



## **Impacts of direct human activity and climate change on north Ethiopian mountain landscapes over 140 Years**

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Studies on recent environmental change in tropical areas are generally conducted over limited time scales. This study makes a multi-scale assessment over a time span of 140 years, in one of the world's most degraded areas: the highlands of Northern Ethiopia. 300 landscapes, pictured on historical photographs, starting 1868, were re-photographed and environmental changes apparent on the paired photographs were analysed through expert rating. General tendencies appearing include an improved vegetation cover nowadays as compared to any period of the last 140 years, with a second optimum in the early 20th century. In the uppermost areas (above 3500 m a.s.l.) an upward shift of the upper tree line (*Erica arborea*) is observed, demonstrating that global warming takes also place in this region. At lower elevations, increased vegetation cover is the result of 25 years of intense rehabilitation activities. Physical soil and water conservation follows the same trend. Regional variations occurring in these trends are observed and discussed. The findings are substantiated by field investigations. The positive changes that result from these conservation activities in the north Ethiopian highlands are an issue of global concern as they show that (1) in our study area direct human impact on the environment is overriding and (2) severe land degradation should not always be irreversible.