



FIELD STATION PROFILES

SCIENTIFIC STATION NKWESEKO

Claudia Hemp¹, Andreas Hemp²

¹Senckenberg Biodiversity and Climate Research Center, Frankfurt, Germany

²University of Bayreuth, Plant Systematics, Bayreuth, Germany

* **Corresponding Author:** C. Hemp; claudia.hemp@uni-bayreuth.de

NAME OF FIELD STATION

Scientific Station Nkweseko

GEOGRAPHIC LOCATION

- Tanzania, Kilimanjaro Region, Hai District, Machame area
- 3° 11' 04" S 37° 14' 26" E
- 1700 m a.s.l.

GEOGRAPHIC CONTEXT AND HABITAT

The Scientific Station Nkweseko is one of few field stations in Tanzania. It is located at the lower border of the montane rain forest surrounding Mt. Kilimanjaro, protected as a National Park and a designated UNESCO world heritage site. The station itself lies in the so-called Chagga Homegardens, a sustainable agroforestry system with high biodiversity, rich in former forest species and a high degree of endemics (e.g. Hemp 2005; Hemp & Hemp 2008, 2011; Hemp et al. 2009).

FAUNA AND FLORA

The foundation of a species inventory was laid by a Swedish expedition led by Y. Sjöstedt recording all major plant and animal groups for Mt Kilimanjaro and some adjacent areas (Sjöstedt 1909/1910). Over the last 30 years a huge database has been created ranging from climate and soil to vegetation and faunistic data. From 1989 to 1996 ethnobotanical and ethnozoological projects were conducted (Hemp & Winter 1999; Hemp et al. 1999; Hemp 2001; Hemp et al. 2009) with later projects on vegetation and Orthoptera, all financed by the German Research Foundation (DFG). From 2010 to 2018 the research unit „KiLi“, again financed by the

German DFG, was established. Climate and soil data were collected and selected groups of plants and animals were monitored, resulting in a wealth of data from all major habitats of Kilimanjaro. Sixty-five plots, from savanna to afroalpine habitats, were established and around 70 bachelor, master and PhD students obtained their degrees. A booklet summarizing the results and providing more insight into study design, participating Universities and Institutes in Tanzania and Europe, and information on available data can be downloaded at: <https://kili-ses.senckenberg.de/en/publications/literature/>

As part of the KiLi Project a rainfall map was developed together with a high-quality physiographic map at a scale 1:100,000 for the entire Kilimanjaro massif as a base for ecotourism, nature conservation, and land planning (Fig. 1) (available at: https://www.hochgebirgsforschung.de/weitere_karten.php). The discovery of the tallest trees in Africa on one of the research plots of the KiLi Project attracted world-wide attention (Fig. 2, Hemp et al. 2016).

In 2020 a second research unit was granted by the DFG with the first phase running until 2024. In this second research group, besides continuing recording long-term climate and vegetation data, a new focus will be set on socio-economic topics (for more information see <https://kili-ses.senckenberg.de/>).

In addition to major research groups, the Scientific Station Nkweseko hosted numerous smaller projects from various European, American and Asian countries collaborating and supporting teams of scientists logistically, and facilitating fieldwork.

ACCESS, INFRASTRUCTURE

The Scientific Station Nkweseko lies about 45 km west of the provincial city of Moshi and approximately 45 km east



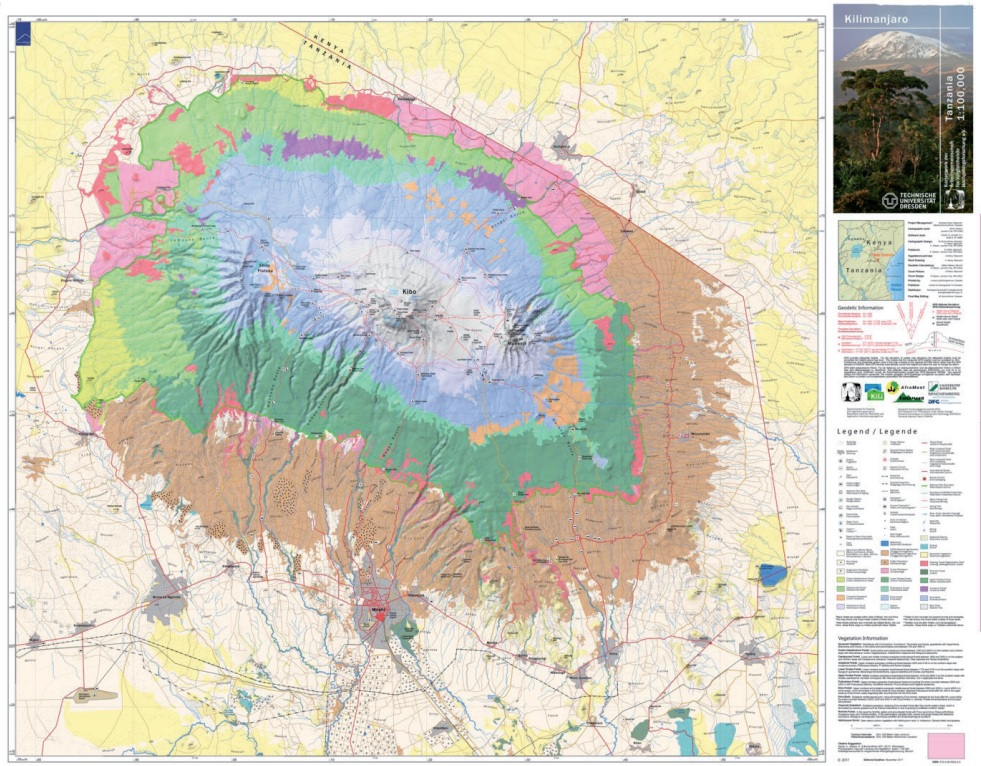


Figure 1. Physiographical map of Kilimanjaro (Hemp et al. 2017).

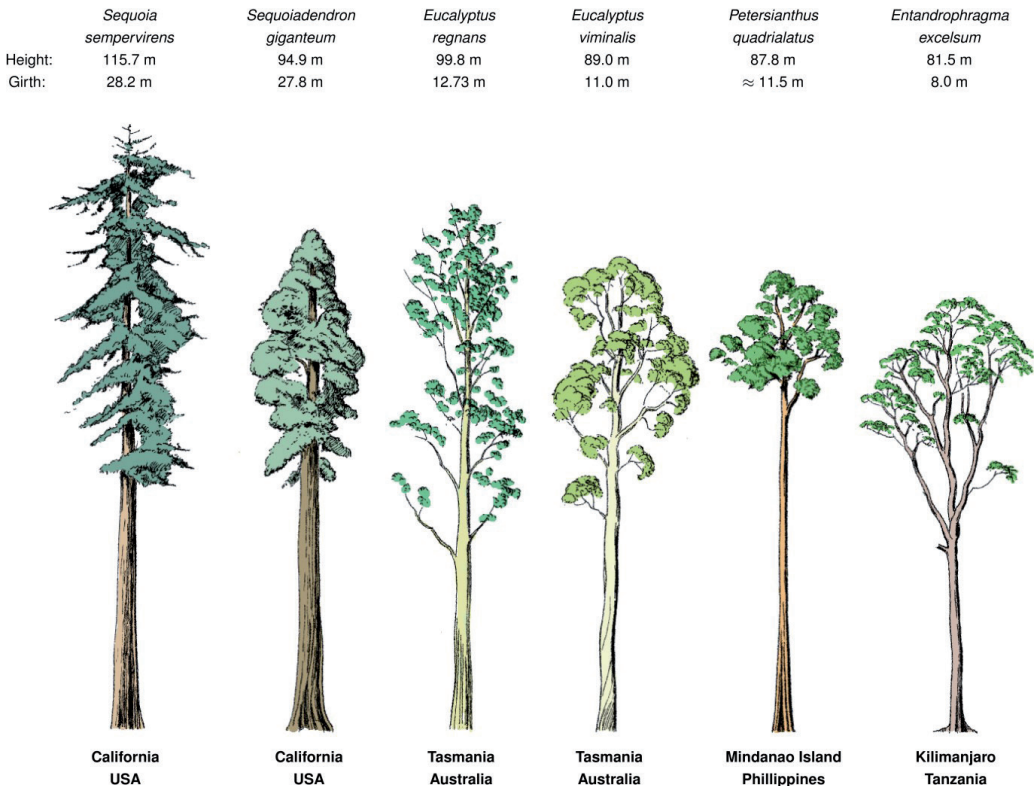


Figure 2. The height, girth, and locations of some of the world’s tallest tree species. Adapted from Hemp et al. (2016).

of the International Airport, Kilimanjaro. It is easily reached by car or by public transport as far as the small village of Foo, about 10-15 min downslope from the station. The station is comprised of the main house and two residential houses that may host up to 20 researchers, a laboratory, and supporting infrastructure (staff quarters, car park, storage rooms; see Figs. 3 & 4).

STATION FEES

Fees for accommodation, transport, and field assistants are negotiable, depending on the kind of collaboration and the project budget.

LEGAL REQUIREMENTS

To conduct research in Tanzania project proposals have to be prepared and sent to the Tanzania Wildlife Research Institute (TAWIRI) and permits for research obtained. Export of samples has to be applied for with TAWIRI as well. For more detailed information and fees see TAWIRI Guidelines at <http://tawiri.or.tz/>.

KEY RESEARCH

Projects at Nkweseko address general biodiversity topics such as inventorying various vertebrate and invertebrate groups as well as all plant taxa (vascular plants, bryophytes, lichens) on Mt Kilimanjaro and the surrounding mountain ranges including Mt. Meru. Since 1996 climate data are recorded for the main habitat types on Mt Kilimanjaro and adjacent mountains, especially in the forest belts. The research unit from 2010 to 2018 assessed the influence of climate, and anthropogenic disturbance on biogeochemical processes and genetic, species and interaction diversity. The current research unit focuses on investigating the interactions and inter-dependencies between people and nature at Mount Kilimanjaro under land-use, climate, and governance change. Generally, the huge climatic gradient on Mt Kilimanjaro, the diverse natural landscapes (savanna, various forest types, afroalpine communities) and anthropogenic influenced areas (agricultural fields in all zones, commercial coffee plantations, rice paddies, sugar cane plantations, and semi-natural Chagga Homegardens) make the scientific station an ideal location to address research



Figure 3. Scientific Station Nkweseko (arrow) located on the southern slopes of Kilimanjaro at the lower border of the rain forest. Source of satellite image: Google Earth. Inset: Aerial image of the station with labeled buildings.



Figure 4. Scientific station Nkweseko. (A) Main house (with 2 common rooms, kitchen, 2 bathrooms and toilet, 4 dormitories (2-4 beds). (B) Adjacent house, left (5 double rooms, kitchen, store, bathroom)) and residential house, right (2 self-contained rooms). (C) Residential house (left) and laboratory with two large rooms and spacy loft (right). (D) Laboratory with the residential house and side house in the background.

in all fields focusing on biodiversity on one hand and relationships of people and nature on the other.

We also offer seminars and field classes for students and university teachers addressing biodiversity topics (<https://www.erasmuscontan.eu>).

FIVE SELECTED PUBLICATIONS

Albrecht J, Classen A, Vollstädt MGR, Mayr A, Mollel NP, Schellenberger Costa D, Dulle HI, Fischer M, Hemp A, Howell KM, Kleyer M, Nauss T, Peters MK, Tschapka M, Steffan-Dewenter I, Böhning-Gaese K & Schleuning M (2018) Plant and animal functional diversity drive mutualistic network assembly across an elevational gradient. *Nature Communications* 9: 3177

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Hemp, A, Zimmermann, R., Remmele, S., Pommer, U., Berauer, B., Hemp, C., Fischer, M. (2016) Africa's highest mountain harbours Africa's tallest trees. *Biodiversity and Conservation* 26(1): 103-113. DOI 10.1007/s10531-016-1226-3

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Links and Contact

Further information at

<https://kili-ses.senckenberg.de/>

<https://www.kilimanjaro.biozentrum.uni-wuerzburg.de>

<https://tanzmont.jimdofree.com>

<https://www.erasmuscontan.eu>

Contact:

Claudia Hemp

claudia.hemp@uni-bayreuth.de; claudiahemp@yahoo.com

Germany Phone +49 (0)924 698 0979

Tanzania Phone +255 653 159 261

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