

Conflicts over property rights and natural-resource exploitation at the frontier

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Abstract

Competition for land at the frontier is analyzed by considering a game between a first settler and a contestant. Although the first settler is the legitimate owner of a plot of land, his remoteness from the government's administrative center makes it difficult to prove it. This creates incentives for a contestant to dispute his claims. Both contenders will expend resources in order to secure ownership. Due to transport costs, the more remote a plot of land is, the lower its output value; this tends to discourage appropriative activities. Land degradation is sometimes used as a substitute to appropriative activities. A lower discount rate may encourage land degradation. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

It is a well-documented fact that many tropical forest areas are being subject to unsustainable land-use practices which result in severe land degradation and the permanent loss of forest cover (Repetto, 1988, 1990; Barbier et al., 1991). A crucial feature common to most tropical forest areas consists in the fact that they are located far from the markets and the government's administrative centers; for

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this reason, they are often referred to as “frontier regions.” The purpose of this study is to try to understand how this particular feature of frontier regions can foster the adoption of unsustainable land-use practices.

There are many factors suspected to contribute to the state of affairs at the frontiers, as there is often a plethora of agents with various and conflicting interests operating in these regions. In the Brazilian Amazon for instance, Schminck and Wood (1992) list the presence of such diverse types of agents as large ranch and sawmill owners, directors of large mining companies, peasants, wage workers, independent miners, rubber tapers, fishers, Brazil nut collectors, Indians, as well as the many levels of government agencies (federal, state, and local), the military and the police. The authors note the presence of “fundamental contradictions within and between [government] agencies (federal, state, and local)” (p. 15), which testifies that the situation can be a complex one to grasp. There remains, nonetheless, one particularity of frontier settlements which is suspected to have a major impact: it is the presence of tenure insecurity.¹ Indeed, one obvious effect of tenure insecurity is to lower the expected value of long-term gains since the settler may have been evicted from the land before these gains have materialized. Hence, the reduced incentives to invest in sustainable land-use practices.²

The mechanics through which ill-defined property rights may encourage an inefficient exploitation of natural resources have been quite extensively investigated, especially in the case of free-access exploitation.³ What has not deserved as much attention in the literature, however, is the fact that incompletely defined property rights may result from a deliberate choice by the exploiter of a resource, who must weigh the benefits of better delineated property rights with its costs.⁴ Indeed, when the owner of a natural-resource site decides to exploit his site, be it a crop-producing plot of land, a pasture, a fishery, a forest, a hunting ground, or else, he must decide not only on the intensity of exploitation of the resource, but also on the level of expenditures necessary to define and enforce his ownership rights. In the case of natural-resource exploitation, the protection of property rights may take different forms: for example, one requires the exclusion of encroachers who may try to appropriate some of the output from the site, while another involves an outright contest over who actually owns the site.

¹ See, for instance, Schneider (1995), Cruz et al. (1992) and Dorner and Thiesenhusen (1992).

² Another effect of insecure ownership is to limit the availability of credit for investments in productivity-enhancing technologies (Besley, 1995; Feder and Feeny, 1991); this effect will not be considered here.

³ Classic references are Gordon (1954), Dasgupta and Heal (1979, chap. 3) and Hardin (1968).

⁴ Alston et al. (1998) have proposed to endogenize the recourse to violence in a model of rural conflict using a game theoretic approach. Their model seeks to create a link between violence and land reform policy in Brazil in order to perform empirical tests. Their model does not, however, explicitly consider the choice of land use and the effect of distance to center.

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