Belgeo
Revue belge de géographie

2 | 2018
Patrimoine, environnement et développement : sens et contresens pour l'espace rural en Afrique

Relations of power driving tropical deforestation: a case study from the Mau Forest (Kenya)

Relations de pouvoir entraînant la déforestation tropicale : une étude de cas dans la forêt Mau (Kenya)

Stefania Albertazzi, Valerio Bini, Adrien Lindon and Guido Trivellini

Electronic version
URL: http://journals.openedition.org/belgeo/24223
ISSN: 2294-9135

Publisher:
National Committee of Geography of Belgium, Société Royale Belge de Géographie

Electronic reference
Stefania Albertazzi, Valerio Bini, Adrien Lindon and Guido Trivellini, « Relations of power driving tropical deforestation: a case study from the Mau Forest (Kenya) », *Belgeo* [Online], 2 | 2018, Online since 16 July 2018, connection on 17 October 2018. URL : http://journals.openedition.org/belgeo/24223

This text was automatically generated on 17 October 2018.

Relations of power driving tropical deforestation: a case study from the Mau Forest (Kenya)

Relations de pouvoir entraînant la déforestation tropicale : une étude de cas dans la forêt Mau (Kenya)

Stefania Albertazzi, Valerio Bini, Adrien Lindon and Guido Trivellini

Introduction

1 The paper investigates the deforestation process in the Mau Forest (Kenya), a large tropical complex (380,000 ha) in the Rift Valley Region (figure 1), focusing on the relations of power that structure this process. Since colonial times the forest has been under pressure from different processes and the deforestation has continued steadily over the years even after independence. In the last twenty years alone, the forest has lost about a quarter of its area (GoK; UNEP, 2008).

2 The paper shows how deforestation is the outcome of different and simultaneous dynamics where the political system has played a pivotal role: all the typical proximate causes of deforestation – namely agriculture, wood extraction and infrastructure (Geist, Lambin, 2001) – have been at work in the Mau Forest and all these drivers were deeply influenced by political factors. Natural resources are part of the political struggle, being at the same time a means and an end in the relations of powers between the stakeholders.

3 The link between natural resources and political issues is crucial in many African States where "politically-mediated access to public resources has been a key mechanism for purchasing allegiance and maintaining support for African rulers" (Mwenda, Tangri, 2005, pp. 449-450). From this perspective, the control over natural resources becomes a strategic element within the neopatrimonial dynamics that characterize African States (Bratton, van de Walle, 1994). In this paper we highlight how these strategies embedded

in national politics have influenced the deforestation process in the Mau Forest and how local communities have reacted to these dynamics.

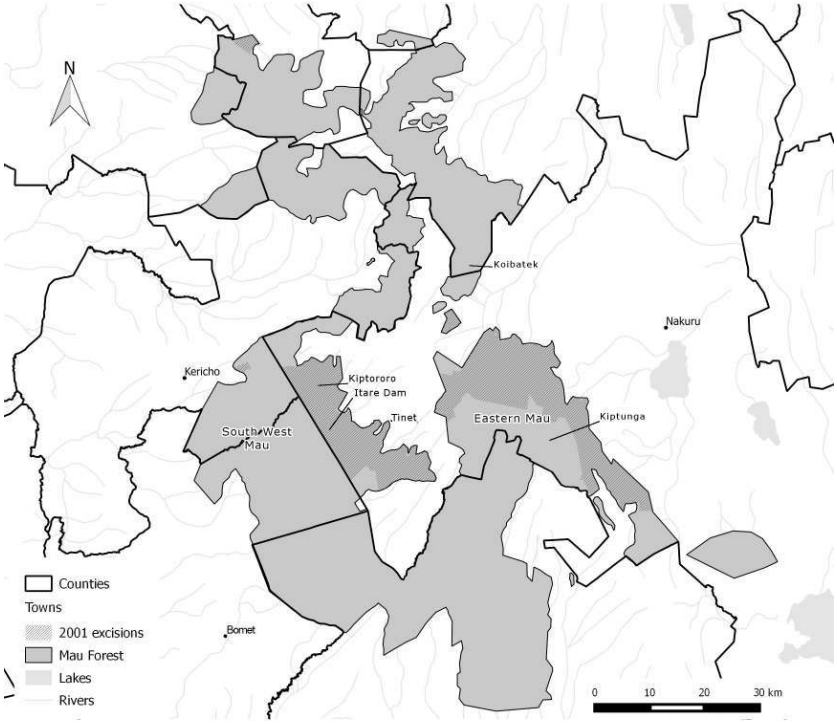
4 The paper is divided into three parts. In the first paragraph we define the context of the Mau Forest[1], highlighting the socio-environmental capital that is at stake. In the second part, we highlight the political issues underlying the proximate drivers of deforestation: for each driver we analyze the actors and the relations of powers that have fuelled the deforestation process. Thirdly, we focus on the relationships between politics, ethnicity and forest management. In the conclusion, we underline the role of politics in the deforestation process.

The Mau Forest complex: socio-environmental context

5 The Mau Forest is the largest nearly-continuous montane indigenous forest in East Africa as well as the most extended natural water tower in Kenya. The forestry complex is part of the upper water catchment area of the twelve main rivers of West Kenya that flow into the lakes Victoria, Turkana, Natron, Baringo and Nakuru.

6 The Mau Complex is composed of 22 blocks[2] – all but one of them (the Maasai Mau) declared forest reserves[3] – located along a North-South axis of 150 km at an altitude of between 1200 m and 3000 m. The Mau Forest plays an important role in the agricultural, tourism and energy sectors. The climate conditions of the area adjacent to the forest have supported the development of the cultivation of tea, one of the main national agricultural products. Maasai Mara National Reserve and Lake Nakuru National Park, two famous tourist destinations, take advantage of the rivers that pass through them and that have their sources in the Mau Forest. Finally, Kenya generates more than 44% of its energy from water and around the Mau Complex several hydro-electric power stations are operational.

Figure 1. The Mau Forest Complex.



Albertazzi, Bini, data from GoK, UNEP, 2008

7 The landscape alternates between escarpments with upland, *plateaus* and volcanic foot ridges. Soils are fertile (Courtney Mustaphi *et al.,* 2014), making the land suitable for small and spontaneous farming. The climate is humid, with temperatures varying according to the altitude and topography: higher areas (up to 3000 m a.s.l.) receive higher rainfall (2000 mm).

8 This climatic zonation causes a habitat zonation that was well described by Kratz (1994) which identifies areas of open bushy forest (up to 2100 m. a.s.l.), a first dense forest (2100-2600 m. a.s.l), thick mature forest with the largest trees (2300- 2600 m. a.s.l.) and an upper bamboo forest (higher than 2600 m. a.s.l.) followed by some open grasslands in the highest areas (2800-3000 m. a.s.l). Most of the high *Juniperus–Podocarpus–Olea* spp. forests have been cleared and large areas have been converted to commercial exotic and coniferous plantations (*Cupressus lusitanica, Pinus patula, and Pinus aurata*). Untouched areas still show the biggest trees, with autochthonous species like *Albizia gummifera, Prunus africana, Olea capensis* and *Podocarpus latifolius.*

9 Animal biodiversity is noticeable and strongly related to habitat quality. Only mentioning omeotherm fauna, of 55 key species cited in the Birdlife International check-list (IBA KE051), 25 are included in a list of birds used by Bennun *et al.* (1996) as an indicator of strong quality forest and we detected 16 of them by participatory survey only in Kiptunga (Eastern Mau) forest (Trivellini, Lindon, 2015). Some endemic species, as well as some threatened at regional level, occur. According to Birdlife International, “this forest holds one of the richest examples of a central East African montane avifauna, and its size means that populations of most species are likely to be viable” (Bennun, Njoroge, 2001, p. 453).

10 Rodgers *et al.* (1982), who classified 17 East African forests according to theriological biogeography, ranked the MAU forest complex, with 25 found species, 2nd out 15[4]. Some key species are present, such as the African golden cat *Felis aurata* (IUCN Vulnerable), the yellow backed duiker *Cephalophus silvicultor* (IUCN near threatened). During our participatory survey, we counted at least 20 mammal species just in the Kiptunga area (Trivellini, Lindon, 2015).

11 Nowadays, the forest is managed by the State through the Kenyan Forest Service (KFS). The forest was declared a Crown Land in the 1930s, and then gazetted as a Forest Reserve twenty years later. Mau Complex has been subjected to drastic deforestation since the colonial era and especially in the fifteen years before the promulgation of the Forest Act (2005). The region of the Mau Forest was and still is an area inhabited by various ethnic groups. The Ogiek, an indigenous hunter-gatherer group, are considered the historical forest dwellers of Mau (and Mt. Elgon) forests; they are currently estimated around 40,000 individuals in the whole country. Ogiek had strong and frequent relationships with the Maasai and the Kalenjin people, with whom they now share some linguistic traits. The so-called Kalenjin tribe consists of many subgroups (i.e. the Nandi, Tugen, Keyyo, Marakwet, Sabaot, Pokot, Terik) including the Kipsigis, who are the most numerous in Mau. Finally, the Kikuyu, who arrived in the region because of the British settlers' dispossessions of land, and after independence acquired a relevant political position in the area (Droz, 1998).

A key driver of deforestation : agriculture

12 Agriculture is generally considered as the main driver of tropical deforestation, but the sector covers many different practices, ranging from traditional shifting cultivation to permanent export-oriented plantations (Geist, Lambin, 2001; Hosonuma, 2012). In the research area, two kinds of agriculture have been affecting the forest in different ways: small-scale permanent agriculture and tea plantations[5].

Demographic growth and small-scale agriculture

13 Within the debate on tropical deforestation, many authors (eg. Allen, Barnes, 1985) have highlighted the role played by the expansion of small-scale agriculture, driven by population growth. In these analyses, the advance of the agricultural frontier is considered as the product either of a planned colonization by governmental actors (Rudel, 2007), or of spontaneous encroachments by local communities (Myers, 1993). In the case of the Mau Forest, the allocation of land by the government to small-scale farmers has played a major role in the recent deforestation. The last massive loss of gazetted forest in this area dates back to 2001 when 61,023 ha of the forest were excised (14% of the total), particularly in the Eastern block (35,301 ha, 54% of that sector) and South West block (22,797 ha, 27%) to make room for small-scale farmers (GoK, UNEP, 2008).

14 In order to have a deeper insight into the nature of this process we can refer to the demographic data of two divisions of the Molo district that were directly affected by these excisions: Kuresoi and Keringet. Comparing the data from the 1999 census with the 2009 census we notice that the two locations where the land was de-gazetted (Tinet and

Kiptororo) registered a high population growth: 66% for Kiptororo and 183% for Tinet. This remarkable increase, far higher than average in the district (28%) is the direct consequence of the land allocation. If we look at the other locations in the two divisions, we notice lower increases (8 cases out of 11) or even decreases in the total population (2 cases). These data could indicate a process of re-distribution of the local population, thus confirming the linkage between demographic pressure and deforestation.

15 Nevertheless, two cautions have to be highlighted. The first one is that, before the 2001 excision, the population density in the two divisions was relatively low (122 hab./km^2 in Keringet, 143 in Kuresoi), and even excluding the forest area, it was below the average of the district[6]. Therefore, in 2001 there was not an unsustainable demographic pressure that forced land allocation. The second point concerns the fact that if we look at the population of the two divisions we notice a significant growth[7] in the 1999-2009 period that means that besides the re-distribution of the local population, the area imported people from outside and land was allocated to immigrants. From this perspective, the link between deforestation and population growth is probably less direct and more complex than usually presented: in this case the population growth was the consequence, not the origin of the deforestation process.

16 The origin of these settlement schemes shows the strong connection between environmental policies and political strategies. Following conservation recommendations derived from the KIFCON[8] project, the Government set up settlement schemes with the official intention of removing forest dwellers and ensuring environmental conservation, but the action resulted in two contradictions: first, the people resettled in Eastern and South West Mau were only to a limited extent Ogiek from the forest, and the initiative attracted people coming from the counties of Bomet, Kericho and Baringo; secondly, the settlements schemes were located inside the protected area.

17 Therefore, beyond the conservation narrative, these settlement schemes were part of a political strategy developed in the last years of Moi's presidency to conserve power in a transitional period. As put by Di Matteo: "Kenya turned to multiparty democracy in 1991 and the creation of a settlement scheme represented nothing but the creation of a political constituency, a vote reservoir" (Di Matteo[9], 2017, p. 23).

Tea production

18 The Mau Forest region is one of the main centres of tea production in Kenya, which is the third largest producer and the largest exporting country in the world (Chang, 2015). British settlers introduced tea from India in 1903 and started to export to London twenty years later. Until the implementation of the "Swynnerton Plan", in 1954, high-value cash crop production (such as coffee, tea, pyrethrum) was restricted to foreign farmers (Thurston, 1987). Only after 1963 did small and large-scale African farmers start to buy portions of land from the British settlers and the small growers were grouped together under the umbrella of the Kenya Tea Development Agency Holdings Limited (KTDA Ltd)[10]. Currently, the Kenyan tea sector combines the two systems, with the big estates producing the 40% of the national total amount of tea and the small-scale growers the remaining 60%. The most important tea production areas around the Mau Forest Complex are concentrated in the Kericho, Bomet and Nandi counties.

19 The tea fields are spread in vast contiguous areas just outside the forest borders. Such concentration is not just related to the favourable farming conditions guaranteed by the

Mau Forest ecosystem, but it is a colonial legacy. These areas represented the Western side of the so-called "White Highlands", the most fertile land of the country reserved to foreign settlers and close to the Uganda railway (Morgan, 1963). Indeed, since the second decade of the twentieth century, multinationals such as Unilever Tea, Eastern Produce Kenya Ltd, James Finlays and Williamson Tea Kenya Ltd have been operating in the three aforementioned counties on land that was expropriated by the British colonialists and that they have leased. As regards to small-scale farmers, they usually hold 0.5-2 hectares of land, part of which is allocated to food crops and trees for sale (Milder *et al.*, 2015). It is worth noting that during the period 1973-2013 the area of tea estates increased by 13% to the detriment of the forest, especially in the period 1994-2003 (Swart, 2016).

20 Concerning the role of politics in the deforestation process, it is interesting to underline two points: firstly, during 1997 (an election year) the government decided to set aside 1,812 ha of land as settlement schemes for Ogiek people in Kiptagich. UNEP and GoK report (2008) pointed out that this initiative occurred in an area where seven years previously President Moi had illegally allocated land for his Kiptagich Tea Estate. Therefore, as explained by the Ndungu Commission, the settlement schemes were illegally allocated to set up a tea zone for the President's estate. In the end, the illegally allocated land exceeded the area of the settlement schemes and only few of the supposed 600 Ogiek families received the aforementioned land (GoK, Ndungu Commission, 2004).

21 Secondly, within the Mau Complex operates the Nyayo Tea Zone Development Corporation, a parastatal company created in 1986 by the President Moi (in a project supported by the World Bank) with the aim of establishing a tea buffer zone to protect the forest against encroachments and logging. The Ndungu Commission wrote that the Nyayo Tea Corporation was a means through which forest land had been illegally allocated with political and patronage intention (Klopp, 2012). Under the front of the "tea buffer zone", large portions of forests were illegally allocated to politicians or civil servants connected to Moi or transferred to third parties for agriculture purposes or to make room for infrastructure. Not surprisingly, the NTZDC was directly managed by the Office of the President, and the chairman of the NTZDC was Isaiah Cheluget, a close partner of Moi (Hornsby, 2012). In this way, an environmental conservation project became a means of spatial control and appropriation by the central power.

Tree plantations and forest degradation: a political history

22 Monospecific plantations of exotic trees cover more than one third of the Mau Forest (GoK, 2013). The origin of these plantations dates back to colonial times, where timber played a pivotal role in the development of the Uganda railway, "the origin and spine of what we now call Kenya" (Wainaina, 2011, p. 40). The first colonial ordinance in the forestry sector, the 1897 "Ukamba Woods and Forest Regulations" put the trees within two miles of the railroad under the railway authorities' jurisdiction and in this period a large part of Kenyan forests was cut down for fuelwood supply.

23 The risk of wood depletion due to overexploitation was a prime concern for the colonial authorities and it was the need for fuel that drove the creation of tree plantations with exotic species such as eucalyptus (Ofcansky, 1984). In 1922, R.S. Troup, director of the Imperial Forestry Institute, directly advocated for the establishment of these "fuel

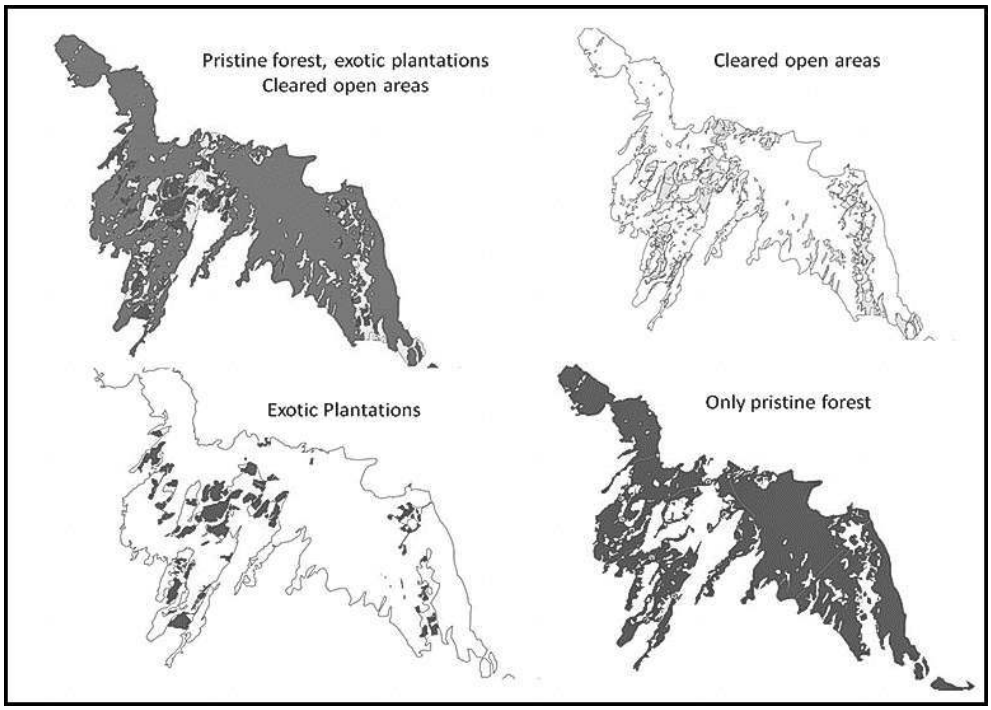
plantations" in his *Report on Forestry in Kenya*: "Although the natural forests contain some excellent fuel woods, the yield per acre is by no means high. Fuel plantations formed on areas cleared of natural forest, therefore, should aim at producing the highest possible yield of suitable fuel per acre per annum" (Troup, 1922, p. 31).

24 It was in these years that 7 small sawmillers decided to create a cooperative called East African Timber Cooperative Society Limited, later called Timsales, the major wood-based operator in the Mau Forest. At the beginning, this sector was mainly aimed at the exploitation of the indigenous forest, but starting from the 1940s the conversion of exotic wood from plantations gradually came to the foreground. After independence the cooperative was transformed into a public company, thus strengthening the strategic role of this industry and its ties to the political system. The Kenyatta family itself became involved in the company and the present company director is Muhoho Kenyatta, the younger brother of President Uhuru Kenyatta.

25 Nowadays, exotic trees plantations in the Mau Forest are managed directly by the Kenya Forest Service with logging companies, such as Timsales, paying for licenses to log in specific plantations. Individual blocks are monitored by foresters, and forest rangers control movement within the forest block (Courtney Mustaphi *et al.*, 2014). According to FAO terminology this form of wood exploitation is not deforestation, but the origin of these plantations from the clearing of the indigenous forest and their impact on the quality of the forest itself, make the picture more complex. Thus, our research was aimed at evaluating the biodiversity in the plantations, with a case study in the Kiptunga block (Eastern Mau), where these plantations cover more than 8000 ha, nearly 80% of the sector (GoK, 2013).

26 We first performed a habitat analysis of the Kiptunga block, based on a ground-truthing activity of GPS points (n = 60) taken on the ground both in rain forest (areas of Chebuin, Kiboet, Olengape, Kaamweu) and in the central area of the plantations blocks (figure 2) and on the consequent photo-interpretation of aerial pictures into a GIS environment.

Figure 2. Kiptunga forest: ensemble of pristine forest, open and plantation areas a); open areas (b); exotic plantations (c); remaining pristine forest (d).



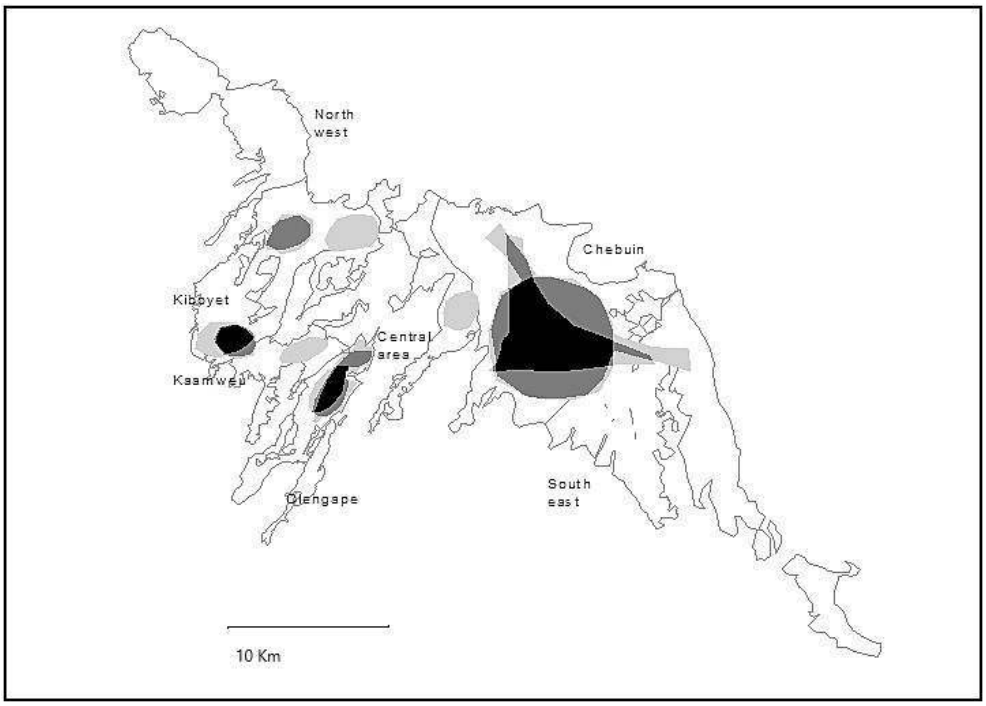
SOUCE: LINDON, TRIVELLINI

27 In the first three areas of rainforest cited, plus a control site of forest patches left close to the plantations, we implemented a photo-trapping activity in order to detect wildlife diversity[11].

28 Parallel participatory work (details in Trivellini, Lindon, in prep.) was carried out with members of the local community (n = 19 informants, most of them hunters), who were asked: to map the areas of main use of ecosystem services (namely hunting, beekeeping, food, medicines and other non timber products gathering); to evaluate the estimated detectability of a sample of 16 bird species, indicators of forest quality (Bennun *et al.*, 1996) and 20 species of mammals, by assigning a rank (1, 2, 3) according to the estimated detectability[12].

29 Results from the participatory mapping activity showed that the ecosystem services were never researched in the exotic plantation forest or (obviously) in the open areas. Results also indicated how ecosystem services, overlapped, identified a hotspot in the largest remaining rainforest area (Chebouin, figure 3).

Figure 3. Hotspots of ecosystem services in the Kiptunga forest as described by the level of overlap.



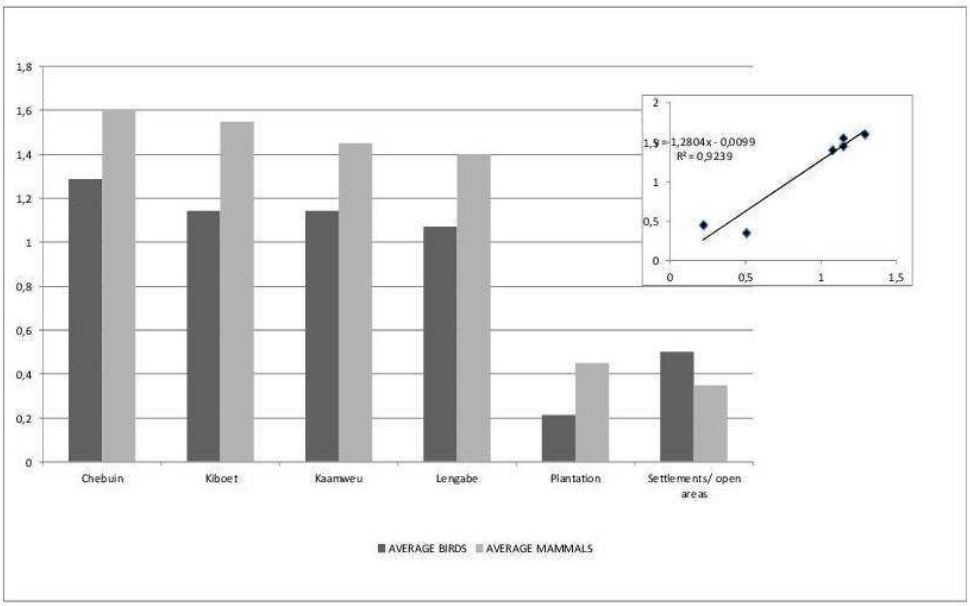
One mapped ecosystem service: light grey; two overlapped ecosystem services levels: dark grey; three overlapped ecosystem services: black

SOURCE: LINDON, TRIVELLINI

30 Results from photo trapping activities confirmed the occurrence of anthropophilic species in the small rain-forest patches closer to the plantation (hyena, *Crocuta crocuta*, often feeding on cattle) and the absence, in the same spot, of wild forest ungulates (red duiker *Cephalophus harveyi*), which was found in all the rainforest spots.

31 Results from the participatory survey on biodiversity occurrence indicated a crash in wildlife species richness estimated by the community in the plantation-forest areas, with statistically significant differences between the plantation-forest values and all of the four rainforest areas[13], both for birds and mammals[14].

Figure 4. Average tax on detectability index per forest sector (Chebuin, Kiboet, Kaamweu, Olengape), plantations and cleared areas as recorded from the perception of the community on every single species.



The correlation shows a very similar pattern for birds (X axis of the dispersion graph) and mammals (Y axis).

LINDON, TRIVELLINI.

32 The crash in mammal and bird biodiversity estimated by the community (participatory data) in the plantation areas, the occurrence of anthropophilic species in the rain forest patches located close to the plantations, the occurrence of wild forest ungulates in the higher quality rainforest (phototraps data) and the main localization of the forest ecosystem services (participatory mapping) in the largest areas of the forest draw a coherent picture. Land use change, especially the transformation of the rainforest into plantation areas, has moved animal biodiversity away, decreasing the ecosystem services available, which seem to be concentrated in the untouched areas of the forest. This is supported even by some assertions made by the community, who declared that "*some animal species had moved away and were present only in the areas of deepest forest*", as well as the fact the people gathering food in the forest "*had to walk more than before*", indicating a less frequent occurrence of provisional vegetation services.

Deforestation and infrastructure projects

33 The most debated infrastructure in the Mau Complex is a dam on the Itare River, in the South West block. The dam is going to be built on land already excised from the forest in 2001, but close to the present boundary of the forest. The project involves the construction of a 280 ha reservoir, plus some other water supply infrastructures, that will provide potable water to Nakuru and other towns in the county, for 800,000 beneficiaries. The Italian company CMC is carrying out the construction work which started in June 2016 and is planned to be completed by 2020[15]. The Itare dam project was put forward by the Rift Valley Water Services Board and is one of the cornerstones of the Kenya Vision

2030, the national long-term development plan, although the first feasibility study dates back to 1998 (Rift Valley Water Service Board, 2015).

34 The main characteristic of the project is that water will be diverted from one slope to another, i.e. from west (Keringet area) to east (Nakuru), via a 114 km tunnel. It is important to underline that the pipelines that will traverse the Bomet and Kericho counties will affect areas of great environmental value. Furthermore, the Itare River flows into the Sondu River, one of the tributaries of Lake Victoria, and this will lead to significant environmental and social impact on a local and regional scale.

35 The project gives rise to a number of questions. From an environmental point of view, it will probably foster deforestation and forest fragmentation, especially in Bomet and Kericho counties. In addition, it will affect the water regime of the Sondu River and Mara River in a context already damaged by the 2001 excisions (GoK; UNEP, 2008). From a political perspective, it is a flagship project for the Government and it is supported and opposed respectively by the two presidential candidates, Kenyatta and Odinga, with the latter backed by the communities that live downstream of the dam site[16].

36 Furthermore, in June 2017 an Environment and Social Impacts Assessment Study Report was published for the construction of a 252 ha reservoir on the Kipsonoi River within the South West forest block. The infrastructure is considered a flagship project by the Government and the County[17] (County Government of Bomet, 2018) and aims at supplying 600,000 people with water through a raw water main of 19 km inside the forest (National Water Conservation and Pipeline Corporation, 2017). The proposer is the National Water Conservation and Pipeline Corporation (NWCPC), a parastatal company whose chairman is Julius Kones, appointed in 2013 by President Kenyatta and at the same time Member of Parliament for the Konoin Consituency (Bomet County).

37 At the end of September 2017, the National Environment Management Authority (NEMA) issued the authorization to the NWCPC to proceed with the work, provoking complaints from the KFS that pushed for alternative sites for the dam, outside the forest border. On February 2018, the KFS unexpectedly changed its position and gave the consensus for the construction of the dam inside the South West block (Chepkoech, Mutua & Mbula, 2018).

Politics, ethnicity and forest management

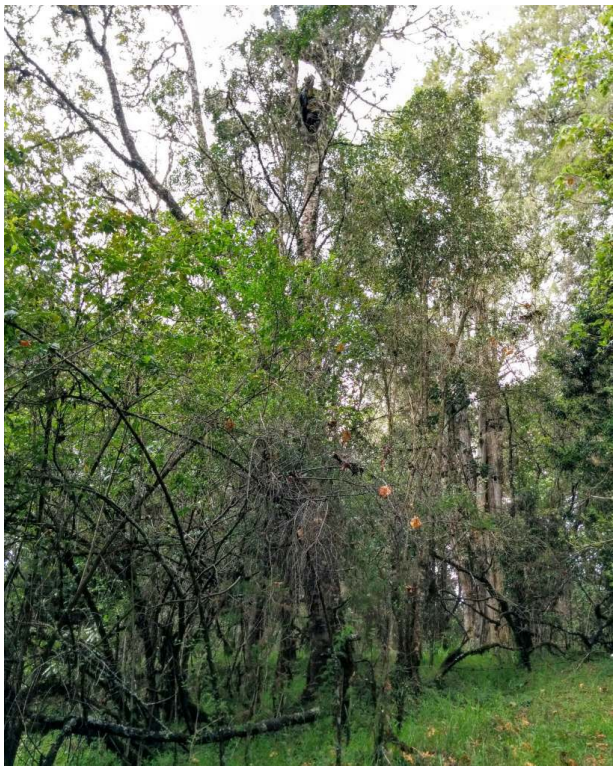
38 Another factor that turns this region in an area of political struggle is the fact that Mau represents the ancestral land of the Ogiek tribe (Sang, 2001). Their traditional livelihood was based on wildlife hunting, beekeeping and gathering of food and medicines from the forest, although since 1930s-1940s they started to farm (Kimaiyo Towett, 2004). Until the establishment of the colonial government, the forest land was communally held by several lineages, whose members maintained frequent relationships of exchange and marriage with the neighbouring Maasai and Kipsigis tribes (Blackburn, 1974). The arrival of the British settlers was a cornerstone in Ogiek history. They started to be evicted from the forest (1911, 1926, 1932), their land was declared Crown Land (1930s) or allocated to white settlers or other tribes (in Nakuru, Naivasha, Mau Narok); finally, their identity was not recognized, with repeated attempts to assimilate them into the largest ethnics groups, such as Maasai or Kalenjin. First under the colonial rule, later under the independent government, they were marginalized and discriminated against because of their low number and irrelevant political power (Sang, 2001). After three decades of

peace, a new phase in the socio-environmental conflict began in 1977. In this year, the national authorities moved against the Ogiek in Tinet (South West Mau Forest), arresting members of the community, destroying their houses and accusing them of being illegal squatters. This course of action, constitutes the background for the forthcoming settlement schemes on excised forest land (see supra).

39 The local community reacted to these initiatives and filed various claims against the government in national and international courts. The last judgement in order of time came out in 2017 from the African Court on Human and Peoples' Rights who recognized the Ogiek as an indigenous population and therein stated that "they [the Ogiek] have the right to occupy their ancestral lands, as well as use and enjoy the said lands"[18] (African Court on Human and Peoples' Rights, 2017, 37). This historical linkage with the forest, together with the presence of a considerable number of Ogiek people in the area surrounding the forest, places this indigenous group in a pivotal position in forest management. The Forest Act (2005) prescribed the development of Participatory Forest Management Plans (PFMPs) for each portion of forest through the action of Community Forest Associations (CFAs) (GoK, 2005). Thanks to the instrument of the PFMP, some CFAs of Mau were able to develop significant projects that reduce local dependency on the forest wood and, at the same time, produce economic benefits for the community. For example, the CFA of Kiptunga extended the commercial network of honey (a traditional Ogiek activity) to cities like Nakuru and Nairobi. Considering that the forest also has a high potential for tourism, new itineraries were developed, members of the Ogiek communities were trained to guide tourists and a new eco-lodge was built in Mariashoni, on the outskirts of the forest. In Koibatek, the CFA was involved in initiatives of reforestation, developing tree nurseries that supply seedlings to the KFS, the County and the schools.

40 In a context such as Mau in which deforestation, ethnicity and politics are so entangled, the CFAs can represent a crucial actor in the implementation of local projects, thus counter-balancing the weight of national groups of power.

Figure 5. An Ogiek tour guide demonstrates the traditional honey harvesting technique in the Kiptunga forest.



Bini, 2016

Conclusion

41 The analysis of the socio-environmental degradation of the Mau Forest shows that all of the three typical proximate causes of deforestation (agricultural expansion, wood extraction, infrastructural expansion) are at work. For agriculture the link is direct: part of the forest has been substituted by planned settlements for small-scale farmers and tea plantations. This change in land use is a typical socio-political process because land is assigned to selected ethnical or electoral pools.

42 In the case of wood production the socio-environmental degradation is determined by the biodiversity loss caused by the conversion of forest into monospecific plantations. This second pattern of forest degradation comes from a physical and political exclusion of traditional communities that dates back to colonial times and continue to this day. Thus, the fall in biodiversity produced by this process recalls the lack of political diversity and the linkages between this lack of participation and natural resource looting carried out by external countries and national groups of power. The multi-methodological assessment undertaken in the Kiptunga forest draws a very coherent picture according to which the land use change induced by – even legal and managed – logging activity crashes the biodiversity of the logged areas and consequently the possibility for local communities to enjoy the presence of ecosystem services.

43 The impact of infrastructure on the Mau Forest is still limited, but it will be higher in the near future as a consequence of the dam that is under construction around the forest and

the related infrastructure (roads, pipelines). These infrastructures will have an impact on the water regime and will accentuate the fragmentation of the forest with significant consequences in terms of biodiversity loss.

44 The evictions of the local communities from the forest that were decided out of the study area following national political interest had an impact on the conservation of the Mau Forest, both directly, via forest excisions, and indirectly, changing the attitude of the community towards the forest. In fact, this strategy is removing an important sense of ownership from the community, thereby inducing spontaneous sources of deforestation. This is brilliantly testified by the words of an old hunter from the Ogiek community, who declared: *"Once we managed the forest and nobody was abusing it, due to a reciprocal control of the hunting areas of the respective groups of people. Then they removed the land from us, and people started poaching, because nobody had no more land anymore, neither respect for it"*.

45 The processes analyzed show the importance of the political dimension in deforestation and forest degradation processes: the government has played a pivotal role in the three sectors and the forest has been used as a strategic asset in the political struggle on a national scale. This dynamic contrasts with the process described in literature (Rudel, 2007) highlighting a shift in the main actors of tropical deforestation from governments to the private sector. On this subject, we can add two cautions and a general consideration. The first caution is related to the fact that Rudel's work is mostly focused on Asia and Latin America and the author suggests that the shift from state-led to private initiatives is weaker in Africa (38-39). This "African exception" is confirmed by the work of Fisher who points out the expansion of smallholder agriculture as the dominant driver of African deforestation (Fisher, 2010). The second remark concerns the fact that in many developing regions, but particularly in African countries, the limit between the public and the private sector is often blurred (Mbembe, 2001): in the Mau Forest, for instance, public settlement schemes were destined to private individuals with personal connections with political figures, the tea sector shows a mix of private and public actors and private logging companies are directly connected to political leaders.

46 Finally, the case of the Mau Forest highlights the fact that African governments' power is strictly connected with natural resource management. This analysis confirms similar considerations developed for extractive resources (Jensen, Wantchekon, 2004) and should re-orient the strategies to fight against deforestation, limiting the impact of national strategies and focusing on community-driven initiatives. Local communities are reacting to these dynamics implementing small-scale projects but, to be effective, these actions should be coupled with a revision of national policies on crucial issues such as land use, protected areas, agriculture, infrastructure and indigenous peoples.

BIBLIOGRAPHY

AFRICAN COURT ON HUMAN AND PEOPLES' RIGHTS, *Application 006/2012 – African Commission on Human and Peoples' Right v. Republic of Kenya*, judgement delivered on Friday 26 May 2017.

ALLEN J.C., BARNES D.F. (1985), "The Causes of Deforestation in Developing Countries", *Annals of the Association of American Geographers*, *75*, 2, Abingdon-on-Thames, Taylor & Francis, pp. 163-184.

BENNUN L., DRANZOA C., & POMEROY D. (1996), "The Forest Birds of Kenya and Uganda", *Journal of East African Natural History*, *85*, pp. 23-48.

BENNUN L., NJOROGE P. (2001), "Kenya", *in* FISHPOOL L.D.C., EVANS M. (eds.), *Important Bird Areas in Africa and associated islands*, Birdlife International.

BLACKBURN R.H. (1974), "The Okiek and Their History", *Azania Archaeological Research in Africa*, *9*, pp. 139-157.

BRATTON M., VAN DE WALLE N. (1994), "Neopatrimonial Regimes and Political Transitions in Africa", *World Politics*, *46*, 4, Cambridge University Press, pp. 453-489.

CHANG K. (2015), *World tea production and trade. Current and future development,* FAO, Rome.

CHEPKOECH A., MUTUA K. & MBULA R. (2018), "Disputes halt dam projects in wake of water shortage", *Daily Nation*, https://www.nation.co.ke/news/Disputes-halt-mega-dam-projects-in-wake-of-drought/1056-4299892-tct3j5/index.html, accessed on May 2nd 2018.

COUNTY GOVERNMENT OF BOMET (2018), *County Integrated Development Plan 2018-2022*.

COURTNEY MUSTAPHI C.J, GITHUMBI E.N., MUTUA J., MUTHONI R., RUCINA S.M. & MARCHANT R. (2014), *Ongoing sedimentological and palaeoecological investigations at Nyabuiyabui wetland, Kiptunga Forest Block, Eastern Mau Forest, Nakuru District, Keny. A report to the Mau Forest Conservation Office, Kenya Forest Service, and the National Museums of Kenya Palaeobotany and Palynology Section*.

DI MATTEO F. (2017), "Community land in Kenya: policy making, social mobilization, and struggle over legal entitlement", *Working Paper Series 2017,* No.17-185, London School of Economics and Political Science.

DROZ Y. (1998), « Genèse d'une "ethnie": le cas des Kikuyus du Kenya central », *Canadian Journal of African Studies*, *32*, 2, pp. 261-284.

FISHER B. (2010), "African exception to drivers of deforestation", *Nature geosciences*, *3,* pp. 375-376.

GEIST H.J., LAMBIN E.F. (2001), *What Drives Tropical Deforestation?*, Louvain-la-Neuve, CIACO.

GOVERNMENT OF KENYA (2004), *Report of the Commission of Inquiry into the Illegal/Irregular Allocation of Public Land (Ndungu Commission)*, Nairobi, Government Printer.

GOVERNMENT OF KENYA (GoK), UNEP (2008), *Mau complex and Marmanet forests, environmental and economic contributions, Briefings notes*, UNEP.

GOVERNMENT OF KENYA (GoK), MINISTRY OF FORESTRY AND WILDLIFE (2013), *Analysis of drivers and underlying causes of forest cover change in the various forest types of Kenya*, Nairobi, GoK.

HORNSBY C. (2012), *Kenya. A History Since Independence*, London/New York, I.B. Tauris.

HOSONUMA N., HEROLD M., DE SY V., DE FRIES R.S., BROCKHAUS M., VERCHOT L., ANGELSEN A. & ROMIJN E. (2012), "An assessment of deforestation and forest degradation drivers in developing countries", *Environmental Research Letter*, *7*, pp. 1-12.

JENSEN N., WANTCHEKON L. (2004), "Resource Wealth and Political Regimes in Africa", *Comparative Political Studies*, *37*, pp. 816-841.

KIMAIYO TOWETT J. (2004), *Ogiek Land Cases and Historical Injustices 1902-2004*, Egerton, Nakuru, Ogiek Welfare Council.

KLOPP J.M. (2012), “Deforestation and democratization: patronage, politics and forests in Kenya”, *Journal of Eastern African Studies*, *6*, 2, pp. 351-370.

KRATZ C. (1994), *Affecting performance: meaning, movement and experience in Okiek women's initiation, Washington*, Smithsonian Institution Press.

MBEMBE A. (2001), *On the Postcolony*, University of California.

MILDER J.C., MOROGE M. & SHAMES S. (2015), “Operationalizing climate-smart agricultural landscapes: the case of a tea-producing landscape in Kericho, Kenya”, *in* MINANG P.A., VAN NOORDWIJK M., FREEMAN O.E., MBOW C., DE LEEUW J. & CATACUTAN D. (eds.), *Climate-Smart Landscapes: Multifunctionality in Practice*, Nairobi, World Agroforestry Centre (ICRAF), pp. 319-333.

MWENDA A.M., TANGRI R. (2005), “Patronage Politics, Donor Reforms, and Regime Consolidation in Uganda”, *African Affairs*, *104*, 416, Oxford University Press, pp. 449-467.

MYERS N. (1993), “Tropical forests. The main deforestation fronts”, *Environmental Conservation*, *20*, 1, Cambridge University Press, pp. 9-16.

NATIONAL WATER CONSERVATION AND PIPELINE CORPORATION (2017), *Proposed Bosto Dam Project, Bomet County, Environment and Social Impact Assessment Study Report*, https://www.nema.go.ke/images/Docs/EIA_1380-1389/ESIA%201381_%20STUDY%20REPORT%20FOR%20PROPOSED%20BOSTO%20DAM%20IN%20BOMET%20COUNTY.pdf, accessed on September 26th 2017.

OFCANSKY T.P. (1984), “Kenya forestry under British colonial administration, 1895-1963”, *Journal of Forest History*, July, pp. 136-143.

OPENDA J., WAMBUI M. (2017), “Itare dam dispute tightens as locals seek CJ Maraga help”, *Daily Nation*, http://www.nation.co.ke/counties/nakuru/Itare-dam-dispute-tightens/1183314-3971510-format-xhtml-o7spww/index.html, accessed on September 26th 2017.

RIFT VALLEY WATER SERVICES BOARD (2015), *Itare Dam Water Supply Project. Environmental and Social Impact Assessment (ESIA) Study Report*, Nairobi, www.nema.go.ke/images/Docs/EIA.../EIA1257ItareESIAStudyReport2016.pdf, accessed on September 25th 2017.

RODGERS W.A., OWEN C.F. & HOMEWOO K.M. (1982), “Biogeography of East African forest mammals”, *Journal of Biogeography, 9*, 4, pp. 1-54.

RUDEL T.K. (2007), “Changing agents of deforestation: From state-initiated to enterprise driven processes, 1970-2000”, *Land Use Policy*, *24*, 1, Amsterdam, Elsevier, pp. 35-41.

SACE (2015), *Intesa Sanpaolo-Sace-Bnp Paribas: € 306 Million for the Itare Dam Project in Kenya*, https://www.sace.it/en/media/press-releases/press-release/sace---intesa-sanpaolo---bnp-paribas-306-million-for-the-itare-dam-project-in-kenya, accessed on September 25th 2017.

SANG J.K. (2001), “Kenya. The Ogiek in Mau Forest”, *in* NELSON J., HOSSCAK L. (eds.), *From Principle to Practice: Indigenous Peoples and Protected Areas in Africa*, Forest Peoples Project, pp. 111-194.

SWART R.E. (2016), *Monitoring 40 years of land use change in the Mau Forest Complex, Kenya. A land use change driver analysis*, Thesis Report, Centre for Geo-Information Science and Remote Sensing, University of Wageningen.

THURSTON A. (1987), *Smallholder Agriculture in Colonial Kenya: The Official Mind and the Swynnerton Plan*, Cambridge, African Studies Centre.

TRIVELLINI G., LINDON A. (in prep.), *Evaluation of natural resource of conservation and tourism interest in the Kiptunga Forest*.

TRIVELLINI G., LINDON A. (2015), *Getting quantitative data from community perceptions: The case of the MAU forest Rapid Biodiversity Assessment*, 3rd International Conference on Environmental Monitoring and Assessment, University of Aarhus, Denmark (02/10/2015).

TROUP R.S. (1922), *Report on Forestry in Kenya*, Crown Agents for the Colonies, London.

WAINAINA B. (2011), *One Day I Will Write About this Place*, London, Granta.

NOTES

1. The paper refers to the Mau Forest as a whole, but a field research was developed in the central sectors where recent deforestation was higher (South West Mau and Eastern Mau); thus, the examples mentioned mostly come from this area. In particular, we conducted biodiversity assessment and participatory mapping (Guido Trivellini and Adrien Lindon) with members of local CFAs in the forest of Kiptunga (Easter Mau block, 2013), Koibatek (Mount Londiani block, 2017) and Ndoinet (South West block, 2017). Furthermore, we (Stefania Albertazzi and Valerio Bini) conducted 30 interviews (November 2017 and February 2018) with members of local communities (most of them active in the respective CFAs) and 18 meetings with relevant stakeholders (local government and forest administrators, NGOs, researchers). All authors discussed the results and contributed to the final manuscript. Stefania Albertazzi wrote three sections ("Tea production", "Infrastructure" and "Politics, ethnicity and forest management"), Valerio Bini wrote three sections ("Introduction", "Small-scale agriculture" and "Conclusion"), Adrien Lindon and Guido Trivellini wrote two sections ("Context" and "Plantations").
2. 16 blocks are contiguous and 6 are considered "satellite blocks".
3. The Kenyan forest protected areas are divided into National Parks, managed by the Kenya Wildlife Service; Forest Reserves, managed by the Kenya Forest Service; Trust Lands, managed by the local government of the County Council. The Mau Forest is a natural reserve and a forest reserve, so both the Kenya Wildlife Service and the Kenya Forest Service are involved in the management of these protected areas.
4. Excluding the Congolese forests and the Ruwenzori areas, which represent outliers in the sample – more than 50 species – and which the authors define as the bio-geographical source area from which all the other forests would derive their fauna
5. Silviculture presents specific characteristics and thus will be treated separately.
6. 158 hab./km^2 with a district average of 173 hab./km^2.
7. More than 44%, with a district average of 28%.
8. Kenya Indigenous Forest Conservation Programme, funded by the United Kingdom (1991-94).
9. This is reported in the description of the events related to the Eastern Mau block by Di Matteo (2017) and confirmed during the interviews we conducted in the South West Mau for the corresponding forest section (2018).
10. The KTDA was established in 1964 as a governmental company with the aim of developing the small-scale tea sector and later privatized (2000). Currently, 560,000 small farmers are the individual shareholders of the 54 factories companies that own the KTDA Ltd all over the country.
11. 4 sampling sites*2 cameras *72 sampling hours = 576 total sampling hours.
12. The initially subjective information is considered objective, as a unique result of a discussion with 19 people and the recognition of the species was guaranteed by the use of pictures, under the precise request to the group to provide also the local name, also peer-reviewed in the group. The resulting matrix generated, both for mammals and birds, the average detectability values of the 36 species agreed in the group of 19 frequent forest users, generating in turn an average values of wildlife estimated presence for every of the six forest sectors.

13. Kruskall Wallis test (0,00529 < all four p values < 0,004612 for birds; 0 < all four p values < 0,04115 for mammals).
14. Spearman rank correlation test, p = 0,008.
15. The project will cost € 306 million and is funded by two banks (Intesa San Paolo and BNP Paribas) and the Italian export credit agency (SACE, 2015).
16. The Kipsigis, Luo and Kuria Council of Elders, the Abagusii Cultural and Development Council and the Ogiek Community presented two petitions to challenge the construction of the dam. Recently the issue has been transferred from the Land and Environment Court of Nakuru to the Chief Justice in Nairobi (Openda & Wambui, 2017)
17. The project will cost approximately KSHS 22 billion, with the amount of 15% funded by the Govern and 85% by a loan from the Chinese Exim Bank. The strategic value of the infrastructure was even underlined during an interview (2018): “the Bosto dam is a flagship project of the Govern and there are no ways to hinder it”.
18. While the Ogiek community obtained an important victory with this statement, the forest ecosystem is still fragmented, thus highlighting a critical gap between social and environmental resilience.

ABSTRACTS

The paper investigates the deforestation process in the Mau Forest (Kenya), highlighting the actors involved and the underlying relations of power. The proximate causes of the deforestation are three: agriculture, wood production and infrastructures. In this context of pressure on natural resources, local communities have developed different projects to reduce deforestation and promote alternative development strategies, especially through the Community Forest Associations (CFAs). These dynamics show that deforestation is a complex issue whose solutions lie primarily outside the forest itself and that it should be tackled with suitable policies on crucial issues such as land, agriculture, infrastructure and indigenous peoples.

L’article analyse le processus de déforestation dans la Forêt Mau (Kenya) et met l’accent sur les acteurs impliqués et les relations de pouvoir sous-jacentes. Les causes directes de la déforestation sont trois : l'agriculture, la production de bois et les infrastructures. Dans ce contexte de pression sur les ressources naturelles, les communautés locales ont développé différents projets visant à réduire la déforestation et à promouvoir des stratégies de développement alternatives, en particulier à travers l’action des Associations Communautaires de gestion de la Forêt (CFAs). Ces dynamiques montrent que la déforestation est une question complexe dont les solutions se situent principalement en dehors de la forêt et devraient être abordées à travers des politiques appropriées sur des questions cruciales telles que la terre, l'agriculture, les infrastructures et les peuples autochtones.

INDEX

Mots-clés: déforestation, écologie politique, Kenya
Keywords: deforestation, political ecology, Kenya

AUTHORS

STEFANIA ALBERTAZZI

PhD candidate, University of Padua, Verona and Cà Forscari University of Venice, stefania.albertazzi@studenti.unipd.it

VALERIO BINI

Researcher, University of Milan, valerio.bini@unimi.it

ADRIEN LINDON

Eliante, adrien.lindon@hotmail.it

GUIDO TRIVELLINI

Eliante, Ecology and Development, guido@gtecodev.com