



Tropentag, October 9-11, 2007, Witzenhausen

“Utilisation of diversity in land use systems:
Sustainable and organic approaches to meet human needs”

Socio-Economic and Ecological Analysis of the Use of Controlled Fires in Pastoralism: Cases of two Agro-Ecological Zones of Benin

TEKA OSCAR¹, VOGT JOACHIM¹, KINDOMIHOU VALENTIN², HOUSSOU LAURENT², SINSIN BRICE²

¹*Karlsruhe University, Institute of Regional Sciences, Germany*

²*Abomey Calavi University, Laboratory of Applied Ecology, Benin*

Abstract

The studies of social acceptability, technical feasibility, economical profitability and ecological effects of the controlled fires use were conducted in two agro-ecological zones of Benin. Objectives were: (i) to test the effects of various controlled fires on the grasslands productivity and quality; (ii) to make a comparative socio-economic analysis of the controlled fires use and the establishment and utilisation of artificial pastures. Socio-economic data were collected through surveys with small breeders, farmers, and managers of pilots' ranches of the “Projet de Développement de l'Élevage au Bénin”. Three types of vegetation fires (early fires, late fires and out-of-season fires) were tested. The use of phytosociological and linear relevés results in the typology and determination of pastures pastoral values. Phytomass was harvested inside and outside protected plots.

Pastures respond differently to various types of fires. Early fires significantly improve productivity with a coefficient of improvement of 18.2% in Sudano-Guinean zone and 24.4% in Guineo-Sudanian zone.

Pasture productivities were low in response to both late and out-of-season fires in both guineo-sudanian and sudano-guinean zones. The coefficient of productivity reduction ranged from 10.0 to 20.1% for the late fire and 26.2 to 50.3% for the out-of-season fire. Both early and late fires improve the pastoral values in the two zones. The average values were 51.2% and 50.7% respectively for early and late fires. Conversely, the out-of-season fires decreased this value in the magnitude of 9%.

Fires are used in Benin for economic, ritual and hygienic reasons. Their application on natural pastures is relatively more profitable than producing artificial pastures. Establishing and maintaining 1 hectare of artificial pasture requires 306.76 \$US/ha/year while managing a natural pasture by fire costs 11.43 \$US/ha in the first year and approximately 4.82 \$US the four last years. Globally, managing a natural pasture by fire is more profitable than producing an artificial pasture which requires investments that small breeders and farmers cannot afford to do with their small resources. Controlled fires might improve the natural pastures productivity and could be recommended in the current degradation context of natural pastures in Benin.

Keywords: Agro-ecological zone, analyze, Benin, controlled fires, ecological, socio-economic