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### **III.20 Alternatives to slash-and-burn agriculture: a research approach for the development of a chop-and-mulch system**

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The introduction of research-based innovations into traditional land-use systems is difficult, as examples from agroforestry have shown. It can take years to decades until a new agricultural practice has been adopted by the farmers and often the innovations are not very well aligned with the problems and concerns of the farmers. Therefore, in our search for alternatives to the traditional slash-and-burn land preparation (in the context of the SHIFT project "Secondary forests and fallow vegetation in the agricultural landscape of the Eastern Amazon region") we opted for field experiments carried out on small-farmers' land in an old agricultural landscape of the Amazon region. To achieve our objective we follow a phased plan: (i) diagnostic research (ii) technology development and prototype evaluation and (iii) adoption-oriented research. During the diagnostic project phase we identified the critical needs for improvement, focusing on nutrient dynamics, fallow regeneration, and fire prevention. Then, instead of designing a completely new land-use system, we aimed at modifying those components of the traditional system which cause or introducing those components which have the potential to prevent degradation processes due to intensified land use. Alternative technologies were developed as a set of modules including the development of a tractor-driven bush chopper for fire-free land clearing and mulching, enrichment planting with fast-growing leguminous trees to improve the biomass production of the fallow vegetation, shifts in the cropping sequence as well as the screening of modern low-input crop varieties under mulch conditions. Adoption of these modules is flexible, leaving the farmer in control of the innovation process. The adoption-oriented research phase is currently underway and assesses the willingness of the farmers to adopt the farming system improvements. Participatory on-farm research facilitates the adoption process.