

Did human activity really trigger the late Holocene rainforest crisis in Central Africa?

Bernard Clist^{a,1}, Koen Bostoen^a, Pierre de Maret^b, Manfred K. H. Eggert^c, Alexa Höhn^d, Christophe Mbida Mindzié^e, Katharina Neumann^d, and Dirk Seidensticker^a

In a paper by Garcin et al. in PNAS (1), it is assumed that a sharp increase in settlement activities in the Central African rainforest during the first millennium BC caused widespread deforestation between 2,600 and 2,020 cal y BP (the late Holocene rainforest crisis or LHRC) (2, 3). Archaeology was only marginally used in this new study by means of a newly compiled radiocarbon database containing 1,202 ¹⁴C dates from 460 sites in Central Africa covering the past 10,500 y. Those dates must be critically evaluated, as not all of them are relevant for assessing the human factor in the LHRC. Not only the quantity of dates counts here, but also their quality.

First, to discuss a possible human impact on the LHRC, the time bracket is too wide. It must be limited to 3000–2000 BP (approximately 3,200–1,950 cal y BP) to correspond with the LHRC. Moreover, the dates in that database are used without properly evaluating their archaeological context. After a critical elimination of dates not serving the purposes of the study, a gradual but neat increase of dated sites in the period considered is observed throughout Central Africa, from Cameroon to Congo, with a distinctive peak after 2,350 cal y BP. However, contrary to what one would expect, there appears to be no marked density of sites that could have caused deforestation around 2,600 cal y BP. This is also acknowledged by Garcin et al. (1): "... the inception of the LHRC as recorded at Lake Barombi occurred ~200 y earlier than the apparent establishment of technological developments in the whole of [Western Central Africa]."

A previous mapping of iron ore reduction and iron-using sites showed a north to south gradient also starting around 2350 BP, possibly associated with early centers in the Central African Republic, Cameroon, and Gabon. Metallurgy became gradually more widespread after 2,020 cal y BP as the number of settlements increased (4). Nevertheless, although settlements and slash-and-burn agriculture led to clearings and fuel was needed for cooking, heating, pottery making, and metallurgy, it is doubtful that this had a significant impact on the forest cover (5). As acknowledged by Garcin et al. (1), there was a "sudden return to rainforest vegetation at 2,020 cal y BP," which contrasts with the fact that archaeologists have recorded the largest number of sites during that specific period. Good spatial data from recently published papers (6–8) point to increased human activities during and after the end of the LHRC, not at the beginning of it. Moreover, charcoal, indicative of human impact on vegetation, was found neither in the Holocene lacustrine sediments nor in the topsoil of the catchment area of Lake Barombi Mbo (9). Finally, historical and ethnographical information from Central Africa attests to a low population density and, consequently, to a limited impact on the forest environment (10).

To conclude, currently available archaeological evidence does not point toward a major anthropogenic impact on the Western Central African rainforest between 2,600 and 2,000 cal y BP. In other words, it is very unlikely that human activity triggered the LHRC.

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^aUniversity of Ghent Centre for Bantu Studies, Department of Languages and Cultures, Ghent University, 9000 Ghent, Belgium; ^bCentre de Recherches en Archéologie et Patrimoine, Faculté de Philosophie et Sciences Sociales, Université Libre de Bruxelles, 1050 Brussels, Belgium; ^cInstitut für Ur- und Frühgeschichte und Archäologie des Mittelalters, Universität Tübingen, 72074 Tübingen, Germany; ^dInstitute for Archaeological Sciences, Goethe University, 60323 Frankfurt, Germany; and ^eFaculté des Arts, Lettres et Sciences Humaines, Yaoundé University I, Yaoundé, Cameroon

Author contributions: B.C., K.B., P.d.M., M.K.H.E., A.H., C.M.M., K.N., and D.S. wrote the paper.

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¹To whom correspondence should be addressed. Email: bernardolivier.clist@ugent.be.

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