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“Towards multi-functional agro-ecosystems
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Grass-capoeira pastures teem with the megadiversity of the NE-Amazon, Brazil

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Abstract

Grass-capoeira pastures (GCP), the partly tolerated secondary vegetation (capoeira) on humid tropical pastures, have been proven to be ecologically sustainable in smallholder agro-silvo-pastoral systems, as browsing cattle do not alter fallow species composition. Beyond enhancing soil fertility, hydrological regulation, and biogeochemical cycles, GCP represent an economically viable and ecologically sound alternative to low-input cattle husbandry and notorious pasture degradation. Even more, GCP encompass a considerable part of the local fauna and flora for nature conservation aspects. We investigated vascular plant and bird diversity on four experimental farms with GCP in Igarapé-Açu, Bragançinha Region, NE-Pará. The flora on GCP was determined using 100 m² plant relevés (n=39) and compared to the complete phytodiversity of the respective farms (n=42). Also, bird counts of up to 50 m around these GCP were compared to the total richness of the Bragançinian avifauna. Results indicate that 277 vascular plant species (78.9 % of known capoeira species), 174 genera (81.3 %), and 55 families (91.7 %) were found on GCP plots. Furthermore, 124 bird species (64.6 %), 101 genera (66.9 %), and 35 families (79.5 %) were detected around GCP, respectively. This means that smallholders could contribute to a high extent to nature conservation on their pasture plots, for which they should be financially acknowledged. While many feared pasture weeds or even poisonous plants are also present on GCP, they also contribute to total biomass production of the fallow vegetation. As a prime example of multi-functional land use, GCPs operationalize Nature-based Solutions by integrating Regenerative Agriculture into low-input farming. This makes them a vital blueprint for Climate-Smart Agriculture in humid tropical forest margins.

Keywords: Birds, climate-smart agriculture, low-input farming, multi-functional land use, nature-based solutions, phytodiversity, regenerative agriculture, smallholdings