

Peat bog reveals more than 1,000 years of Tanzanian history

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Scientists at the University of York have charted more than 1,000 years of Tanzanian environmental history using sediments extracted from a peat bog.

Working in the Eastern Arc Mountains of Tanzania, where only 15% of the [tropical forests](#) remain compared to 1,000 years ago, the team aimed to identify if the region's rich biodiversity had altered over the years and what major events in history, such as the emergence of the ivory trade in the Victorian period, might have contributed to changes in the forests.

Researchers took layers of peat from a bog, where material, such as pollen, charcoal from fires, and other remains from the environment, are trapped and preserved over many years in the sediments. Using radiocarbon dating techniques they were able to reconstruct how the ecosystem changed over the past 1,200 years.

Research results show that the forest ecosystem remains quite stable—the same as it was more than 1,000 years go. This suggests that climate change has not yet impacted on the forest, possibly due to its proximity to moist, fresh air from the Indian Ocean. Results also show, however, that the shrinking size of the forest is largely due to [human activity](#).

Dr Robert Marchant, from the University of York's Department of Environment, said: "The Eastern Arc Mountains are a biodiversity hotspot, but it has been under threat from human activities for many

years.

"Forests that are now separated by some miles were once joined together, but what we don't know is just how much these changes have impacted on its biodiversity over time and what activity had the biggest impact on its environment.

"With this new data we were able to see at what points the environment started to change and through historical records we matched these changes to particular events in time. For example we start to see pollen from New World crops, such as maize, start to spread from around 1750, as well as evidence of forest plantations of pine trees, and eucalyptus from the Colonial period, which are not native to the environment.

"Maize crop enters our record at a time when large parts of the forest were cut down and farmed to accommodate the European ivory trades—or caravan trades as they were known."

In the 1860s European and Arab traders to the region slaughtered up to 70,000 elephants for their ivory each year. It was traded to other countries for the production of a range of items, from ornaments, piano keys, cutlery handles, jewellery, and as part of exhibits. It not only decimated the elephant population, but also the impact the animals had on the forest composition and distribution.

Dr Jemma Finch, who carried out the work at York, but is now based at the University of KwaZulu-Natal, South Africa, added: "We start to see large increases in charcoal in the record at about the time colonial forest offices arrive to cut trees for timber trading.

"It is only in the 1980s that we start to see less human activity in the records. This was the time when a timber ban was put in place and forest

preservation policies established."

The researchers highlight that although human activity has been the biggest impact on the forest over the years, and biodiversity is relatively stable today despite the diminished size of the forest, [climate change](#) is still a threat to its future.

Dr Marchant said: "This research can help us identify the best areas of the [forest](#) to conserve for sustainable growth, where plant and animal life and, most importantly, the ecosystem services that sustain the Tanzania nation, are most likely to be supported.

"If predictions about a wetter, but much warmer, climate in the future are accurate, then now is the time to start to invest in this important landscape so that it is still here in the next 1,000 years."

The research is published in the journal *The Holocene*.

More information: J. Finch et al, Ecosystem change in the South Pare Mountain bloc, Eastern Arc Mountains of Tanzania, *The Holocene* (2016). [DOI: 10.1177/0959683616675937](https://doi.org/10.1177/0959683616675937)

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