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Adrien Coquereau[1], Camille Jahel[1], Gatien Falconnier[1], Kefasi Nyikahadzoi[2], Louise Leroux[1], Marc Piraux[1]

[1]CIRAD, Montpellier, France

[2]University of Zimbabwe, Harare, Zimbabwe

Participatory landscape modelling: towards co-design of sustainable future landscapes in the Murewa district of Zimbabwe

Abstract

Majority of the population in Sub-Saharan Africa directly relies on natural resources and biodiversity, which have seen rapid decline in several rural areas over the past few decades. This poses a challenge for local people in meeting their basic needs. Our study aims to pinpoint actionable strategies and pathways toward desirable futures (e.g. better food security and income while preserving biodiversity) against a backdrop of low-income agricultural landscapes and pressure on natural resources. Taking the Murewa district in Zimbabwe as a case study, we initiated a series of participatory workshops in two contrasting agricultural landscapes that have been confronted with the same dynamic of progressive forest degradation over recent decades, but whose drivers of change differ. Initially, participants (local farmers and non-farmers) co-built a set of plausible futures that were subsequently mapped onto various landscape configurations. They selected indicators they deemed crucial for evaluating the performance of these future landscapes. We developed a spatial model to quantify these indicators for each future landscape, integrating multiple datasets encompassing biophysical factors (land use and cover maps derived from remote sensing, soil characteristics and climate data), alongside socio-economic data (demographic information from household surveys). These quantitative assessments fed into iterative discussions aimed at collectively pinpointing desirable landscapes. Afterward, we conducted backcasting exercises for each selected landscape, allowing participants to identify leverage points. This ongoing study, which compares the outcomes of workshops held in contrasting current agricultural landscapes, will reveal similar leverage points for transitioning towards a more sustainable future.

KEYWORDS: Population, Agricultural Landscapes, Pathways, Natural Resources, Farmers, Biophysical, Sustainable Future