Potencial use of coffee agroforestry systems to adaptation-mitigation synergies for climate change

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Introduction

Mitigation and adaptation have been proposed by the international community as the main strategies to face the climate change, but its integration is taking more relevance.

Materials and methods

This study estimated the mitigation-adaptation synergy (MAS) in the three most dominant coffee production systems in Líbano, Tolima – Colombia: agroforestry system (AFS) with *Cordia alliodora* (AFS-C), AFS with plantain (AFS-P) and monoculture (M) (Andrade *et al.,* 2014). Carbon footprint and diversity of ants were estimated as mitigation and adaptation indicators, respectively.

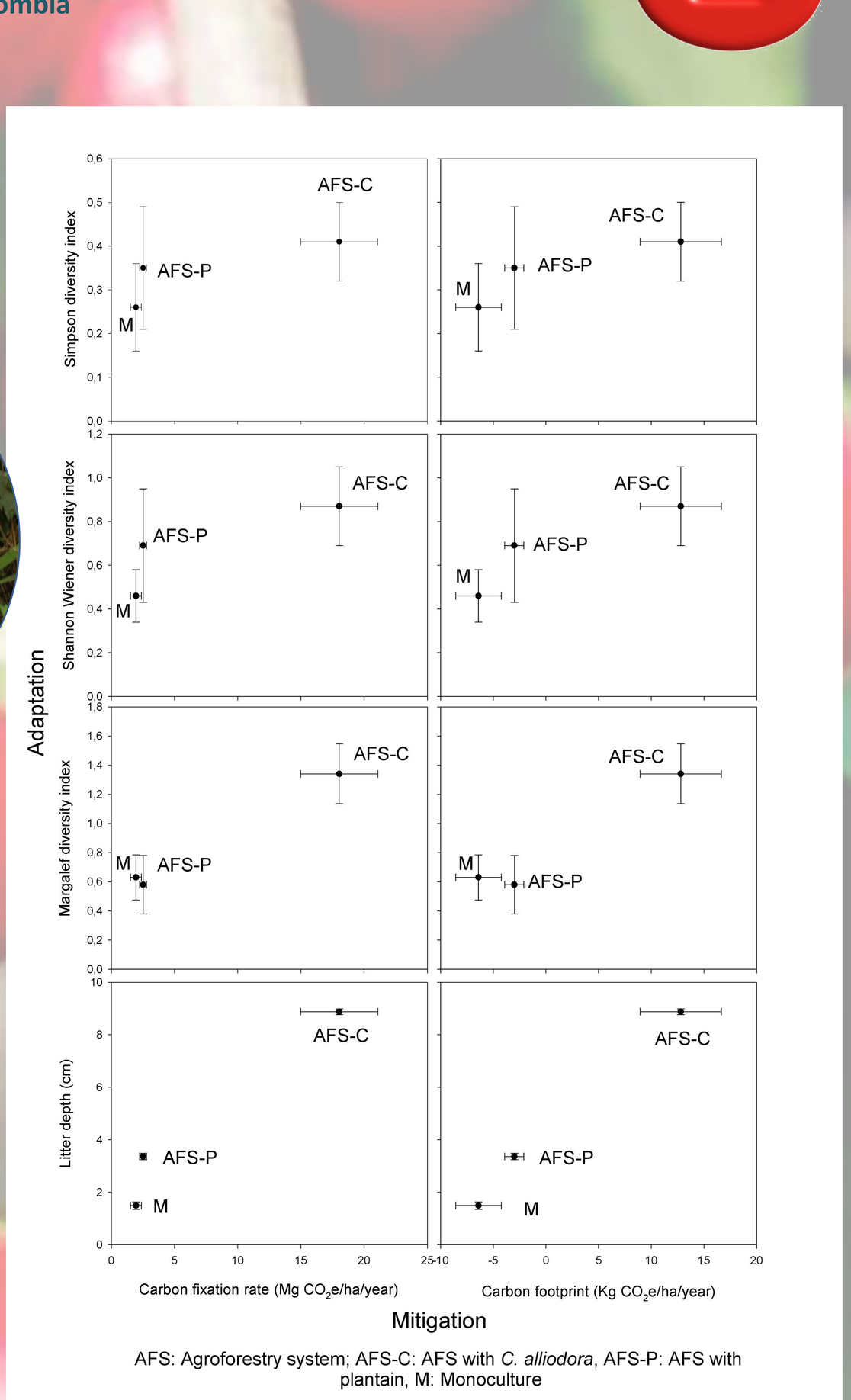

Figure 1. Comparison of adaptation and mitigation variables indicators in the three most dominant coffee production system in Líbano, Tolima – Colombia.

Results

The inclusion of trees in coffee production systems changed from negative to positive the carbon footprint: 12.8 vs -3.0 vs -6.4 Mg CO_2e/ha/year for AFS-C, AFS-P and M, respectively) (Figure 1). In the same way, AFS-C had the highest richness of ants according to Margalef index (1.3) than AFS-P and M (0.6); in contrast, no differences between systems were detected in Shannon-Wiener and Simpson Index (Figure 1). The genus *Cephalotes, Dorymyrmex, Hypoponera, Pachycondyla, Octostruma* and *Proceratium* were exclusively found in AFS-C due to its requirement of high biomass and necromass.

Conclusions

The AFS that includes native trees, can be an acceptable strategy for mitigation-adaptation to climate change, due to its advantages in improving carbon footprint and hosting a high diversity of ants. The AFS-C have characteristics more similar to natural forests which allow to generate more services as carbon sequestration and those derived from biodiversity conservation.

References

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