Partial stories: repeat photography, narratives and environmental change in Tanzania

Dr. Pauline von Hellermann

Department of Anthropology, Goldsmiths University, London, United Kingdom

p.vonhellermann@gold.ac.uk

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Abstract

Repeat photography has emerged as a popular tool in visualising climate change, yet has been employed relatively little by visual environmental anthropologists. Based on research in Tanzania's South Pare Mountains, this paper demonstrates that repeat photography can be a powerful method for environmental anthropologists both practically and epistemologically: repeat photography as a practice integrates well with ethnography, whilst the contradictions emerging through multi-modal research help us reflect on the narratives about environmental change we encounter and write ourselves. At the same time, in-depth ethnography is crucial for understanding the lived experience and wider politico-economic dimensions of landscape change not visible through repeat photography alone.

Introduction

After an hour or so of scrambling up and down the hill, we finally felt we had found the spot where the old picture [of Vudee mission] had been taken. Looking across the hills and down into the valley, I exclaimed: look how many more trees there are now! Zawadi shouted back, equally excited: And look how many more houses![1]

[Figure 1 inserted here]

Repeat photography, once the purview of quaint 'Then and Now' local history books, has emerged as an important and popular method for recording and understanding environmental change. It helps to visualise environmental changes for general audiences, such as the dramatic

[1] Extract from fieldnotes, Vudee, 12th August 2008

images of disappearing glaciers taken by James Balog on behalf of the Geological Society of America,[2] and it can show small scale developments and changes in species composition and biomass that satellite imagery does not capture. Repeat photography is by now recognised by the scientific establishment as a useful (complementary) method for recording and visualising climate, vegetation and landscape change, used by natural scientists (Webb, et al. 2010), geographers (Cerney 2010; Kull 2005) and environmental historians.[3] In contrast visual anthropology has so far, with a few exceptions,[4] been curiously silent on repeat photography as a method to engage with the Anthropocene and environmental change – a silence all the more notable given that visual anthropologists have used and thoughtfully reflected on repeat photography in different contexts (Elkins 2011; Smith 2007; Vium 2018), and have produced wonderfully innovative and important work with and about environmental photography (e.g. Thomsen 2015) and film (e.g. Sullivan 2016).

Yet it can be particularly rewarding for anthropologists to include repeat photography in their wider research into environmental change and local practices, knowledges, narratives and values, in three key ways. For one, repeat photography can considerably enrich ethnographic fieldwork. It provides an instant geographical anchor, historical depth, and an excellent starting point for discussing local environmental change. It is ideal for attracting local people's interests and for photo elicitation – using photos to elicit responses, views and stories which may not have emerged without photos (Buckley 2014; Edwards 1992). It forces the researcher to spend a lot of time walking through forests and fields, along paths and beyond them, encountering many

[2] https://www.mnn.com/earth-matters/climate-weather/stories/startling-before-and-after-images-melting-glaciers-tell-story-climate-change, accessed on 17th October 2018

[3] http://repeatphotography.org/biblio/, accessed on 16th October 2018

[4] https://anthrodendum.org/2018/08/02/repeat-photography-coastal-change-notes-research-method/, accessed 5th November 2018

different people in the process, creating new social situations and relations. Hard copies of historical photographs can be used as presents or small tokens of gratitude for local people, and indeed the repeat photography itself can be used to produce a locally appropriate historical document, as a potentially effective and meaningful way of 'giving back' to the community. In short, repeat photography ideally lends itself to engaged and community oriented multimodal anthropology (Collins, et al. 2017; Dattatreyan and Marrero-Guillamón 2019).

Secondly, at a more epistemological level, the very process of combining repeat photography with ethnographic research challenges us to think through our own assumptions and to clarify how we want to engage with environmental change as anthropologists. The magnitude and urgency of environmental change – climate change in particular but also alarming rates of extinction, etc – have meant that, in recent years, environmental anthropology, for decades a somewhat eccentric niche field in anthropology, has grown exponentially. It seems almost every anthropologist is now interested in the 'non-human' and the Anthropocene, and there is a considerable amount of funding available for research relating to the environment. This explosion of interest means that there are by now many kinds of environmental anthropology, with radically different approaches. Sanders and Hall[5] identify two broad groups here: those anthropologists who are funded by and work with climate scientists, sharing their climate change paradigm, who provide a so-called 'human dimension' but which often amounts to little more than an 'add-on' on research projects conceived and dominated by climate science; and those anthropologists, at the other end of the spectrum, who seek radically different approaches, questioning the very terms and thoughts conventional thinking rests on (e.g. de Castro 1998; Haraway 2016; Latour 2014). The identification of this dualism is helpful and important, but

[5] http://savageminds.org/2015/09/05/anthropologies-21-is-there-hope-for-an-anthropocene-anthropology/

somewhat simplifies and reduces both existing and possible anthropological 'takes' on environmental change. In particular, Sanders and Hall's juxtaposition leaves out an identifiable third group who I will here call 'empirical revisionists': anthropologists working in the field of political ecology who, along with geographers and other political ecologists, critique dominant global assumptions, frameworks and narratives, but who nevertheless pin this critique to certain truth claims, rooted in local perspectives and research (Adger, et al. 2001; Leach and Mearns 1996).

Repeat photography presents, in the first instance, an empiricist approach, in that it can make quite definite statements about local vegetation change, such as for example the fine studies in Southern Africa conducted by Timm Hoffman, Rick Rohde and others (Hoffman and Rohde 2011; Rohde and Hoffman 2012; Russell and Ward 2014; Ward, et al. 2014). Indeed, repeat photography has been used effectively both in support of dominant global narratives of climate change – e.g. to document the rapid melting away of glaciers – and by political ecologists critiquing dominant narratives, such as about deforestation in Africa (Boerma 2006; Fairhead and Leach 1996; Tiffen, et al. 1994). But the apparent certainty it offers is easily fractured by ethnography: local people's memories of landscape change often contradict the evidence provided by photographs as well as, indeed, each other. Of course, it is normal to encounter contradictions, plurality and conflicts in ethnographic, indeed in most research; acknowledging, explaining and resolving contradictions in one way or another are all integral to what we do as researchers and writers. Some do so by forging one overriding account that seems, to them, the 'true' one; others by avoiding truth claims altogether; yet others by explicitly highlighting the inherent plurality, partiality and polyphony of ethnographic research (Clifford and Marcus 1986; Edwards 1992). With the representational crisis of the 1990s long behind us

now, such ‘truth making’ processes are not explicitly discussed much anymore. But it seems worth dwelling on them a bit more again when it comes to researching and writing about environmental change, and to combining repeat photography with ethnography, because these processes not only confronts us with challenging contradictions, they also forces us to engage critically with narratives and their politics: the narratives suggested, seemingly so clearly, by repeat photography; existing global and local narratives; and the narratives that we then construct ourselves as anthropologists. Given the current concern about environmental change, it seems useful and timely to (self-critically) reflect on this process, on the ‘take’ on environmental anthropology we eventually arrive at, and on the narratives we ourselves produce.

In this self-reflexive way, I argue that, thirdly, anthropological insights and in-depth ethnography can help considerably to overcome the limitations of repeat photography. On its own, repeat photography shows little beyond vegetation and landscape changes recorded in one locality – a locality often fairly random in terms of recording landscape change – at two points in time that are equally random. Ethnographic research enhances these snaptshots immensely, in that it helps to provide not only a fuller, more detailed picture of changes in species composition and of broader landscape changes in locations and times not caught by either camera, but also much needed knowledge on why, when, and by whom, landscapes were changed; what meaning and impact these changes had for local people; and the overall social, economic and political context in which they took place. Anthropologists can go considerably further than the limited ‘human dimension add-on’ Sanders and Hall describe: when different methods, such as repeat photography and ethnography, are integrated in multi-modal research, anthropologists can provide much deeper, holistic understanding of the environmental changes captured in repeat photography, understanding that is community-based and locally relevant.

This paper will explore all three of these facets of combining repeat photography with ethnographic research, by describing my own experiences with both methods during research I conducted in the South Pare Mountains of north-eastern Tanzania, in 2008 and 2009. This research was part of the HEEAL (Historical Ecologies of East African Landscapes) project, hosted by the Archaeology department at York.[6] HEEAL brought together a small team of archaeologists and palynologists, researching different aspects of the longer and shorter term historical ecology of East Africa, in particular north-eastern Tanzania (e.g. Biginagwa 2012; Coutu 2015; Heckmann 2011; Iles, et al. 2018); my own remit, as an anthropologist, was to research recent environmental changes, memories and values. This paper, then, begins by discussing the practical experiences of combining repeat photography with ethnography and proceeds to reflect on contradictions and narratives before mapping out the plural, multi-faceted, holistic understanding of environmental change in the Pare Mountains resulting from this multi-modal research process.

Multi-modal research in the South Pare Mountains: merging repeat photography and ethnography

Shortly after joining HEEAL in January 2008 I came across a collection of landscape photographs taken by missionaries in Tanzania in the early 20th century that had recently been digitalised by the University of Southern California.[7] This collection immediately caught my attention: immersed as I was at the time in the 'empirical revisionist' political ecology literature I had long been fascinated by repeat photography and its potential for challenging dominant crisis

[6] HEEAL was funded by a Marie-Curie Excellence grant (MEXT-CT-2006-042704).
[7] These USC digital archives can be found at http://digitallibrary.usc.edu/

narratives (e.g. Boerma 2006; Tiffen, et al. 1994), and the geographical coverage of the photo-collection coincided with the area researched by HEEAL. I decided to focus on the South Pare Mountains, where the Leipzig- Lutheran Mission operated, because missionaries here took a particularly large number of clear, scenic landscape photos with visible landmarks. The South Pare Mountains were also comparatively less well researched than other parts of the Eastern Arc Mountain range, with much excellent anthropological and environmental history work existing about Mount Meru (Spear 1997), the Usambara Mountains (Conte 2004), and the South Pare's closest neighbours, the North Pare Mountains (Sheridan 2000, 2001, 2002, 2004).

Rising up steeply from the plains surrounding them, the South Pare Mountains, like the whole of the Eastern Arc Mountain range, are characterised by sharply different vegetation zones at different altitudes: dry, savannah style vegetation at the lowest levels; mixed farming, bush and forest at mid altitudes; and heath, ferns and highland moist forest at the highest altitudes, resulting in large species diversity and high endemism, particularly in higher altitudes. In fact, the whole Eastern Arc Mountain Range was declared one of the world's 25 biodiversity 'hotspots' by Conservation International in 1998. The ancestors of the people living in South Pare in the early 20th century and still today – who are known as the Pare people to the rest of the world, but call themselves Asu – started settling here in the 17th and 18th century, with some clans coming from the Usambara mountains to the south, others from Taita in Kenya (Oral sources and Kimambo 1969). They combined pastoralism and farming maize, cassava, bananas and other crops at different altitudes, skilfully adapted to different local conditions (Håkannson 1995; Sheridan 2002). The Leipzig Lutheran-Evangelical Mission set up its first and main base in the South Pare Mountains in Gonja on the eastern slopes in 1908, followed by further missions and churches in Mbaga and Vudee and a church in Chome by 1911. Most of the photographs,

taken mostly by himself but also others, were donated to the mission archives by Wilhelm Guth (1888-1980), who served as a pastor in Gonja from 1911 to 1914 and again from 1927 to 1938.

[Figure 2 to be inserted here]

During fieldwork – conducted in 2008 and 2009 – I lived in Mhero, the highest ward of Chome district on the western slopes of the South Pare Mountains (Fig. 2), and visited Gonja, Vudee and Mbaga each twice, for several days. Throughout, repeat photography was my starting point, but it merged into and was always enmeshed with wider ethnography. I brought with me around 60 laminated, sturdy A5 prints of missionary photographs – about half of them landscape pictures for repeat shots, half pictures of people, churches or mission stations that I hoped local residents might like. Indeed, the photos attracted a great amount of interest wherever I went, particularly perhaps amongst older and more historically minded people. They were usually able to identify the churches and geographical features on the old photos almost immediately and guided me to the buildings and the areas where pictures had been taken from. In fact, even for a visitor like me, buildings and landscape features were often quite easily identifiable. What proved more challenging was to find and access exactly the same spot the old picture had been taken from, as pathways had changed and new buildings and particularly trees were often in the way – in these situations, also, the sizeable group of helpers usually involved sometimes made it more difficult to insist and keep on going until the 'perfect' spot was found. Sometimes also new trees in the foreground made it difficult to see wider changes in the landscape as a whole; in these cases, I took pictures from nearby positions from which broader changes were more visible.

The everyday fieldwork practices involved in repeat photography – finding and speaking to older, historically knowledgeable men and women; then walking through the landscape and asking questions about its history – also became my central ethnographic practices. In Chome, I was lucky to find two invaluable research assistants and friends, Zawadi and Mrinde,[8] both elderly local residents with immense interest, generosity, knowledge and social connections. I would set off every morning with either one of them exploring different parts of Chome, talking to people we encountered along paths or working in fields, visiting and interviewing others in their homes. In this way I gradually came to know and understand the complex, hilly Pare landscapes and learned about plants, farming, land ownership, politics, sacred groves, family histories and much more. Mrinde and Zawadi also walked with me to Vudee, Gonja and Mbaga, where local village officials, elders and many others helped our repeat photography and talked to us about local history, practices and concerns.

Findings: repeat photography versus local memories

I managed to obtain 18 workable repeat photos: four each in Gonja, Vudee and Chome and six in Mbaga. Due to the difficulties of finding exact locations, and also most likely due to using a camera with a different angle width, no picture pair is an absolutely perfect repeat, but they are workable in that they clearly *almost* cover the same view. I have selected two representative repeat pairs from each location here. The first two pairs (Figs 3a-4b) were taken in Vudee, situated north of Chome on the western slopes and the driest of the four villages.[9] Once an

[8] Here and throughout the paper, in accordance with the wishes of those I worked with and interviewed, I am using real names. To offer some degree of anonymity, however, I am using first names only.
[9] Rainfall in the South Pare Mountains as a whole is less than on the North Pare Mountains, averaging around of 1000mm per year on the wetter eastern, and 750mm on the drier western slopes.

important mission station, with a hospital and secondary school, today it feels like it has seen better days – many of the wooden stalls of its large market were empty and understocked even on market days. Here, the repeat photography shows a definite if small increase in tree cover, both on the hills and in the valley bottom; however, today as in the past its tree cover is quite sparse and *Euphorbia candelabrum*, the dry climate plant (visible in the foreground of Fig 4a) still widespread.

[Figures 3a-4b to be inserted here]

In contrast, both old and new pictures taken in Gonja (Figs 5a-6b), the main mission site on the wetter eastern slopes and still today the largest, most important and developed part of South Pare, show more luscious and dense vegetation cover with many more trees. Here, too, however, there is a discernible small increase in tree and vegetation cover:

[Figures 5a-6b to be inserted here]

Mbaga (Figs 7a-8b), north of Gonja on the eastern slope, was a small mission post in the early 1900s and today remains fairly small, although it hosts Tona Lodge, the only successful tourist-oriented guesthouse in the South Pare Mountains which regularly hosts groups of hikers using it as a first practice base to prepare for Kilimanjaro's higher altitude. Here, the photos show definite increase in tree cover, as despite being on the wetter eastern slopes the area was quite open a century ago:

[Figures 7a-8b to be inserted here]

Finally, Chome: a sparsely populated, rather less significant part of the South Pare Mountains in the early 20th century, in which no mission station or hospital were built, it has

grown and developed significantly over the last 100 years, and in the process, tree and vegetation cover has notably increased, too, as the pictures taken here (Figs 9a – 10b) show:

[Figures 9a-10b to be inserted here]

With some variation, the pictures suggest that the overall direction of vegetation change in South Pare is one of tree cover increase: more marginal in the consistently drier Vudee and more luscious Gonja, but quite marked in Mbaga and Chome. Indeed, this was further corroborated by other photographic evidence (where repeat photography was not possible) and my own observations, exploring the areas in photographs and beyond on foot and recording all vegetation (Figs 11a and 11b).

[Figures 11a and 11b to be inserted here]

Like other repeat photography projects in Africa (e.g. Augenstein 2017; Boerma 2006; Fairhead and Leach 1996; Tiffen, et al. 1994), my photos seemed to provide a clear counter-narrative to the stories of environmental degradation and deforestation dominating international perceptions of the South Pare Mountains – exactly, as I, coming to this as an 'empirical revisionist' political ecologist, had hoped to find. But what about local memories and narratives?

Some people's memories resonated with what the photos suggested. One Sunday after church, my friend Kisenge – cobbler, farmer, evangelist – invited me back to his home in Chaimpishi part of Chome, where I met his 90 year old father. Sitting outside the house and looking at the landscape around us, he recalled, as I recorded in my notes, that "in the past there were very few families living around here, only three: one up there, one up there, one up there. The landscape was basically *pori*, bushland, only with very small trees. It was not forested

(*mshitu*)"[10] Nehemia, the secretary of the Farmers Association, with whom I had a long and interesting conversation about irrigation and land management practices in his office one day, similarly stated that "in the past, there were no trees; people had to go far away to fetch firewood. Now they can get firewood at home, just from their fields." And Mrinde also once confirmed that "in the past, many hills were covered in bush, not forest, it is only recently that people started planting trees."

However, such statements were rather few and far between in a more dominant local discourse of environmental decline. Mrinde himself, when I told him about my project, initially told me that in the past, "there were many more trees, big indigenous trees, which have now been cut down". This was echoed by many others in Chome. I chatted to Nakazaeli, a teacher at Chalao Secondary School in his 60s, whilst attempting to take the repeat shot of Gwanga Hill, in Gwanga ward of Chome (Figs 9a and b). To me, the hill very clearly showed tree cover increase, but Nakazaeli, looking at the old picture whilst standing with me directly in front of the hill as it is now, commented that "in the past, there were many more trees, and now there are fewer. Some trees were used for local medicine. Unfortunately, they have been cut without any replacement. People are trying to plant, but they don't look like the previous times." I also showed the picture to Safina, a 75 year old farmer whom we met on our way back, digging in her field of Irish potatoes in the valley bottom. She looked at the picture and then at Gwanga Hill in front of us, but nevertheless maintained that when she was young, the hill was covered by many very big, indigenous trees, and that "in the past, people really protected trees, but they not do so any more now; now they just cut the trees". Later Kidaru (Zawadi's centenarian father and another long

[10] All quotations in this paper are not verbatim but extracts from full, written out English notes of interviews, based on comprehensive notes taken during interviews conducted in Kiswahili, with or without translators.

term Chome resident) recalled that when he was young, “many people had plots with trees, but now, many plots are open, because now people are using firewood and cutting trees”; that “in the past, there were many more natural trees around than now”, that there was “forest everywhere, with pigs, monkeys and baboons”, but by now “people had cut them all back, to build houses”. The discourse of environmental decline was even more striking in Gonja. Kitua, a retired accountant who lived in a nice house not far from Gonja mission, decorated by beautiful pictures painted by his son, regretted that “people did not keep a good environment – water streams which were flowing here are now dying”; that the climate had changed and that cassava now had many diseases and was no longer a good crop to grow. The main reasons for environmental decline, he said, was that there were now many more people here than before, many of whom didn’t have good knowledge of how to protect the environment and who are cutting trees.

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What to make of the contradiction between the seemingly clear story told in the photographs and people’s memories, and of the discrepancies between different accounts? There are many good reasons for not taking people’s recollections at face value. For a start, as anthropologists know well, the interview process itself can shape people what people say, both in terms of the questions asked (by myself and translators), and the answers interviewees (and translator) think the interviewer wants to hear. In my case, my Kiswahili and especially Kipare were quite shaky to begin with, so Mrinde, Zawadi or others translated for me when necessary, with, I knew, some agency and interpretation. My own evolving knowledge and use of key Kiswahili terms – e.g. *mshitu* (forest), *pori* (bush), *miti* (trees), *maendeleo* (development) and *mazingire* (environment) – thus really mattered, as did my understanding of how people used these terms locally. For example, I initially often asked about changes in the environment, *mazingire*, but this, I slowly

realised, could have different meanings. Kisenge's neighbour Elizabeth told me that now, the environment (*mazingire*) was much better than in the past, because people had better hygiene and were much healthier, and Elizuri, a wonderful, over 100 year old lady living in Vudee, told me that now the *mazingire* was much better, because in the past they all slept on the floor, but now she had her own bed, as she proudly pointed out to me – a bed that had no mattress or sheets.

Moreover, like elsewhere (Boerma 2006; Fairhead and Leach 2003), people were of course familiar with colonial and postcolonial dominant understandings of environmental degradation, perhaps all the more so in the context of Tanzania's drive towards decentralised community conservation in recent decades and a reinvigoration of what Agrawal (2005) terms 'environmentality': Pare residents had been subjected to several rounds of environmental education, and many actively participated in conservation efforts such as fire-fighting or tree planting and had served on village *mazingire* committees. It is not surprising that this heavily shaped their own perceptions and discourses about environmental change, and also, of course, what they thought I wanted to hear.

People also tend to tell moral stories through stories of environmental change, as Rudiak-Gould (2014) showed so well with climate change narratives in the Marshall Islands. Sheridan (2012:230) writes about stories of declining rainfall in North Pare that "the impression that rainfall has declined is a consequence of a particular cultural interpretation of ecology. This ecocosmology links an orderly environment with orderly relationships among people, and especially orderly claims to resources." In the South Pare Mountains, too, many accounts by older people – of people no longer caring for trees, soil being worse, the landscape less beautiful

– were framed in terms of the familiar regret over the 'youth of today', nostalgia for a better past, and a sense of overall moral decline.

With very old informants one also wonders how lucid they are; what to make of Kidaru remembering "forest everywhere, with pigs, monkeys and baboons"?[11] But of course, it is not just centenarians whose memories may be questionable: it is well known that memories are not reliable evidence (Fernyhough 2012). We are all capable of 'false memories', or less dramatically, may simply not care much about some issues and therefore not remember them – whether there were more trees now or in the past in the South Pare Mountains was, after all, my question, and not necessarily a priority for people actually living there. Given these caveats on the validity of memories, Fairhead and Leach (1996) already suggested some time ago that, in order to understand environmental change properly, it is better to ask people concrete, specific questions about changes in procuring firewood or grasses for thatching roofs, or about the availability of particular tree species, rather than the open question "how has the landscape here changed?"

Nevertheless, I was reluctant to dismiss the landscape memories I had gathered out of hand, and, by implication, to judge the photographic evidence to be more valid, more reliable. After all, people had different ages and could be remembering and referring to different periods in time, before or after the mission photographs were taken, or thinking about areas not captured in the photos. In fact, it was the process of listening carefully to all statements, taking them all equally seriously – who was I, after all, to decide who was a 'reliable' witness and who was not? To say what was important or not? – of thinking through all the different points made and of

[11] This vision of 'forests everywhere' and rich forest fauna is squarely at odds with early 20th century photographs and historical landscape descriptions by travellers such as Baumann (1891).

trying to reconcile them with each other as well as the photos, that made me realise more fully just how partial, reductive and misleading repeat photography itself can be. It suggests a linearity of vegetation change from 'then' to 'now' that, in fact, does not exist: the two pictures are simply two different snapshots of one particular location, with many different possible developments in the century between they were taken, and indeed earlier, and equally many different possibilities in parts of the landscape not captured by the camera.

At the same time, trying to reconcile the repeat photography with the many different accounts I heard and thinking about them as narratives – why people would choose to talk about environmental change in the way they did – provoked some much-needed critical reflection on my own biases and assumptions, and on the kind of narratives I myself adhered to or hoped to construct. As explained above, I had undertaken this project in the hope of finding more evidence challenging dominant crisis narratives. But listening to and reflecting on the quite different stories I was told brought home to me that I could not dismiss local accounts of degradation as misinformed or biased, as wrongly shaped by powerful global crisis narratives, and then present my repeat photography as 'true', when really this would have been just opting for a different narrative: a counter-narrative, but nevertheless a narrative, as politically motivated as those it seeks to dispel.

Indeed, I realised not only that it is difficult, if not impossible, to write about environmental change without constructing some of kind (political) narrative – with causes, culprits, consequences, and coherence – but also that, right from the beginning, our research and the process of trying to make sense of an often bewildering array of contradictory data are shaped by existing narratives that are quite difficult to escape: just as it is said that there are only seven basic stories in novels, so there are, really, a limited number stories we tend to tell about

environmental change. Thus all stories about environmental change in 20th century Africa, whether told by local people, governments, conservationists or historians, basically fall into two broad camps, degradation and improvement narratives – with different variants of each, depending on timing and the impact attributed to colonialism, capitalism and local people respectively (von Hellermann 2016a).

The dilemmas and reflections arising from combining repeat photography with ethnography and a growing recognition of the impossibility of transcending the repertoire of existing narratives, meant that I found myself unable to write, as I had originally intended, a straight forward, definitive account of 'environmental change in the South Pare Mountains', counter-narrative or other; it had to evolve into this reflective, methodological paper instead. Having said this, the process of listening to all voices carefully and working through the dilemmas arising from these also ultimately resulted, I believe, in a more fruitful way of thinking and writing about environmental change; a plural, fluid one that simultaneously recognises both the validity and the partiality of different narratives, including those told by the repeat photographs. In the following, therefore, I will present first the plural, multi-faceted understanding of environmental changes in the South Pare Mountains I arrived at, but then also their wider social, political and economic dimensions that, to many local residents, mattered much more than tree cover change itself.

Environmental change in the South Pare Mountains: multiple stories

When the Leipzig missionaries arrived in the South Pare Mountains in the early 1900s, the people and landscapes they encountered and captured in their first photos had experienced

dramatic changes only a few decades before. In the second half of the 19th century, Gonja and Mbaga on the eastern slopes and Vudee and Chome in the west were extensive settlements of people of different Pare clans; each clan had their own areas and sacred groves, but a few groves in each location were larger and used for communal prayers as well as initiation rites for young men from all over the Pare and even Usambara mountains (von Hellermann 2016b). People were skilful famers, growing different crops at different altitudes, terracing some parts and building complex, communal irrigation systems (Håkannson 1998; Kimambo 1969; Sheridan 2002).[12] They were also pastoralists, however; particularly on the drier western slopes which had ample of grazing land and were 'extraordinarily rich in cattle in the nineteenth century' (Håkannson 1998:273). Several older people in Chome and Mbaga told me that their parents and grandparents used to create pasture land for their cattle by regularly setting small controlled fires that facilitated the growth of grasses – 'like the Maasai', as Shangwe, Mrinde's older brother, put it.

In the late 19th century, however, both Pare people and cattle were severely ravaged by a combination of devastating factors, still recalled by local people today: rinderpest swept across East Africa, decimating cattle everywhere; Maasai pastoralists, whose own cattle were dying, raided Pare cows; and slave traders travelling along nearby Arab caravan routes captured young men and women (Kimambo 1969). Altogether the late 19th century was a difficult, traumatic period in South Pare, drastically reducing the number of cattle and people living here. The German traveller Baumann, who visited the area in 1890, describes Chome as a bleak, deserted place: "The shabby settlements of Chomme are scattered on the slopes of this hollow. As this

[12] In Chome, for example, large parts of old irrigation systems are still in use today, but there are also remnants of old terracing and irrigation channels that have long been abandoned.

area is completely isolated from all warm winds and only cold mountain winds reach it, the climate is very bleak. Scarcely any bananas grow here any longer and beans grow poorly, and so the inhabitants must resort to the meagre produce from their maize-fields for their main source of food, while raids have long since rendered cattle raising virtually impossible" (Baumann 1891: 135). And he writes about Ndungu, just up from Gonja: "The slope which rises up behind this was until recently cultivated land, as the numerous bananas, now growing wild, and the remains of irrigation channels indicate. Today this area is uninhabited, having been depopulated by Masai and by disease and it is with regret that one sees the lush green slopes lying fallow" (Baumann 1891: 134). These, then, are the landscapes depicted in the early photographs: a few sacred groves visible on otherwise largely grassy hills, shaped by many years of pastoralism and fires, with some low bush (*pori*) starting to regrow due to the recent disappearance of cattle (see, for example, Fig. 10a).

Over the course of the 20th century, landscapes were transformed in multiple, multi-directional ways. Firstly, German, British and later postcolonial government directives curtailed fires (although never completely) and encouraged tree planting, in particular of fast growing exotic species, such as eucalyptus (*Eucalyptus spp.*), grevillea (*Grevillea robusta*), cypresses (*Cupressus spp.*), pine (*Pinus spp.*) and black wattle (*Acacia mearnsii*), which was used for tannin production. Something of a colonial backwater, tree planting in the South Pare Mountains was, to begin with, largely confined to the efforts of missionaries and chiefs – many of the latter, in fact, used tree planting as a form of punishment. It was in the 1940s, when the Mass Literacy Campaign (Kimambo 1991) introduced large scale tree planting through schools and nurseries, that tree planting really took off; by 1953, the District Commissioner noted that '[…] the results of this campaign are already visible. There is no doubt that the Wapare have become very "forest

minded" and need no convincing as to the benefits to be obtained through re-afforestation'.[13] Government tree planting programmes were boosted in the 1990s by TIP (Traditional Irrigation and Environment Development Organisation), a Tanzanian environmental NGO working in conjunction with and supported by SNV (Netherlands Development Organization). In Chome especially, TIP tree planting resulted in quite substantial new tree planting on a number of family farm plots, very visible during my stay there. Here, then, one can tell a definite improvement narrative about tree increases resulting from colonial and postcolonial environmental policies, akin to those told about similar developments in other parts of Africa (Boerma 2006; Carswell 2007; Cline-Cole 1996; Tiffen, et al. 1994). This narrative also clearly emerges from the repeat photography, with many of the photo pairs showing an increase in planted exotics (eg. Figs 8-10).

Concurrent with government tree planting initiatives, however, broader, organic changes took place, which reshaped landscapes even more profoundly. The most important of these was population increase, due in particular to missionary influences (Kimambo 1991, 1996). Baumann (1891) estimated the population of the South Pare mountains to be 4,900 in 1890, which increased to 51,300 by 1948, 85,500 by 2012.[14] More people meant more homesteads, roads, schools, buildings, and, of course, farming. This trend inevitably involved the removal of indigenous trees, particularly along frequently used roads in and between villages, when roads were widened and more houses built along them; a change that is particularly notable for people

[13] TNA, 19/6/1, Annual Report of the Pare District 1953.
[14] Last figure based on 2012 Tanzania Population Census, http://www.citypopulation.de/php/tanzania-northern-admin.php?adm1id=0303. This lists all the wards in Same District, including the lowland ones, and gives the total for the whole district. To obtain the figures for the South Pare Mountains alone I added up all the individual wards on the mountain. 1948 figure in TNA, 19/3/6, Africa Census 1948.
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living in the area. Growing demand for farmland brought with it some encroachment into community forests, such as Heikungu and Kwasembua in Chome, and, on occasion, into small sacred groves – with conversion to Christianity, families no longer used these prayers and needed space to expand their houses and kitchen farms. Some people also began farming on steep uphill slopes, creating problems with soil erosion, with soil degradation in general frequently reported as a problem, particularly in Gonja. None of these developments are visible in the repeat photos, all of which happen to show different views. But they mean that all the local narratives I was told about degradation and loss of trees have some validity, too, just like broader narratives in the conservation literature about the effects of population increase (e.g. Cleaver 1992), and about the loss of traditional religious beliefs resulting in the destruction of sacred groves (as discussed by Sheridan and Nyamweru 2007).

However, even though these negative developments are stressed both locally and in the wider environmental narratives about Africa, they were actually of comparatively small scale. Most farmland expansion was into former pasture land or low bush (*pori*), and encroachment into woodland and sacred groves in particular, fairly minimal. As I have explored elsewhere (von Hellermann 2016b), even as Christians local people largely continue to protect sacred groves, for historical, identity and conservation reasons. Within farms, too, indigenous trees such as Msame (*Albizia gummiferia)* and Mvumo (*Ficus thonningii*) are kept and fostered, as they provide important fertilizer and shade. In fact, population increase significantly *contributed* to tree cover growth, in the form of fruit trees – avocado, orange, guava, banana, and many others – planted in homesteads, along paths and in farms. It is this kind of organic growth that has most significantly transformed South Pare landscapes, and that is so clearly visible in the repeat photos (eg Figs. 2-7, 9-10). There is thus another strong improvement narrative that one can tell here, one that is

rooted in local farming practices and knowledge rather than policy intervention and akin to Fairhead and Leach's (1996) reading of Guinea landscapes.

No single narrative or story fully captures environmental change in the South Pare mountains: multiple processes in different places mean that several distinct degradation and improvement narratives all have some validity and explain the diversity in local understandings and reactions to the photographs. These different stories are also, however, always partial, each focusing on only one of several simultaneous processes of vegetation change. Indeed, a focus on vegetation change in itself creates partiality: it needs to be understood in the context of wider social, political, economic and ecological changes which are ultimately more important to local people than whether tree cover has increased or decreased. It is this wider 'human dimension' we turn to in the last section.

'The human dimension'

We already saw above that, when asked about general changes in the environment (*mazingire*), some people did not talk about tree cover change at all, but about development, health and hygiene; and that nobody really shared my excitement about the increase in tree cover the repeat photography revealed. As the exchange in Vudee opening this paper shows, most of the people assisting me were more interested in increase in houses than in trees. Moreover, as I gradually began to realise, for many people in South Pare more trees were not necessarily a positive development. Of course they appreciated and valued trees in many ways: as crucial sources of firewood, building material, fruit, medicine and fertilizer, and for their environmental benefits of protecting water sources, preventing soil erosion and attracting rain. Local, indigenous trees, particularly those in sacred groves, also had a lot of symbolic meaning, rooting families and

communities in the landscape and providing living connection to their ancestors (von Hellermann 2016b). But planted exotics were, in many ways, quite problematic. For a start, some exotics can be quite damaging ecologically, particularly water demanding eucalyptus (National Botanical Gardens of South Africa 1959). In Mbaga, I learned that the ward government had recently banned the planting of eucalyptus on hill tops and had started cutting it back, as it was reducing water flows into the village. This is hard work, however: eucalyptus is an invasive species that regenerates easily on its own, particularly after wildfires. Black wattle too, now no longer used for tannin dying, has become a real nuisance for local farmers, as it invades all spaces and is difficult to control.

Tree planting has also significantly exacerbated existing inequalities in landownership and wealth: here as elsewhere (Mwanukuzi 2009; Snyder 1996; Yasu 1999), exotics were often planted to claim and mark landownership. With South Pare gradually changing from land abundance to growing competition, some families were more successful than others at staking out areas for themselves. Today there are a few richer families and individuals who have large areas of land at their disposal, who, like Peter on Gwanga Hill in Chome (Fig 10b) can afford to dedicate some plots to tree planting, and who can let sizeable areas of land lie fallow, their ownership claimed by planted grevillea trees dotting otherwise unused land (much of Mpeta Hill in Fig 9b looks like this).

The main reason why a substantial proportion of potential farmland is lying fallow now is that the South Pare Mountains have become an area of outmigration in recent decades, with most younger people leaving to work and study in cities. South Pare in fact – after many decades of relatively high income through coffee production - boasts a large number of highly successful citizens now working in government, higher education and business. They have built large,

expensive houses for their parents or themselves in South Pare, but their homeland constitutes to them an attractive mountain resort they come back to for holidays or retirement to, not a permanent residence. Meanwhile, other families are struggling to make a living on much less land. Their children, too, are leaving the South Pare Mountains, as they cannot live by farming alone, but – poorer and less well educated and connected – they tend to find much less prestigious employment in cities. These families cannot afford to plant trees: in order to feed themselves from the scarce land they have their priority is to grow maize, which requires full sunlight. Many of these poorer families struggle to produce enough to feed themselves: according to the doctor at Mhero dispensary in Chome, malnutrition was the biggest health issue in the area. Government and NGO food aid operations were common, particularly after the rains had failed during the long rainy season (*Masika*) in spring 2009 (see also Ikeno 2007). For many poorer Pare inhabitants, therefore, the increase in tree cover, with all the abundance and lusciousness so evident in repeat photography, was not a positive story, and not theirs (see also Murton 1999).

Conclusion

The wider politico-economic dimensions and actual lived experiences, as discussed in the last section, are crucial for fully understanding environmental change in the South Pare Mountains and writing locally meaningful stories about it. Yet they are entirely invisible in the repeat photos themselves and did not emerge through questions tightly focused on environmental change; I grasped them only after spending several months living in the area, talking to people about a whole range of other issues, in particular power and money – in short, by doing ethnography. Repeat photography, therefore, becomes a much more powerful research tool when combined

with prolonged ethnographic research than it is on its own, not only for recording but also for understanding environmental changes.

At the same time, I have tried to show here that integrating repeat photography in our ethnographic research can also makes us better environmental anthropologists, at both practical and epistemological level. Through the tangible and locally meaningful material historical photographs can provide, through the rootedness in place and the large amount of walking it involves, and through the kinds of conversations it engenders, repeat photography as a practice lends itself extremely well to ethnographic research into environmental changes and values. But it also forces us to reflect and think more carefully about our research methods, the claims that we want to and can make as anthropologists, and the kinds of narratives we write. For me, it has resulted in a stance that simultaneously acknowledges the validity and importance of trying to make evidence-based truth claims, whilst also always recognizing their limitations. Environmental changes, and the different ways people experience them, are inherently plural and complex, and we can ultimately only ever tell partial stories about them. It is exactly these kinds of partial stories, however – rooted in multi-modal, reflexive ethnographic research – that must be told and heard, at a time when the whole world is grappling with environmental change and what it means more than ever.

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