

Neotropical Ecosystems



WAVES

Water Availability, Vulnerability
of Ecosystems and Society
in the Northeast of Brazil

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edited by
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Integration of Information on Fallow Systems toward Supporting Public Policies

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The rotational slash and burn agricultural system, largely dependent on the duration of the fallow period to restore the productivity of the land, is still extensively practiced by small land holders in the Northeastern Pará State, Brazil. Clear signs of agronomic and ecological failure of this system have been represented by consistently decreasing crop yields, fallow period shortening, and structural and compositional depletion of the natural recovering vegetation (capoeira). The SHIFT-capoeira research project (Env-25) has been developing and introducing fire-free alternative management practices such as (i) the enrichment of the capoeira vegetation to improve biomass production and nutrient recovery/fixation, (ii) use of a bush-chopper that allow the mulching (instead of burning) of the biomass, (iii) mulch management/fertilization for optimal weed

control and crop absorption of stocked nutrients, and (iv) crop rotation/association/cultivation techniques that are, on the one hand, adapted to fire-free agricultural production, and on the other, more suited to fulfil the household as well as the commercial needs of the farmers. The focus of this study is the evaluation of the contribution of these management alternatives for the sustainability of the agricultural activity developed by the small land holders in Northeastern Pará, with special reference to the non-monetary gains in terms of ecological function restoration and natural resources conservation afforded by fire-free management practices. The final purpose of the research effort is to draw indications of public policies directed to improving the efficacy of the development programs dedicated to the small landholders of the region.

A Structured Equations Model of Migration in the WAVES Region

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The main goal of the sub-project of socio-cultural and socioeconomic is to analyze, through a interdisciplinary study, the social, economics, cultural, and political factors that lead to changes in water and land uses and their influence in the quality of life and migration. Developing an integrated regional model as a tool to evaluate strategies for sustainable rural development under changing climatic and socioeconomic conditions for reducing poverty and also migration is necessary.

In this context, one among other contexts, the working socio-cultural and optimization groups aim to analyze a framework with which to examine the links between the often noted "push" causes of rural migration in Tauá and the individual characteristics that distinguish migrants from the rest of the rural population. By including expected rural income, education level, sex, age, opportunity of employee and amenities, as endogenous variables, and changes in

climate and public policies, as exogenous variables, by providing an empirical test of the model based on individual survey data gathered in a rural area in 1995.

The structural equations model will be presented and hypothesized determinants of the probability of migration are derived. The model that will be used for such purposes, where the behavior of a decision maker who must choose from a finite set of alternatives like to migrate or not is called model with qualitative dependent variables. Forecasting models are also used because they are essential in the integrated modeling and are associated with most of the critical decisions that must be made. The individual survey data will be repeated in next July because consideration of the climate conditions as well as socio-economics and political aspects changes over time will be taking into account in order those models can be calibrated in the future.