

Role of cattle in the fallow systems in Eastern Amazon region

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The slash and burn system has been a feature of the Bragantina region for at least 80 years. Its success depends on restoration of soil fertility during the fallow period through recolonization with natural vegetation ("Capoeira") and immobilisation of nutrients in living biomass. The reduction of fallow periods, declining yields in annual crops and low values in soil organic matter, macro- and micronutrients indicate that this system has reached its performance limit. Development trends in the region are increasing cultivation of perennials and creating pastures. Consequently cattle numbers and pasture area have increased rapidly since the eighties.

The reason for keeping cattle is seen as an increased financial security and economic viability of the farms favoured by cultural, fiscal and institutional incentives. The introduction of pastures takes land out of the cropping cycle so that when the cultivated area of annual crops is not reduced, the fallow period is shortened. Thus, to add cattle to the smallholder cropping system increases the ecological instability of the farms.

The project will therefore explore the possibilities of alleviating the undesirable ecological effects of pasture establishment while sustaining socio-economic advantages of cattle.

One way may be to integrate. Given the growing diversity of cropping activities, different alternatives for integrating cattle with crops are feasible. One possibility is the inclusion of pastures in the annual cropping cycle. A schematic model already exists which combines cattle, capoeira and annual crops making use of the gradual recolonisation of pastures with woody vegetation instead of countering this process by slashing or herbicides. The feasibility of this model will be tested in the subproject "Using pastures as an intermediate succession stage in the Capoeira cycle". The working hypothesis is that integration will have a comparative advantage over separation. The test will be to compare the regrowth of secondary vegetation in fallow land succeeding short-term pastures with that following annual crops and the productivity of integrated with that of separated pastures. It has also to be tested, if the "deterioration" of separated long term pastures is associated with soil degradation i.e. the land loses its regenerative capacity, which would also give a comparative advantage to integrated pastures.

The second subproject will explore the different forms of integration with cropping activities more generally using a systems approach. The working hypothesis is that integration of cattle with cropping activities has not reached the optimum intensity. To test this, the effects of different forms of integration will be compared by economic analysis of the cattle component. At the same time interactions between cattle and crops and the main factors influencing the integration intensity will be studied leading also to an evaluation of the ecological properties of different integration scenarios.

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