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Farmers’ and academia’s views”

## Ecological sustainability of cocoa production: role of traditional agroforestry systems on biodiversity conservation and ecosystem services in Cote d’Ivoire

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### Abstract

In Côte d’Ivoire, as in all West Africa, the cocoa farms from forest conversion result in drastic decline of forest vegetation and its biodiversity. Facing this unendurable situation, agroforestry systems (AF), such as the smallholders’ plantations where trees have long been maintained and associated for diverse purposes can offer promising sustainable alternative. But what is the ecological sustainability of the traditional agroforestry systems in Côte d’Ivoire and what are their role on biodiversity conservation, ecosystem services? In addition to the goods and services provided by the associated species, only local farmers’ perceptions on these species and systems seem to be able to allow their maintenance and the success of this cultivation system. To address these questions, a study had been carried out in the Centre of the country to analyse the practices through a survey of one hundred and five peasants in which we recorded their utilisation of plant species in cocoa plantations and their perceptions. We also inventoried the diversity of plant species in 105 plots of 625 m<sup>2</sup> each and the services that can be benefited from these traditional AF focusing on provisioning services. We analysed how the tree species contribute to biodiversity conservation (a special focus on the species with high conservation value). Then the biomass and the carbon stock of the associated trees had been computed. The results showed that 65 species were recognised by farmers as being compatible or not with the cocoa cultivation. Large trees like *Milicia excelsa* that would maintain soil fertility or moisture in the environment, were marked favourable to cocoa. The majority of food species had no known effect on cocoa trees. The study showed that most of species are associated with cocoa trees to provide food and medicinal goods to local people. Tree biomass and rates of carbon sequestered were important. The farms housed high conservation value species. The study suggested the agroforestry systems in the Centre provide important ecosystem services as well as biodiversity conservation.

**Keywords:** Biodiversity conservation, Côte d’Ivoire, ecosystem services, farming practices, perceptions, shade species