Designing innovative agroforestry systems in oil palm-dominated landscapes

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Background. TRAILS stands for "climaTe Resilient lAndscapes for wIldLife conServation". TRAILS is a multidisciplinary research project aimed at identifying innovative solutions at the landscape level.

Methods. Mixed-tree forests provide habitat: Pioneer tree species are most efficient in restoring sustainable riparian forests and provide shelter for wildlife. As soon as the canopy starts closing, small mammals, primates or birds start to disseminate seeds originating from nearby patches of natural forests.

Biodiversity corridors provide climatic resilience: Agroforestry systems have an important role to play in mitigating climate change, through the sequestration of atmospheric carbon dioxide in plants and soil. Changes in GHG emissions and soil organic carbon stocks are monitored after land conversion into agroforest. Mixed plantations provide a livelihood: It is key to understand changes in the structure and stability of oil palm planters' income induced by the transition from monoculture plantations towards mixed-planted systems.

Objectives

- To install oil-palm-based agroforestry systems: mixed planting are installed using selected oil palm seedlings and native forest species grown in dedicated nurseries in the study area (Sabah, Borneo Island, Malaysia).
- To monitor wildlife recolonization dynamics (abundance, diversity, and mobility) in areas covered with mixed-planting, riparian corridors, and oil palms.
- To study the agronomic performance of oil palms: growth, development, and nutrition of palms together with fruit yields and bunch characteristics are measured.
- To understand key characters of climate resilience through the monitoring of bioclimatic condition of the parcels and their ability to provide environmental services.
- To analyze the socioeconomic impact of the transition from oil palm monospecific plantation to agroforestry systems.

Conclusion

TRAILS builds on a complementary partnership, linking academic, NGOs, private and public stakeholders, thus enabling integrated approaches arising from various science fields, from agronomy and forestry to veterinary sciences while including a detailed socioeconomic approach of livelihoods.