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Forest Reserves and Local Rights: German East Africa's Mt. Kilimanjaro*

By Robert Munson

Environmental history tells the stories of human interactions with the environment; the profound episodes of intervention that trigger major transformations of the environment as well as the less evident, but still important, interactions that subtly shape the physical landscape. The German-Chagga[1] contest over the rights to the forests on Mt. Kilimanjaro in the early colonial period is an example of the latter—a less dramatic interaction between two cultures and their shared environment that nevertheless shaped the slopes of Kilimanjaro. From the arrival of the German colonial government on Kilimanjaro in 1889 to their eviction in 1916, the Germans worked to create a system to preserve the forests. The German efforts and the response of the Chagga set the stage for the subsequent colonial-African interaction on the mountain, and the basic framework set in place by the Germans remains important even today. Although the German foresters' story is fairly straightforward to discover (as they left behind many written records), the full history of German forestry on Mt. Kilimanjaro still needs to be told.[2] The Chagga side is more difficult to piece together, in part because the early twentieth-century Chagga and their European observers did not consider forest resources to be a *critical* environmental issue, and thus sources rarely mention the forests. What was written, however, suggests some ways in which they dealt with this important issue.

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* I owe thanks to my Air University (Montgomery, Alabama, USA) colleagues Rob DiPrizio and Dan Henk and to the many participants of the African Studies Association annual meeting panel (2007) who kindly listened to a draft of this paper and provided valuable comments and feedback.

[1] Over the years in the literature, the Chagga have been known alternatively as Wachagga, Dschagga, Chaga, etc., but the Chagga themselves use Wachagga and Mchagga. For simplicity here I will use the shorter English version Chagga for the singular and plural.

[2] During the German period, numerous but usually general articles on German colonial forestry appeared in technical publications such as *Berichte über die Land- und Forstwirtschaft in Deutsch-Ostafrika* (Heidelberg), *Deutsche Forst-Zeitung* (Neudamm) or *Der Pflanzer* (Tanga). Theodor Siebenlist published one full-length monograph titled *Forstwirtschaft in Deutsch-Ostafrika* (Berlin: Parey, 1914), but even it was not very specific since it covered the entire colony. More recently, scholars have written retrospective works such as Hans Schabel's study "Tanganyika Forestry Under German Colonial Administration," *Forest and Conservation History* 34, 3 (1990), 130–41, and Thaddeus Sunseri, "Fueling the City: Dar es Salaam and the Evolution of Colonial Forestry, 1892–1960," in James R. Brennan, Andrew Burton, and Yusuf Lawi, eds., *Dar es Salaam: Histories from an Emerging Metropolis* (Dar es Salaam: Mkuki na Nyoka, 2007), 79–96.

Background

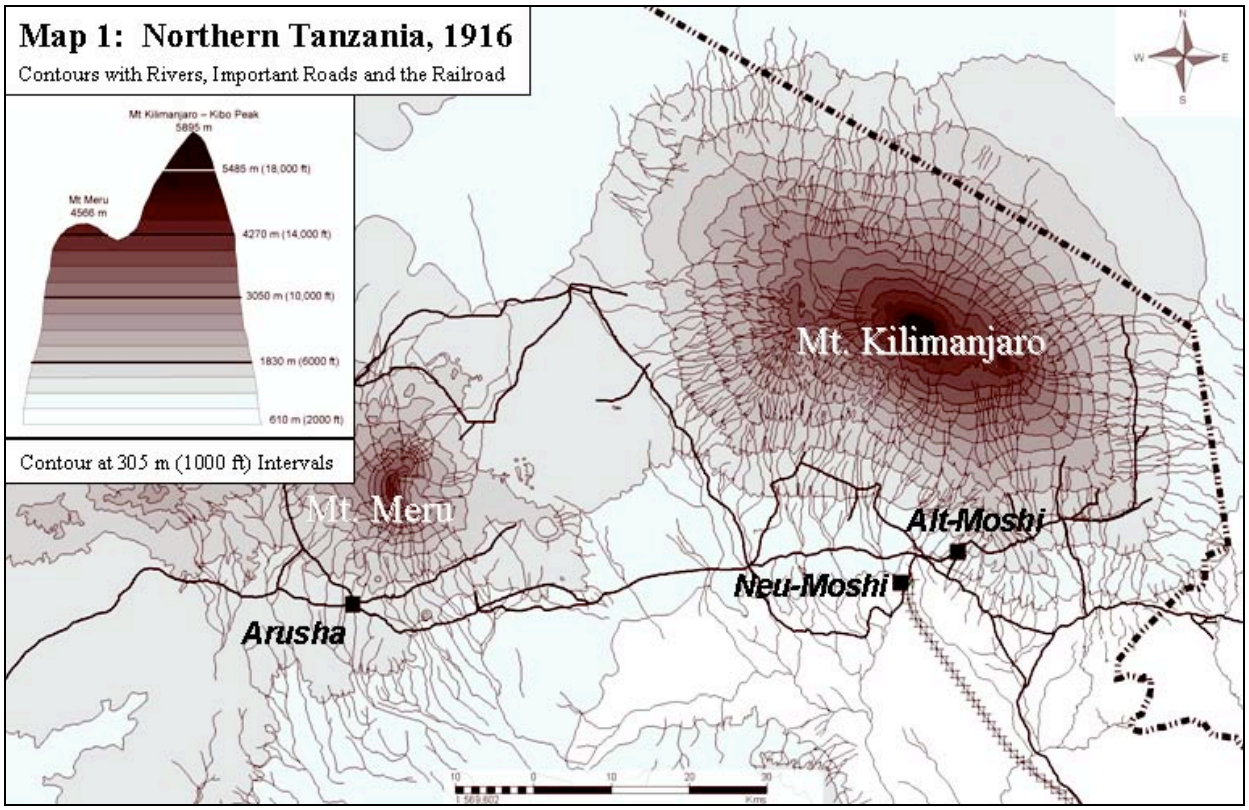
The Chagga of Mt. Kilimanjaro built their society upon wood. Situated in the middle of the savanna in northern Tanzania, Mt. Kilimanjaro stood (and stands) like a wooded island in a sea of grass (see Map 1). The Chagga people had lived on the mountain for hundreds of years before the German colonial era on Kilimanjaro began in 1889. On these mountain slopes the Chagga practiced sedentary agriculture, relying on their banana groves and fields of millet and maize for their daily subsistence and ceremonial uses. Their stall-fed cattle complemented the banana-agriculture, adding valuable manure to maintain the fertility of the soil. The Chagga primarily occupied the moist southern and eastern slopes, framed in below by the mixed forest and savanna and above by the high altitude forest (see Map 2). From these two wooded areas they obtained the timber and other forest products upon which they depended in their daily lives.

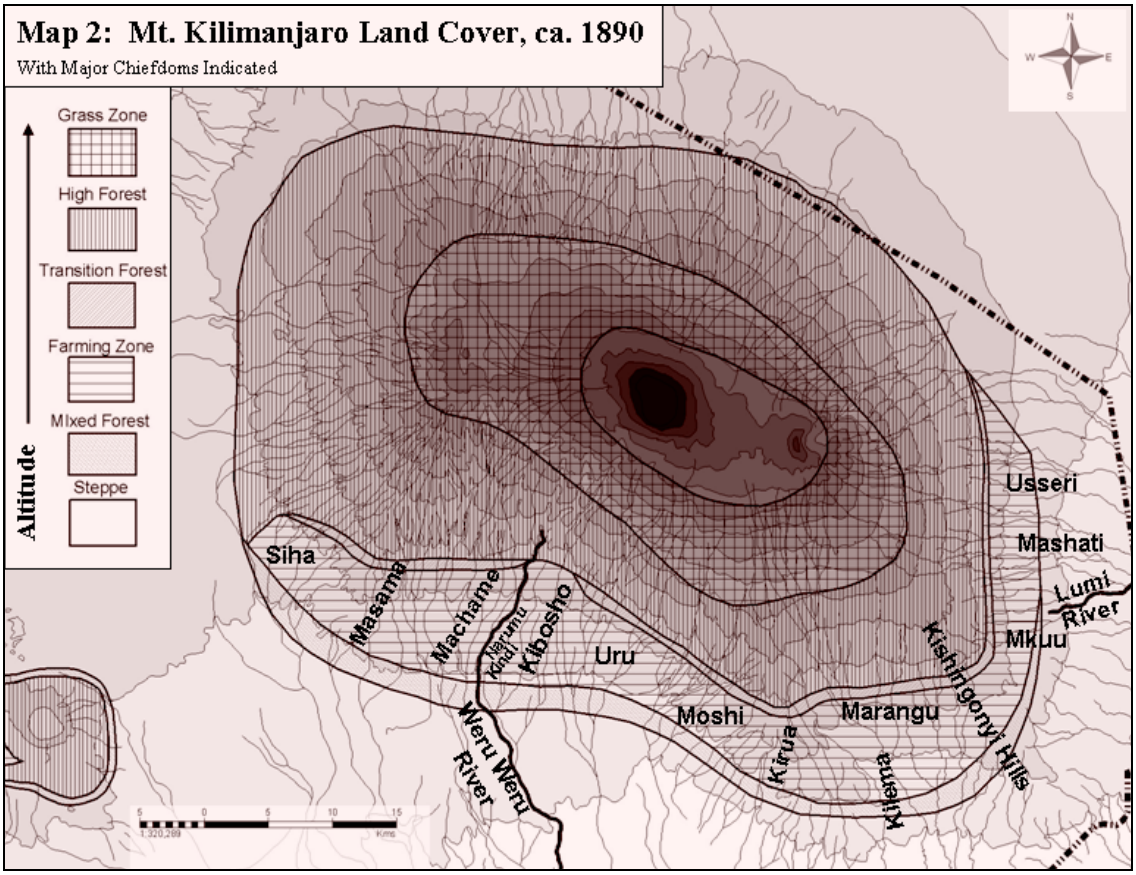
The Germans came to East Africa in the late nineteenth century. After the Deutsch-Ostafrikanische Gesellschaft (German East African Company) failed in its attempt to establish a private colony, the German government declared a protectorate over the area in 1885 as the colony of Deutsch-Ostafrika (German East Africa). In their slow expansion of control, the Germans established a permanent military station on the mountain in 1889 and slowly began to claim the forested areas in the name of the colonial government. Although German control became effective slowly, it caused the Chagga to alter their use of forest resources in order to retain their rights to these necessities of life. Their strategy, a combination of avoidance, cultural adaptation, and initiative, consisted of three main components. First, they often successfully ignored the emerging laws. Second, they adapted their pattern of forest use, concentrating more on the smaller forested areas close-at-hand due to a combination of availability and changing historical circumstances. Finally, and least recognized, the Chagga took the initiative and adopted exotic tree species that provided many of their needed forest products and fit well with their settlement pattern.

The Chagga Need the Forest

Wood was an important material resource in Chagga society, and forest products contributed to most aspects of their daily lives. Unfortunately, precolonial and German colonial anthropological, mission, and government sources contain little information on the Chagga forest or forest product use *per se*. However, they do indicate the importance of forest products in every-day life. This general paucity of information can be attributed to the ubiquity of forest resources. The Chagga had sufficient wood for their needs and, in comparison to the surrounding area, the Kilimanjaro slopes held an abundance of natural resources. The use of these resources was a given, and thus their presence was rarely a reason for comment.[3]

[3] For example, Bruno Gutmann in his massive work *Das Recht der Dschagga* devotes little space to the rights the Chagga had to the forests, implying there was not much contention over these resources. See Bruno Gutmann, *Das Recht der Dschagga* (Munich: C.H. Beck'ische Verlagsbuchhandlung, 1926).


Map 1: Northern Tanzania, 1916
Contours with Rivers, Important Roads and the Railroad
Mt Kilimanjaro – Kibo Peak
5895 m
5485 m (18,000 ft)
Mt Meru
4566 m
4270 m (14,000 ft)
3050 m (10,000 ft)
1830 m (6000 ft)
610 m (2000 ft)
Contour at 305 m (1000 ft) Intervals
Mt. Kilimanjaro
Mt. Meru
Alt-Moshi
Neu-Moshi
Arusha


Map 2: Mt. Kilimanjaro Land Cover, ca. 1890
With Major Chiefdoms Indicated
Grass Zone
High Forest
Transition Forest
Farming Zone
Mixed Forest
Steppe
Altitude
Siha
Masama
Machame
Kibosho
Uru
Moshi
Marangu
Kilema
Kirua
Weru Weru River
Kishingonyi Hills
Mkuu
Lumi River
Mashati
Usseri

While the Chagga use of wood is difficult to quantify, sources show that the Chagga depended upon it for many of their necessities. Georg Volkens, the first German scientist to live on Mt. Kilimanjaro (1893–94), noted how the Chagga made their various household tools and implements of either wood or clay. Similarly, August Widenmann, a medical doctor stationed on the mountain with the German *Schutztruppe* (colonial troops), detailed Chagga wood use: long poles and boards were used for construction in their homesteads; poles and larger pieces of timber were used for household implements such as spoons and containers, as well as tools such as hoes and digging sticks; and most of their weapons were crafted with wooden elements.[4]

In addition to the durable uses of wood in and around the homestead, the Chagga needed fuel for cooking, brewing beer, and similar uses. Unfortunately, the Chagga use of fuels received even less attention in the anthropological studies than their tools. The Chagga used the manure of their stall-fed cattle to maintain the fertility of the banana groves, and thus manure was not likely to have been widely used as an alternative fuel. In one of the few mentions of wood used as fuel, Georg Volkens described how Chagga women brought firewood to his station to sell, and his published work even included a photograph of the women carrying large bundles of firewood.[5]

Two specialized professions in Chagga society similarly depended on the forests. First, the few beekeepers within Chagga society needed large tree trunks (20 cm in diameter) to hollow out and make into artificial hives, and then needed access to the forest to hang these hives.[6] Second, the smiths, while few in number, needed significant quantities of wood to fuel their forges and produce tools from the iron ingots obtained in trade.[7]

German Forestry on Mt. Kilimanjaro

Forests dominated the Chagga landscape *on the slopes* of Mt. Kilimanjaro. The land the European travelers crossed to get to the mountain, however, was dominated by dry savanna, bushes, and grass. From the traveler's perspective, the forests on the mountain and the riverine Rau forest at its base were the exceptions in this otherwise dry, savanna landscape (see Map 2). Germany is a land of forests and this contrasting African landscape—mostly dry with the mountainside arboreal reminders of home—presented the German colonial regime with an exceptional challenge in their construction of a "new Germany" in Africa. Deutsch-Ostafrika was a part of Germany and the land must be taken care of as the Germans at home would have and, within limits, made as productive as possible.

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[4] Georg Volkens, *Der Kilimandscharo: Darstellung der allgemeineren Ergebnisse eines fünfzehnmonatigen Aufenthalts in Dschaggaland* (Berlin: Reimer, 1897), 223–24, 230; A[ugust] Widenmann, *Die Kilimandscharo-Bevölkerung: Anthropologisches und Ethnographisches aus dem Dschaggalande* (Gotha: Justus Perthes, 1899), 60–61, 65–66, 70–71.

[5] Volkens, *Kilimandscharo*, 251; see also Tafel 6 (p. 241).

[6] Widenmann, *Kilimandscharo-Bevölkerung,* 82; Gutmann, *Recht*, 307.

[7] Sally Falk Moore, *Social Facts and Fabrications: "Customary" Law on Kilimanjaro, 1880–1980* (Cambridge: Cambridge University Press, 1986), 26–28.

The Germans brought their *Forstwissenschaft* (science and theory of forestry), ideas, and goals into this environment. German forestry at the end of the nineteenth century symbolized the progress Germany had made as a nation—the world recognized German *Forstwissenschaft* as the most advanced in the world. German foresters had successfully put science to the service of economics, scientifically improving the production of important forest products in a very crowded country. The Germans compounded the model of forestry practice brought from Europe with their own historical interpretation of the East Africa landscape: they saw the mountain forests in Deutsch-Ostafrika as merely the remaining parcels of a once great contiguous forest and blamed African land use practices for deforestation. The Germans believed that once cut, these forests would not rejuvenate naturally, thus the foresters needed to find the right species and invest much work in order to reforest the landscape.[8] This combination of imported German forestry practice and theories about the relatively unknown East African environment deeply influenced the developing forest service in Deutsch-Ostafrika.

Forstwissenschaft teaches that in order to protect a forest, its borders must be properly marked. The greatest dangers to the surveyed forest then come from fire and uncontrolled access. Theory thus calls for ordering the forests to protect them: cutting fire breaks along the edges and within the forest as well as conducting patrols and providing effective punishments for infringement of the laws.[9] These beliefs along with the historical interpretation of the landscape thus focused the priorities of the foresters in *Bezirk*[10] (district) Moshi on these tasks:

1) Protection—immediate safeguarding of standing forests, especially against fires;

2) Reservation—surveying, marking, and mapping to protect for the future;

3) Experimentation—search for new species for afforestation.

Beginning in 1889, the initial work fell to military and civilian station officials with other primary responsibilities. However, after the creation of the *Forstbezirk* (forest district) in April 1907, professional foresters came to the area and professionally managed operations as they would in Germany.

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[8] For example, Franz Stuhlmann, "Ueber die Ulugruruberge in Deutsch-Ostafrika," *Mittheilungen von Forschungsreisenden und Gelehrten aus den Deutschen Schutzgebieten* 8, 3 (1895), 218–22. Stuhlmann in East Africa represented a general European stream of thought shared by scientists of all nationalities. The French provide another well-researched example and had a forestry tradition that closely intertwined with that of the Germans. See, for example, James Fairhead and Melissa Leach "Rethinking the Forest-Savanna Mosaic: Colonial Science and Its Relics in West Africa," in Melissa Leach and Robin Mearns, eds., *The Lie of the Land: Challenging Received Wisdom on the African Environment* (Oxford: James Currey, 1996), 105–21.

[9] Tuisko Lorey, *Handbuch der Forstwissenschaft* (Tübingen: Laupp'schen Buchhandlung, 1888), 1.2:2–8.

[10] Like many of the German words used in this essay, I use *Bezirk* instead of the English translation "district" because the German *Bezirk* functioned differently than the later British districts.

Official documentation on German forestry efforts for the pre-1907 period is very sparse. In September 1897, the military commander in Alt-Moshi[11] wrote that the station had known of the serious need for reforestation in the *Bezirk,* but had not been very successful in reforestation efforts. He believed that due to the slow but steady increase in the Chagga settlement area, the only space available to plant trees was either above the Chagga settlement band in the high altitude forest or below it in the bushy savanna forest.[12] The military station attempted to test some new tree species but the seed (conifer varieties and mulberry trees) sent from the central offices in Dar es Salaam did not arrive fresh and subsequently did not sprout. Other attempts at planting different tree species (*Pinus austriaca*, *Eucalyptus* spp. and *Acacia* spp.) were similarly unsuccessful.[13]

Several years later, the officials began to deal with the reservation of land for forest reserves: they could only fully protect the land once it was designated as such. In December 1904 the *Militärstation* (military station) Alt-Moshi held the first *Landkommission*[14] to reserve the Rau forest at the base of Kilimanjaro. The government knew little about the area, and ultimately reserved an estimated 25,600 hectares (ha).[15] Six local *mangis* (chiefs)[16] attended the proceedings and apparently did not raise any objections to the plan. Only a handful of Africans lived on the 25,600 ha piece of land and none could lay claim to the area.

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[11] Alt-Moshi (i.e., Old Moshi) was the center of German rule on the middle slopes of Mt. Kilimanjaro. Late in the German colonial period, the colonial government began to construct the city of Neu-Moshi below the mountain on the savanna. This latter city, the German Neu-Moshi, is the city now known simply as Moshi.

[12] Tanzania National Archives (TNA) G 8/593, "Brief von Militärstation (MS) Moschi (Mos) (Merker) an Dar (es Salaam)," 30 September 1898, Bl 15R. Note on TNA sources: during the colonial period the Germans organized their files in Berlin and Dar es Salaam along similar lines, so the citation of the documents is fairly straight-forward. I have adopted the recommendation of the Bundesarchiv, Berlin and used it with slight modifications for archival sources from the Tanzania National Archives in Dar es Salaam. Due to the German method of numbering the individual sheets—not each side of a page—I use "Bl" to indicate the *Blatt* (sheet) with a following "R" or "L" indicating the right or left side of the facing side. In the rare files without sheet numbering, I have necessarily left off the "Bl" indication.

[13] TNA G 8/593, "Brief von MS Mos (Merker) an Dar," 25 Sep 1897, Bl 49R–50L.

[14] The reservation procedure followed a strict protocol. The responsible government officials would first mark the borders of a piece of land and then call a *Landkommission*. This commission was usually composed of a government chairman, several Chagga leaders from the surrounding area, and often included missionaries and other interested parties. They would determine if any Africans could lay claim to the land by virtue of use. If so, the land would be left in their possession or suitable compensation would be negotiated either directly with the people or their *mangi* (chief). If the land was then without claim, the government would declare it to be *Kronland* (crown land) and thereafter in possession of the government. The central government in Dar es Salaam would subsequently have to ratify this commission.

[15] One hectare (ha) = 10,000 m^2. Note: as explained later in the paper, this is not the same Rau Forest Reserve as depicted on Map 3.

[16] These *mangis* came from Kahe, Kirua, Uru, Mbokomu, Kindi, and Moshi.

The Africans probably saw no threat to their use of the forest, and so did not complain.[17] In a subsequent action, in late 1905 the *Militärstation* declared three pieces of the southern Kilimanjaro forest as forest reserves, but the governor in Dar es Salaam would not ratify the declarations since the borders had not been well marked. At this time, the military station believed the Chagga posed no danger to the Kilimanjaro forest "since neither the soil nor climate of the forests were suitable for their [Chagga] crops."[18]

Forestry efforts in the *Bezirk* increased after a government decree established the *Forstbezirk* (forest district) Moshi on 10 April 1907. This brought professional foresters to northern Deutsch-Ostafrika, with an average of two remaining in the *Bezirk* at any one time. The first foresters expressed frustrations over the government's hitherto perceived non-action in forest protection. On their arrival they instituted an organized process of forest triage to put the forests into acceptable German shape, concentrating on protection and reservation, only later attempting experimentation.[19]

The foresters brought their conceptions of forest dangers to Africa, and they believed fire posed the greatest danger. These professionals blamed, *inter alia*, African honey gathers and Maasai for the fire menace.[20] The Germans protected against the threat of fire in two general ways—education and active protection. For the former, the foresters conducted a "public information" campaign that they believed was successful. They instructed Africans on the dangers of fires at several *shauri* (meetings) held in Alt-Moshi and thereby prevented careless forest fires.[21] While these meetings likely did not attract the Maasai, the Germans at least felt comfortable that some Chagga knew of the dangers and would perhaps do something to prevent the spread of fire.

The German foresters approached active protection from two directions. One was by the construction of firebreaks. Firebreak construction was very labor intensive, thus limiting the foresters to small projects. The only significant breaks made were in the Rau forest, a 6-km long border cut, 5-10 m wide, and the division of this forest into three sections separated by 3-m wide roads. Not only did this minimize the potential for fire damage, but provided a second benefit of eventually easing timber exploitation.[22] On west Kilimanjaro the foresters

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[17] Dar es Salaam subsequently approved the designation. TNA G 8/740, "Landkommissionsverhandlung (LKV) Nr. 19, Moschi," 7 December 1904, Bl 13R–14L. *Amtlicher Anzeiger für Deutsch-Ostafrika* Nr 20 of 1905.

[18] TNA G 8/593, [incomplete report], n.d.; TNA G 8/593, "Briefentwurf von Dar an MS Mos," 14 March 1905, and "Brief von MS Mos (Abel) an Dar," 1 April 1906; TNA G 8/593, "Brief von MS Mos (Willman) an Dar," 20 September 1906. "… da weder Boden noch Klima sich für ihre Kulturzwecke eignet."

[19] TNA G 8/593, "Brief von Forstverwaltung (FV) Mos, Aruscha (Rohrbeck) an Dar," 2 February 1908.

[20] TNA G 8/514, "Jahresbericht 1907/1908, FV Mos (Rohrbeck)," 21 July 1908, pp. 1–2 of report; TNA G 8/593, "Brief von FV Mos, Aruscha (Rohrbeck) an Dar," 2 February 1908.

[21] TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 212R.

[22] "Sonderbericht der Forstverwaltung von Deutsch-Ostafrika für das Jahr 1909, 3. Forstbezirk Moschi," *Berichte über Land- und Forstwirtschaft in Deutsch-Ostafrika* 3 (1906), 305, 307; TNA G 8/515, "Bericht über

cut an 800-m firebreak to protect the valuable stands of "cedars" (*Juniperus procera*).[23] For these tasks, the Germans hired manual laborers. The foresters' reports and correspondence hold little information about these workers, but it appears that at any one time, the foresters had between thirty-five and eighty in their employ. These workers tended to be difficult to recruit since many from outside Kilimanjaro did not want to work in the cold, high altitude zones. On the other hand, they also had difficulties recruiting workers for the intensively managed Rau forest, for, despite comparatively high salaries (up to 13 Rupies per month), the people from Kilimanjaro did not want to go to the savanna and risk illness.[24] These work crews exposed many Chagga to the German forestry efforts and would have passed some of these efforts and knowledge onto Chagga society at large.

The second type of active protection involved the Germans hiring and stationing *Waldwächter* (forest guards) around the forest perimeters.[25] These men occupied permanent quarters and had responsibility for protecting a certain area of the forest. The forest guards received a good salary and the foresters never reported having problems finding these few employees. Among the first hires were three Nyamwezi men who after nine months asked to go due to the cold climate.[26] Subsequently, most of the employees came from the local area. These Chagga men had grown up in the area and were used to the climate, they knew the trees, the lay of the land, and how people used the forest.

As the German foresters learned more about the East African forests and gained more experience in the area, they learned they could not completely prevent fire and, in any case, the danger was less than supposed. By the end of the colonial period, these officials were only worried about the dry northern, western, and northeastern edges of the Kilimanjaro forest and the Rau forest on the savanna. The foresters saw these steps to protect the forests as essential, but they would not suffice for long-term management or protection. Only by surveying and marking the boundaries and then giving legal title to the government could a rational, long-term policy of protection, and eventually improvement, be implemented.

After the establishment of the *Forstbezirk* in 1907, the professional foresters turned quickly to permanently reserving the forest along the Rau River and the mountaintop

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die vom Forstaufsher Rauer und Förster Jahn im Etatsjahre [1 Apr 1909 – 31 Mar 1910] ausgeführten forstlichen Arbeiten, Vermessungslager am Engare-Nairobi," 29 April 1910, pp. 2–3 of report; "Jahresbericht der Forstverwaltung für das Wirtschaftsjahr 1910/11," *Pflanzer* 8, 1, Beiheft (1912), 23–25.

[23] TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 213R; TNA G 8/594, "Brief von Bezirksamt (BA) Mos an Dar," 11 May 1911, Bl 126R.

[24] TNA G 8/593, "Brief von FV Mos (Rohrbeck) an Dar," 21 March 1908; TNA G 8/514, "Brief von BA Mos (Methner) an Dar," 12 March 1909; TNA G 8/514, "Jahresbericht 1907/1908, FV Mos (Rohrbeck)," 21 July 1908, p. 5 of report; TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 220R.

[25] The Germans tended to use the two terms *Waldwärter* (forest warden) and *Waldwächter* (forest guard) interchangeably in their reports. For simplicity, I will just use the latter *Waldwächter* or the English equivalent.

[26] TNA G 8/514, "Bericht über die von Förster Jahn im Etatsjahre 1908 ausgeführten forstliche Arbeiten, Rauwald bei Moschi," 15 April 1909, p. 5 of report.

Kilimanjaro forest.[27] As discussed above, a 25,600 ha area had been declared as the Rau *Forstreservat* (Forest Reserve) in 1905. Following the increase in European settlement, in 1907 the now-civilian *Bezirksamt* (district office) Alt-Moshi proposed to reduce the size of the official 25,600 ha Rau Forest Reserve. They reasoned that since little of it had useful forest, the rest could be used to satisfy the incoming settlers. Dar es Salaam only slowly acceded to this proposal, eventually agreeing with the foresters that a smaller, more manageable forest reserve would be easier to protect and reforest.[28] The foresters provided the additional justification that a ring of plantations around a smaller forest would encourage Africans to stay away.[29] Once given permission, the foresters quickly marked and surveyed a new forest reserve, followed by a new *Landkommission*. Only two African leaders[30] came to this commission and they apparently voiced no objections. Thereafter, the government declared 2050 ha as *Kronland* (crown land), entering the final German boundaries of the Rau Forest Reserve into the records (see Map 3).[31]

From the beginning of the *Forstbezirk* in 1907, the foresters did not see the Kilimanjaro forest as immediately threatened, and waited until 1909 before beginning to actually survey the forest and mark the boundary of what would be the protected area. They accomplished this work piece-by-piece, starting on the sparsely populated northern and western slopes. In May 1911, the *Bezirksamt* held three land commissions and declared a large portion of the Kilimanjaro forest, primarily the west and north, as *Kronland*. At the same time, the foresters surveyed and marked the forest border above the populated area on south Kilimanjaro.[32] By 1913 the foresters had submitted two other land commissions to Dar es Salaam and with these, virtually all of the Mt. Kilimanjaro forest had marked borders and had been declared crown land (see Map 3).[33] With these declarations, the Germans considered the forest reserved for the future.

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[27] Rohrbeck, the first forester assigned to the area, saw the mountain forest on Kilimanjaro as important for the protection of water resources (*Schutzwaldungen*) rather than for exploitation. On the other hand, he believed the riverine forest on the Rau could be a significant source for cut timber in the coming years, although perhaps not right away. TNA G 8/514, "Jahresbericht 1907/1908, FV Mos (Rohrbeck)," 21 July 1908, pp. 3–4 of report; TNA G 8/548, "Brief von Forstbezirk Moschi, Arusha (Rohrbeck) an Dar," 25 November 1907.

[28] TNA G 8/740, "Briefentwurf von Dar an BA Mos" (18 Jan 1908); "Briefentwurf von Dar an BA Mos," 5 May 1908; "Brief von BA Mos (Zencke) an Dar," 2 September 1908; "Brief von Dar an FV Mos," 13 October 1908.

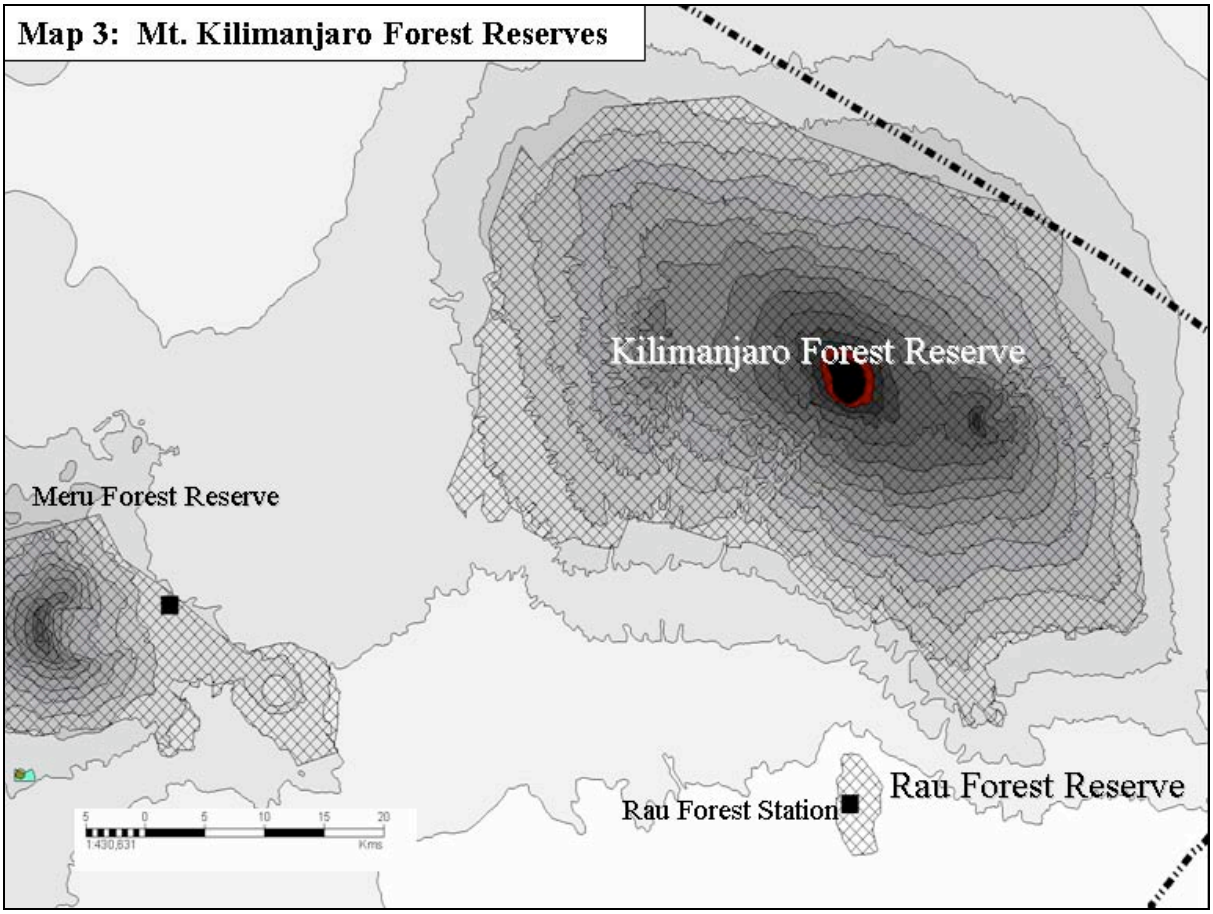
[29] TNA G 8/593, "Brief von FV Mos (Rohrbeck) an Dar," 21 July 1908, p. 5 of letter.

[30] The two were *Mangi* Salema from Moshi and *Akida* Kojanka from Uru.

[31] TNA G 8/514, "Bericht über die von Förster Jahn im Etatsjahre 1908 ausgeführten forstlichen Arbeiten, Rauwald bei Moschi," 15 April 1909, pp. 1, 4 of report; "Sonderbericht," 305; TNA G 8/740, "LKV Nr 94, Moschi," 16 June 1910.

[32] This became LKV #183 in 1913.

[33] TNA G 8/744, "Brief von Forstamt Wilhelmstal an Dar," 19 December 1911; "LKV Nr 182, Rombo," 15 January 1913; and "LKV Nr 183, Moschi," 3 May 1913.



Experimentation was the third priority, after protection and reservation. Experimentation was hardly a foresters' monopoly. Virtually all Germans on Mt. Kilimanjaro, from the military officials to missionaries and settlers, tried planting not just trees but also a myriad of other exotic and endemic plants to see which would grow best in the local conditions. The foresters merely added a bit of scientific rigor to the endeavor and began with experimental nurseries in the Rau forest in 1909. They attempted to plant many exotic species but by April 1912, in the last documentation of the efforts, they had only reforested 2.40 ha of the 2050 ha Rau reserve, or a mere 0.1 percent.[34]

The Chagga Are No Longer Alone: Others Use the Forest

From the first German military station on Mt. Kilimanjaro in 1889, the German efforts to protect and set aside the forests slowly increased and became more effective. Parallel to these official efforts, another danger to Chagga access to forest products slowly materialized and then grew. It was simply the case that the demand for timber was increasing in a number of ways.

The Chagga themselves still used wood in most of the ways explained above. Certainly some uses of wood changed as the colonial era progressed and trade grew in

[34] "Jahresbericht der Forstverwaltung pro 1911/12," *Pflanzer* 9 (1913), 346.

northern Deutsch-Ostafrika. They no longer had as much need for their traditional weapons and, in some instances, replaced these weapons with guns. While some products available in trade (such as enameled pans) replaced a few of the wooden household items, the consumption of wood as fuel and as construction material remained constant or perhaps increased. In the first instance, fuel wood requirements of the Chagga across Kilimanjaro would have been proportional to the population and, while demographic figures are notoriously unreliable, the population likely did not decline once the Germans occupied the mountain. Similarly, the use of construction timber also probably increased. In one observation during the early colonial period, August Widenmann comments on the changes he saw during the 1890s: "Almost all chiefs have built for themselves large houses which imitate the style on the coast through their rectangular form with gabled roof and through their construction with a large quantity of beams and boards."[35] The chiefs were only a small part of the population but their changing habits accompanied by other social changes, such as the increasing number of Chagga converts to Christianity, meant that coastal-style houses were becoming increasingly common, in stone and mud but also in wood.[36]

While the Chagga consumption of wood was certainly not decreasing, they faced competition from a new direction. The German colonial presence brought a new class of permanent residents to the mountain—immigrants from Europe, south Asia, as well as other parts of Africa.[37] These new people, ranging from missionaries, settlers, and officials to traders and soldiers, began using the same timber resources the Chagga had previously used alone. From the beginning of the German occupation in 1889 to 1913, the immigrant population grew from essentially zero to 467 Europeans and 355 other non-indigenous people (Indians, Askaris from other parts of Africa, etc.) compared to an estimated 118,300 Chagga.[38] These new residents all needed supplies for their personal use, and certainly fuel for cooking and heating made up the bulk of their wood use. While the numbers of

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[35] Widenmann, *Kilimandscharo-Bevölkerung,* 62. He provides a photograph of one of these houses, obviously constructed with much timber, in Tafel 6. "Fast all Häuptlinge haben sich für ihren persönlichen Gebrauch neuerdings eigene große Häuser gebaut, welche den Küstenstil durch ihre rechteckige Form mit Giebeldach nachahmen und mit einem großen aufwand von Balken und Bretten hergestellt sind."

[36] Robert B. Munson, "The Landscape of German Colonialism: Mt. Kilimanjaro and Mt. Meru, *ca*. 1890–1916," (Ph.D. Dissertation, Boston University, 2005), 361ff.

[37] The only significant non-Chagga elements around Mt. Kilimanjaro in the precolonial period were the trading caravans and the nomadic Maasai of the savanna. The caravans consumed quantities of firewood when they stopped for the night, but they were only periodic visitors. The Maasai would have been more permanent users of some forest products, but their use would have been comparatively minimal. Unfortunately, these variables are impossible to quantify.

[38] These German numbers reflect a census of the Europeans and other immigrants, and an estimate of the number of Africans in *Bezirk* Moshi, the vast majority of whom would have been living on or very close to Mt. Kilimanjaro and hence in the area of this study. Reichskolonialamt, ed., *Die Deutschen Schutzgebiete in Afrika und der Südsee 1912/13: Amtliche Jahresberichte* (Berlin: Mittler, 1914), Statisticher Teil 10–11 (table A.II.2), 36–39 (table A.II.3).

immigrants are not high compared to the total number of Chagga, one can postulate that the immigrants used greater quantities of wood per capita.

In addition to wood use for fuel, the immigrants began to construct their own buildings on the Kilimanjaro slopes. The first missionaries turned to wooden buildings as soon as they could and the government itself built its first large structure, the *boma* (fort) at Alt-Moshi between 1893 and 1894. The small centers of European life at Alt-Moshi, Marangu and, after 1911, the city of [Neu-]Moshi at the foot of Kilimanjaro, also began to consume wood. Little detail exists about the quantity of construction timber needed, but the government specifically reserved between 500 and 700 large trees in 1911 in the Rau forest for the planned construction of government buildings in [Neu-]Moshi. The officials designated the lion's share of this reservation for the construction of the new government *boma*.[39] Similarly, the settlers who were spread out on the lower slopes used wood in the construction of their houses, fences and other buildings, coming into direct competition with the Chagga.

Not only did the immigrants use the forest products the Chagga needed, but the European settlers on the mountain also affected the wood supply in another way. By occupying land and generally claiming the exclusive use of it, the settlers took away additional Chagga timber sources (functionally similar to the forest reserves). From the very beginning of the German reign on Kilimanjaro, settlers began coming to the mountain, but the stream increased significantly after 1905. From this point on, the settlers slowly created a partial barrier on Kilimanjaro below the Chagga settlement areas, limiting Chagga access to the lower slopes and concentrating settlement now into a finite band around the mountain (see Map 4). Wood supplies were simply becoming more difficult to get.

The Chagga Adapt to the New System

The Chagga required wood, the colonial government promulgated laws, its forest administration protected the forests, and the increasing foreign colonial presence increased competition for the land's natural resources. Herein lay the conflict that the Chagga had to resolve. The Chagga needed to retain their rights to the forest resources and thus they worked out a *modus operandi* through three main strategies, two obvious and the third surprising. The three strategies roughly paralleled the three German attempts to scientifically manage the forests. First, the Germans tried to protect the forest and, in parallel, the Chagga ignored the attempts at protection. Second, the Germans attempted to survey and mark the forests. The Chagga, in response, adapted and intensified their use of other forest parcels they could access more easily. Finally, while the German foresters experimented with new types of trees, the Chagga did likewise and adopted, for example, two species that fulfilled their needs and grew well in the settled areas.

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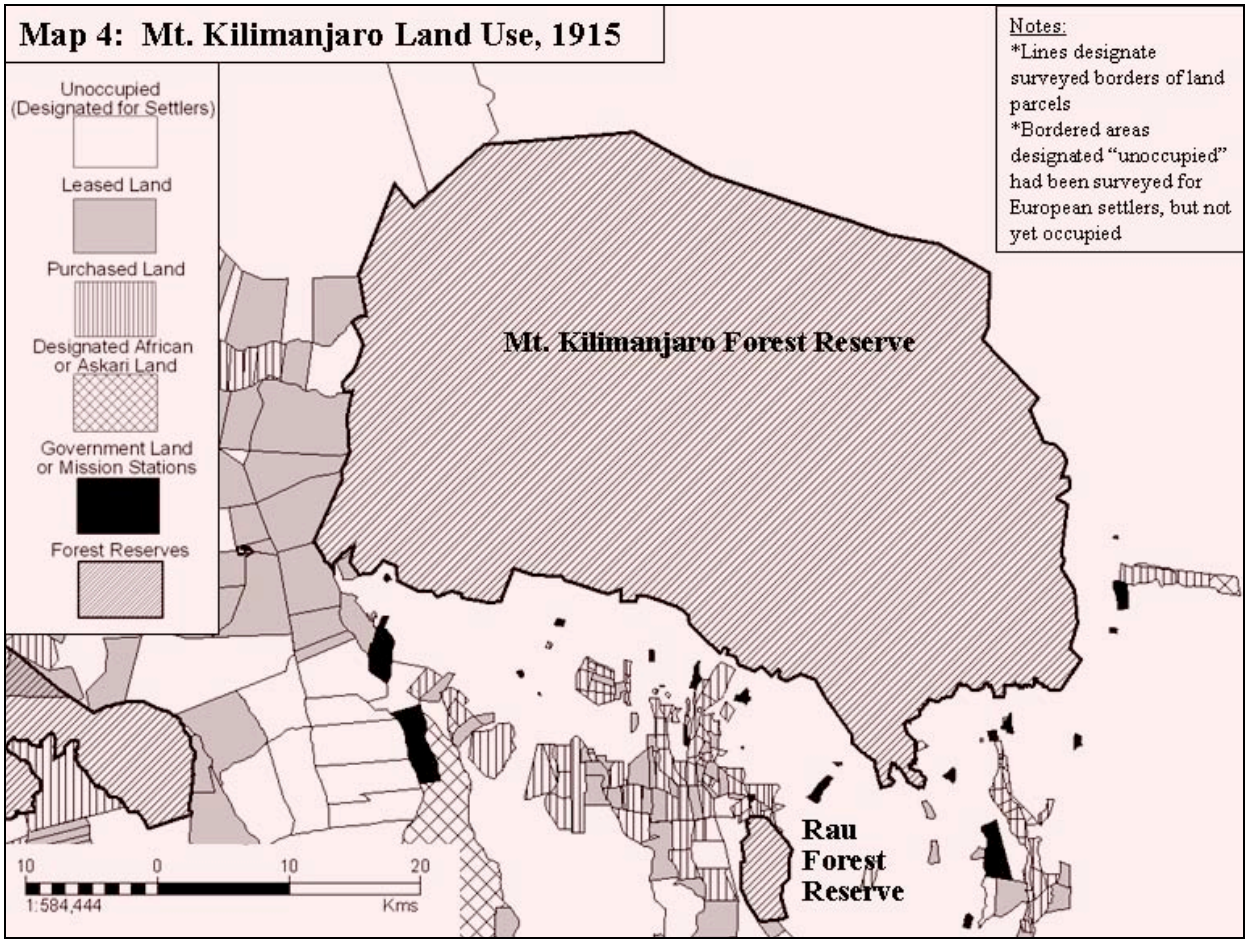
[39] TNA G 8/740, "Brief von BA Mos an Dar," 11 May 1911.



1. Ignore the Law

In the first instance, *despite* and *because* of the slow implementation of laws and forest reserves, the Chagga could choose a strategy of simply ignoring the Germans and continue using the forests as they had in the past. Essentially, they were able to avoid the laws because the Germans had insufficient manpower to enforce them, and because the Germans closely followed their own rules and regulations.

In the first case, the Chagga could continue using some resources as in the past despite the implementation of the laws, since the Germans could not enforce their laws very effectively. As mentioned above, the Germans slowly built up a corps of forest guards to patrol and protect the forest borders, first against fire but later against people entering and cutting the wood. The archives provide sparse but intriguing details on these Chagga *Waldwächter*.

These forest guards were never very numerous. At the formation of the *Forstbezirk* in April 1907, the government already had a few trained guard personnel and the new administration sent them out to patrol for fire. In March 1908, this amounted to two forest

guards, in "moving-posts" (*Wanderposten*) on western Kilimanjaro.[40] The number slowly grew with additional men hired to assist in the fire patrol duties and in planting bean and maize fields. The Germans wanted to make the guard posts independent of the local inhabitants—not only to save money but also to professionalize the service and make the *Waldwächter* accountable only to the government.[41] By 1912, a total of thirty-seven personnel[42] were spread throughout the Forstbezirk, in the Kilimanjaro and Rau forests (but also on Mt. Meru and near Kahe—at this time these two forest reserves were included in the German forest district).[43]

Eduard Deininger, an experienced forester stationed in Wilhelmstal (in the Usambara Mountains, now Lushoto) traveled through the *Bezirk* in mid-1909 and estimated that they needed five guards on Kilimanjaro and one in the Rau. The border of the Kilimanjaro reserve was about 210 km long and Rau's 21 km. Based on Deininger's estimates, that translates to one man covering about 40 km on Kilimanjaro (or one man covering about 20 km if only the heavily populated southern and eastern half is considered) and 21 km in Rau, a large area for one man on foot! Two other foresters with experience in Deutsch-Ostafrika held differing opinions on how many forest guards would be ideally needed. Siebenlist believed one could successfully watch several thousand acres while Badermann was less certain, stating it was based on the perceived danger, e.g., how thickly populated the surrounding area was, but the largest area would be about 2000 ha. In any of these cases, the number of forest personnel was quite low.[44]

The German evaluations of these *Waldwächter* were always positive. In 1909, Forester Jahn described his employees positively as having "diligence, conscientiousness and cleverness" (*Fleiss, Gewissenhaftigkeit, Anstelligkeit*) and referred to them as *farbige Beamte*—calling them "colored civil servants" by name, a respectful German designation![45] In 1912, Forester Naepfel reported he was happy with their work: "In this way, despite the

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[40] TNA G 8/593, "Brief von FV Mos, Aruscha (Rohrbeck) an Dar," 2 February 1908, and "Brief von FV Mos (Rohrbeck) an Dar," 21 March 1908.

[41] TNA G 8/514, "Bericht über die von Förster Jahn im Etatsjahre 1908 ausgeführten forstliche Arbeiten, Rauwald bei Moschi," 15 April 1909, pp. 2–5 of report.

[42] The Germans broke down the 37 into 3 categories: 24 *Waldwächter*, 2 forest policemen and 11 fire guards. The significance of the different titles is not explained in the reports.

[43] TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 211R.

[44] I calculated the total lengths of the borders as well as the areas of the reserves as depicted on Map 3. The corresponding areas are: Kilimanjaro 180,000 ha, Meru 38,000 ha and Rau 2,300 ha. The Kilimanjaro figure covers the complete top of the mountain, much of which was not forest but high altitude grass fields and alpine areas. TNA G 8/594, "Bericht von Forstassessor Deininger (Aruscha) an Dar," 15 August 1909, Bl 50L–50R; Theodor Siebenlist, *Forstwirtschaft in Deutsch-Ostafrika* (Berlin: Parey, 1914), 13; Badermann, "Fünf Jahre Forstwirtschaft in den deutschen Kolonien," *Zeitschrift für Forst- und Jagdwesen* 47 (1915), 608–609.

[45] TNA G 8/514, "Bericht über die von Förster Jahn im Etatsjahre 1908 ausgeführten forstliche Arbeiten, Rauwald bei Moschi," 15 April 1909, pp. 2–5 of report.

large area of the *Bezirk*, a fairly good protection was implemented."[46] Overall, the foresters were happy with the performance of these guards, although the Germans believed that they all needed much supervision.[47] Deininger observed in mid-1909 that the Germans did not control the forest guards close enough and recommended that this control be increased, *inter alia*, by the foresters visiting each of these employees at least once or twice a year.[48] It is likely that direct German supervision of the *Waldwächter* was never very close, and while these guards did a sufficient job, it probably did not equal the job the Germans would expect to be done in Germany. In any case, a small number spread out across a large area would have had a very limited degree of effectiveness when balanced against the responsibilities they would have had within their family and chiefdom. Thus, *despite* the implementation of the laws, the Chagga could continue using the forests as they saw fit, with limited interference by the forest guards.

In the second case, *because* of the slow implementation of the laws, the Chagga could continue using some timber resources. This was possible because the Germans were very legalistic and intent on following their own policies and laws; the Germans could not prevent nor punish cutting in areas not legally protected. As noted above, the Rau forest received total legal protection as a reserve in 1907 and the complete Kilimanjaro forest only in 1913. This means that little timber on Kilimanjaro was *legally* protected before these dates. An example from 1908 shows how this legalism played out. One of the foresters reported to Dar es Salaam how Greek settlers had cut over 4,000 Rupies worth of Kilimanjaro mvule (*Chlorophora excelsa*) without permission; however, since the land had not yet been designated, the government could do nothing to recoup the money.[49] This same phenomenon likely occurred among the Chagga but because the quantities were smaller, the Germans did not concern themselves with the specific cases.

Overall, the combination of the small forest guard contingent size and the slow reservation of the forested areas meant that in many cases the Chagga could continue using their accustomed forestry resources. This happened despite the fact that the German colonial government would often consider this use to be counter to the spirit of preserving the mountain's forests, but possible because the Germans did not positively protect the timber.

2. Change Pattern of Use

Parallel to the slow German efforts at surveying, marking, and declaring the forests crown land and thus protected, the Chagga also adapted their pattern of land use and began to concentrate on using the timber stands in the settled areas more intensely (depicted as the "farming zone" on Map 2). This was possible for two reasons. First, forested areas still existed within and between the chiefdoms on the Kilimanjaro slopes. As Harry Johnston

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[46] TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 211R. "Auf diese Weise hat sich, trotz der grossen Bezirke, ein ziemlich genauer Schutz durchführen lassen."

[47] TNA G 8/516, "Jahresbericht 1911 der Forststation Mos," n.d., Bl 224R.

[48] TNA G 8/594, "Bericht von Forstassessor Deininger (Aruscha) an Dar," 15 August 1909, Bl 50L–50R.

[49] TNA G 8/593, "Brief von Rohrbeck, FV Mos an Dar," 12 August 1908.

observed during his four months residence in Moshi in 1884: "Looking westward we might gaze over the whole belt of inhabited country as far as [Machame].… Many a forest-crowned hill intervened.…"[50] Second, while many of these areas had been preserved by the Chagga as buffer zones against aggression from other chiefdoms, these defenses were no longer needed with the enforced German "pacification" of the area.

In general, when the defensive need for these areas disappeared, the Chagga certainly looked favorably upon more intensely using the timber available in the immediate vicinity. This not only provided easily accessible timber supplies but opened up land for the intensification and expansion of settlement, something seen favorably by the Chagga. The missionary Bruno Gutmann quotes the Moshi *Mangi* Rindi who often said: "Bring your banana groves together so that the jackals no longer come into our settlements."[51] Other than the areas across the Kilimanjaro slopes between the chiefdoms, most of the chiefdoms had room to cut above the intensely settled areas. A map and description produced during a survey of part of the Kilimanjaro forest borders in 1910 illustrates this well. The surveyors noted how the reserve border of the contiguous high altitude forest lay completely above the Chagga farms with numerous small patches outside the marked, reserved forested area.[52] Thus most Chagga would have access to isolated stands of trees spread across the mountain slopes above their settlement areas, but below the reserved forest border.

Gutmann similarly observed more intensive cutting within the settled areas, based on his long years of residence in the Moshi chiefdom. He noted how many of the springs feeding the irrigation system had been drying up since the forested areas around the springs had been cut and converted into fields.[53] Gutmann does not note the motivation for this cutting, but the end result for the forest was the same—the trees were cut and the Chagga would have been able to put these to use. Additionally, Gutmann comments on the sacred groves, the only forested areas that had traditional laws governing their use. Legally, only people from the local clan could cut timber in these groves, if others did they would have to pay a special fine.[54] The fact that Gutmann mentioned these stipulations in his work and mentioned little else about forests implies that the sacred groves were vulnerable to cutting.

The German administration's records provide some additional evidence that the Chagga intensified the use of standing timber within the settlement areas. In 1911 the

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[50] H[arry] H. Johnston, *The Kilima-Njaro Expedition* (London: Kegan Paul, Trench, 1886), 124.

[51] Gutmann, *Recht*, 303. "Rindi pflegte zu sagen: 'Rückt zusammen mit euren Hainen, damit die Schakale nicht mehr in Siedlungsbereiche kommen.'"

[52] TNA G 8/744, "LKV Nr 130, Moschi" & "Karte des Wald-Reservats-Grenze des Kilimandjaro," (1:25,000), January–March 1910, Forstaufseher Rauer.

[53] Gutmann, *Recht*, 418. When *Recht* was published in 1926, Gutmann had been on Mt. Kilimanjaro from 1902 until the German missionaries were expelled in 1920, only returning in 1925. He spent about 11 of these years in the Moshi chiefdom. See Ernst Jaeschke, *Bruno Gutmann: His Life, His Thoughts, His Work* (Erlangen: Verlag der Ev.-Luth. Mission, 1985), Chapter 1.

[54] Gutmann, *Recht*, 308.

German foresters noted that the use of the contiguous forests (i.e., especially Kilimanjaro but also the Rau) was very limited as far as they could judge, but they expected it to increase in the future since the unreserved forest patches strewn across the landscape, which currently covered the local needs, were being used up.[55] They predicted that once the patches were gone, the Chagga would turn to the Kilimanjaro and Rau forests.

This second Chagga strategy of changing land use was due to increasing scrutiny by the colonial authorities, denser European settlement, and their own adaptation to the situation. The historical changes meant the Chagga could more intensely use the former buffer zones and they saw it as rational to settle more densely.

3. Adopt New Species

While the German foresters experimented with new types of trees, the Chagga did likewise, but with other ends in mind. The German foresters wanted to reforest the landscape, but the Chagga who tried new plants had another goal—to find those that might improve their lives. The Chagga certainly had access to exotic species as the government stations, the settlers, and the missionaries all brought and attempted to plant many non-indigenous species on Kilimanjaro. The Chagga traditionally grew trees along with their other crops, and thus were inclined to adopt and adapt new, promising, and potentially more productive species to their own uses.[56] Of the countless numbers introduced, two trees nicely illustrate Chagga adoption of new species: the Mexican cypress and grevillia.[57] The German-era evidence concerning these two trees is sparse, but a plausible scenario can be developed by looking back from the present day.

The first example of an exotic species that had an impact on the Chagga is that of the Central American tree *Cupressus lusitanica*. The Mexican cypress came to East Africa quite early in the colonial period, primarily through the impetus of the missionaries on Mt. Kilimanjaro. While rarely mentioning the specific scientific name, many of the early mission stations received "cypress" trees that likely included this species. One highly intriguing, specific reference from 1912 lists the species of trees received by the Lutheran mission station Nkoaranga on Mt. Meru, including *C. lusitanica*.[58] While this station was on Mt. Meru, the German Lutheran stations on Kilimanjaro and Meru worked closely together and shared their botanical success stories.

The first use of the Mexican cypress was primarily as a decorative plant and as a Christmas tree. Christianized Chagga likely adapted the tree for this use and spread it from

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[55] "Jahresbericht der Forstverwaltung für das Wirtschaftsjahr 1910/11," *Pflanzer* 8, 1, Beiheft (1912), 26.

[56] Moore, *Social Facts*, 331–32, note #7.

[57] For more specifics, see Munson, "Landscape," chap. 5, especially pp. 505ff.

[58] "Brief von Amani an Nkoaranga," 3 September 1912, in file "Bepflanzung Amani," in box "Nkoaranga" (Shelf 2, Box 47), Kanisa la Kiinjili la Kilutheri Tanzania (Evangelical Lutheran Church in Tanzania) Archives, Moshi. Among the species listed were *Cupressus brasiliensis*, a botanical name no longer used, but given the providence of Mexican cypress, this is likely a synonym for *C. lusitanica.*

the mission stations, planting it around their homesteads. In this way they would have discovered its many uses. On one hand, it functions nicely as a fence or hedging shrub, something very important among the Chagga because it helps to define boundaries and protect property. In conversations on Mt. Kilimanjaro, many Chagga noted that they liked the Mexican cypress simply because it looks nice and remains green; they preferred live hedges to barbed wire or other fencing around their property. It makes a very good hedge or fence, and when planted and trimmed as a hedge, this bush is quite difficult to pass through.[59] On the other hand, *C. lusitanica*'s wood is very useful and effectively provides what the Chagga need. This tree is fast growing and produces quality, lightweight wood. If allowed to grow as a tree (versus being used as a hedging shrub), it develops a straight trunk. These two characteristics made it a valuable timber for light construction and interior uses, exactly what the Chagga needed for their homesteads.[60] It also would provide a ready supply of firewood.

As discussed above, the Kilimanjaro provenance of *C. lusitanica* was likely in the missions as a decorative tree. *Grevillea robusta,* which most likely came to Kilimanjaro primarily for its utilitarian qualities, is another example of a useful tree adopted by the Chagga. *G. robusta* (or simply grevillea) originated in eastern Australia and came with some of the early German officials and missionaries.[61] The Germans used the species as a coffee shade tree and it grew in the *Bezirk* quite extensively before 1916. The tree was present in the European plantations on the lower Kilimanjaro slopes in large numbers by 1911 when a traveling group of agricultural experts noted: "*Grevillea robusta* with its finely feathered leaves giving a partial shadow has proven itself very well as a shade tree."[62]

The Chagga slowly adopted this tree, and some of the earliest were likely those who were the first African coffee planters, given the early correspondence between these two trees. The main use of grevillea by the Chagga has not, however, remained as a coffee shade tree, since the local people have found much better uses for it. A majority of Chagga, no matter what their profession, regard themselves as farmers and many have opinions about this useful tree. A Lutheran pastor, Rev. Shayo, listed some of grevillea's advantages: it grows quickly and the leaves can be used to feed cattle as well as be put on the stall floors. Additionally, the wood can be burned and is easy to saw into planks for construction. Other people echoed these uses, especially its utility for construction. The tree itself is usually not cut down for firewood, but instead only some branches are removed. Several Chagga commented that they thought it was a native African tree—illustrating its acceptance into the

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[59] Discussions with B.N. Mchau, Kolila Secondary School, 24 January 2003; Dale, UN Developmental Program driver and small farmer, 4 February 2003; Rev. Kalebi Yassom Shoo, Machame Lutheran Parish, 22 February 2003; James Sige and Mr. Kisaka, Forest Industry Training Institute, 5 May 2003.

[60] Tim Noad and Ann Birnie, *Trees of Kenya*, 4th ed. (Nairobi: self-published, 1994), 89.

[61] Noad and Birnie, *Trees of Kenya*, 233.

[62] C. Hanisch, T. Schmidt, and G. von Wallenberg Pachaly, "Ostafrikanische Landwirtschaft: Reiseschilderungen," *Arbeiten der Deutschen Landwirtschaftsgesellschaft*, no. 230 (1912), 135. "Hier hat als Schattenbaum die *Grevillea robusta*, deren feingefiederte Blätter einen guten Halbschatten ergeben, besonders gut bewährt.…"

society.[63] The quick growth within the settlement areas and the multitude of uses explain the success of grevillea among the Chagga, and explain why they would have adopted this species as a preferred one.

These two exotic tree species, *Cupressus lusitanica* and *Grevillea robusta,* illustrate the Chaggas' third strategy—innovatively adopting imported species that complemented their settlement and land use strategies, and provided the timber products they needed as their access to other areas was being constrained by increased German control on the slopes of Mt. Kilimanjaro.

The German Forestry Legacy

The fascinating interplay between German colonial forestry and Chagga land use on the southern and eastern slopes of Kilimanjaro can be summed up by the following. The Germans attempted to protect the forests while the Chagga maintained their access to what they needed through three adaptive strategies. The Chagga opposed the efforts of the German forest administration, they adapted to the new pressures on the mountain, and they innovatively used newly imported species, modifying their use to fit their specific needs and settlement pattern. The loss of forest access had not become a *critical* environmental issue, but the Chagga responded rationally to maintain access to what they needed for their way-of-life.

The Chagga's three-pronged adaptive response to the German-imposed forestry pressures would continue in the years ahead, since the important thrusts of German forestry continued in spirit and practice after 1916, despite the eviction of the German colonial government and foresters. After the British occupied northern Deutsch-Ostafrika and the conclusion of World War I allowed normalcy to return to the area, the new British foresters revived the German colonial legacy, adopting the German forest reserves without much change. The new mandate government enacted their first forest ordinance on 1 September 1921 and included the Rau as one of the first German reserves to continue to receive protection.[64] The Mt. Kilimanjaro forest fell under a later ordinance. There was little disruption in the forest administration despite the change in governments, for when the British took control, the German-laid boundaries of the reserves were not difficult to follow and caused little dispute.[65]

The still-protected Rau forest occupied the British forest service while the new savanna city of Moshi continued to grow. During the first surveys, the British foresters could follow the old German-marked boundaries with little difficulty. The government quickly produced a working plan and in 1922 gave an exclusive timber concession in Rau. A sawmill

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[63] Discussions with Arnold T. Mandara, Mdawi (Kilimanjaro), 20 January 2003; Rev. Alphaeus Z. Shayo, Mamba-Kotela Lutheran Parish, 14 February 2003; Pilosi Temu, Komakundi-Mamba, 15 February 2003; Rev. Kalebi Yassom Shoo, Machame Lutheran Parish, 22 February 2003.

[64] Groome, "History of the Forest Department" [1921–1950], 1–6, 9. Rhodes House, MSS. Afr. s. 1389.

[65] Groome, "History of the Forest Department" [1921–1950], 3. Rhodes House, MSS. Afr. s. 1389.

soon began production. At this time, the Rau forest was seen as one of the two main production forests in Tanganyika.[66]

Moshi continued to grow and became the center of life on the southern slopes of Kilimanjaro. A recent study of urbanization in Moshi explains the town's development through its strategic location, the ability to support trade, the surrounding food production, a good water supply, and the climate. The Rau Forest Reserve provides a green belt to the east of the city that moderates the microclimate of the town, however "the forest is now severely damaged due to uncontrolled felling of trees for timber, firewood and charcoal purposes." The author notes the growth in population from 8,048 in 1948 to an estimated 133,000 in 1994.[67] Vicky Nderumaki, an ecologist with the United Nations Development Program, cites similar problems with the forest: not much now stands because of population pressure in the area. But to illustrate how people have taken advantage of the ecological circumstances, she noted how many people who live there grow rice, fed by the ground water.[68]

The Germans protected the Rau forest because of its special existence as a forest on the otherwise dry savanna. But the presence of water, which enabled the forest to grow, also enabled the city of Moshi to grow beside it, eventually damaging the forest as the concentration of people kept rising. The Rau forest still remains on Tanzanian maps, although, like much of southern Kilimanjaro, it appears to be more a dense area of human habitation and human-environment interaction. Large trees still grow and the density of trees still set it off from the surrounding savanna.

The Kilimanjaro forest, with a somewhat different history than the Rau forest, never came under an organized plan of exploitation while the Germans remained in Tanzania. The Germans were planning for the future and, as detailed above, the only forest cutting was the low-level use by the local inhabitants. Some discussion emerged concerning the potential of economically exploiting the "cedars" (*J. procera*) on west, north, and northeast Kilimanjaro, but the government did not pursue this idea further because of the lack of transportation.[69]

As in the Rau forest, the British also continued the German policies on Mt. Kilimanjaro. On the northern and northeastern sides of Kilimanjaro, along the border with Kenya, the mandate government began reforestation schemes in the 1920s following logic surviving from the German period: "The reafforestation project is primarily concerned with the establishment of trees on open scrub and grassland, both of which most probably were

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[66] The main production species were mvule (*Chlorophora excelsa*) and cordia (*Cordia* spp.), most likely *Cordia africana* (also known as mringaringa). Both mvule and mringamringa are indigenous. Groome, "History of the Forest Department" [1921–1950], 1–6, 9. Rhodes House, MSS. Afr. s. 1389.

[67] Colman Titus, "Urbanisation and Environmental Management: The Case of Moshi Municipality Tanzania," (MA thesis (Demography), University of Dar es Salaam, 1996), 51–57, 58.

[68] Discussion with Vicky Nderumaki, Moshi, 8 March 2003.

[69] TNA G 8/594, "Briefentwurf von Dar an [BA Mos?]," 18 July 1914, Bl 166R, and "Brief von Forstamt Wilhelmstal an Gouverneur, Tabora," 10 September 1914, Bl 167R.

once forested and have been subjected to repeated burning."[70] Additionally, the British wanted to stimulate production and trade in forest products and, in addition to those in the Rau, gave an exclusive concession on Kilimanjaro early in the mandate period.[71] Intensive exploitation of the valuable timber on southern Kilimanjaro, especially the indigenous camphor (*Ocotea usamberensis*) stands, began only after 1945. In addition to the organized exploitation, the use of trees by the local inhabitants continued so that by 1965, one observer could write: "There is very little forest at the present outside the reserve, though there are large numbers of timber trees in the lands of the Wachagga people."[72] Among the Chagga on their own land, the trees have become a crop similar to others—valued and protected for their uses, but not given too much land at the expense of other crops.

The German Kilimanjaro forest reserve, with some minor boundary changes over time, evolved into Kilimanjaro National Park in independent Tanzania. At the Marangu entrance to Kilimanjaro National Park, the entrance used by most tourists, one can see huge eucalyptus trees (*Eucalyptus saligna* et al.)—likely not directly planted there by the Germans, but serving as reminders of the many exotic species the Germans imported. These many exotic species served the Chagga well and enabled them to change their practice of using forest products so they could maintain their rights on Mt. Kilimanjaro despite the German and British colonial government attempts to protect and preserve the mountainside forests.

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[70] P.J. Wood, "A Note on Forestry on Kilimanjaro," *Tanganyika Notes and Records* 64 (March 1965), 112–14.

[71] Groome, "History of the Forest Department" [1921–1950], 6. Rhodes House, MSS. Afr. s. 1389.

[72] Wood, "Note on Forestry," 111.