



## Artigos Técnicos

### SHIFTING CULTIVATION AND SUSTAINABLE DEVELOPMENT

Farming is going through a transition phase, as a consequence of the processes of globalization of world economy in which economic inefficiency and environmental impacts will be largely replaced by more sustainable production systems. However, shifting cultivation or migration currently being conducted in about 30% of the agricultural soils of the planet and provides the livelihood for an estimated population of 250 million people, notably those of the poorest countries. In the Amazonian shifting agriculture still remains as one of the systems of land use most important, both from the economic point of view - responsible for at least 80% of total food production in the region - but also by the amount of people who depend on it directly or indirectly. It is a traditional system of agriculture developed and practiced in almost all the region for at least 600,000 small farmers, producing mainly beans, cassava, rice, corn, mauve, jute, fruits, cotton and other products. Large areas of forests in the Amazon has been cleared to practice shifting cultivation. Studies conducted by Embrapa Amazônia Oriental demonstrate that, despite the small individual areas used in the practice of this activity (between 10 and 50 ha), the 600 000 farmers, cultivating an average of 2 ha for two consecutive years, and leaving these fallow for 2 h about 10 years, probably have caused the deforestation of at least one fifth of the total deforestation in the Amazon, a process that can be called "deforestation silent."

Shifting cultivation is based on the recycling of nutrients. The fires release into the soil, about half the nitrogen and phosphorus from incinerated biomass and almost all other nutrients in the form of ash. The high temperatures prevailing in the tropics and high humidity accelerate all the processes of decomposition of plant biomass. Nutrients removed by harvesting, and losses due to leaching and erosion of the soil, resulting in a decrease in initial soil fertility. In this case, nutrient deficiencies and significant increase in invasive plant new crops unfeasible, the areas being abandoned or left fallow for the emergence of secondary vegetation - the barns.

Environmental sustainability and the technical-economic-social shifting cultivation are inconsistent and therefore do not provide the foundations for the consolidation and expansion of rural development. Despite their importance in the regional economy, the expansion tends to decline with decreasing agricultural expansion due to restrictions on deforestation, the consolidation process of development poles, and with increasing population density and consequent increase in demand for food and land prices rise. In these circumstances, the long fallow periods - a necessary condition for maintaining the agronomic sustainability of the system - will no longer be as stable as before and in the long run, shifting cultivation systems will be replaced by more intensive land use.

In this context, agricultural research emerges as a major factor in the provision and generation of alternative technologies that enable sustainable development with equitable distribution of costs and benefits among the peoples involved. The concept of sustainability can be incorporated into the research process as a criterion for evaluation of technologies generated / or adapted, and developing projects. To this end, the policy research should include evaluation and monitoring of natural resources, conservation of genetic resources and biodiversity in priority areas, beyond the generation of appropriate technologies in order to prevent the impacts of agricultural activities. To Embrapa, efforts should be channeled to prioritize those activities: agro-ecological zoning, through simulation and modeling to predict the performance of agricultural systems; protection practices and soil conservation, genetic improvement of varieties and clones resistant to pests and diseases, sustainable agroforestry systems, exploitation of native forests for sustainable yield, promoting alternatives to diversify agriculture and forestry, multiple

cropping, intercropping and crop rotation, biological control of pests and diseases, increased length of use of deforested areas; recovery pastures and other areas; domestication of genetic resources and prospects; chemical and biological evaluation of Amazonian species, selection of tree species for charcoal production, improvement in the efficiency of extraction, development of agriculture in wetlands and impact assessment environmental impacts resulting from investment projects in the Amazon.

Newton de Lucena Costa - Embrapa Roraima

Newton de Lucena Costa - [newton@cpafrr.embrapa.br](mailto:newton@cpafrr.embrapa.br)

