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Water management practices and adaptation to climate change: Cocoa farmers perceptions in Alto Beni, Bolivia

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Cocoa is mainly managed by smallholder farmers in the tropics and constitutes one of the most important export commodities, being an important source of income. Lately, conventional cocoa monoculture has been promoted to achieve high short-term productivity at the expense of deforestation. However, such systems have negatively affected the water cycle with more intense heavy rains and longer drought periods, which is threatening food security and human welfare. In that sense, the perception that farmers have on climate change is determinant to the adoption and implementation of adaptation measures and policies in agriculture.

Thus, it is imperative a more agroecological approach to answer the question whether and to what extent cocoa farmers perceive and adapt their farming practices to the climatic variations, in conjunction with water use estimations of cocoa systems under different management. As such, the present study includes an analysis of farming practices' adaptations to climate change and a comparison of evapotranspiration in cocoa cultivation under different management.

In Bolivia, traditional cocoa production systems include shade trees. Particularly, cocoa agroforestry systems managed organically have proven to have smaller water footprint and are considered an effective nature-based solution to address climate change, biodiversity loss, food insecurity and rural poverty among other environmental and social challenges of this value chain. This study sought to assess evapotranspiration as a measure of water use in conventional monocultures and organic agroforestry systems in a long-term field trial in tropical Bolivia. In addition, to assess water and climate change-related management issues and their impacts on local rural livelihoods, farmers were interviewed to assess their perception of climate change, the adaptation of farming practices and water management related knowledge.

The results provide a joint assessment of the water use, key characteristics and, potential challenges of different management for cocoa cultivation in the context of water-related climate change. The socio-economic profile of farmers as well as the characteristics of the cocoa farms are described. Furthermore, on farm activities related to water management, a comparison among farmers' perceptions on the current climatic picture and the use of weather forecast tools among other adaptations are presented.

Keywords: Adaption to climate change, agroforestry, Bolivia, cocoa, farmers' perceptions

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