

58. Are tree plantations climate-smart? The case of rubber tree plantations and the natural rubber commodity chain

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Industrial tree crop plantations often enter in direct competition for land with forests. In those cases, the net result on climate is detrimental. In other cases, the possibility for tree crops to fulfil the objectives of CSA deserves a deeper investigation. This study analyses the case of natural rubber production in Thailand. The natural rubber (NR) commodity chain presents two promising features to reach CSA objectives. First, family farms represent the majority of surface areas under rubber plantations. These production systems may contribute to local sustainable development and food security. Second, NR is a natural competitor of synthetic rubber (SR) made from crude oil. Substituting SR by NR may hence allow for reductions in GHG emissions from fossil sources. We developed a multi-disciplinary research project with these two features as a backbone. The goal was to improve the productivity and the sustainability of rubber smallholdings, while making sure that their NR output would suit for SR substitution particularly in terms of consistency. Results showed a high diversity of farm structures and agricultural practices in rubber smallholdings. The diversification of farm activities, of income source and latex harvesting methods appeared to be important adjustment variables to cope with uncertainties linked to price fluctuations and natural hazards. The impact of clone, latex harvesting and post-harvesting practices on the physico-chemical properties of NR was assessed. Results also showed how rubber plantations could improve the soil ecosystem services and particularly the soil carbon content when rubber trees were planted on lands previously used for intensive annual crops. The next step of the research project is to integrate these results into a multi-criteria analysis, such as Life Cycle Assessment, in order to design and assess adaptation strategies of the NR supply chains to global changes.

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