Geophysical Research Abstracts
Vol. 16, EGU2014-5606, 2014
EGU General Assembly 2014

Anti-erosion stone bunds influence rodent dynamics and crop damage in Ethiopian highlands

Yonas Meheretu (1), Kiros Welegerima (1), Mekonen Teferi (1), Gidey Yirga (1), Mitiku Haile (2), Vincent Sluydts (3), Hans Bauer (4), Jan Nyssen (5), Jozef Deckers (6), and Herwig Leirs (7)

(1) Mekelle University, Department of Biology, P.O. Box 3102, Mekelle, Ethiopia (meheretu@yahoo.com), (2) Department of Land Resources Management and Environmental Protection, Mekelle University, P.O. Box 231, Mekelle, Ethiopia, (3) Institute of Tropical Medicine, Nationalestraat 155, B 2000 Antwerpen, Belgium, (4) WildCRU, Zoology, University of Oxford, The Recanati-Kaplan Centre, UK , (5) Department of Geography, Ghent University, B-9000 Gent, Belgium, (6) Division of Soil and Water Management, K.U. Leuven, Celestijnenlaan 200E, B 3001 Heverlee, Belgium, (7) University of Antwerp, Evolutionary Ecology Group, Groenenborgerlaan 171, B 2020 Antwerpen, Belgium

In areas of subsistence agriculture, a variety of soil conservation methods have been implemented in the last few decades to improve crop yields, however these can have unintended consequences such as providing habitat for rodent pests. We studied rodent population dynamics and estimated crop damage in high and low stone bund density fields for four cropping seasons in Tigray highlands, northern Ethiopia. Stone bunds are physical structures for soil and water conservation, and potentially habitat for rodents. We used a general model to relate the proportion of crop damage to rodent abundance, stone bund density and crop stages. We found a positive correlation between rodent abundance and crop damage, and significant variation in rodent abundance and crop damage between high and low stone bund density fields. Furthermore, crop damage also varied significantly between crop stages. We concluded that Mastomys awashensis and Arvicanthis dembeensis were the two most important crop pests in the highlands causing significant damage. Fields with high stone bund density ($\sim$10 m average distance apart) harbor more rodents and endure a significantly higher proportion of crop damage compared to fields with lower stone bund density ($\sim$15 m average distance apart). The fact that rodent abundances peaked during the reproductive stage of the crop and around harvest implies the need for management intervention before these crop stages are attained.