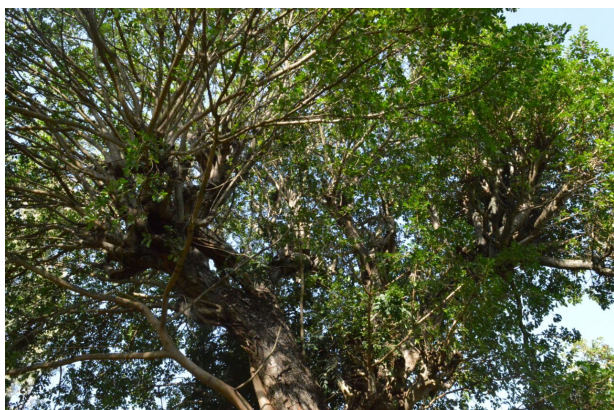


Alienation in Agriculture: How the Shamba System Promotes the Degradation of Kenyan Montane Forests

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Mugumo tree (“Mugumo Tree Branches,” 2016).

“In the beginning Ngai, who is the God and the divider of the universe, called Gikuyu the father of a tribe. Ngai gave Gikuyu a share of his land with rivers, valleys, forests rich with fruits and animals of all types.

Now Ngai used to go around inspecting and admiring the beautiful earth. One day He took Gikuyu on top of Kirinyaga (Mt. Kenya). It was the highest point of the mountain. He showed Gikuyu a spot in the center of the country where there were many *mugumo* (wild fig) trees. Gikuyu saw that the land was very beautiful. And Ngai said to Gikuyu, ‘Go. Build your homestead on that spot with *mugumo* trees,’ and he called the selected place where the *mugumo* trees grew *Mukurwe wa Gathanga*.”

—Kikuyu creation myth (Mwangi, 2015).

Introduction and Outline

Deforestation of montane woodlands in central Kenya threatens Kenyan social and agricultural systems as well as native ecosystems (Maathai, 2010). Indigenous plant loss reduces forest ecosystems’ capacities for rainwater conservation, eroding valuable topsoil and desiccating rivers essential to irrigation. Detriments to agriculture are exacerbated by the clear-cutting of forests and establishment of exotic tree monocultures for commercial timber production.

The Kenyan *shamba* system, an arrangement allowing local farmers to grow crops while tending to exotic tree saplings on commercial or state-owned land, has long been supported as a solution to deforestation and an aid to subsistence agriculturalists. Yet closer examination reveals how the *shamba* system further endangers indigenous forests in Kenya by alienating local interests from those of the environment, thereby promoting environmental degradation. Although dependence upon native plant species for food and medicine once aligned the interests of indigenous farmers

with those of forest ecosystems, imposition of the *shamba* system upset traditional customs of land appropriation, alienating Kenyans from the land on which they relied. The system opposes the practices by which indigenous populations sustain themselves and practices that support forest preservation, as it incentivizes farmers to clear native vegetation and to actively hinder the growth of plantation saplings. By incentivizing corrupt and unsustainable land management practices, the Kenyan *shamba* system assures the continued degradation of montane forest as well as the disruption of normal soil renewal and irrigation processes essential to successful agriculture.

In the following section, I introduce the problem of Kenyan montane deforestation and the challenges it poses to agriculture in rural areas. I then examine the importance of woodland preservation to pre-colonial indigenous populations, detailing the roles of trees and agroforestry practices in various domains of traditional Kikuyu society. In the third section, I explain how British colonial land policy, first implemented in the 1900s, alienated indigenous

peoples from ancestral lands, and I contrast the environmental exploitation that emerged with the sustainable practices of pre-colonial Kikuyu tradition. In the fourth section, I examine the emergence of the modern Kenyan *shamba* system and detail the various ways in which it promotes exploitation of forest resources. Finally, I connect colonial land alienation and redistribution to the loss of traditional values and practices supporting forest preservation to demonstrate how the *shamba* system disrupted Kikuyu populations' intimate relationships with native woodlands, misaligning human and environmental interests and promoting environmental degradation.

Deforestation and Agriculture in Kenya

Loss of native vegetation in the mountainous region of central Kenya is considered one of the country's most pressing environmental problems, and it is especially detrimental to Kenyan agriculture (O'Keefe et al., 1984; Maathai, 2010). In functioning montane ecosystems, native forests provide steady water supplies by storing water during rainy seasons and releasing it slowly into rivers during dry periods. This intra-seasonal regularity of river flows bolsters the resilience of agriculturally dependent households against seasonal environmental and economic changes (Maathai, 2010). Yet tree removal disrupts the water regulation system, increasing local susceptibility to wet-season flooding and dry-season drought. The agricultural consequences of tree removal are many: reduced river flows in dry seasons contribute to drought, more powerful wet season flows erode valuable topsoil (UNU-IHDP & UNEP, 2012), and native tree loss induces chemical and physical changes that decrease nutrient levels and increase acidity in any soil that remains (Allen, 1985). In addition to costing the Kenyan economy approximately 16 million USD annually (UNU-IHDP & UNEP, 2012), these ecological changes impede the agricultural success of subsistence households (Maathai, 2010). Hence, forest removal presents an economic and social problem as well as an environmental one: Just as deforestation disrupts the functioning of native ecosystems, it contributes to extreme poverty and malnutrition in families that rely on healthy forests for the success of small-scale agriculture (Maathai, 2010).

Pre-colonial Land Preservation

A description of pre-colonial land use in central Kenya is necessary to demonstrate the contribution of colonial systems to modern land-hunger and to practices that contribute to deforestation. Many pre-colonial populations in Kenya relied heavily upon forests for utilitarian, cultural, and spiritual purposes. The Kikuyu people, who occupy the southern slopes of Mt. Kenya, have long traditions of practical knowledge about forest resources, such as plants' medicinal and edible properties (Castro, 1991; Dewees, 1993). Learning about trees was a central focus of the Kikuyu enculturation process for both men and women, and Kikuyu oral history tied ancestral forest use to sociocultural identity (Castro, 1991). Furthermore, trees played roles in religious ceremony, as the Kikuyu considered forests to be inhabited by spirits and other supernatural forces (Castro, 1991).

Due to the importance of forest resources for practical use, cultural identity, and religious ceremony, practices conserving native vegetation were integral to Kikuyu society (Kilson, 1995). Although the Kikuyu are a primarily agrarian people and regularly clear terrain for agriculture, they developed land use practices to ensure the survival of forest cover on Mt. Kenya. When clearing forest for agriculture, farmers left designated areas of native vegetation intact. Customary Kikuyu tenure rights included restraints on cutting trees, as permission had to be obtained from local elders before harvesting trees or farming on mountain slopes (Castro, 1991). In addition, the planting and protection of trees were accepted means of establishing rights to unclaimed land as well as means of demarcating clan and homestead boundaries (Castro 1991). This convention incentivized care for native vegetation, which often served both utilitarian and demarcation roles. For instance, *Muhindahinda* and *mukandu* trees were commonly planted between huts; the former was used to make household implements, while berries from the latter were used as famine food (Dewees, 1993). Landholders even placed curses on trees of significance, such as the sacred *Mugumo* tree, to protect them from human encroachment (Castro, 1991; Dewees, 1993). These tree-promoting practices created a considerable forest presence on and around Kikuyu farms, providing regular irrigation to Kikuyu farmland.

In agrarian Kikuyu society, retaining nutrient-rich soil was equally imperative as conserving forest cover for tree use, and the two goals went hand-in-hand. Agricultural success relied upon a pre-colonial land inheritance system that ensured fragmentation of lineage land holdings: By cultivating crops on regularly reapportioned plots over diverse ecological zones, Kikuyu farmers minimized the risks of micro-climatic variations, pests, and diseases (Deweese, 1993). Kikuyu households also practiced a series of farming techniques, such as bush fallowing and crop rotation, to protect soil from degradation, and farmers integrated diverse tree species into plots of cultivated land to assure soil renewal despite frequent crop planting (Castro, 1991). Removal of integrated trees was rare, as Kikuyu beliefs held that any destroyer of boundary and agro-forestry vegetation would die almost immediately (Deweese, 1993).

The cultural meanings attached to trees and the fragmentation of land holdings through land inheritance had the concomitant effects of protecting local forests and promoting nutrient-rich soil, benefitting sylvan organisms and agrarian producers alike. Though these practices promoted ecosystem health in Kikuyu territory, their conservatory impacts on trees and soils were natural outcomes of effective land use rather than deliberate efforts to preserve resources for the sake of the environment (Castro, 1991). Pre-colonial Kikuyu ecology exemplifies an approach to agriculture that sustains the quality of cropland by preserving the integrity of surrounding woodlands. In such a system, tree conservation and clan prosperity are inextricably linked, so human and environmental interests align.

Colonial Land Redistribution

The human-forest alliance of early Kikuyu custom was challenged by the implementation of new land policy under British colonial rule in the late 19th century. The enactment of the Crown Land Ordinance in 1915 brought all land in Kenya under the authority of the British Crown, stripping Africans' legal rights to land ownership (Kilson, 1995). What emerged was a deep sense of insecurity among the Kikuyu, whose agricultural, religious, and social systems heavily depended on land possession and forest use (Kilson, 1995). Yet colonial impacts

extended beyond passive disenfranchisement: Firsthand accounts relate the brutality with which Europeans razed Kikuyu huts, storage barns, and cattle pens, sending inhabitants scrambling to escape their own estates (Kilson, 1995). The displacement of Kikuyu and other indigenous peoples from their homesteads to inferior farmland—some 60,000 in central Kenya by 1932—led to a sense of alienation from nature among local populations (Kilson, 1995). In a 1932 memorandum submitted to the Kenya Land Commission, an indigenous farmer laments the hardships undergone by the Kikuyu:

We have suffered because our old lands have been taken from us [...] We are fined if we cut firewood or timber for building within the forest. We must now buy grazing, firewood, etc. in places that once were ours (quoted in Kilson, 1995, p. 120).

European land acquisition triggered the geographical and cultural separation of Kikuyu peoples from the ecosystems on which they depended, the same ecosystems that had benefited from the protective measures of Kikuyu systems of land use. The Kikuyu and other indigenous populations of Mt. Kenya were shunted to land of inferior quality, much of which was agriculturally unviable (Kilson, 1995). Because displaced peoples had neither ancestral nor functional connections to their new and unfamiliar environments, religious and cultural customs that once had promoted sustainable cultivation and forest preservation began to lose meaning.

In the 1930s and 1940s, British authorities began allowing establishment of commercial tree plantations on formerly Kikuyu land to provide timber for building and firewood. As the tree species upon which the Kikuyu had depended were slow-growing and economically less profitable than the exotic eucalyptus and pine, much of the indigenous forest was cleared to make way for exotic plantations (Maathai, 2010). With the clearing of native vegetation came the consequences of deforestation: seasonal flooding and erosion, intermittent water shortages, and soil nutrient depletion.

The subsequent introduction of exotic monocultures, rather than reversing the effects of native vegetation loss, did little to mitigate the environmental deterioration to which deforestation contributed. In a naturally occurring forest, 99

percent of biodiversity is comprised of non-tree components (Kirubi et al., 2000). Whereas the diversity of species in native forests had assured a balanced soil nutrient profile, high demand for select nutrients by newly planted monocultures altered soil nutrient ratios, thwarting the growth of other forest species and destroying local biodiversity (Smith, 1994; Maathai, 2010). Monocultures' sparse and unvaried vegetation lacked the capacity to receive and conserve rainwater; it thus failed to mitigate the harm that native-species removal had caused to agriculture in surrounding areas (Gerber, 2011; Maathai, 2010). Hence, not only did monoculture establishment in Kenya allow for the destruction of native forestland, but it also undermined the efforts of local populations to practice agriculture in forest-adjacent areas (Kirubi et al., 2000; Maathai, 2010).

The Shamba System and Forest Abuse

To support monoculture seedlings until harvest, the Kenyan government and commercial timber companies recruited landless Africans, many of whom were alienated Kikuyu households struggling to survive without access to arable land (Witcomb & Dorward, 2009). Once native vegetation had been cleared from the areas designated for exotic plantation, timber companies allowed farmers to cultivate crops alongside exotic timber seedlings until the tree canopy closed and lack of sunlight precluded further crop growth. The plots of monoculture land cultivated by native populations become known as *shambas*, which typically could be farmed for up to three years at a time. Tree canopy closure on any *shamba* heralded farmer relocation to another *shamba* plot, where trees recently had been felled, to repeat the cultivation process (Witcomb & Dorward, 2009). In theory, if enough land was available on timber plantations, Kenyan farmers could consistently grow subsistence and cash crops—maize, potato, beans, wheat, pyrethrum, and kale—to support their families without property of their own (Oduol, 1986).

This farming of “borrowed” land, a practice that became known as the *shamba* system after the names of the individual *shamba* plots, became popular with Kenya's growing population and spread quickly. By the mid-1980s, 160,000 hectares of forest plantation had been established, and 16 percent of national

maize production took place on *shamba* land (Oduol, 1986). In the years following its institution, the *shamba* system was outlawed and reinstated several times due to corrupt behavior by state Forest Department officials, who charged farmers for plot use and pocketed the profits (Witcomb & Dorward, 2009). Today, the *shamba* system remains in effect in a form much like the original. *Shamba* system proponents maintain that the system reconciles the interests of commercial foresters and local farmers. Many praise it for providing employment and sustenance to rural Kenyans who, without land, have few other sources of income, and farmers' care for seedlings is thought to benefit timber companies by promoting tree survival (Oduol, 1986).

Although it may benefit participants in the short term, the *shamba* system has proven detrimental over the long term by promoting continued deforestation and incentivizing practices that undermine the efficiency of the system itself. Kironchi (1996) argues that high population density and food insecurity in plantation areas, coupled with the limited number of *shambas* available at any given time, make the system untenable in its original form and destined for corruption. Indeed, because farmers do not pay to use *shamba* land, there invariably emerges what Hardin (1968) terms a *tragedy of commons*: Many Kenyan *shamba* farmers exploit plantation access, consuming forest resources without considering the damaging effects of this consumption to natural ecosystems and to other farmers. As a result, a range of illegal activities—poaching, illegal logging, charcoal burning, and marijuana cultivation—take place on plantation land, harming local ecosystems as well as exotic plantation trees (Witcomb & Dorward, 2009).

The situation is exacerbated by rapid increases in the Kenyan population: When the number of willing farmers exceeds the number of available plantation plots, farmers are incentivized to clear native vegetation illegally in hopes of expanding plantation area and obtaining more *shambas* for potential cultivation (Oduol, 1986). Often, this is accomplished by indiscriminate burning of local forests. In 1981, Wanyeki found that 40 percent of reported forest fires in Kenya result from efforts to obtain more *shambas*, and subsequent Forest Department investigations revealed that much of this burning took place in water catchment

areas critical to sustaining river flow (Kagombe & Gitonga, 2005). Illegal clearing of native vegetation exacerbates the impacts of deforestation, intensifying soil nutrient depletion and disrupting normal rainfall patterns. These consequences harm the very agricultural practices upon which *shamba* farmers depend, increasing the amount of work required to successfully plant and harvest crops (Deweese, 1993; Maathai, 2010).

Even after having acquired land for cultivation—through legal or illegal means—*shamba* farmers have little reason to support timber production by supporting the healthy growth of plantation saplings. Farmers receive *shamba* plots for cultivation with no guarantee of receiving future plots when tree canopies close. Because sapling growth expedites the process by which farmers lose their *shambas*, the more efficiently farmers cultivate their saplings, the sooner they relinquish opportunities for crop cultivation and reliable means of agricultural subsistence. Coupled with the fact that farmers receive no portion of timber sales—and thus have no reason to encourage healthy growth of monoculture trees—this creates little incentive for sapling care and strong incentive for sapling destruction. Studies in Mt. Kenya Forest suggest that nearly 30 percent of farmers are directly involved in deliberate efforts to hinder exotic sapling growth, delaying canopy closure and prolonging their own access to plantation plots (Witcomb & Dorward, 2009).

Conclusion

The willful exploitation and destruction of forest resources by rural *shamba* farmers sharply contrasts the sustainable agricultural practices once prevalent in indigenous Kenyan societies. The implementation of the *shamba* system, with its various incentives for environmental destruction, fundamentally changed human-environment relationships in central Kenya. Rather than caring for a variety of forest species whose comestible, ceremonial, and medicinal properties sustained daily life, local Kenyan populations under colonial rule began to cultivate exotic species whose value, in the form of commercial timber, benefitted logging companies alone. This lack of an intimate relationship with forest ecosystems, facilitated by colonial land alienation and redistribution through the *shamba* system, impedes modern implementation

of sustainable agro-forestry practice. Though monocultures' contributions to erosion and irregular river flows make agriculture increasingly difficult for *shamba* participants, farmers subsisting on meager crop yields have little opportunity to plan beyond the immediate needs for food in order to support sustainable forest development (Maathai, 2010). Because the benefits of obtaining more *shambas* for cultivation are more immediate than the long-term advantages of healthy forest ecosystems and stable irrigation, Kenyan farmers burn the very vegetation that their predecessors endeavored to sustain.

Furthermore, because modern *shamba* farmers have nothing to gain from successful growth of monoculture trees, they have little incentive to protect the exotic species under their care. No longer do populations rely upon *Muhindahinda* and *mukandu* trees to demarcate clan boundaries; ownership and boundaries have little meaning for the temporary inhabitants of borrowed commercial land. Nor do native trees have value to farmers for their roles in protecting healthy soil, as each farmer will leave the degraded *shamba* plot before nutrient depletion fully affects his or her own crop yield. By opposing the interests of farmers to those of native forests and of healthy natural ecosystems, land alienation and *shamba* system implementation has relegated healthy central-Kenyan forests—and productive subsistence agriculture—to the pre-colonial past.

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