

Changes in Plant Understory Biodiversity in Sauri, Kenya From 2006 to 2011

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Agricultural expansion has caused an unprecedented loss in biodiversity over the last 50 years (Culman et al., 2010). Loss in biodiversity is associated with low biomass productivity, low vegetative nutrient concentration, poor nutrient and water cycling, and poor soil formation (Millenium Ecosystem Assessment, 2005; Tilman et al., 1997). It is also linked to poor ecosystem stability and resistance to drought and to invasion by exotic species (Chapin et al., 2000; Richardson, Horrocks, & Larson, 2010). Humans depend on proper ecosystem functioning for food, water, timber, the regulation of nutrient cycles, climate regulation, disease prevention, and numerous cultural services (Chapin et al., 2000; Millenium Ecosystem Assessment, 2005). As such, thoughtful management and diversification of crops can potentially stabilize or even improve ecosystem functioning.

Sauri, Kenya is one of fourteen sites where the Millennium Villages Project works to help poor communities lift themselves out of poverty. One of the major goals of the project is improve sustainability through a reduced loss in biodiversity. Thus, this study investigated understory plant diversity in Sauri after five years of intervention by the Millennium Villages Project. 78 plots were sampled in 2006 and then resampled in 2011. Plant species and percent abundance were recorded at each plot, and the Shannon diversity index was used to quantify plot diversity. Despite no change in land use, results show increased evenness in plant diversity according to land use. This suggests that Sauri farmers are managing all types of land cover, building soil quality and increasing crop yield. The study also looked at the change in diversity of commonly eaten plants over the five-year period. A decrease in diversity of commonly eaten plants was observed, with a P-value < 0.001. This may indicate that farmers have not acknowledged the benefits of diversification, or that MVP's help in the construction of new roads in Sauri has given villagers greater access to distant resources and made them less reliant on the productivity of their individual farms.

A loss in edible crop diversity could have severe impacts on Sauri's soil quality, agricultural productivity, and overall ecosystem functioning. Yet, further analysis is necessary to confirm these results. The methods of data collection were not identical in both sampling years, which may undermine the comparison of the two data sets. However, attention must be given to this potential threat to the health of Sauri's ecosystems.