around commercial and artisanal mining sites are well-covered by the national media, and are inevitably part of the perspective of those living near the Mkuju River Project as they think about their futures (Bryceson et al. 2012). Locals raised concern about the spread of HIV/AIDS in their villages, from its relatively moderate levels (Tanzania HIV Impact Survey (THIS) 2017; Larmarange 2014). A joint initiative to mitigate HIV/AIDS in infrastructure sectors, signed in 2006 by the World Bank, the African Development Bank, and several other major international financial institutions and donors, requires HIV/AIDS prevention and treatment efforts at all major infrastructural activities in Tanzania. Although not discussed in the village, the mining company pinned posters around the mining site warning workers of the risks of tuberculosis. Tuberculosis is associated with silicosis caused by dust inhalation at underground mines (Mills 2008), including those for mining uranium (Hecht 2012b). Tanzania already bears a high burden of tuberculosis, however, Namtumbo District is regarded as having a successful tuberculosis management campaign, but it is unclear how this will cope with the influx of workers at greater risk of infection in the area (Ministry of Health and Social Welfare 2013).

Other concerns surfaced relating to the general category of the ills of rapid urbanization. The Selous Secondary School, situated on the road to the mine, between the closest village and the concession, has become a locus of concern. The principal of the school acknowledged fears that girls at school will enter into relationships with miners, an especially great risk in Tanzania, where pregnant girls are often excluded from pursuing mainstream schooling after giving birth (Pinock 2018). Villagers raised general concerns about increased

crime in the area. In association with consideration of the construction of a paved road through the villages, villagers mentioned the mining company arranged for education about road safety. A District police officer came to one village and addressed primary school students about safety on the road that is poised to experience commercial traffic for the first time. One senior nurse raised concerns about the mine resulting in insufficient or expensive food and water in the area.[118] Questions about water sufficiency were also articulated by Selous game rangers aware that commercial mining requires vast amounts of water; they voiced concern that mining activities would deplete the local groundwater supplies or lower the local water table, impacting humans and non-humans alike. Still, the Ward Executive Officer thought that the ward would benefit from the mine, in terms of jobs, but also in terms of improvement of the road, water infrastructure, health, and education. Mantra already sponsored the refurbishment of two libraries in secondary schools in Namtumbo District, the distribution of several hundred desks to schools across Ruvuma Region, support for the construction of a laboratory at the Selous Secondary School, as well as paying for the emergency replacement of the roof at the Likuyu Sekamaganga Primary School following its damage in a storm in 2015.

The rumours about water contamination and *homa*, in addition to fears about urbanization, are fundamentally connected to the anticipated influx of workers associated with the mining project. Fears about risks to male bodies that work at the mining site are entangled with the rumours that mining has already begun, and that outsiders are coming to the area and taking mining jobs, leaving locals without employment at the mine. Similarly, fears about a spike in HIV/AIDS infections are embedded in familiarity with other areas of Tanzania that experienced the same in the face of rapid urbanization. The hypothetical men

[118] At the time of the conversation with the nurse, at least one other researcher came to the village and asked the health workers about uranium mining issues, which may have influenced her attitude.

who come to the area to work for mining-related projects may start relationships with local women and girls, developing new networks of sharing the social capital and financial wealth coming from mining jobs, perhaps to the exclusion of local men. The gendered elements at play here are impossible to ignore and are considered in depth below.

Local men may be worried that outsiders will 'take' their women (after taking their jobs, prestige, and wealth). They may be fearful of being replaced by outsiders. Local men may also be anticipating their victimization if they do work at the mine and expose themselves to the contaminating agents thought to exist in and around the mining site. The risk of contracting *homa* and its imminent threat to male fertility appears as an attack on both their masculinity and their capacity to produce wealth in the form of wages and families, in an area where large families are prestigious and, often, necessary for the labour-intensive hand-tilled cultivation that is the norm for agriculture.

Men may also be seeing the mine as an entity that will extract something from them—their fertility. The transactional nature of wage work at the anticipated mine demands the input of labour from (generally male) bodies in exchange for a cash wage and the prestige of working for the commercial endeavour. However, if men see that there is an additional transaction in the process of the labour-capital exchange, the extraction of their labour but also their reproductive capacity, perhaps they see that their employment at the mine comes at an unknown, feared cost. Adding to the anxiety caused by the rumours, women in one village noted that Mkuju River Project workers were taken by the company periodically to Songea town for health testing. Some of the women saw this as evidence of a responsible company caring for employees, while others more sceptically wondered what the testing was for, and whether the workers were taken to Songea for the sake of secrecy, discretion, or for access to the most well-equipped hospital in the area.

The focus on men—the male worker, the male body, the excluded male villager—only presents half of the picture. Village leaders, speaking on behalf of their constituents in a meeting, asked the mining company representative if women would have the opportunity to work at the mine. The leaders were told women could apply for jobs, but it was broadly accepted that men would obtain more jobs from the project than women.[119] Still, some young women hoped for jobs at the mine, and anticipated work including cleaning, washing, and cooking. Women in the area are the primary farmers and water collectors. The generally flexible interpretation of Islam practiced nearly universally in the area continues to allow for polygamy, while still permitting women sexual freedom. Re-introducing some of the regional differences noted in chapter seven, outsiders coming to the area, generally thought to be Northern Tanzanians, are more likely to be Christian, and come from a different ethnic group. The influx of men different in terms of ethnicity, religion, and geographic origin may have unpredictable impacts in Likuyu Ward as the mine develops.

The link between water quality and *homa* can be explored via the dimensions of gender, urbanization, and development. As principal water collectors, whether from a river, a pump, or an open well, it is generally women and girls who extract water. Contaminated water would, therefore, first come into contact with women and girls in these villages. It would then be the women and girls who bring the contaminated water into the home for drinking by the entire family, and it would be women and girls who cook with the water and introduce it into the food for the family. In this way, women and girls could become the channel exposing the family, and therefore the villages, to contaminated water.

The mining company committed to joining the overall discourse surrounding mounting fears about water quality in the villages with their pronouncement of water testing

[119] During my visit to the mine in late 2014, there appeared to be fewer than five women working at the site and approximately forty men. So, this perception seems accurate.

in the villages. Introducing notions of urbanization shifts the ways in which Mantra's intervention can play out. Village leaders and villagers alike all expected the construction of the road through the village would bring other infrastructural interventions, including electricity and piped water. Under this perception, the development of the water infrastructure, made possible only because of the construction of the mine, could be the conduit bringing contaminated water into the villages. Piped water could relieve women of some responsibility for water collection, shifting gender roles. In that sense, the fear of water contamination could be connected to mistrust of the infrastructural investments in the area, thought to be the result of the mining industry but perhaps constructed entirely separately from mining efforts, if they are constructed at all. The Mkuju River Project ESIA makes no mention of bringing water infrastructure to the villages, nor has the company expressed any plans to build water infrastructure in the villages aside from the two hand pump wells they sponsored in one of the villages in Likuyu Ward. Even without infrastructural investments, the purported plans for village water testing by the mining company may still appear to villagers as an intervention by the company, one that may be interpreted as a 'development' project by its neighbours.

Contextualizing rumours among concerns about urbanization exposes aspects of the complexities of local expectations for the future, in particular, some of the ways villagers embroider their opinions and plans with tangled, conflicting, and overlapping information. Like the sources of that knowledge, the (positive and negative) expectations of the future are interconnected, and, in some cases, possibly realistic. Regardless of their relationship to reality, the rumours appear embedded in a quagmire of information about what might come to the area along with the mine.

Conclusion

Beyond employment, people in the villages closest to the Mkuju River Project expect this major extraction initiative to impact them with infrastructural, demographic, and health consequences. Although most people vocally support the mine, amidst dependence on small-scale agriculture and limited alternative economic opportunities, hopes for the future of the mine are tempered. From a muddle of information available, people in the villages closest to the site are attempting to position themselves for the possibility of industrial extraction. Mining company outreach, communication from the Tanzanian government, grassroots initiatives by civil society organizations, and rumours all intermingle in the area. In the process, it is evident that more information does not necessarily mean less uncertainty; in fact, more information seems to induce greater uncertainty.

Unpacking the rumours around the Mkuju River Project, the external threats to body, masculinity, and future, we can see the ways in which uncertainty is felt in the body. The 'truth' of the rumours in this sense is irrelevant since the embodied experiences are real. In this way, the hearsay alone is affecting everyday life. Felt risk of *homa* and actual fact are blurred. Rather than attempting to adjudicate rumours, this chapter instead traced the sources of information and highlighted related evidence that may have led these stories to have traction or maintain momentum. The pitting of local wisdom about the *homa* and the seemingly associated fears about water contamination against information from the mining company about water constitutes one epistemological nexus. Yet, people in Likuyu Ward, and everywhere, do not simply receive information from a single source, nor do they necessarily create oppositions with differing sources of knowledge. The Tanzanian government, and its manifold regulatory bodies engaged in the development of the Mkuju River Project, creates multiple and sometimes conflicting streams of content about various aspects of the mine. Local people receive additional advice from a non-governmental

organization, which aims to raise awareness about uranium and its risks and benefits. Once-discrete pieces of information brought into the fold of understanding may, in the process, be misconstrued, by accident or by virtue of cross-pollination with other details. Adding vague information, or even purposeful misinformation, to the mix, the uncertainty created in this melting pot of knowledge is, perhaps, all but guaranteed. Who benefits from this uncertainty? Does the uranium mining industry and government regulatory infrastructure benefit, in terms of ability to undertake this billion-dollar initiative, in part by manufacturing ignorant, compliant villagers? Do villagers, hoping for employment, ignore or contest a negative rumour in order to protect their own future job opportunities?

Anthropologists have documented the ways in which rumours often appear in situations when new activities emerge and create uncertainty (Bonhomme 2012). The incursion of industry in an area otherwise devoid of such activity would initially seem to fall into this category. It seems necessary to consider how specific these rumours of *homa* are to resource extraction, as opposed to other industrial activities. Civil society, raising concerns about ISL, appears to calculate that it is the proposed method of extraction that is a source of concern, not solely tying their unease to the type of mineral extracted. These groups voice concerns about the impacts of hydraulic fracturing activities like those involved in ISL mining, particularly in light of recent experiences of natural gas extraction in other parts of the world (Colborn et al. 2011). Civil society, especially in the case of conservation organizations, may take this tack as they had previously lost the footing from which to protest the overall construction of a mine as a result of the UNESCO decision to annex the mine out of the Selous World Heritage Site and the Tanzanian government's approval of the special mining license for the project.

Moving uranium to the focus, the mineral is, for many, indelibly connected to fears of radiation and apocalyptic nuclear weapons attacks (Gusterson 1999) and power plant

meltdowns. The singularity of the uranium associated with nuclear weapons and power plants and their perceived dire risk of radiation disaster is often in contrast with what Gabrielle Hecht (2009) calls the 'banality' of raw uranium found at mines; the ways in which uranium does not become exceptional and 'nuclear' until it is processed, in part through the unwillingness of mining companies and regulating agencies to deal with raw uranium as radioactive in the careful ways refined uranium would be treated. Tanzanian government regulators appear unevenly cognizant of the risks of uranium mining. Tanzanian civil society, informed by German anti-nuclear campaigners, spreads awareness of the hazards in the villages surrounding the project. In the villages, it seems this risk may be taking on a 'felt' form. However, this embodied experience of the perils of uranium extraction may or may not be the result of the purposeful distribution of knowledge detailed so far.

The scientific community continues to debate the impacts of radiation, particularly the health impacts of long-term, low-dose radiation, like that which may be experienced in villages near a mine and yellowcake processing facility. Doubt and uncertainty are the norm in the scientific study of radiation (Goldstein and Hall 2015). On this topic, the scientific community largely falls into two camps, the dominant of the two revolves around the U.S.-based science of the Hiroshima and Nagasaki radiation studies, and denigrates Soviet or Russian-sponsored post-Chernobyl studies (Goldstein and Stawkowski 2015; Petryna 2002). The debate continues, with the socio-political context co-configuring the current state of the science. Scientists working with data from aboveground nuclear tests in Kazakhstan found evidence that radiation increased genetic mutations that were transmitted from parents to their children, though the mutations could not be linked to deformities in subsequent generations (Stawkowski 2016). On the other end of the scientific spectrum, scientists using atomic bomb survivor data suggested that it showed humans did not seem to be as sensitive to the genetic effects of radiation when compared to results of testing on laboratory mice (Goldstein and

Stawkowski 2015). Meanwhile, nuclear advocates take a step further to propose that the current radiation safety standards are overly cautious, based on a belief that there is no firm scientific data indicating that low radiation doses cause permanent impacts on human health (Allison 2009).

While not attempting to validate or invalidate rumours, we can still take concerns about the *homa* seriously. The symptoms of contamination that the young men recounted at the beginning of the section bear remarkable similarity to some of the symptoms of radiation exposure and contamination. Sickness caused by radiation, ranging from cancer, genetic mutation, skin burn, and death appear in the scientific literature amidst ongoing studies of the ways in which irradiated adults bear children with birth defects. Villagers said they learned of the *homa* from other villagers, so it is unclear if this originated in conversations with civil society leaders or their grassroots participants warning about the risks of radiation, from other sources of information about the science of radiation exposure, or if this is a rumour completely disconnected from scientific knowledge of radiation. Villagers who think mining already started at the Mkuju River Project, in the absence of any direct impacts seen on their health to date, may find this as evidence to support the public statements by the Ministry of Water that there would be no negative impacts on health in the area. Villagers who heard non-governmental representatives explaining the possible risks of radiation exposure may be inclined to validate concerns about water contamination and *homa*. The rumours about the status of the mine are difficult to detach from rumours about the possible contamination of bodies and water.

The threat of diminished fertility caused by radiation has a basis in scientific knowledge of exposure to radiation, but the present thesis is not a scientific study of radiation and health, and so instead can focus on some of the specificities of cultural understandings of infertility. Until the early 1990s, infertility in the Global South had received minimal

academic attention (Inhorn and Buss 1994), and early studies suggested women bore the major burden of infertility around the world (Inhorn 1994). More recent studies consider health care interventions in male infertility in Malawi (Parrott 2014), and the connections between impotence and male infertility in Zimbabwe (Moyo 2013). Much of the literature contends that (in)fertility is 'inherently political' (Inhorn 1994), and in the case of male fertility, often deeply connected to masculinities. Inhorn and Wentzell (2011) describe masculinity as 'emergent' and put forward a theoretical approach that accounts for the processes of change within a normative culture, highlighting in particular how, amidst the experience of infertility, manhood is plural and dynamic, especially in the context of health technologies.

The connection between *homa* and (in)fertility, targeting youth, full of vitality and strength, who would be capable of physical labour at the mining site, foregrounds the perceived threat to masculinity. In the Tanzanian context, the construction of manhood may be instructive: in northern Tanzania, myths circulate of men with closed anuses and infertility for the Chagga people can result when faeces (male) come into contact with anyone else (Moore 1976). These kinds of changes in fertility suggest some of the interconnected anxieties about the unbounded male body, sociality, and procreation that are also relevant at the Mkuju River Project. Invisible, unknowable, and perhaps slowly accumulating toxic agents (thought or able to perforate the body) raise questions about what contaminated bodies and spaces are, and what happens when those bodies and spaces cease to be productive and, themselves, turn to waste. The relationship between bodies, toxicity, waste, and value, from the Marxist *lumpenproletariat* or the superfluous worker (Ferguson 2015), to the human-as-waste (Yates 2011) all highlight the ways in which human bodies are economically (and sometimes physically) displaced from work or the wage-earning world, but also revealing the ways this bleeds into a social displacement as well.

This focus on the body allows us to try to account for the rumours of infertility caused by *homa* separate from scientific explanations of chemical contamination. The body gives these rumours a material form, as we try to think through the ways that pollution can be connected to social reproduction. The body, permeable and unbounded, is enmeshed in the expectations for the future, as evident in the rumours of male infertility. Beyond the Douglas (1966) suggestion of the symbolic body, physically bearing the signs of societal sensitivity by way of physical violations of the body, Scheper-Hughes provides a theoretical scaffolding for which to deconstruct a 'social illness' (1993). Where sickness is a threat to the social, moral, and reproductive order, illness is political. *Homa* could be seen as speaking to the precarious lives of people as well as the social and economic contradictions percolating in the villages surrounding the Mkuju River Project. At the same time, the *homa* can be a commentary by local people on their bodies and the way that future employment or proximity to the mine may sap their life force or vitality, or the way an exclusion from alternatives to extraction-related job opportunities is also narrowing their capacity for social reproduction. Where protest against the mine may be dangerous, in terms of possible discrimination in future employment, or by way of discipline by other villagers who support the project, can the spread of rumours of *homa* serve as a 'safe way' to express fear or discontent with the development of the mine? For men who say that they have heard of the *homa* but still hope for jobs with the operation, can the sharing of the rumour be a permissible expression of (otherwise disavowed) feelings of concern about the future by casting them as rumours of contagious infertility?

If the *homa* is a social illness, the rumour might be seen as a mechanism for coping with uncertainty. The rumours themselves are carried in the bodies, not just in the bodies of young men who hope for jobs, but also in my own. As with the minder in the opening vignette who interfered in the interviews, through my physical presence in the villages and

the information I shared, I too injected certainty, and uncertainty resulted. Despite my efforts to try not to be part of the rumour mill, it may have been unavoidable. The felt risk of the rumours and the invisible risk of chemical contamination are mapped together with the more mundane bodily threats elicited by crop destruction, crop failure, or elephant attack that are prevalent in the area.

Even though the Mkuju River Project is in an area without a history of large-scale mineral extraction, people are aware of some of the difficulties that might lie ahead from the discourse in the popular media regarding Tanzania's history of mining and current experiences with extraction in other parts of the country. In Tanzania, extraction projects have similarities to development projects. In the same way development initiatives, like the village irrigation scheme from chapter seven, seem to not follow predictable timelines, and distribute benefits unevenly, so too seem to go extraction operations like that at the Mkuju River. There is local awareness that opportunities for jobs at the mine will likely be restricted to manual labour. However, the exact way in which the area will be physically transformed by mining remains unclear at all levels as plans for the mine are unfinished and not publicly available. Additionally, it is not clear what the mining infrastructure will look like at the site itself, or in the nearby villages. The places of extraction, the methods of mining, and the process of refinement will continue to be hidden from villagers, tucked away within the restricted access of the Selous Game Reserve. Once the minerals leave the mining site, they will pass through the villages in trucks, continuing on to destinations and end products unknown.

The possibility of ISL mining, as opposed to open pit or underground mining, brings attention to the subsurface transformations that may take place in the future. The visible excavation of earth in the originally proposed open pit mining contrasts with the invisible chemical processes and subterranean geological structures which determine the feasibility of

this unconventional type of mining. The expertise of the parent mining company, Uranium One, in making the extraction of low-grade deposits commercially profitable by way of ISL mining, serves to highlight the comparative lack of domestic capacity, since this type of mining has never been undertaken in Tanzania, or anywhere in sub-Saharan Africa. Through testing, the mining company can 'see' the uranium and, to protect its corporate interests, does not have to share their knowledge of the deposit publicly. The superiority of the commercial knowledge stands in opposition to the generally acknowledged need for additional training in some of the main regulators for the project. The mining company can 'see' underground from their extensive drilling, while some government officials admit lacking adequate expertise to enforce Tanzanian law. The Ministry of Water officials who come to the villages to communicate with the villagers to 'avoid violence and negative things' are assumed to have sufficient knowledge of the underground transformations that could impact drinking water and therefore public health.

Knowledge about uranium itself, its nature, risks, and uses as well as knowledge about the project are shared and spread throughout the area around the mine. In spite of the rumours about the project's progress and safety issues, young people say they are willing to take the risk to have a job at the mine regardless and are fearful that migrants from other parts of Tanzania will get jobs in their place. Critical knowledge is translated out of academic debates and commercial brochures and into the Kiswahili-speaking, unevenly educated, destitute communities around the concession. Meaningful adjudication of claims and rumours is so far limited to being an individual, rather than village-wide, endeavour.

Circling back to the academic examination of rumours, which so often seem to arise when new activities appear and create uncertainty, perhaps the vampires of colonial East Africa can, again, help to make sense of the Mkuju River Project. White (2008) dismisses allegations that rumours of vampires were mere fears, misunderstandings, or superstitions,

instead arguing that, from the rumours, we can see how Africans made sense of the invasions and extractions marking the colonial world around them. Vampires, often appearing in the uniforms of new colonial bureaucrats, including game rangers and firefighters, 'speak' of fears of new development, intertwined with an appraisal of the deepening penetration of the appendages of the colonial state. Nearly a century later, we can see parallels between bloodsucking colonial vampires and a *homa* which emasculates uranium miners at a mine yet to be. Perhaps the introduction of industrial activities associated with uranium mining in this otherwise rural area similarly reveal anxieties about new technologies, social reproduction, and bodies. The ambiguous role of the imagined Mkuju River miner, who exchanges a cash wage for his manhood, raises questions of the unknown legacies of the radioactivity associated with uranium, but also those of the miners and their families. The focus of concerns around contamination of water suggests a questioning of how the most basic needs will be met in the future, and concerns about the kinds of new, unforeseen challenges that villagers may encounter as industrial extraction inserts itself into their rural periphery.

Conclusion

> She knows little about the agreements between the Mkuju River Project and the Selous Game Reserve, the conservationist explains from her office in Dar es Salaam. She is a high-ranking representative in a major organization and has worked in Tanzania for many years. She adds that, even without the details of the Anti-Poaching Unit or the environmental management plan for the mine, her primary concern about the entire project at the moment, which is in 2016, revolves around disaster preparedness. She is fairly sure that the Tanzanian government has zero capacity to deal with a mining disaster of any kind. The conservationist fears what might happen to the Rufiji River watershed if there were any chemical spills, tailings pond overflows, or if underground wells were compromised. The Selous is so remote and lacking infrastructure, she fears it could take weeks to import any equipment needed to contain or manage an accident.
>
> Then she changes the subject, saying she recently had an experience in another aspect of her work that she wants to share. Elsewhere in Tanzania, she attended a meeting on the topic of deforestation and the REDD+ programmes in the country designed to mitigate the effects of climate change.[120] To the room of conservationists and foresters, a speaker addressed the meeting, concluding: *Don't worry about deforestation—we will have nuclear power*. She remembered the audience responding with a standing ovation.

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The Mkuju River Project mine, planned to be located within sub-Saharan Africa's largest and oldest wilderness area, the UNESCO World Heritage Site Selous Game Reserve in Tanzania, serves as the focal point of this study. The specifics of this project, a uranium mine, a woodland area of global interest, a relatively long history of conservation activities, and the involvement of the international heritage community, informed the decision to focus on the interplay of history, heritage, value, and expectations with regimes of natural resource management. This thesis posed the question, to what extent can history and heritage help to understand the changing value(s) of natural resources amidst shifting expectations for the future in an area of natural resource extraction?

This study engaged with mixed methods, including archival research, oral history collection, participant observation, interviews, and natural resource mapping, ultimately

[120] This refers to the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries.

revealing the ways in which histories, heritage, expectations, and natural resources themselves can be dynamic and multiple. Conducting research during the liminal period of time before industrial extraction began, there was a draw to examine expectations for the future in the face of uncertainty. I situated this study in the *longue durée* in order to contextualize the current situation and the positionality of actors within the historical record, creating a juxtaposition of historical antecedents with expectations of what is yet to come alongside the infinite lifespan of the radioactivity emitted by uranium. Tracing the history and plans for the mine's development highlighted the ways in which the Mkuju River Project represents, not so much a project threatening to damage a pristine wilderness, as another chapter in the longer story of extraction from the Selous Game Reserve.

The call to approach conflicts over natural resources from a 'resource materialities' perspective (Richardson and Weszkalnys 2014) was instructive for analyzing a resource not yet mined: uranium. Un-extracted Tanzanian uranium may not have been tangible during the study, but nonetheless became possible to contact via history. Tanzania's (perhaps surprisingly long) nuclear history is reviewed in chapter three. Within the larger narrative of African uranium in the nuclear world, I charted the incremental progress toward the construction of Tanzania's first uranium mine, based on previously unpublished archival documents. The mounting interest in uranium from the British colonial government did not cease at independence but was adopted by the Tanzanian government. Following the confirmation of possibly major deposits in the early 1980s, the Tanzanian government, for unknown reasons, did not further pursue uranium exploration until the first decade of the 2000s, ultimately leading to the licensing of the Mkuju River Project. This archival history is presented in contradistinction with local people's memories and oral histories. Some locals are re-remembering their history in light of the discovery of uranium. These people in the villages around the Mkuju River Project are making claims not to uranium wealth, but to the

riches of the mining company, to repay them for sacrifices resulting from their ancestors' expulsion from the planned extraction area while under British colonial rule in the first half of the twentieth century.

The articulation of local people's connection to uranium may appear to contrast with the ways in which villagers hope for jobs at the mine. Tanzanians foresee the possibility of improving their lives via wage labour, which is otherwise essentially unavailable in the immediate area of the Mkuju River (chapter seven). Villagers also anticipate some of the indirect benefits the mine will bring to their villages. I engaged with rumours to examine the contradictions between this overwhelming optimism for the project and the frustration vented by villagers who anticipated their exclusion from jobs associated with the project. Rumours circulate the area that extraction already started, and that outsiders are coming to the village and taking jobs. The financial benefits of the jobs in question form just one part of the overall construction of the value of mine-related employment. The social value of the work presents itself as multiple: bringing subsistence and small-scale farmers into physical proximity with this internationally traded, refined, and feared mineral and also closer to the site of 'development' and the modernity and possibility the mine is thought to embody. The dynamism of value illustrated in this context of uncertainty is also channelled in the impermanent affective encounters orchestrated by the sharing of rumours.

The ambivalence of value also appears when following the possibilities of uranium from its origin in the earth to the ways it may circulate through the world via markets, labour, and bodies, as investigated in chapter eight. Young people say they are willing to assume the risk to have a job at the Mkuju River regardless of rumours of an illness related to mine-induced contamination, that may or may not be an understanding of radiation sickness. Yet, rumours of a mysterious illness impacting male fertility suggest an underlying connection between male bodies and anxieties about future social reproduction. The urbanization that

may accompany the development of a commercial mine stands as an existential threat to the current way of life in the area. Anxiety about the possible negative socio-economic impacts of the mine may be unacceptable, possibly policed by other job-seeking villagers or self-policed by locals fearful of possible retaliation by the company. In this case, casting the anxiety about the future as an illness may serve as a political strategy, a commentary on the precarity with which people see themselves in the shadow of the Selous Game Reserve at this liminal time before mining begins.

Grounding the resource materialities perspective in archival and oral histories made the still subterranean uranium more tangible and the analytical framework more robust. Historical knowledge can help us better understand the progression of natural resource management regimes over time. Mapping these regimes, and the resources themselves, reveals them to have genealogies of their own, embedded in the financial, material, strategic, and psychological values of those resources. In exploring the human history of the site of the Mkuju River Project in chapter two, I argued that the 'wilderness' narrative of the Selous is inaccurate and misleading by historically tracing significant settlements and population movements in the area which impacted the creation of the Selous as the largest wilderness area in Africa. Historical knowledge can also help explain how different actors are positioning themselves in the face of the potential for large-scale resource extraction. This was the case in chapter three, wherein local people demonstrate the historical basis they rely upon to navigate this uncertain space of repeated extraction when they activate memories of their own past sacrifice and that of their ancestors. History, of an individual nature or more broadly of a group or region, links with and influences the value systems of the associated people, in turn impacting what individuals expect from their own futures.

The resource materiality framework of attending to a resource and its path became challenging to negotiate amidst multiple resources: wildlife, minerals, ecosystems, land,

water, and more. Rather than choose to set aside other resources, I found that resource materiality could be deployed to examine the relationships among resources. Land for village use appears in contention with conservation interests in land in the southwestern part of the Selous throughout history. The conservationists and the heritage community find (in some ways) the extraction of uranium to be antithetical to wildlife conservation in the Selous. Villagers in the area are concerned about land grabs and illegal land acquisitions around the mine, even though the concession is not in the village and will not directly displace a single Tanzanian from their property. Additionally, concerns about uranium, or commercial activities generally, contaminating water and ultimately causing sickness in the villages illustrate how water and mineral resources intersect.

Thinking about wildlife and uranium both as resources facilitates the breaking down of artificial barriers between supposedly sacrosanct 'nature saviours' and shadowy 'nature destroyers'. The historic overlap between wildlife conservation areas and mining areas in Tanzania, reviewed in chapter three, speaks to this nexus. Turning attention to the present, the nexus reappears in the context of Mantra's flagship corporate social responsibility initiative: the Anti-Poaching Unit. Focusing its budget for corporate social responsibility on the muscular conservation approach of a paramilitary anti-poaching force, the mining company positions itself as aligned with the Ministry of Natural Resources and Tourism, which is desperate for funding for the Selous. The anti-poaching project moves ahead without changing the mining company's position in relation to the main mining licensing agency, the Ministry of Energy and Minerals. This mining company-funded biodiversity conservation initiative, regardless of the intentions of those supporting it, burnishes the company's reputation in an international context amenable to greenwashing. By maintaining the UNESCO label in the face of elephant poaching, perhaps partly due to the funding and support for the Anti-Poaching Unit, Mantra and the Tanzanian government jointly fashion a

reality in which extraction and conservation can coexist, quieting opposition to the project and protecting the company's 'social license to operate' from international-level criticism.

In chapter two, I knitted together ethno-historical and archival information, ultimately revealing a common thread of control/discipline, violence, and extraction from the southwestern Selous. The historical record highlights a trend of the (colonial and then independent) government leveraging the presence of foreign entities (insect and human) in the forests of the Selous in order to extract village land for government purposes. A history of violence in the area associates control of resources with use of force. From controlling people and land in terms of slaves and the Ngoni invasion before the twentieth century, to colonial control of labourers and wildlife, to the current paramilitarization of poaching and anti-poaching, this entire history parallels an abiding interest in possessing wildlife (hunting). The violence, de-territorialization of land, and exploitation of local resources in the Selous by outsiders, I argue, are the historical predecessors of uranium mining in the area. Further challenging the idea of the Selous as an untouched wilderness, chapter three examined the ways in which the vast land holdings of the Selous repeatedly appear in the archival record as targeted for mineral resource exploration, without limiting the conservation activities in the area.

Land and wildlife appeared in connection and contention repeatedly in the study. From precolonial history, to colonial and post-colonial evictions, to the incursion of Mozambican refugees and possibly freedom fighters, chapter two traces the ways in which land was extracted from local people in the name of conservation. Later, chapter six introduces land as, perhaps, the most valuable resource in the villages surrounding the Mkuju River Project. Although conservation and mining dominate the macro views on the development of the area, local people are overwhelmingly concerned about land rights, outsiders buying land, and land grabs. Through an analysis of land, in connection with both

uranium and wildlife, tensions emerge that hint to the complexities of Tanzania's current postsocialist moment. Villagers concerned about land seem caught between anticipating that their (local) government will protect and advocate for their land rights and are then up in arms when local government officials behave in individualistic (corrupt) ways. This political power struggle is then intersected with the capitalist attitude of an international mining conglomerate bent on 'managing expectations' of communities in order to protect the project and therefore their profit. By engaging in a methodology integrating natural resource mapping, my research connected concerns about land and space with resources hidden below the surface, ultimately illuminating tensions between socio-economic stagnation and change in rural postsocialist Tanzania.

Connecting the history of the area with heritage, chapter four examines the role of UNESCO and the ways its heritagization system functions as a technology. The UNESCO label, marking the Selous as a site of outstanding universal value, is put to 'work' by German funders who condition their support of Selous conservation programmes upon maintenance of the label, currently in danger due to high levels of elephant poaching. This stands in contrast to recent events wherein the Tanzanian government successfully lobbied for the annexation of the Mkuju River Project from the UNESCO site. The annexation of the Nyota Prospect concession preserved the UNESCO status and, in a sense, endorsed that uranium mining could take place at the Mkuju River and not threaten the outstanding universal value of the remaining areas of the UNESCO site. In the world of UNESCO, the Selous is a virgin woodland, the creation and preservation of which would honour the (construction of a specific version of the) past for 'use' by (certain subsets of) present populations. This past, in which the wilderness is disconnected from people living in the immediate area, is also imagined into existence for future 'use' by (certain elements of) posterity.

Foregrounding rumours provided another perspective from which to encounter uranium and also map expectations during a period of uncertainty. Chapters seven and eight linked the economic-oriented rumours that mining already started and that migrants from other parts of Tanzania were taking jobs associated with the project with anxieties about a *homa*, the previously mentioned sickness said to afflict male workers at the mine site with infertility as a result of water contamination. Rather than qualifying the rumours, these chapters delved into the sources and transmission of information about uranium itself, about the health of workers at the site, and the safety of drinking water in the area. This required attending to the ways this knowledge was translated from government to citizens, from scientists to people with limited education, from English to Kiswahili, from civil society to communities, and from a commercial mining company to small-scale farmers. The streams of information, both multiple and conflicting, challenged people in the area who are attempting to decipher inconsistent messages from sources of varying degrees of trustworthiness, underscoring how more information does not necessarily lead to less uncertainty.

By unpacking the rumours around the Mkuju River Project, it became possible to think through the entanglement of development, bodily integrity, masculinity, and attitudes regarding the possibility of uranium mining. The classic anthropological technique of probing rumours was deployed to consider expectations for the future without limiting this to a narrow focus on hopes (Miyazaki 2006). By reckoning with rumours, in the periphery, a more ambivalent picture of uncertainty emerged in the context of anticipated large-scale resource extraction. The uncertainty of the moment is perhaps embodied by people who fear a *homa* that can cause male infertility. The rumour itself is carried through the body, and the difference between felt risk and actual fact disappears. Whispers of a sickness caused by Mantra's activities, despite a mounting public awareness campaign by the mining company on water quality, highlight how uncertainty is maintained in a world where actors want to

inject certainty. Avoiding the totalizing aspects of uncertainty theory, following the paths of rumours of a 'social illness' connected embodied uncertainty of social reproduction with the 'certainties' introduced by government, company, and non-governmental actors.

Toward an Intersectionality of Natural Resources and Other Theoretical Implications

Returning to the opening vignette, it is clear that uranium and nuclear power have captured the imagination of many Tanzanians. Perhaps of equal or greater relevance is the link made between nuclear power and deforestation. The speaker associated Tanzanian uranium with a modernizing optimism for the potential of (imagined) Tanzanian nuclear power to relieve the pressure on forests. Perhaps the speaker was referring to Tanzanians cutting down forests for fuel for fires, a need assumed to be eliminated by a domestic nuclear power source. Or perhaps they meant that nuclear power, generated anywhere in the world, could be part of a solution to climate change, which would alleviate the need to police deforestation (and therefore eliminate the need for the reactive forest protection programmes, such as REDD+). Either way, these practitioners, who were far from the immediate area of the mine, conceptualize uranium and forestry as interrelated. Village, district, regional, national, and international stakeholders, in contrast, did not make the link between these disparate resources in the present study. Rather than highlighting a deficiency, this can serve as an example of how uranium must be considered in connection with other resources.

Oral and archival historical evidence unearthed a number of resources explored and extracted from the planned mining area. The present and past multiplicity of resources at stake in and around the Mkuju River Project demanded an analytical strategy taking that into account. This led to an 'intersectional' approach to natural resources: uranium, wildlife (elephants), forests, land, water, and beyond. As introduced in the first chapter, Kimberle

Crenshaw's original formulation of this term critiqued dominant forms of analysis for thinking about discrimination only along 'a single categorical axis' (1989, p.140): either sex or race. She highlights how this marginalizes those multiply-burdened by racism and sexism, 'Because the intersectional experience is greater than the sum of racism and sexism' (1989, p.140). It is this conceptualization of the 'sum' as greater than the constituent categorical axes that I find informative to my engagement with natural resources. Beyond a materiality perspective of an individual artefact as it moves through the world, a resource materialities (Richardson and Weszkalnys 2014) conceptualization acknowledges what the authors of the term describe as the distributedness of resources that make them different from other elements of material culture. A relational conceptualization of a resource, as highlighted in the concept of resource environments (Richardson and Weszkalnys 2014), helps to further situate natural resources as, rather than an artefact, an assemblage of things, discourses, practices, and more 'that allow those substances to exist as resources' (2014, p.7). Building on the conceptualization of resources that are 'allowed' to exist by other things, I suggest that there is something to be gained by acknowledging that resources come into existence, at least in part, as a result of their intersections with others, including other resources. It seems that by attending to such intersections, we can advance our thinking about resources as dynamic and 'becoming' (Zimmermann 1933) partly as a result of their interactions with others without attempting to attribute intention to non-living things.

Returning to Crenshaw's theorization of intersectionality, we can conceptualize the multiple axes or vectors present at the Mkuju River in order to identify points of intersection. The multidimensionality of resources in the present thesis has been investigated spatially, temporally, and socially. Across one axis, space, there is a mine said to have one of the largest deposits of uranium in the world landlocked within a wilderness area the size of Switzerland. From this theoretical orientation, the Selous emerged, not as a place of eternal

wilderness, but instead as a ‘sacrifice zone’ (Kuletz 1998), set aside for de-territorialization, discipline, and extraction. The infinite time frame for uranium’s radioactive decay can be traced in association with the villagers’ life histories and expectations for short-term jobs at the mining site as well as the history of natural resource management in the area, forming another axis. The social vector can include the relationship between the various stakeholders, but also in terms of the different resources themselves. A study of this uranium mine would be incomplete without consideration of the intersections with, not just the connections to, land, water, and wildlife, among others.

Linking uranium with land, as in chapter six, it seems that, through speculation, it is the capacity of uranium to radiate economic possibility, and not simply radiation, that forms one of its constituent traits. Expanding from this idea, what could be gained by a construction of uranium through its material interactions with the environment in the Karoo formation that is sedimented around it? In contrast to understanding uranium based on its ability to be leached and recovered from wells above ground, perhaps we can understand its coming into being based on the geological timescales of the sandstones which host the uranium. Because the Karoo formation in the Selous Basin was identified in the mid twentieth century as having geologic potential, it was targeted for exploration. The discourses and practices that created the Karoo and knowledge of it, in a sense, also created the dispersed, low quality uranium; its potential for geologic riches perhaps also influenced Tanzanian officials to maintain the Selous and its wilderness as a way of preserving access to potential mineral resources. Going further into the geology, this part of the Karoo formation is filled with clastic sediments, essentially broken pieces of rocks, though largely sandstone. Uranium appears in these sediments as a precipitate: a solid substance that is produced out of the reaction within a liquid solution. The environment in which uranium was formed may not have ‘acted’ to produce uranium, but the intersections and interactions which took place resulted in the

production of uranium as a distributed mineral resource. The dispersed points of creation of uranium as it exists in sandstones, through the chemical reactions from liquid to solid taking place over geologic space and time, are almost a mirror to some of the ways the dispersed subterranean resource is extracted by in situ leach mining, which employs a liquid solution injected into the sandstone, causing a chemical reaction that changes the uranium (by oxidizing it), then the liquid solution mobilizes the uranium so it can be pumped, as an impregnated solution, above ground. The chemical reactions seem to form a point of intersection wherein uranium is altered and moved, so that above ground, the 'pregnant solution' can produce uranium. The technological advances of the hydraulic fracturing which allow for the extraction of natural gas, piloted in places like Oklahoma, are the reason that the sandy earth in southern Tanzania could now, potentially, come into existence as yellowcake.

Trying to think about the intersections of uranium and elephants, we can return to the history recounted in chapter three. The KUNA group leader explained that his ancestors knew that the yellow soils in the wilderness were valuable because of their utility to construct houses, but also because animals preferred to eat the soil. The animals consumed the soil, marking it as different than other soils and therefore known to humans and non-humans; this served to identify a point at which wildlife intersects bodily with uranium-laden soils. In this history, uranium comes into existence, in part because of this intersection with wildlife. While an in-depth discussion of the consumption of soils (geophagia) is outside the scope of this thesis, the absorption of uranium through the bodies of non-humans marks an intersection that, according to KUNA, serves as a basis for the historic awareness of the existence of uranium in the area. Crisscrossing the vectors of time and sociality, the KUNA leader is activating past memories of wildlife behaviours as well as a historical knowledge of those soils to create a record of past human knowledge of the existence of uranium as part of an effort to possibly 'conjure' (Tsing 2000) a current claim on the uranium mining company.

Perhaps by thinking intersectionally, we can advance our understanding of natural resources as existing relationally to each other, to humans, and to non-humans: that natural resources themselves can often be seen in a constant process of making and unmaking each other chemically, physically, temporally, and socially, where human intervention represents one intersection among many. Intersections suggest that each vector is not only changed because of the interaction but that, utilizing Crenshaw's formulation, we can see that the summative experience of the intersection is greater than that of its parts. This conceptualization, without fetishizing the resources or attributing agency to them, continues the work of materiality, relationality, and ontology to decentre the human from the focus of enquiry, and may be able to serve as another step toward a decolonization of knowledge of natural resources. Focusing on the points of intersection highlights the multiple burdens of these sites of meeting, without necessarily (re)creating oppositions between resources and vectors. In the process, we may be able to incorporate this understanding of resources, like the forests and uranium from the beginning of the chapter, as inherently co-constructed through these intersections in order to advance the efforts to retain a political awareness of resource extraction and advance a more just distribution of the benefits and costs of such exploitation (Bilge 2013).

Thinking intersectionally about resources also reveals connections between claim-making and value. In chapter three, a community group made a claim on Mantra, not for a stake in the Mkuju River royalties, but for compensation for property lost during expulsions under British colonial rule. In chapter seven, rumours about outsiders taking jobs emphasize the extent to which local people feel entitled to jobs at the Mkuju River Project. The frustration so frequently heard on the topic signals that most local people feel the jobs, and therefore wages and associated social capital, belong to them already. Through this rumour, jobs are claimed, but lost jobs and opportunities for advancement in the present and in the

future are also claimed. In a sense, this (socio-economic) injury can be seen as similar to the rumours of physical harm (male infertility) blamed on mining activities (chapter eight).

In each of these circumstances, people are making claims to wealth associated with the mining project, but in different ways. Claims of being the injured party in the case of employment discrimination or bodily harm highlight the conveyance of the self into the future; current exclusion from the project and its benefits may be established at present so they are available, if needed, at some other time. Demanding money from Mantra as reparations for colonial injustices may seem to be a stretch. Nonetheless, these demands suggest the property damages caused by colonialism are connected to the external wealth and power of a foreign mining company. Rumours about toxic water are intertwined with fears about the possible impact of uranium mining and social changes in the area. The currently low market value of uranium does not eliminate the demand for mine-related jobs at present or in the future. Claims to injury may connect, across axes, the value of future uranium with past oppression and injustice.

Reading along, against, and across the grain (Stoler 2009) of both historical information and portending rumours, this thesis avoided some of the ahistoricity sometimes criticized in the theoretical engagement with expectations and futures (Mathews and Barnes 2016). Embedding the status of the Selous Game Reserve as a UNESCO site of World Heritage within the larger history of the management of the site and its resources connects heritage with history in ways that are legible to international actors, but largely invisible to local people. The ways in which various actors interpret or portray the Selous as a primordial wilderness, now and for future generations, supports claims by Zetterstrom-Sharp (2015) of the ability of heritage to influence the future. Heritage, in the context of the Mkuju River Project, also serves as a tool with which the international community can discipline the Tanzanian government, encouraging it to behave in certain ways, though there is evidence to

suggest the Tanzanians are resisting. In this way, the UNESCO label can act as a technology (De Jong and Rowlands 2007) capable of creating pasts and futures. This thesis explored the ways in which international donors conditioned funding for wildlife conservation inside the Selous on maintenance of the UNESCO label. In doing so, these foreign countries generated additional pressure on the Tanzanian government to take action to ensure the site is not downgraded as a result of damage to the outstanding universal value of the Reserve.

The ecotourism-extraction nexus first put forward by Büscher and Davidov (2013) unsettles the conventional opposition thought to exist between conservation supporters and industrial mining. This theoretical proposition advanced debate about conflicts over natural resources by highlighting the ways in which there may be similar interests across the 'abyss' said to separate conservationists from the rest. The corporate social responsibility programme set out by the mining company, funding an anti-poaching project inside the mining concession in close collaboration with the Tanzanian Ministry of Natural Resources and Tourism, a Wildlife Management Area, as well as private hunting companies provides evidence that the 'nexus' perhaps should be expanded to encompass a broader alliance between wildlife conservation and natural resource extraction interests. A conservation-extraction nexus challenges the theoretical and activist opposition between the two, thereby creating opportunities for analyzing circumstances defined by complex or conflicting natural resource management regimes. This also provides traction for opening new avenues in the stagnating debates around consumptive and non-consumptive tourism.

The conservation community is currently defined by fierce internal divisions (Holmes et al. 2017). Conservationists, accused of being both weak and strong, both capitalistic and completely disconnected from markets, where wilderness is either outside every doorstep, or only worth preserving when far away and in vast quantities (Sandbrook 2017), often sense anthropological attention as a threat. An intersectional approach to natural resource

management may induce the diverse conservation community to introspectively examine current practices and could potentially be used to support existing efforts to limit the silo-ing of research, which has begun to stymie innovative partnerships in the field. Particularly in the context of a conservation-extraction nexus, consumptive and non-consumptive tourism along with mineral exploitation can all be seen as forms of 'extraction', which may provide pathways for future research.

As protected areas around the world face greater pressure from a variety of factors, the world warms, species approach extinction, and demands for consumer goods and so-called developed world lifestyles increase, how are we to make sense of the resulting conflicts over natural resources? The Mkuju River Project in the Selous Game Reserve illustrates many of those forces. Yet, how representative of broader trends are the circumstances surrounding the Mkuju River Project? Can the Selous, on a scale so enormous it is comparable to few other protected areas, be a test case? Do stakeholders see and treat the Selous as a model for other protected areas? Or do actors see the Selous as something else, standing in for a type of conservation of large open spaces? Is a large-scale, in situ leach uranium mine a standard to which other commercial initiatives can (or should?) be compared? Or is in situ leach mining of uranium too dissimilar from the increasingly common artisanal mining activities underway in much of sub-Saharan Africa, the (less common) instance of operation by a junior mining company, mines using traditional extraction methods, or mines that extract less admired and loathsome ores? Although much can be learned from this study, the Selous and the Mkuju River Project are rather extreme examples and are not put forward here as a test case. In the future, the Mkuju River Project may present opportunities for additional study if the project commences construction in 2020 or in the event that extraction is further delayed. Continued research on the development of the uranium mine could form a longitudinal study. Questions about the future of the

UNESCO status, labour migration, urbanization, gender issues, ecosystem impacts, and human health consequences of the development of the Mkuju River Project, traced in this thesis, remain outstanding.

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Appendix A: WMAs in Detail

The Wildlife Management Areas (WMAs) Regulations (2002) (revised in 2005, replaced with 2012 WMA Regulations) identified sixteen pilot WMAs, including the Mbarang'andu WMA. WMAs are governed under existing laws: the Wildlife Conservation Act of 1974, the Village Land Act 1999, and the Local Government Act (District Authorities) 1982; and they are enabled by a series of other related statutes: 2004 Environmental Management Act, the Wildlife Conservation Act of 2009, the 2008 Wildlife Conservation (Non-Consumptive Wildlife Utilization) Regulations, and the 2010 Wildlife Conservation (Tourist Hunting) Regulations.

The administrative process for creating a WMA begins with villages agreeing to form a WMA at a village assembly meeting. The village then forms a registered community-based organization (CBO) to allow the village interests to be represented in the corporate entity that will manage the WMA. The CBO completes a strategic management plan for the WMA. Villages then conduct land use planning exercises to survey, map, and register land, demarcating areas of village land to be set aside for wildlife tourism. Villages produce bylaws subject to Environmental and Social Impact Assessments. The WMA individually sets up a governance system, and establishes either a General Management Plan or a Resource Management Zone Plan. At this point, the CBO can apply to the Director of Wildlife, Ministry of Natural Resources and Tourism, to declare the CBO is an Authorized Authority (AA) and gazette the WMA. The AA then applies to the Director of Wildlife for user rights to the wildlife in the WMA and can apply for a hunting block or seek investments from private tourist companies in the hunting block. Companies are invited to competitively bid to lease land within the WMA for use as a hunting block. The highest bidder then is contractually tied to the villages through agreements with the WMA; bids must receive

approval from the Director of Wildlife. Villages are guaranteed a portion of the profits generated by the private tourism company.

The Mbarang'andu WMA, as an institution, reflects the belief in the democratization of natural resource management of the WMA legislation. Democratic elections take place every two years allowing each of the seven member villages to nominate two representatives to the board of the WMA. The WMA is governed by an executive committee, consisting of a chairman, vice chairman, secretary, and treasurer. The village representatives populate committees for oversight of various activities of the WMA. Village representatives to WMAs receive training in natural resource management either at the Community Based Conservation Training Centre at Likuyu or at the Pasiansi Wildlife Training Institute in Mwanza.