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Land Tenure Center
1300 University Avenue
University of Wisconsin–Madison
Madison, Wisconsin 53706

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FARMLAND DEGRADATION IN DEVELOPING COUNTRIES: THE ROLE OF PROPERTY RIGHTS AND AN ASSESSMENT OF LAND TITLING AS A POLICY INTERVENTION

by

Daniel Wachter

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PREFACE

Daniel Wachter of the University of Zurich, Switzerland, prepared this paper during a research stay at the Environment Department of the World Bank and at the Land Tenure Center of the University of Wisconsin-Madison. A previous version of this paper was published as a World Bank Divisional Working Paper under the title "Land Titling for Land Conservation in Developing Countries?" The author would like to thank John Bruce, Carol Dickerman, and Steve Lawry of the Land Tenure Center; Jock Anderson, Shelton Davis, John English, Ernst Lutz, and Raymond Noronha of the World Bank; Hans Hurni of the University of Berne; and Twig Johnson of the US Agency for International Development for their most helpful comments and reviews of earlier drafts of this paper. The editorial assistance of Meta de Conquereaumont and Carol Dickerman is also gratefully acknowledged.

EXECUTIVE SUMMARY

This paper approaches the links between land tenure and land degradation in developing countries from a property rights economic perspective. Property rights economic explanations of land degradation tend to be deductive and abstract in nature, however, and do not always adequately reflect the complexity of tenure insecurity problems in the developing world. Conversely, there are numerous empirical case studies of tenure insecurity in different developing regions, in different agricultural systems, or in different agrarian structures which often do not come to any clear conclusions about the need for and the merits of land titling.

This study tries to synthesize property rights economic theory and the different strands of empirical literature in order to develop a framework for discussing the implications for land titling. In keeping with the recent literature on property rights regimes, this framework recognizes that tenure insecurity problems differ according to the initial property rights setting: private rights over land (for example, Latin American agrarian structures), common rights over land (for example, the traditional African land management system), state-owned land (for example, a state farm in a socialist country), or nonproperty (for example, frontiers and settlers in tropical forest areas). Land titling as a solution is concerned with more than simply individual, freehold land titles; for land resources with unclear or nonexisting rights, common property or state ownership are conceivable solutions under certain circumstances.

A property-rights-oriented environmental policy relies fundamentally on the state to perform specific tasks. For land titling to successfully support the objective of land conservation, the state must provide infrastructural services and a strong and impartial legal framework. The state also must avoid creating a distorted structure of agricultural incentives and provide farmers with an enabling environment that goes beyond the provision of clear property rights.

1. INTRODUCTION

Two main concerns motivated this study. One was the growing problem of *land degradation* in developing countries (Brown and Wolf 1984; Chisholm and Dumsday 1987; World Commission 1987, p. 133) and the hope that an examination of land titling in the context of land conservation and sustainable agriculture might contribute to a lessening of this problem. The second, more theoretical motivation was to investigate the possibilities and limitations of applying the new *property rights paradigm* of environmental and resource economics to the environmental management of agricultural land in developing countries. In the past ten to twenty years, the traditional ways of explaining environmental problems and the policy recommendations—mainly command and control interventions or taxes/subsidies based on the externality argument (see section 2.3)—have steadily given way to the "property rights approach" (Randall 1975; Eggertsson 1990). The rationale for the property rights approach is that establishing or strengthening exclusive *property rights* to environmental goods will give resource users an incentive to take care of the resources and use them in a socially optimal way.

This paper deals basically with two fundamental questions:

- How do different property rights or land tenure arrangements affect the way land is used?

- If insecurity or a lack of property rights has detrimental effects on land use, should the environmental authority intervene through land titling, and, if so, what can this realistically be expected to achieve?

Land titling and land registration have long been a part of agrarian and land reform programs, where their objectives have primarily been to enhance social equity and agricultural productivity (McEntire 1973; Eckholm 1979, p. 24f.; Peters and Maunder 1983; Atkins 1988; Feder et al. 1988). While the links between land tenure and social equity or agricultural productivity have been widely studied, those between land titling and land conservation remain a neglected and controversial area of research needing much more investigation (Holzheu 1980, pp. 48-51; Anderson and Thampapillai 1990, pp. 16-19; Kirby and Blyth 1987; and Quiggin 1987, pp. 208-10). There is a revival of interest in land titling for the purpose of achieving environmental objectives (Eckholm 1979, pp. 29-30; World Commission 1987, pp. 129 and 141; Durning 1989b, p. 40f.; and World Bank 1989c, p. 20). This study is part of this concern, looking at land titling and land legislation, particularly as a means of arresting the growing problem of land degradation.

1.1 CAUSES OF LAND DEGRADATION

While the emphasis is on land tenure insecurity as a causal factor in land degradation, there are, of course, other causes as well that have received considerable attention (see, for example, Blaikie 1985; Blyth and Kirby 1985; Chisholm and Dumsday 1987; World Commission 1987, pp. 118-46; Southgate 1988; and Anderson and Thampapillai 1990). These and other more specific studies identify numerous causes of land degradation, including fragile ecosystems, agricultural policies, knowledge of appropriate technologies, population growth, poverty, and sociocultural factors.

Some authors (for example, Schmidt and Haase 1990) claim that a purely physical factor—*fragile ecosystems*—contributes to land degradation in developing countries. They argue that the tropical or arid areas that constitute large parts of the developing world are more vulnerable to degradation than are mid-latitude ecosystems. This factor is related to socioeconomic factors such as population growth, inequalities of wealth, and unequal access to land resources, which drive many people from regions more suitable for agriculture into fragile or marginal areas (Eckholm 1979, p. 29; Blaikie 1985; and Southgate 1988, pp. 3-5).

There is ample evidence that government policies and market interventions can seriously damage the quality of land resources. Most important are *agricultural policies* that distort input and output prices. On the input side, many governments subsidize fertilizers, water, or land-clearing activities which often increase the exploitation of land resources. On the output side, artificially high or low prices can encourage too intensive land use or cause underinvestment because of lack of capital (Repetto 1988; Willis et al. 1988; Binswanger 1989; Mahar 1989; Lutz and Daly 1990; and Lutz and Young 1992; see also section 9.3).

Another often-mentioned factor leading to land degradation is a *lack of knowledge* about land conservation or appropriate production techniques. Often the appropriate technology exists but information about its use has not reached the end users because of deficiencies in extension and education (Anderson and Thampapillai 1990, p. 20; Reganold et al. 1990, p. 119).

The relationship between *population growth* and land degradation is clearly more complex than some simplistic and deterministic models suggest. What cannot be denied is that beyond certain population density thresholds, population growth increases the pressure on scarce resources and thus creates a need for more sophisticated resource management systems and institutions (Todaro 1982, p. 162f.; World Commission 1987, p. 95f.; Keyfitz 1989; Lele and Stone 1989; Anderson and Thampapillai 1990, p. 16; and Bromley 1990b, p. 25).

Poverty is another factor which contributes to land degradation through its influence on the decision-making and the time horizon of users of land resources. The poorer people are, the more their daily struggle for survival pre-empts any long-term planning or

agricultural strategies (World Commission 1987, p. 49f.; Durning 1989b; Jagannathan 1989; and Perrings 1989).

And finally, some analysts have suggested that *sociocultural factors* rather than economic ones influence the behavior of agricultural decision-makers, leading to "inappropriate" or "suboptimal" decisions on land use. This is, however, a very contested issue. Many authors claim that farmers in developing countries are quite rational, considering the many different risks and uncertainties they must confront (Wharton 1969; Kelsey and Quiggin 1989; and Winston 1989).

1.2 Land Tenure and Land Degradation

While recognizing the complexity and multicausality of land degradation implied by this brief summary of causal factors, this study nevertheless focuses primarily on land tenure. Other factors are touched on only briefly. The study further narrows its focus to land titling in the context of tenure insecurity rather than land reform. Tenure insecurity and inequality in landownership or farm size are the two broad strands in the literature on the links between land tenure and land degradation (Eckholm 1979, pp. 28-30; and Atwood 1990, p. 660).

The *agrarian structure approach* is concerned with problems such as the concentration of the best land in the hands of powerful landowners, which pushes poorer farmers onto small, marginal plots, or differences in the size of holdings, which affect land use, cropping systems, and environmental degradation.

The *tenure insecurity approach*, on the other hand, looks at the influence of tenure security on the incentives to use land in a sustainable manner or the willingness to invest in land conservation. This approach coincides in many ways with the study of property rights economics (Dragun 1987), which is concerned mainly with such issues as exclusiveness, completeness, attenuation, or enforcement of property rights and the relevance of these factors to economic actions (incentives). This study focuses on the tenure insecurity issue, even though separating the two issues is difficult, and many land titling projects designed to improve tenure security are accompanied by some redefinition of land rights or land reform.

Property rights economic explanations of land degradation tend to be deductive, abstract in nature, and do not always adequately reflect the complexity of tenure insecurity problems in the developing world (Soederbaum 1990). Conversely, there are numerous empirical studies preoccupied with tenure insecurity problems in different developing regions, in different agricultural systems, or in different agrarian structures. These studies often do not come to similar conclusions about the need for and the merits of land titling. This paper tries to bridge the gap between the two kinds of studies, synthesizing the property rights economic theory and the different strands of empirical literature, developing a framework of tenure insecurity problem situations, and discussing the implications for land titling.

1.3 STRUCTURE OF THE REPORT

This study is structured as follows: chapter 2 explores such fundamental concepts as land or property rights, while chapter 3 analyzes land degradation from a property rights economic point of view, arguing for a property rights-oriented land conservation policy. The rationale and the basic objectives of land titling for land conservation are addressed in chapter 4. Because the issue is more complex than may be commonly assumed, chapter 5 investigates various problem situations, showing their diversity. The implications of this diversity of problem situations for land titling are discussed in chapters 6 to 8. Since land titling depends on the state for registration and enforcement of property rights, chapter 9 examines the role of the state. Finally, chapter 10 presents the major conclusions concerning land titling for land conservation.

2. SOME ECONOMICS OF LAND DEGRADATION

This chapter introduces some basic concepts of land and resource economics that are fundamental to the arguments presented in this study. It covers the concept of land (section 2.1) and the symptoms of land degradation (section 2.2), and provides an overview of environmental economic explanations of land degradation that integrates the property rights argumentation of this study into the general environmental economics discussion (section 2.3).

2.1 THE CONCEPT OF LAND

The term "land," in the sense of *ground*, *soil*, or *earth*, has a variety of meanings. Barlowe (1986, pp. 7-15) and Dovring (1987, pp. 4-9) identify at least six of these:

- Space, situation: Referring to the surface on which life takes place, this meaning of land includes location with respect to markets and other features, accessibility, and so forth.

- Nature: Land in this sense refers to the natural environment, which is conditioned by light, rainfall, wind, soil, topographic conditions, and the like.

- Property: This concept involves real estate and has legal connotations. It is concerned with the areas over which individuals or groups exercise rights of possession and use, and with the nature of the rights and responsibilities they hold.

- Factor of production: Economists frequently refer to land, along with labor, capital, know-how, and management, as a basic factor of production. This meaning encompasses many of the natural things modern society uses (raw materials, minerals, energy resources).

- Consumption good: In addition to its productive use, land often has a value as a consumer good (parks, recreation areas).

- Capital: Land, while a unique and separate factor of production, is also realistically viewed as a type of capital, especially agricultural land in which farmers have made investments and soil improvements.

This study is concerned primarily with land as a factor of production—the productive basis for agriculture—but in both a narrower and a broader sense than defined above. Narrower, because we will talk of soil only and omit other features such as raw materials.

Broader, because agricultural land beyond its subsistence uses clearly is not merely a gift of nature but has many properties of constructed capital goods (Clark and Furtan 1983, pp. 356-60), even though it remains a resource governed by biological and ecological processes.

For practical reasons, this study is concerned only with *agricultural land*, its degradation and conservation. The need to conserve other land resources such as natural habitats is equally great, but for the purposes of this study, it is assumed that the environmental authorities, and societies as a whole, meet their responsibilities to conserve these resources. The degradation of agricultural land affects these resources as well, however. Many valuable or fragile ecosystems that should not be developed because of their biodiversity or protective functions (tropical forests, mountain areas) could be preserved if surrounding agricultural areas were transformed into highly productive lands (Nelson 1991; and Southgate 1991).

Agricultural land is difficult to categorize as either a nonrenewable (stock) or a renewable (flow) resource, the two major categories of natural resources (Rees 1985, pp. 13-14). Stock resources, which may have taken millions of years to form, are from a human perspective now fixed in supply. Flow resources renew themselves within a relatively short timespan. Some are independent of human capture (solar radiation, wind power) while others are renewable only within certain limits of use—they can be overexploited to exhaustion (fishery, forest).

Agricultural land has characteristics of both stock and flow resources (Holzheu 1980, p. 48; Barlowe 1986, p. 23; and Conway and Barbier 1990, p. 29). The total amount of land suitable for agriculture is limited—with the limits being approached ever closer as world population increases and agricultural land is increasingly lost to other uses such as housing or industry. Yet agricultural land has a regenerative capacity as well, although its purely natural regenerative capacity is limited. To keep a plot of land continuously productive takes investment, maintenance, and replacement of nutrients. This means that land can readily be transformed into a nonrenewable resource through mismanagement. In addition, land is the basis for many other renewable resources (natural habitats of flora and fauna), which further intertwines the concepts of renewable and nonrenewable resources (Swallow 1990).

2.2 Symptoms of Land Degradation

Since agricultural land is both a managed capital good and a natural resource, it follows that there are two broad types of land degradation (Wachter 1990, p. 77): overexploitation of land resources, and underinvestment in land.

Overuse takes many forms. In the context of low-input agriculture, it may take the form of overgrazing; in a high-input situation, it may come about through overuse of fertilizers. Biological and physical phenomena such as erosion of top soil, soil acidification, salinization, and overload of soil nutrients are other forms of overuse (Burch et al. 1987;

Schmidt and Haase 1990). Yet another is the loss of agricultural land to uses such as industry, transportation, or housing, which generally leads to the complete and irreversible destruction of agricultural land. Underinvestment includes the degradation of existing capital components of land through lack of maintenance—irrigation schemes, terraces, tree alleys (Leblond and Guerin 1983)—as well as failure to make land improvements because investment incentives are lacking. Some areas of the developing world (areas of shifting cultivation, frontier situations in tropical forest areas, low-input agriculture in Africa) are more severely affected by overuse, others by underinvestment, leading, for example, to the decay of terraces.

2.3 Environmental Economics and Land Degradation

Environmental economics provides a formal way of analyzing human actions that affect the environment; in itself, it says nothing about the underlying determinants of those actions (Frey 1985, p. 37; Quiggin 1987). Rather, it seeks to determine whether the costs or benefits of these actions are borne or received by the causing party or by others—that is, it looks at externalities. Externalities are benefits (positive externalities) or costs (negative externalities) that are transferred between economic agents without the causing party being compensated (in the case of a positive externality) or charged (in the case of a negative externality). In environmental economics, there are three theories or approaches for explaining environmental degradation, and all are closely related to the concept of externality (Mishan 1981, pp. 377-474). These are the theory of social cost, the theory of collective goods, and the property rights approach.

Theory of Social Cost

The theory of social cost goes back to Pigou (1920) and his recognition of the relation between private and social cost. If economic agents do not bear the full (social) costs of their actions—that is, if there are externalities—factors of production will not be optimally allocated. It is assumed that the market cannot cope with the externality problem by itself. The theory of social cost would explain land degradation as the result of farmers' use of practices for which they do not bear the full costs (for example, downstream costs of water pollution or erosion), or of positive externalities (related, say, to protective functions or biodiversity values) that cannot be transformed into income and so force land users to adopt inappropriate production practices.

Policy recommendations derived from social cost theory are generally directed at internalizing the externalities, and so eliminating them through direct interventions (Chisholm et al. 1974; Chisholm 1987). In land conservation policy, these might include land-use zoning (banning agriculture on fragile lands), regulation of specific activities and farming practices, resource taxation to reduce the use or harvest rate of renewable common pool resources, and subsidies to encourage farming practices beneficial to the environment or to reduce resource use (Pearce 1989, pp. 21-25; Steiner 1990).

Theory of Collective Goods

The theory of collective goods is closely related to the theory of social cost since externalities are a constituent part of collective goods. A pure collective good (national defense, clean air) has three properties: nonexcludability (nobody can be excluded from consumption so anybody can benefit), nonrivalry in consumption (one person's consumption does not impair that of another), and externalities (the possibility of free-riding because of nonexcludability). Many environmental goods have the properties of collective goods, particularly those of nonexcludability and externalities. However, most environmental problems arise when nonrivalry no longer applies. According to this theory, environmental problems emerge when users can exploit scarce environmental goods, such as grazing areas, without contributing to their maintenance or conservation. No one has an incentive to conserve the land because the benefits of conservation are dissipated among all users. The policy recommendations are similar to those derived from social cost theory.

Property Rights Approach

The property rights approach in environmental economics shares with the first two approaches the belief that externalities cause environmental degradation. However, property rights theorists argue that the main problem is not externalities but rather absent or poorly defined property rights to environmental goods. If land rights—say to grazing land—were clearly defined and fully and exclusively assigned, then land users would have an incentive to take care of their land resources and use them in a socially optimal way. The strategy, then, is to establish or clarify property rights (Furubotn and Pejovich 1972; Alchian and Demsetz 1973; and Cheung 1978; for a detailed discussion, see chapter 3).

The property rights approach, while it can be applied to many environmental goods (for example, the establishment of property rights to air through air pollution quotas), is an obvious choice for analyzing land degradation in developing countries. That land rights are frequently unclear, unspecified, disputed, or nonexistent is widely regarded as a problem for developing countries (Johnson 1972; World Commission 1987, p. 141; and Southgate 1988, pp. 5-8). Furthermore, property rights over land are a centuries-old institution, and thus this approach does not require the introduction of an "exotic" instrument such as pollution quotas.

It is important to define the terms "property rights," "land title," and "land titling" clearly. Property rights are the rights of individuals or groups to use resources. The concept is a broad one; it includes not only the legal concept of property rights, but also social norms (Eggertsson 1990, p. 33) and informal rights over land, a common case in traditional societies where the state has not attempted or has not been able to register and legalize customary rights.

Secure property rights are essential to the working of the economy. They help resource owners use their resources productively without incurring high costs for heading off encroachments. Clearly specified and enforceable property rights are a necessary

precondition for the emergence of markets. Only when producers can reap the fruits of their efforts and when consumers can securely possess and dispose of demanded goods does it become worthwhile for rational economic agents to engage in market activities (Randall 1980, pp. 153-62).

Three types of property rights are commonly distinguished (Barzel 1989, p. 2; Eggertsson 1990, p. 34): use rights (legitimate uses of assets); rights to obtain income from assets and to contract the terms of their use with other individuals; rights to alienate assets, to transfer rights over an asset permanently to other individuals.

Economists plead for nonattenuated property rights to ensure Pareto-efficiency. A set of nonattenuated property rights is:

> 1) Completely specified, so that it can serve as a perfect system of information about the rights that accompany ownership; . . .
>
> 2) Exclusive, so that all rewards and penalties resulting from an action accrue directly the [persons] empowered to take action; . . .
>
> 3) Transferable, so that rights may gravitate to their highest-value use;
>
> 4) Enforceable and completely enforced. An unenforced right is no right at all (Randall 1980, pp. 157-58).

Such rights need not be legal or officially recognized. Informal rights or social norms often fulfill the same purpose provided that they are secure and enforced—an important caveat since, in case of dispute, informal rights may be more difficult to enforce than formal rights. For the case of rights over land, this is where the issue of *land titles* comes in. Although some authors regard land titles as synonymous with land rights (formal or informal), this study explicitly distinguishes the two, reserving the term "land title" to designate a document or legal certificate. As Dale and McLaughlin (1988, p. 19) explain, "to prove who owns the rights to any particular area of land it is necessary to investigate the . . . entitlement. Title is the evidence of a person's rights to property" (see also Simpson 1976, p. xlviii). Stanfield (1985, p. 1) defines land title as "a document which certifies, within a particular legal system, that some individual or group of individuals has property rights over a certain piece of land." Thus, the central feature of a land title is that it makes *evident* and *certifies* land rights.

~~As with land title, there are different interpretations of *land titling*. It may be viewed~~ as the act of assigning rights (formal or informal) or of giving legal recognition to existing or newly created rights. This paper uses the term in the latter sense. Within that understanding of land titling, Dale and McLaughlin (1988) distinguish two main types or purposes —registration-oriented land titling, and registration accompanied by a redefinition of rights.

"Theoretically at least, . . . land registration should not change any rights in land but rather give them stability and provide a framework for land administration. . . . However, the verb 'to title' has been widely . . . used to embrace not only . . . registration . . . but also . . . land reform. So called 'land titling' programmes have been used to bring about major social changes . . ." (Dale and McLaughlin 1988, pp. 24-25; see also Williamson 1984; Lawrance 1984).

Registration-oriented land titling is appropriate in settings in which customary land rights are being transformed into formal rights, or in frontier situations where settlers are given title to land that is officially the property of the state. Registration-oriented land titling may include some "streamlining" of land rights, land consolidation, or settlement of land disputes. The registration plus redefinition of rights type of land titling—separating the two types may be difficult in practice—encompasses many different circumstances from land reform in a *minifundio-latifundio* context to the replacement of common property rights over land with individual ownership rights.

3. PROPERTY RIGHTS ANALYSIS OF LAND DEGRADATION

This chapter analyzes land degradation from a property rights economics point of view. It compares the implications for land degradation in a situation with clear, exclusive property rights over land with one with insecure or absent property rights.[1] The analysis is carried out in two steps, following the hierarchy of problems that accompany the stages of agricultural development and land use (Weitz 1971; Todaro 1982, p. 234f.; see also section 2.1). In the first step (section 3.1), land is assumed to be a pure renewable resource, with overuse resulting from increasing demand for resource flows (due to population growth, for example). This situation is characteristic of low-input agricultural systems in large parts of the developing world. Under subsistence farming or pastoralism, land has traditionally been treated as a pure renewable resource.

At higher stages of agricultural development, after a transition to commercial and more intensive farming or ranching, land becomes more and more a managed capital good. Property rights or tenure arrangements now assume importance because of their influence on incentives to invest and access to credit. Thus the second step of the analysis considers the relations between property rights and land as a capital good—the importance of clear property rights for the adoption of land conservation techniques, soil improving investments, and the like (section 3.2).

A final analytic issue considered here is the discount rate, which may work against land conservation. Are clear, exclusive property rights of any help against land degradation if the owners of the rights have a short-term planning horizon and can or do not care about the future?

3.1 LAND AS A PURE RENEWABLE RESOURCE

The essential feature of renewable resources is the regenerative function or the natural growth law (Fisher 1981, p. 79; Stroebele 1987, p. 126). The usual assumption about the form of the regenerative function is that growth is a function of the size of the resource stock (see figure 1). But the relationship is not monotonic. The increment (Y) of the resource depends on the size of the stock (X). As stock increases, the increment in the resource first

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1. Problems related to the establishment, enforcement, or exchange of property rights are not discussed in any detail in this chapter. Nor will the precise nature of clear property rights be discussed. Chapter 5 covers the different possible property rights arrangements that can provide tenure security.

rises and then falls. The classic example is a fishery. In a pool with a low concentration of fish, breeding conditions are excellent because of the abundance of nutrients. As the stock of fish increases, yield will increase too at first, because of the favorable conditions; at x_m the resource reaches its maximum sustainable yield (MSY). After that point, congestion and competition for food become noticeable. As nutrients become scarcer, the yield falls. The same analysis applies to agricultural land. In a previously uninhabited or scarcely populated area, low-input agricultural production can be increased by extending the area under cultivation. Exhausted plots can be regenerated by shifting cultivation. But with ever-increasing demand for agricultural products and for land for cultivation, point x_m can be passed, and the yield will begin to decrease. If the cultivated area is further extended and nutrients are not replaced, the point of land exhaustion will be reached (point x_c in figure 1).

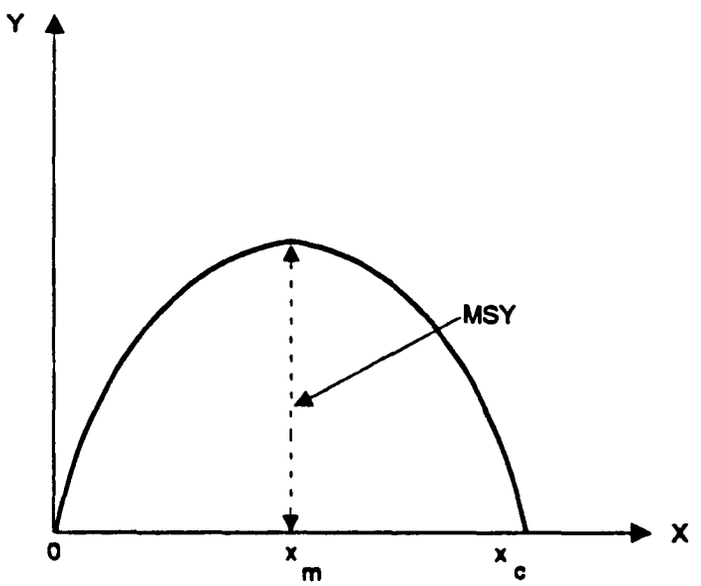


Figure 1: Regenerative function

Also important is the relation between the natural scarcity of the renewable resource and the level of demand and harvest costs—whether regenerative capacity exceeds or falls below actual demand (Stroebele 1987, pp. 130-39). Figure 2 depicts these two cases. The lower part of figure 2 depicts the regenerative function, with X being the resource stock and

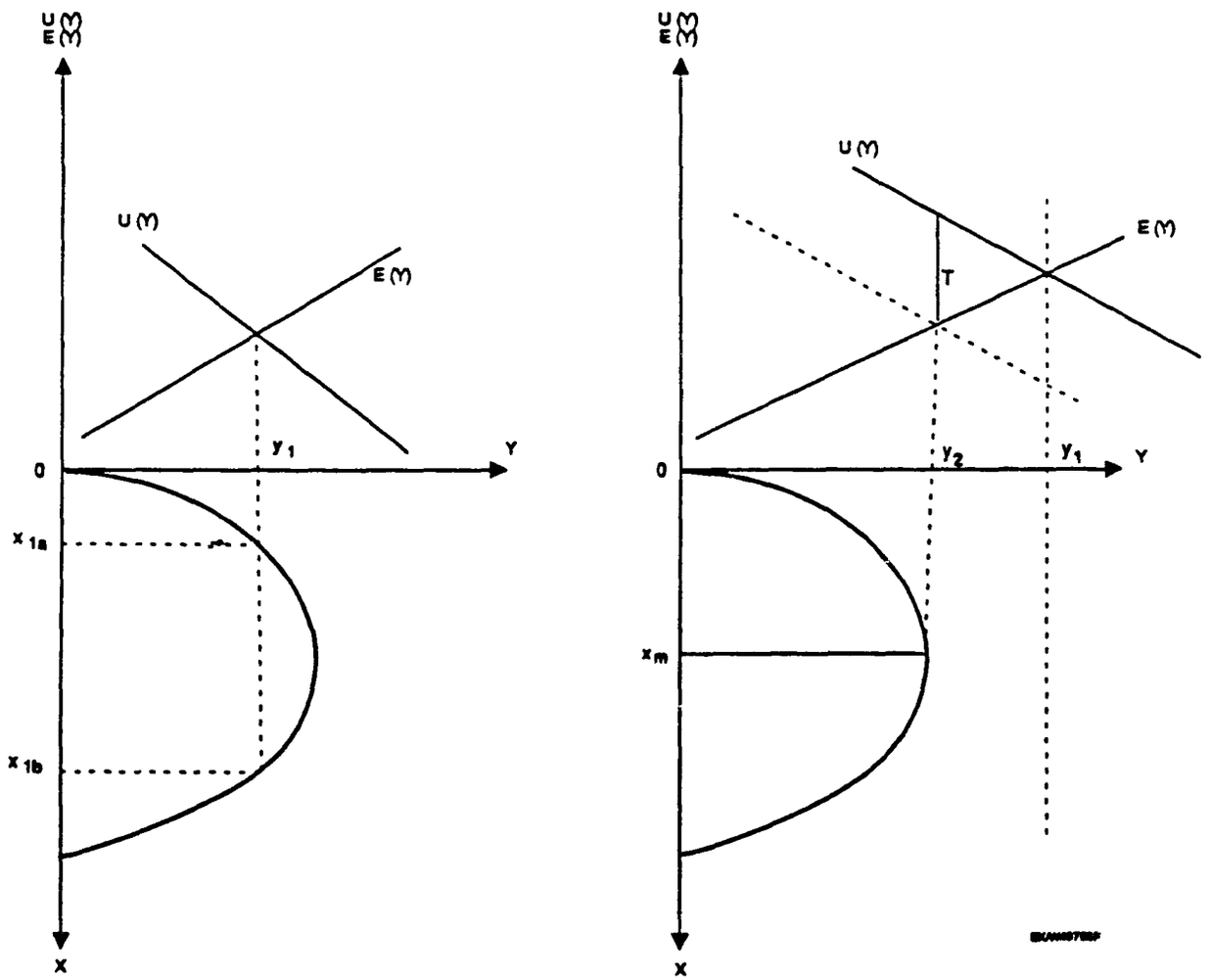


Figure 2: **Scarcity of a renewable resource**
(adapted from Stroebele 1987, p. 131)

Y the resource flow. In the upper part, U(Y) is the demand or utility function for resource flows, E(Y) is the effort function depicting the costs of harvesting. A proportional relationship is assumed, with constantly increasing costs depending on the amount of resource units harvested.

In figure 2a, the relation between the demand function and harvest cost function is such that the resulting demand is below the maximum sustainable yield of the resource. The resource is not scarce, since the harvest rate y_1 can be sustained infinitely. In figure 2b, actual demand y_1 exceeds the maximum sustainable yield. At this harvest rate, the resource is soon exhausted. The regenerative capacity sets the limit here. If regenerative capacity cannot be increased, effective demand has to be reduced to at least y_2 to conserve the renewable resource—one means might be to introduce a tax (T) on the consumption of resource units that reflects their natural scarcity value.

Many renewable resource problems in the developing world can be explained in terms of the analysis presented in figure 2b (see also figure 3). Shifting cultivation or nomadism is compatible with sustainable resource use as long as populations are small enough to avoid major degradation of the forest or grazing areas. A rise in population (a shift of the demand function to the right) or a drop in harvest costs (say because of improved infrastructure) pushes actual demand above the maximum sustainable yield (see figure 3).

Finally, we are ready to introduce *property rights* into the picture represented by figure 2. It must be stressed that, from an environmental perspective, property rights are relevant only in circumstances depicted by figure 2b. When farmers or pastoralists can enter freely into the use of a scarce renewable resource and no cooperative agreements can be reached (prisoners' dilemma), each will ignore the *user costs* (the present value of possible future profits forgone by using a resource unit today).

The use of nonrenewable resources always entails user costs since any unit consumed today is lost for future use. This is not necessarily so with renewable resources if they are used in a sustainable way (a harvest rate not higher than the maximum sustainable yield). But in the situation depicted in figure 2b, user costs arise because uncontrolled use of the renewable resource would lead to its exhaustion. Without clear and enforced property rights, everyone is afraid that neighbors will reap the fruits of one's own restraint in resource use, so user costs are ignored. By contrast, a resource user who has a secure, long-term property right over the resource will take into account any possible future utility from the resource. When user costs figure in the decision-making of a rational economic agent, a race to exploit the resource is avoided and conservation objectives are served. (Poverty and immediate ~~demands for cash may work against land conservation, however, even when property rights~~ are secure, as will be discussed in section 3.3).

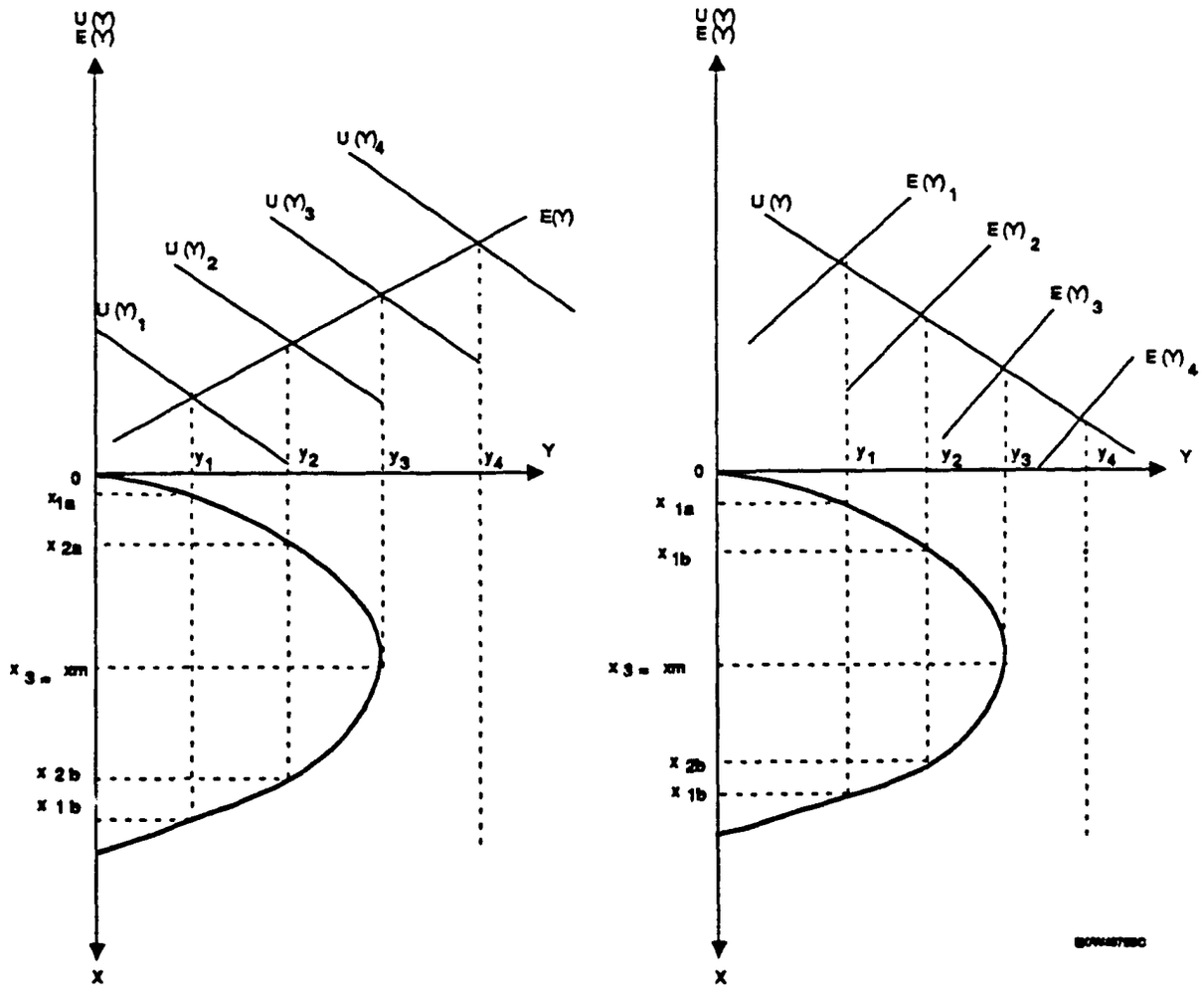
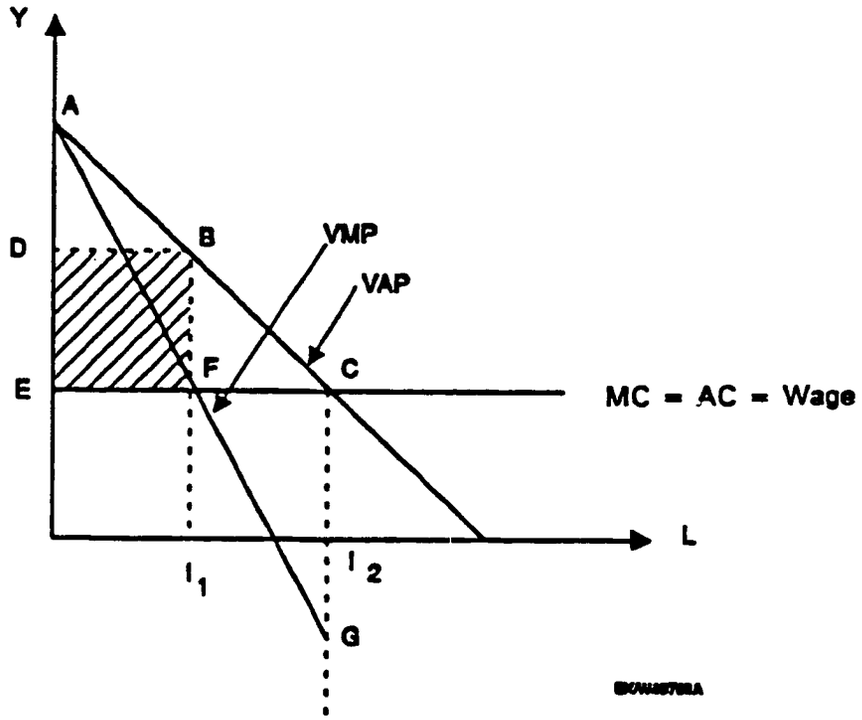


Figure 3: **Effects of increasing demand or decreasing harvest costs on renewable resource**
(adapted from Stroebele 1987, pp. 152 and 154)

An often-discussed process is that of *rent dissipation* under conditions of open access to a scarce resource, eliminating the net income from the resource through the interplay of competitive forces. It can be illustrated by a simple graphic model (Eggertsson 1990, p. 86; Anderson and Hill 1983, p. 440). Consider a fixed common pool resource (for example, a grazing area) that requires labor to harvest its resource flows (see figure 4). VAP is the value-of-average-product curve resulting from labor input; VMP consequently depicts the marginal product. The opportunity cost of applying labor to the natural resource is determined by the (exogenous) market wage in alternative activities.



Y	=	Output
L	=	Labor input
MC	=	Marginal costs
AC	=	Average costs
VMP	=	Value of marginal product
VAP	=	Value of average product

Figure 4: Rent dissipation in the common pool

The first user will equate the wage rate with the value of the marginal product and will therefore allocate l_1 units of labor to resource exploitation, capturing rent equivalent to the area DEFB. Because there are no exclusive rights to the resource, more users enter the grazing area, reducing marginal productivity. Since they do not themselves have to suffer the full reduction in marginal productivity—some of it will be externalized to other pastoralists—they will add labor up to the point where the value of the average product equals the wage rate (l_2), a point at which the value of the marginal product may even be negative. Without institutions to govern the use of resources, all rent will be dissipated through the increased harvesting effort (prisoners' dilemma). The inefficiency created by the overcommitment of effort to the fixed resource is shown by triangle CFG, the area where MC (marginal cost) lies above VMP. (Institutional solutions to the open access problem—from exclusive private property rights to common property regimes—are discussed in chapter 5.)

3.2 Land as a Capital Good

The situation becomes more complex when we consider land as a managed capital good requiring not only restraint in resource use but also maintenance and investments. While restraint in resource use, by sacrificing present for future consumption, may also be regarded as an investment, we focus here on "real" *investments for land conservation*, requiring inputs of labor and capital. Examples include bench terraces, contour bounds, windbreaks, drainage works, irrigation works, correction of slope of water courses, rehabilitation of water-logged soils, and agroforestry (Leblond and Guerin 1983; Blaikie 1985, p. 41; Hurni 1988b; Barbier 1990).

The effects of clear property rights on land conservation investments are generally viewed in terms of behavioral incentives and access to credit (Johnson 1972, pp. 261-68; Anderson and Thampapillai 1990, p. 15; Feder and Feeny 1991, pp. 139-43). *Behavioral incentives* are those that induce users to work and invest in land conservation (the twin of incentives to restrain overexploitation of resources, as examined in section 3.1 for land as a renewable resource). Economic agents who cannot be sure of receiving the benefits of their efforts (because of positive externalities; see section 2.3 for an explanation) do not have as strong an incentive to work and to invest as they would have in a situation in which all externalities were internalized. In addition, their planning horizon and the duration of their investments would be rather short term (Johnson 1972, p. 262).

Exclusive property rights give rise to several specific incentives for investing in land conservation, such as the ability to prevent reductions of future income streams (Collins and Headley 1983), to increase future income streams (Gruen 1959; Feder et al. 1988, p. 103), or to increase the value of land as a capital asset (King and Sinden 1988; Palmquist and Danielson 1989). For this last incentive to come into play, property rights must include transfer rights and rights to obtain income from the asset, since the value of the land can be realized only by renting or selling it.

Many land conservation measures require capital inputs, and that means they require *access to credit*. Many have argued that to get credit from formal credit markets, farmers must be able to use their land as collateral, which means they must have clear property rights and tenure security as well as an officially recognized land title (Feder et al. 1988, pp. 5-9). Of course, access to formal credit markets does not guarantee that the credit will be used for land conservation measures; it can also be used for environmentally damaging or inappropriate land "mining" technologies or in an environmentally neutral manner (see section 9.3).

3.3 The Problem of the Discount Rate

Land conservation is a long-term issue. As with any other investments or specific production technologies, the decision to adopt land conservation measures is determined by the stream of benefits and costs they generate, the time period over which these benefits and costs occur, and the discount rate applied to them.

Future benefits and costs are valued less than present ones by rational decision-makers, because the future is inherently somewhat insecure (Endres 1985, p. 129). The rate with which future costs and benefits are depreciated is the discount rate. Within the logic of economics, "optimal depletion" of natural resources may make sense (see, for example, Perrings 1989). Nonrenewable resources are by definition used up over time, so different discount rates simply have an effect on the duration of resource use. For renewable resources, however, what matters is the relation between discount rate and natural growth rate. If the discount rate is higher, it would be efficient to exhaust renewable resources (Stroebele 1987, p. 134). The conflict between economically optimal resource use and sustainability is obvious (Pezzey 1989, p. 48f; Markandya and Pearce 1991). From it arises the problem of intergenerational equity, if decisions about resource use and discounting are made from the perspective of the present generation.

Land titling may not ensure sustainable land use if individuals apply sufficiently high discount rates. Much has been written about the relationship between private and social discount rates, about why society as a whole might view the future differently than individuals, and why a discount rate lower than the interest rates in private markets should apply. As Norgaard (1991, p. 29) notes, this is so for at least two reasons. First, market interest rates include individual risk factors. What might be real risks to individuals, however, are frequently only transfers from the perspective of society. Second, transfers to future generations may have a public good quality since resources transferred to one's children may become available to the overall economy.

That social discount rates are lower than private ones does not necessarily mean that governments act accordingly, however. Public choice theory, which focuses on the analysis of political phenomena such as voting, electoral competition, and legislative behavior, suggests that governments do not always work in the public interest. Rather, they develop

and implement policies according to the influence of interest groups and their own selfish behavior (Mueller 1989; Eggertsson 1990, pp. 271-77).

Several authors have hypothesized that discount rates may be particularly high in developing countries. One often-mentioned reason is poverty (Durning 1989b, p. 25; Pezzey 1989, p. 53), which encourages a short-term planning horizon. If certain conservation measures incur net costs at the beginning and produce net benefits only after a long time period, poor people will not be able to adopt them. This is very important for land conservation investments. Another argument is that institutional uncertainty and instability in many developing countries may increase the normal discount rate by an additional risk component. If, for example, there is a risk of expropriation or expulsion from their farmland, farmers are unlikely to adopt a long planning horizon (Stroebele 1987, p. 60).

4. THE RATIONALE OF LAND TITLING FOR LAND CONSERVATION

This chapter presents the rationale and the basic objectives of land titling to promote land conservation, beginning with an examination of the meaning of tenure insecurity (section 4.1). It looks at the three basic objectives of land titling (section 4.2) and then explores the rationales for registration-oriented land titling and for redefinition-of-rights-oriented land titling (section 4.3).

4.1 THE MEANING OF TENURE INSECURITY

As laid out in chapter 1, this study focuses on tenure insecurity rather than on agrarian structure in examining the links between land tenure arrangements and land degradation, and it does so from the perspective of the property rights approach within environmental and resource economics. By also taking into account the capital good characteristics of agricultural land (see section 3.2), however, this study interprets tenure insecurity in a broader sense than this approach to land degradation might suggest. A narrow interpretation, deriving from the concept of land as a pure natural resource (see the concept of land in sections 2.1 and 3.1), would view tenure insecurity in terms of disputed property rights, the absence of property rights, or open access. And it would view land titling as an instrument for bringing land resources out of the public domain, for establishing or increasing security of tenure for those operating the land.

Thus, preventing open access problems is just one function of property rights. The other two are to create behavioral incentives to work the land and to invest in it and to provide or improve access to credit. Therefore, we distinguish three tenure insecurity issues, to which we will often refer in the remainder of this study: insecurity of tenure in the literal sense; lack of access to credit; lack of behavioral incentives to work and to invest.

Different combinations of these three tenure insecurity issues result in different tenure insecurity problems. Problems with access to credit and behavioral incentives may be encountered even where simple land tenure is secure. For example, property rights may not be transferable, depriving owners of the incentive to increase or maintain the value of the assets over which they have rights. Or owners may lack legal titles, which are a precondition for access to institutional credit. (The complexity of tenure insecurity problems is addressed explicitly in chapter 5, and the implications in terms of land titling in chapters 6 to 8.)

4.2 THREE BASIC OBJECTIVES

Land titling—assigning legal status to land rights (see section 2.3)—is thought to reduce all three forms of tenure insecurity and so to increase land conservation efforts (see, for example, Atwood 1990; Feder and Feeny 1991; Lemel 1988; IUCN, UNEP, and WWF 1990, p. 91; and ECLAC 1991, p. 33). Thus, the objectives for land titling are to: increase tenure security; increase supply and demand for credit; foster land markets.

INCREASED SECURITY OF TENURE

Advocates of land titling argue that titled land rights are more secure than unregistered ones in case of conflicts because the state guarantees the right of ownership of registered land and the rule of law. As defined by Feder et al. (1988, p. 28), "security of ownership is . . . the possession of legal rights of ownership, certified by an appropriate state-issued document." The importance of clear, undisputed *property rights* and *tenure security* to land conservation was discussed in chapter 3. What the promoters of land titling claim, however, is that there is a link between tenure security and legal title that makes *land titles* a prerequisite for land conservation.

This hypothesis needs to be qualified. For one thing, an absence of legal title does not necessarily mean that tenure is insecure: title ownership is not synonymous with ownership security (Roth et al. 1989, p. 211; Atwood 1990, pp. 661-62). Tenure security is a function of the landholder's perception of the probability of losing land or a specific right in land within some future time period. As Roth et al. (1989, p. 211) point out, "high levels of tenure security can exist without legal possession of title. For example, customary land allocation in parts of Africa provides individuals with tenure security to such rights as grazing and cultivation, without any legal title definition, registration or government enforcement . . . . It cannot automatically be assumed that . . . customary tenure systems are inherently weak."

Nor does legal title necessarily provide tenure security. If property rights are ambiguously defined (say because of weak land administration infrastructure) or inadequately enforced by the government, landholders may not perceive their tenure to be more secure because they have a legal title. Land titling may even increase tenure insecurity if, whether deliberately or not, land rights are *redefined* through a land titling program and the state lacks the authority or the means to enforce the newly established rights. All of these problems are addressed more thoroughly in the following chapters.

INCREASED SUPPLY AND DEMAND FOR CREDIT

Where land has to be managed as a capital good requiring maintenance and investments, credit for investments in land conservation (and farm productivity in general) is crucial for preventing land degradation. Possession of a legal title is required for access to formal credit.

Clear, legal title is needed to mortgage land and to borrow money from lenders who do not have personal or detailed information about the borrower. Collateral is less important in informal credit markets, where the decision to lend is based on personal familiarity with the borrower and social pressures can be applied to ensure repayment. That means that farmers without secure ownership are less disadvantaged in the informal credit market than in the formal. However, as Feder et al. (1989, p. 6) point out, "informal credit is typically much more expensive than formal credit . . . and is confined for the most part to relatively small short-term loans" (see also Aleem 1990; and Aryeetey 1991, pp. 7-8).

Legal titles are thought to increase the farmers' demand for credit as well as the supply of credit (Roth and Barrows 1988, pp. 6-8) by strengthening tenure security. Tenure security increases landholders' expectations of receiving the full benefits of an investment over time, thus increasing their incentives to invest and their demand for credit.

As discussed later in this study, however, the reality in many developing countries is that legal title does not by itself guarantee access to formal credit. Credit market distortions and restrictions may prevent land titling from having this desired effect.

Fostering of Land Markets

One incentive for land conservation provided by clear property rights is the possibility for landholders to profit from increasing land values. But if land markets are severely restricted, the value of land as an asset may be adversely affected (Johnson 1972, p. 266). First, the greater and the more effective the restrictions, the lower the value of land will be—other things being equal—because of limited effective demand. In the extreme, land whose productiveness had been maintained would not be worth more as a capital asset than degraded land. If land were a tradable asset, there would be an incentive for land conservation, because land could be sold or rented, allowing the previous landholder to realize the value of the land. Secure tenure alone, then, without the right to sell or rent the land, may not provide sufficient incentives for land conservation. Second, the greater and the more effective the restrictions on the sale of land, the less the land is worth as collateral, since in case of loan default, the lender could not easily sell the land and recover the loss. Thus, where land markets are restricted, credit is likely to be more expensive and investment in farm productivity and land conservation to be lower.

It is widely accepted that legal land titles are a prerequisite for a well-functioning land market because they reduce information costs and uncertainty about land rights and thus facilitate land transactions (see, for example, Stringer 1989, pp. 18-24; Feder and Feeny 1991, p. 140). Without legal titles, the argument goes, potential buyers cannot be certain they are buying land from the real owners or they incur high costs to get full and unambiguous information.

Again, however, we have to be careful about claiming that legal titles are necessary for land markets to function well. Working informal land markets exist in many developing

countries (Atwood 1990, pp. 662-64), and while they may be confined to a particular ethnic group or area and are not always open to outsiders, they nevertheless provide the land value incentive for land conservation. And, as was pointed out in the case of tenure security and access to credit, in many developing countries legal titles often do not in practice fulfill the purpose theory suggests they should because of administrative or other institutional weaknesses.

4.3 REGISTRATION OF RIGHTS VERSUS REDEFINITION OF RIGHTS

As explained in section 2.3, the term "land titling" is used in this study to mean the registration or certification of land rights. Its objective is to increase the security of these land rights and to improve access to credit and foster land markets. Yet simple registration of existing informal land rights is the exception rather than the rule. Many land titling initiatives attempt to redefine rights as well.

What are the environmental justifications for government intervention in land rights? (The political motivations are not addressed here.) Broadly speaking, they are based on two different interpretations of the rationality of property rights over natural resources. The *adaptive evolution* interpretation views the evolution of property rights as a response to socioeconomic conditions and ecological factors (see, for example, Demsetz 1967; Cheung 1968; Rhoades and Thompson 1975; Netting 1976; and Libecap 1978; see also the discussion of the pros and cons of traditional common property regimes in section 7.1). Netting (1976, p. 137) presents a typical argument for this position: "My contention is that in the absence of decisive legal or military controls from the larger society, the system of property rights in the peasant community will be directly related to the manner in which resources are exploited, the competition for their use, and the nature of the product produced."

Proponents of this approach argue that with increasing resource scarcity, property rights change endogenously toward greater specification because people have an incentive to internalize the increasing value of the resource, and institutions evolve to maintain the resource services. The structure of property rights is seen as endogenous to relative factor prices: as prices change, property rights will be adjusted through a rational response to new economic conditions. This approach to some extent challenges the property rights analysis of land degradation presented in chapter 3, which argues that in the absence of well-defined rights, land resources will inevitably degrade under conditions of scarcity and competition. In contrast, the adaptive evolution hypothesis argues that, as the implicit value of the resource increases, property rights institutions will evolve to permit a more efficient use of the resource.

According to this reasoning, the state should intervene minimally in land rights. Its role is to register and legalize rights, to enforce these rights, and to provide a legal framework to facilitate the exchange of property rights and the settlement of disputes. Direct state intervention in property rights is conceded only where specific factors such as high

transaction costs hinder the decentralized allocation of property rights when large numbers of people are involved, or when high exclusion costs discourage people from establishing exclusive property rights (Eggertsson 1990, pp. 113-14 and 264).

The contrasting approach might be called *structuralist*. Structuralists (for example, Durning 1989b; Herring 1983; see also Atkins 1988, p. 941; Van Arkadie 1990, pp. 159-61) argue in terms of institutional blockages, of power and market imperfections that severely impede local adaptive strategies. An example is the Latin American agrarian structure, characterized by a small number of large holdings and a large proportion of (frequently untitled) smallholdings. The related land degradation is often explained on the grounds of this skewed landownership. Stringer (1989, p. 9) argues that this "highly concentrated land ownership pattern . . . results in land-price distortions, inhibits the formation of new and more efficient farms, and causes the inefficient use of capital and labor resources"—and, we would add, of land resources (see also Atkins 1988, p. 941).

Traditional rural institutions are sometimes viewed as archaic and not flexible enough to adapt to recent pressures, such as population growth, commercialization of agriculture, and the breaking up of village economies. Indeed, the influence of powerful interest groups and state regulatory interventions in agriculture, forestry, and land-use policies have in many places weakened or prevented adaptive strategies (Lawry 1990, pp. 407-10). Therefore, structuralists argue, present land rights arrangements may not be rational and well-adapted for sustainable land use, and a redefinition of land rights oriented toward better land management may be justified.

Attempts to redefine rights must, however, take into account the problem of the transaction costs that arise from the change from one property rights arrangement to another (Barzel 1989, p. 14; Eggertsson 1990, p. 14). These transaction costs may be very high, since changes in land rights in developing countries, where economies are largely agrarian, are an immensely political matter. If those whose rights are diminished or eliminated are a powerful group, fierce political opposition may arise. In addition, tremendous transaction costs may arise from the forced dissolution of traditional regimes of common property rights over land if this causes the disruption of rural societies and resource management systems. Therefore, attempts to redefine land rights must be well justified and carefully designed to ensure effective implementation and establishment of the new rights.

5. Different Problem Situations: Initial Property Rights Settings and Related Tenure Insecurity Issues

Up to this point, the analysis of property rights and land degradation has been limited to a simple comparison of the case of clear, exclusive, and enforced property rights with that of insecure or nonexistent property rights. But tenure insecurity problems can be far more complex in practice, as this chapter will show. To keep the complexity to a manageable level, however, the chapter identifies a number of *typical problem situations* from a property rights perspective. The chapter establishes a framework for classifying these problem situations (section 5.1) and then examines three broad categories (sections 5.2 to 5.4).

5.1 A Framework of Problem Situations and Avenues for Land Titling

Attempts to distinguish and identify typical tenure insecurity problem situations come up against the complexities of the real world—climatic conditions, economic policies, agricultural systems, and so on. Typologies based on farming or agricultural systems appear promising, but they are based mainly on technical and agronomical features and do not explicitly consider property rights or land tenure as an important variable (Duckham and Masefield 1969; Andreae 1977a, and 1977b, pp. 105-8; Ruthenberg 1980, pp. 14-18; Webster and Wilson 1980, p. 176ff.).

The approach chosen here links up with the recent literature in environmental and resource economics on different property rights regimes. It distinguishes private, common, state, and nonproperty (see figure 5). Environmental economists in the neoclassical tradition, while implicitly accepting the ideological and historical background of neoclassical theory, frequently posit private property rights or individual freehold land rights as an ideal (Quiggin 1988b, pp. 1071-73). They tend to categorize property as either private or common property with uncontrolled open access. In reality, however, there are many types of property rights arrangements, including combinations of group, state, and private property rights (Anderson and Hill 1983, p. 438; Bromley 1989b, p. 872; Magrath 1989a, pp. 1-2; Ostrom 1990, p. 12; and Salazar and Lee 1990). The land tenure insecurity problems differ substantially in settings of private property rights over land (for example, a Latin American agrarian structure), common property (for example, a traditional African land management system), state property (for example, state farms in a socialist country), or nonproperty (for example, frontier areas, squatter situations in tropical forest areas).

Extending this classification for problem situations to possible avenues for land titling results in the matrix depicted in figure 6. The problem situations and avenues for land titling form a matrix, with the nature of the original property interests and that of the newly titled rights as the two dimensions. For land resources with unclear or nonexisting rights,

individual, freehold land titles are not the only solution. Common property or state property regimes may also be viable responses to certain circumstances. Finally, the category "nonproperty" is not listed among the previous interests in figure 6 because, while outright nonproperty may be an essential problem for natural resources when biodiversity or rare species are at issue, agricultural land will always be under one regime or another, whether formal or informal, private, common or state rights. This does not exclude the possibility that de facto nonproperty may exist for agricultural land—in many instances, state property means de facto nonproperty (see section 5.4).

State property	Individuals have *duty* to observe use/ access rules determined by controlling/ managing agency. Agencies have *right* to determine use/ access rules.
Private property	Individuals have *right* to undertake socially acceptable uses, and have *duty* to refrain from socially unacceptable uses. Others (called "non-owners") have *duty* to refrain from preventing socially acceptable uses, and have a *right* to expect only socially acceptable uses will occur.
Common property	The management group (the "owners") has *right* to exclude nonmembers, and non-members have *duty* to abide by exclusion. Individual members of the management group (the "co-owners") have both *rights* and *duties* with respect to use rates and maintenance of the thing owned.
Nonproperty	No defined group of users or "owners" and so the benefit stream is available to anyone. Individuals have both *privilege* and *no right* with respect to use rates and maintenance of the asset. The asset is an "open-access resource."

Figure 5: **Four types of property rights regimes** (Bromley 1989b, p. 872)

		Nature of newly titled rights		
		Private	Common	State
Nature of previous interests	Private	Private farm titling - registration of rights - redefinition of rights 1	Agrarian reform (cooperative type) 2	State farm agrarian reform 3
	Common	- Individual titling in traditional common property regime - Privatization of cooperative 4	- Group titling in traditional common property regime - Retaining, reforming cooperative 5	Nationalization of traditional common property regime 6
	State	- Colonization project - Privatization of state farm 7	Colonization project (group titling) 8	Retaining, reforming state property 9

Figure 6: Types of land titling projects, grouped according to the nature of previous interests and the nature the newly titled rights (adapted from Stanfield 1985, 3)

The property rights regime classification of tenure insecurity problem situations and avenues for land titling was selected for two reasons. First, because the structure of land rights is crucial for the characterization of agrarian societies and their problems (Handelman 1981; Thiesenhusen 1989), and second, because this study focuses on property rights. Nevertheless, the classification presented in figure 6 serves mainly as an organizing structure for the discussion of land tenure and land titling problems; it should not be assigned too much meaning beyond that.

5.2 An Initial Setting of Private Property

Initial Settings

There are a number of very different agrarian structures, all of which rely on the basic institution of private landownership (Todaro 1982, pp. 224-32), and each of which may give rise to a different set of issues and problems. Even within the prototype of the family farm with full individual (or family) landownership, there may be very different agrarian structures—for example, an egalitarian structure with medium-sized farms, inegalitarian structures with skewed landownership, or an egalitarian structure of individual smallholders. But individual landownership does not necessarily imply owner-operated farms. Land can also be rented out, thereby causing tenancy-related problems.

The *egalitarian structure* with a large proportion of *medium sized farms* is not a frequent pattern in today's developing world. It can be found in certain European settler areas (for example, southern Brazil) or in countries that pushed through an agrarian reform with a family farm objective (Taiwan, South Korea). *Inegalitarian structures* include those with unequal distribution of both landownership and operational unit size (typically called a "Latin American" agrarian structure) and those with unequal distribution of landownership but a more even size distribution because of widespread land rental (generally known as an "Asian" agrarian structure; Johnston and Tomich 1985, p. 9). An *egalitarian structure of smallholdings* typically characterizes squatter or frontier situations in many different regions and usually is found on land that legally belongs to the state but is de facto nonproperty (Leonard 1987, p. 123ff.; Binswanger 1989, p. 5).

Tenure Insecurity Problems

Tenure insecurity problems may be as diverse as the different agrarian structures based on private landownership. There is little in the land tenure literature on tenure insecurity in ~~an *egalitarian structure of medium-sized farms* since legal titles are the rule and social~~ relations are relatively stable.

For *inegalitarian structures*, tenure insecurity problems are related to the two main types, the "Latin American" and the "Asian." In a *"Latin American"* agrarian structure, smallholders are likely to suffer from all the tenure insecurity issues discussed in chapter 4

because of their weak political and economic position (see, for example, Development Associates 1982; USAID 1987 and 1988; Stringer 1989). Often, smallholders lack legal titles because the procedures for obtaining them are so expensive and time-consuming. Moquete et al. (1986, pp. 85-107) calculated the costs for obtaining legal title to land in Panama, including bus trips to the Ministry of Agrarian Reform (to request land inspections, arrange land surveys, and other administrative details), lost income for the days spent at the ministry, survey and materials costs, fees for registration and publication, and a tax based on the value of the land. (Bribes were not included in these calculations.) They found that smaller farmers incurred higher relative costs than larger farmers: about US$330.00 (US$33.00 per hectare) for a farmer with 10 hectares of land and US$1,100.00 (US$22.00 per hectare) for a farmer with 50 hectares. Moquete et al. note that since most smallholders could not afford these costs, only about a quarter of all farms have legal titles. What possession of a legal title adds to tenure security in this type of structure is unclear. One could easily hypothesize that in a very unequal society, the state and the legal system will not effectively protect even the legal rights of rural smallholders (see section 6.1 and chapter 9).

A key tenure insecurity issue that arises for the *"Asian"* agrarian structure concerns the widespread belief that tenancy is inferior to full ownership for land conservation, a belief well rooted in economic theory (Bills 1985, p. 2). According to theory, farmland is used to maximize the present value of annual net returns from agricultural production and the value of the land asset at the end of the planning period. One could, therefore, hypothesize that renters are interested in land conservation only to the extent that the annual income stream is affected and that they ignore changes in capital value because these accrue to the landlord. Renters would be expected to ignore land degradation phenomena that do not affect the income stream. The tenure insecurity arising from the short term of a lease can serve as an obstacle to long-term conservation since renters may not be willing to invest in land conservation if the benefits accrue to another party.

Tenancy need not lead to land degradation, however, and much depends on the nature of the renter's contract. Contracts are central to property rights theory, because they reallocate rights among contracting parties. Since contractors are free to stipulate whatever they wish, land conservation measures may be included in the contract; what is important is that the responsibilities be clear and undisputed. With such contractually delineated responsibilities also comes the problem of enforcement and control, or the agency cost of monitoring compliance. "An agency relationship is established when a principal delegates some rights—for example, user rights over a resource—to an agent who is bound by a (formal or informal) contract . . . in return for payment of some kind" (Eggertsson 1990, pp. 40-41). A contract that provides tenants with economic incentives for land conservation, such as long-term secure tenure (see Bell 1990a, pp. 148-50; Singh 1988a) or compensation for soil conservation efforts (Blaikie 1985, p. 68), would clearly be advantageous.

Under an *egalitarian structure of smallholdings*, farmers usually do not possess legal titles to their land except under state-sponsored settlement programs. Lack of title certainly means lack of access to institutional credit and exclusion from the formal land market, but

whether it also means insecurity of tenure in the narrow sense very much depends on the situation. In some cases, as in a land titling project in a squatter area in Thailand (Feder et al. 1988) which will be discussed in section 6.1, tenure conditions are fairly secure and legal titles serve mainly to provide access to credit. In other situations, squatters suffer from insecure tenure (World Bank 1989b, p. 24).

5.3 An Initial Setting of Common Property

Initial Settings

The literature on property rights arrangements other than private property has expanded in recent years, especially that dealing with common property regimes (for example, Ciriacy-Wantrup and Bishop 1975; Runge 1984; Wade 1987a and 1987b; Quiggin 1988b; Bromley 1989b; Bromley and Cernea 1989; Larson and Bromley 1990; Lawry 1990; and Ostrom 1990). Often, however, the environmental economics literature treats communal or common property and nonproperty or open-access as synonymous. Hardin (1968) used the term "tragedy of the commons" to describe the case where economic agents are trapped in a prisoners' dilemma and scarce resources are inevitably degraded. This terminology has led to confusion between common property regimes, consisting of a well-defined group of authorized resource users with the right to exclude nongroup members, and open-access regimes, where the tragedy of the commons is really found.

Noronha (1985, p. 177) distinguishes three degrees of common tenure: a system of common ownership, exploitation, and management (the most comprehensive type); one in which group members have individual rights to use the same land (the "commons"); and one in which the group exercises control over individual use of land. With a similar distinction in mind, Ostrom (1990, pp. 30-31) states that common property does not necessarily imply that resource units have to be used jointly. If one distinguishes between the resource system and resource units produced by the system, it might well be that the whole resource system is held in common with rules concerning the use of the resource, while the members of the group may have individual use rights. These distinctions are important because they determine the nature of the problems faced by common property regimes.

There are two important types of common property regimes in developing countries today: traditional or indigenous common property regimes, and the cooperative common property regimes in the socialist tradition. Traditional or indigenous common property regimes, which are often informal property rights arrangements, are predominant throughout ~~sub-Saharan Africa and are also found among tribal or indigenous populations in Latin~~ America and Asia. Typically, they involve common ownership of the resource system, but provide the members with individual use rights (Atwood 1990). Common property regimes of the cooperative type were introduced in a number of developing countries after independence or in the aftermath of social revolutions. The ejido-system in Mexico (Wessmann 1984), the *ujamaa*-system in Tanzania (Hyden 1980), or the *Sociedades Agrícolas*

de Interés Social in Peru (Heimpel 1983, p. 273) are examples. Such common property regimes were often designed in the most comprehensive way, with common ownership, exploitation, and management.

Tenure Insecurity Problems

For tenure insecurity issues that arise within common property regimes, it is useful to distinguish between a minimum definition of common property, and common property arrangements required to regulate and manage resource use intensively (Lawry 1990, p. 406). A *minimum definition* of common property requires only that the rules define who has rights to use the land resources and who is to be excluded. Many problems of traditional common property regimes arise when the external access controls no longer work effectively. This is probably the most important land tenure problem of indigenous people. For example, in the tropical forest areas, traditional access controls no longer work because of population growth in surrounding areas and improvements in access (roads and other communication infrastructures), leading to open-access land degradation problems.

Rules and mechanisms of *internal governance* are necessary where local resource demand exceeds sustainable supply. If the group cannot regulate its members under conditions of scarcity and competition, this will also result in open-access problems. Ostrom (1990, p. 180) evaluated several actual common property regimes and derived the following catalogue of rules and mechanisms for the internal governance of common property regimes: clear boundaries and membership of groups; clear definitions of rights and duties of members; clear rules of resource use; monitoring mechanisms; sanctions in case of misbehavior; conflict resolution mechanisms.

Another problem of internal governance or organization of common property regimes, in addition to the need for rules and mechanisms for avoiding overuse, is providing incentives to work and to invest. If individual members cannot claim the return on their efforts and investments in land improvements and land conservation, common property regimes are not able to intensify land use or invest in land conservation measures that may be necessary under pressures such as population growth. Restrictions on the trade or inheritance of land rights may constitute another disincentive. If individuals do not have individual use rights or cannot trade in these rights, then potential increases in the value of the land do not serve as incentives to farmers.

Access to credit may also become a problem under common property regimes, as the experience of the ejidos[2] in Mexico illustrates: "A recurring problem involves the ejidos ~~which borrow from the public banking system. Income shortfalls and failure to repay result~~ in overdue accounts, which are at times difficult to collect; this creates a vicious circle . . .

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2. Ejidos are cooperatives with communal landownership and individual, inheritable use rights. After the Mexican revolution of 1917, ejidos replaced many big landholdings, totaling up to 50 percent of the agricultural area.

since it makes it difficult to obtain a new loan, even when the borrowers represent only some members" of the ejido (World Bank 1985b, p. 34). The problem could be avoided if the ejidatarios, who have individual use rights (Wessmann 1984, p. 244), could also borrow individually.

How do these tenure insecurity issues affect the two common property regimes described above? *Indigenous tenure* systems are often thought to assign land rights to the community and thus to discourage land improvements and land conservation. It is argued that individual farmers, without secure private rights to the land, may not be able to claim the full returns on their investment in land improvement or land conservation. What is often ignored, however, is that farmers typically have secure use and inheritance rights, even though land transfers may be restricted to the ethnic group or the extended family (Noronha 1985, p. 136ff.; Migot-Adholla et al. 1991, pp. 156-57). And many of these systems have been flexible enough to adapt their rules and mechanisms of internal governance to changing socioeconomic conditions. Some even seem to work under conditions of considerable resource scarcity (Binswanger and Pingali 1984). But recent pressures, such as population growth, increasing commercialization of agriculture, and changes in traditional norms and values, have sometimes undermined the working of the traditional rules and mechanisms of internal governance or have made them obsolete, requiring new or adapted rules (see section 7.1).

In *cooperative* systems, it was the original design that was often defective. Where it was influenced by collectivist ideas, cooperative members were not granted individual use rights, or income was distributed in an egalitarian manner, so the incentives to actively engage and participate in the common property regime were missing.

A good example is the *ujamaa* system in Tanzania (Hyden 1980, pp. 96-128). The *ujamaa* (literally, familyhood) system which was introduced in Tanzania in the 1960s created communal village production units. According to Hyden (ibid., p. 98), there were three basic principles underlying "*ujamaa* living: (a) respect . . . [for] the rights of the other members; (b) common property—acceptance that whatever one person has in the way of basic necessities, they all have; and (c) obligation to work—every member . . . taking for granted the duty to join whatever work needs to be done." It is important to notice the differences from the previous, traditional way of land use. *Ujamaa* "struck a familiar chord in rural Tanzania but it is important to remember that it was a principle traditionally practised only within each household. The notions of rights and obligations only included the extended family . . . . It did not address itself to the mutual responsibilities and rights of individual households in a given local community" (ibid., p. 99). *Ujamaa* meant an extension of the principles guiding life and work to the whole village community—a form of collectivization. (The Chinese people's commune was a major inspiration.) As might be expected, the system was not very appealing to farmers, and its performance in terms of agricultural production and investments was poor (ibid., pp. 117-23). While this experience does not mean that agricultural cooperatives by definition must fail, it does mean that the design must provide incentives to farmers and appropriate mechanisms for internal governance (see section 7.2).

5.4 An Initial Setting of State Property

Initial Settings

Just as common property does not necessarily imply that resource units are used jointly, but only that the resource system is held in common, so too state ownership of land does not necessarily mean that the state is directly involved in operating the land. In most countries, residual or traditionally uninhabited lands are state owned. Settlement schemes often involve state-owned land. In many developing countries, states also claim ownership of common property resources including fisheries, forests, and grazing lands (Lawry 1989, p. 2). And in some socialist countries, the state exercises control over most, if not all, agricultural land.

Tenure Insecurity Problems

The tenure insecurity problems of state-owned property can be quite diverse. In many instances, state ownership means de facto nonproperty because the limited financial and managerial capacities of governments in many developing countries do not allow the state to exercise effective control over much of the land it owns. For residual or traditionally uninhabited areas, this will mean that the tenure insecurity problems and land degradation processes will be similar to those described for environments with informal individual interests in land (section 5.2) or informal common property regimes (section 5.3; see also Riddell 1986, p. x).

Somewhat trickier is the situation in which the state actually exerts control over land use. One case is that in which some or all land is the property of the state, but use rights are given to individuals or groups. The most important example of this property rights arrangement today is found in China, under the rural reforms that began in 1978 (Fureng 1988, p. 10). To overhaul the people's communes, the "household joint-production-package responsibility system" was introduced. According to Fureng, the responsibility system differed fundamentally from the people's communes in three ways:

- Farms could own their own means of production—except for land and machines—and even invest on the land for which they contracted. Thus a mixed ownership system was formed.

- Income was no longer distributed teamwide on an egalitarian basis, introducing an incentive for farmers to produce more.

- Farmers were allowed to make their own decisions on plowing, planting, and harvesting as long as they fulfilled the state-assigned quotas.

As with tenancy arrangements (see section 5.2), such a system is not necessarily bad for land conservation, but depends on specific contractual stipulations concerning land

conservation measures and responsibilities, monitoring and control mechanisms, and incentives for land conservation. Tenure security problems depend on whether use rights are transferable and inheritable, whether they are acceptable as collateral for credit, and whether the contract is sufficiently long-term and secure. Thus, a property rights arrangement with state ownership and exclusive use rights for individuals or groups may be similar to one of full private or common property rights. However, serious tenure insecurity problems may arise if the state acts arbitrarily, frequently changes use rights, or inappropriately regulates land use (see chapter 8).

A final configuration of state property is the state-operated farm. The abandonment of this property rights arrangement in most—mainly socialist—countries today points to its significant drawbacks. Direct state management has rarely worked well because state agencies lack timely information on resource condition and use practices (Lawry 1989, p. 419) and because political considerations usually prevail over economic principles, leading to widespread failures of state-operated farms (Eggertsson 1990, pp. 125-92).

6. LAND TITLING IN AN ENVIRONMENT OF PRIVATE PROPERTY RIGHTS OVER LAND

This chapter, which follows the horizontal structure of figure 6 in section 5.1 (see p. 29, boxes 1 to 3), looks first (and foremost) at the titling of individual land rights in an environment of individual interests in land (section 6.1). In an initial setting of individual landownership, the titling of private land rights, which is widely regarded as the only solution to tenure insecurity problems (see section 5.1), is unlikely to be contested and will therefore predominate. Less frequent in this setting of private interests in land are efforts to assign common or state title to property, so these are explored more briefly (sections 6.2 and 6.3).

6.1 FROM PRIVATE INTERESTS TO PRIVATE PROPERTY

This section examines the possibilities and limitations of registration-oriented land titling (land titling that does not attempt to change the agrarian structure but simply to increase the security of individual land rights) and redefinition-of-rights-oriented titling of freehold interests. It also addresses land titling related to tenancy.

REGISTRATION-ORIENTED TITLING OF INDIVIDUAL FREEHOLD INTERESTS

Few problems or complications would be expected with the simple registration of freehold interests in an environment of individual rights over land since land rights are not being redefined. Feder et al. (1988), in a now famous and often-cited study of individual smallholders in Thailand, found a significant positive correlation between land titles and investment and farm productivity (not land conservation, admittedly). They studied two groups of farmers that differed only in that one group possessed legal titles to their land and the other did not. The farmers in one group were squatters who operated farms in state-owned forest reserve areas. Those in the other group operated outside the boundaries of the forest reserve on land to which they had legal title. The two groups operated in geographical proximity, and since the pattern of agricultural expansion in Thailand has always been through a process of forest clearing, there were no sociocultural or ethnic differences between the two.

Not only was there no systematic difference in the ability, management skills, or other underlying characteristics of the two groups, there was not even significant tenure insecurity (in the narrow sense) for the squatters. Indeed, the main function of the titles was not to increase security, but to provide access to credit (Feder et al. 1988, pp. 31-37):

> The small probability of eviction, the fact that land tax is being collected on squatters' land, and the availability of public services are all factors which enhance the squatters' perception of ownership security. Indeed, when squatters were asked what they perceived as the most important advantage of possessing a secure landownership document . . . , the majority stated favorable access to institutional credit . . . . Only a few suggested protection from eviction or land disputes as important aspects of legal ownership. Land disputes, in fact, have not been frequent in the past.

While registration-oriented land titling in a setting where individual rights already exist is unproblematic in principle, it is questionable whether the positive results of the Thailand case study are very relevant for other settings with individual landownership. Where tenure is insecure, the crucial factor is the ability and willingness of the government to provide legal titles that also provide the hoped-for security. If legal titles do not provide security, their usefulness for increasing access to credit and facilitating land markets may be reduced or even eliminated. In many developing countries, the government is unable to provide the necessary conducive environment because of financial and managerial constraints affecting the legal system and land administration (see chapter 9 for more detail). Also, other necessary supportive services, particularly credit, may not be readily available. And in this area as well, the state has an important role as regulator of credit markets (or even as a direct supplier of credit).

The state may also be unwilling to provide these necessary underpinnings for successful land titling, especially where the structure of land distribution is strongly inegalitarian. As Johnston and Tomich (1985, p. 26) point out, "To a considerable extent, the tendency to extol the superior efficiency of large farm units is motivated by special interests of groups that stand to benefit from a dualistic pattern of development. The owners and managers of large private enterprises . . . clearly have a vested interest in perpetuating policies that give them preferential treatment." They might even obstruct efforts to build up the land administration infrastructure necessary for registration-oriented land titling, since it would strengthen the government's capacity to implement agrarian reforms. An example of such obstructionism confronted the National Land Administration Program, which could not be implemented in the northeast region of Brazil due to, among other things, opposition by powerful landowners (World Bank 1985a, p. 28).

Still, generalizations are difficult to make. Johnston and Tomich (1985, pp. 25-26) also note that

> small farm development strategies were feasible in Japan, Republic of China and the Republic of Korea . . . *despite* a highly unequal . . . distribution of land ownership . . . because large landowners found it profitable to rent out their land in small plots . . . , [thus] the size distribution of *operational* units was [much less unequal]. Although this meant that income distribution in rural

areas was very unequal, landowners and tenants shared an interest in investments in agricultural research, irrigation and other types of infrastructure that facilitated technological progress.

Strong policies in support of smallholders may also be possible where there are other groups that counterbalance the influence of large landowners. Many other historical, political, or cultural factors may also be important in creating a supportive public services environment for agricultural development and tenure security.

Redefinition-of-Rights-Oriented Titling of Individual Freehold Interests

Where the concern is a redefinition of land rights to achieve a different structure of individual landownership, the most prominent issue is redistributive land reform to reduce inegalitarian landownership. From an environmental or land-use perspective, redistributive land reforms are called for when the land market fails to operate efficiently and leads to inefficient use or misuse of land resources (see Todaro 1982, pp. 226-29; Atkins 1988, p. 941; Thiesenhusen 1989). Large landowners often value their holdings for the power and prestige they confer rather than for their agricultural potential. Large parts of these landholdings, which are often the most fertile lands in the country, are therefore un- or underutilized. On the demand side, few potential buyers have the resources to purchase land, even if the large landowners were willing to sell, since most of the population lives in acute poverty or operates very small holdings. The market fails for another reason as well, as Bell (1990a, pp. 155-56) points out: "If such means of financing were available, so that all who desired to hold land as an asset could acquire it, the notional demand for land as an asset would be fully realized and the price of land would almost certainly rise, to the advantage of those who held it at the outset. . . . If the prime objective is to secure significant gains for the poor, they must be able to acquire land on favorable terms, which implies that some other group must lose thereby" (see also Stringer 1989, p. 9).

In the absence of alternative income opportunities, then, smallholders are trapped in poverty. Those who live close to the subsistence level are likely to have a short-term planning horizon and to apply a high discount rate (see section 3.3). This is very important for land conservation because if certain measures incur net costs at the beginning and produce net benefits only much later, poor people will not be able to adopt them. In addition, several factors that contribute to rural poverty, such as population growth and specific laws of succession, can seriously undermine the benefits of land titling if they lead to land fragmentation and to inviable, overexploited holdings. Thus, as mentioned in the introductory chapter, the issues of inequality and tenure insecurity cannot be strictly separated.

Ultimately, the redefinition of land rights in developing countries, whose economies are still largely agrarian based, remains an intensely political matter. Reform of land rights is particularly difficult if those who stand to lose are a well-organized and powerful group (high *transaction costs*). For that reason, most important land reforms in the twentieth

century have occurred during times of crisis, such as social revolutions or civil wars (Powelson 1988; Bell 1990a, p. 151).

Land Titling and Tenancy

There are basically two alternatives for dealing with tenure insecurity problems related to tenancy (Herring 1983, p. 8): tenancy reform, to provide the operators of the land with incentives for land conservation; and land-to-the-tiller type of reform.

Tenancy is not in principle harmful to land conservation; much depends on the nature of the contracts (see section 5.2). Tenancy reforms that improve land conservation are in the interest of landowners, since such reforms will maintain or increase the value of their assets. On the other hand, to recall the discussion about the relation between poverty and land degradation, a land-to-the-tiller type of tenancy reform has its rationality in terms of land conservation.

The radical solution, however, involves high transaction costs. In a world of economic and political imperfections, the relative efficiency of land tenancy often has to be acknowledged (Cheung 1968 and 1969). The landlord-tenant relationship combines a landowner's advantages in credit markets (because of economies of farm size) with small-scale tenants' advantages in operating the land (because of diseconomies of farm size; Johnston and Tomich 1985, p. 20).

6.2 From Private Interests to Common Property

From an initial setting of private property rights, land titling as well as individual property rights can lead to common property rights (figure 6, box 2). Moves from private land rights to common landownership involve transaction costs and also need to be examined from a general efficiency perspective. The efficiency of common property depends largely on how the rights and duties of group members are defined and on the mechanisms established for internal governance (see section 5.3). In practice, changes from individual ownership to common landownership (for example, the ejido-system in Mexico or the *Sociedades Agrícolas de Interés Social* in Peru) have fared poorly (Heimpel 1983, p. 273), but most of these changes were prompted by social revolutions, and it is questionable whether most farmers joined these communal systems voluntarily. And, more important, these common property regimes were badly designed, with weak internal governance mechanisms and incentives. Under certain circumstances, common property regimes may be appropriate (joint costs, technologies benefiting a large number of farmers) provided that incentives and internal governance mechanisms are adequate (see chapter 7). Therefore, the legal system should at least offer the opportunity to set up such systems voluntarily.

6.3 From Private Interests to State Property

There are no convincing examples of state ownership of agricultural land. In theory, an appropriately designed mixed system of state property with exclusive use rights for individuals or groups may closely approximate a system of full private or common property. In practice, however, the dangers of state ownership of land—government failures related to bureaucracy, special interest influence, and limited financial and managerial capacities to effectively control the land resource—make state property a very questionable alternative. (The issue is examined more thoroughly in chapter 8.)

7. Land Titling in an Environment of Common Property Rights over Land

One of the most contentious issues in the land titling debate is that of land titling in an environment of common rights over land (Atwood 1990). It is there that the clash occurs between land titling advocates, who argue from mainstream neoclassical economics, and anthropologists, historians, and other researchers, who are critical of these recommendations. At the extremes are land titling advocates who regard common property regimes as an anachronism (such as Johnson 1972) and opponents who denounce attempts to individualize land tenure as Eurocentrism or capitalistic imperialism (such as Lovell 1988).

The issue is examined in three ways in this chapter. First, attempts to individualize or privatize common property regimes are examined (section 7.1). Then arguments are presented for resolving tenure insecurity problems in common property regimes while retaining the institution of common property (for example, through group titling; section 7.2). Last, the question of nationalization of common property regimes is addressed (section 7.3).

7.1 From Common Interests to Private Property

Traditional Common Property Regimes

The literature on the effects of the privatization or individualization of common property regimes, especially traditional or indigenous regimes, is quite extensive (for example, Atwood 1990; Barrows and Roth 1990; Besteman 1990; Bruce 1986; Coldham 1978 and 1979; Dickerman 1987; Lovell 1988; Noronha 1985). The empirical evidence shows that most efforts to privatize traditional common property rights have failed, largely because knowledge about land titles and incentives for local people were lacking. The result was either a rapid unraveling of the titling effort as local farmers failed to participate and customary tenure systems maintained their hold (Coldham 1978 and 1979; Barrows and Roth 1990, p. 289), or a major disruption of the societies and land management systems as land grabbing by outsiders displaced customary users (Lovell 1988, p. 38). According to Runge (1984, p. 2), such land titling initiatives have not only failed to stop overuse, but have increased inequality as well. Lands formerly held in common have often been transferred to those with influence over the allocation of use rights, such as high-ranking government bureaucrats, and these individuals have then failed to manage these resources effectively.

The history of European efforts to superimpose Western types of tenure arrangements on South Asia during the colonial period demonstrates these same harmful effects. As Myrdal (1968, pp. 1033-36) argues:

> European [land] policy was largely guided by the view that a system of private property should be encouraged and reinforced by law . . . even if it meant riding roughshod over the distinctions drawn in the traditional system between rights to occupy land, to receive tribute from it, and to dispose of it. . . . One of the significant social consequences . . . was the breakdown of much of the earlier cohesion of village life with its often elaborate, though informal, structure of rights and obligations. . . . These arrangements often gave rise to confusion [and uncertainty about land titles that] . . . has produced endless litigation and has also deferred investment in agriculture.

Such circumstances would hardly be likely to favor land conservation.

Many of the problems mentioned by Myrdal concern the transaction costs related to the transfer from a system of common land rights to one of individual property rights over land. The disruption of social systems and of natural resource management systems can make these transaction costs quite high indeed.

But transaction costs aside, an understanding of the reasons for the failure of many privatization attempts demands a better understanding of common property regimes. Common property regimes have evolved in response to local needs and conditions, and they ought not to be dismissed out of hand on ideological or ethnocentric grounds.

Common property arrangements continue in much of the developing world (especially in traditional or indigenous societies), and even in the developed world, some common property regimes have survived the forced enclosure movements of the fifteenth and sixteenth century (for example, Swiss grazing lands; see Rhoades and Thompson 1975; Netting 1976; and Stevenson 1990). Members of traditional common property regimes typically have secure tenure, even though their rights are generally informal (see section 5.3).

There are several arguments in favor of common property regimes and for retaining them where they function well (see Runge 1984, pp. 1-6; Eggertsson 1990, p. 262; Larson and Bromley 1990, pp. 238-41; Lawry 1990, pp. 405-6; and Ostrom 1990, p. 37):

- If technologies causing externalities are applied or if joint costs exist (for example, erosion control benefiting a large number of people, or complex irrigation schemes), group action may be necessary to ensure efficient resource management.

- If the benefits of private property rights are slight (say because productivity is low in an extensive grazing area) compared to the costs of delineating and enforcing those rights (fencing, for example), it may not be worthwhile to switch from common to private ownership.

- The transaction costs of well-defined and enforced private property rights typical in the West may simply be too great for a subsistence economy in which poverty is widespread.

- Ecological factors may influence the cost-benefit ratio of private property rights. In arid or semi-arid rangelands, where range productivity varies seasonally and spatially with the amount of rainfall, communal ownership allows relatively easy herd movements in pursuit of grazing lands.

- Because of social norms and values embedded in a centuries-long tradition of communal landownership, indigenous societies may be unable or unwilling to accept private property rights, and attempts to intervene could cause major disruptions. However, this issue is very complex; social norms and values attached to landownership patterns are clearly related to economic conditions. Traditional patterns of landownership and natural resource use are often economically rational under specific conditions (for example, shifting cultivation under circumstances of very low population density), and adapt flexibly to changing conditions (Binswanger and Pingali 1984).

However, one has to acknowledge that some, particularly the social and economic, factors may lose their weight and shift the balance away from common property in many settings. Lawry (1990, p. 408) notes that as part of the general transformation of the societies of the developing world, reliance upon communal resources is declining in many situations. Increasingly, villagers engage in nonagricultural economic activities or rely on remittances from family members living in cities. These factors reduce the incentives for individuals to participate actively in common property regimes. And as village economies are opened up, respect for traditional authorities may wane, making it more difficult to maintain the internal consensus needed to manage communal land resources.

Given these changes in society, as well as pressures that are increasing the scarcity of land resources (population growth, commercialization of agriculture), common property resources may indeed have to evolve into systems of individual tenure, just as neoclassical economics would suggest. "[Private] property rights develop to internalize externalities when the gains of internalization become larger than the cost of internalization. Increased internalization . . . results from changes in economic values, changes which stem from the development of new technology and the opening of new markets, changes to which old property rights are poorly attuned. . . . The emergence of new private . . . property rights will be in response to changes in technology and relative prices" (Demsetz 1967, p. 350; see also section 4.3 on the adaptive evolution of property rights).

Demsetz (1967) applies this theory to the introduction of private ownership of land among Indian hunters in eastern Canada at the beginning of the eighteenth century. Initially, when the Indians hunted beavers only for their own consumption, the opportunity cost of land was very low and exclusive private rights were nonexistent. With the development of the fur

trade, an increase in demand led to a sharp increase in hunting, and investments were needed to protect the resource (stock of game). The spread of exclusive private rights to take beaver from well-defined hunting grounds accompanied this shift in the cost-benefit ratio of private property rights. Researchers predict similar developments in common property regimes in today's developing countries (Lawry 1989, p. 11; Shipton 1989).

What does all this mean for land titling? Primarily, it means that traditional communal land tenure systems are complex, requiring more than a simple transformation, by way of land titling programs, into individual tenure systems. As Bromley and Cernea (1989, pp. 59-60) argue, "over-confidence can lead to the arrogance of simple answers to complex problems, or to the futility of worn-out [responses] to new and different challenges. . . . Planning procedures must be dialectic and flexible, open to probes and searches for the right questions to ask, and to the discovery of feasible answers."

Environmental and land administration authorities need to guard against launching land titling initiatives in common property regimes for ideological or ethnocentric reasons, where the basic conditions—for example, land scarcity, commercialization of agriculture—are not present. Such premature, ideologically guided land titling, which often has the implicit or explicit objective of speeding up socioeconomic development, has failed in most cases. The need for land titling and registration arises when there are growing uncertainties about the application and effectiveness of indigenous systems for controlling land transactions. This usually takes place where there are uncertainties about which are the legitimate authorities controlling land use and land transactions and where land values and pressures on land are rising. Useful indications of these processes are the rise in litigation and widespread recognition of the need to formalize the land rights system (Noronha 1985, p. 220; Falloux and Rochegude 1988, p. 18).

But even under these conditions, individual titles may not be required. One alternative is *group titles*, especially where the major problem is intrusion and encroachment by outsiders, rather than the failure of internal governance. Group titles should also be considered where technical factors (for example, livestock management versus seasonal cropping) or ecological factors (for example, regional variation in productivity because of varying rainfall patterns) make common property preferable to private property solutions, even under changing socioeconomic conditions (see the above discussion of the pros and cons of common property regimes). (Group titling is discussed more thoroughly in section 7.2.)

However, where internal governance of common property regimes no longer works, it might indeed become necessary to consider individual land titling. The issue then is to decide between a voluntary system, in which individual landholders are responsible for seeking title and paying the registration costs, and a compulsory system of registration of rights, in which all farms or parcels are titled by the state whether every farmer seeks or desires title or not (Roth and Barrows 1988, pp. 2-3).

Each method has its advantages and disadvantages. Compulsory titling is likely to suffer from lack of interest and participation unless the state is willing to put pressure on and assist farmers through supportive policies. Voluntary systems run the risk of land grabbing by outsiders or by the shrewdest farmers, causing serious problems for these societies (Besteman 1990, p. 51). Most experts believe that once a decision has been made to proceed with a formal system of registration and titling, lands within a selected area ought to be titled in a systematic manner (Noronha 1985, p. 221).

Formal registration and titling make heavy demands on manpower, training, and maintenance so land titling efforts ought to be concentrated only on areas where the necessary conditions exist. Nationwide land titling is infeasible in many poor developing countries because of these high costs, but in any event, it is unnecessary in areas where land is abundant or has no commercial value and other factors are absent (markets, communication systems, inputs), or where the traditional system of internal governance is still working well, even under conditions of land scarcity.

For land titling to have a positive impact under these circumstances would require a conducive environment in which the state is able and willing to provide secure legal titles. And supportive policies, especially for credit, also ought to be available, so that investments in land conservation can really be undertaken.

COOPERATIVES

Some special concerns relate to land titling in cooperative types of common property regimes that do not apply to traditional or indigenous common property regimes. The performance of these common property regimes (the ejido-system in Mexico, the *ujamaa*-system in Tanzania) has been poor (see section 5.3). They suffer not so much from encroachments by outsiders or tenure insecurity in the narrow sense, but from flaws in their internal organization and structure of incentives. In the ejido case (Wessmann 1984, p. 244), peasants have fairly secure use rights, but they are dependent on the ejido for finance and marketing; since the collective has been unable to provide those services adequately, incentives are weak (see also Heath 1990, pp. 35-44).

When considering whether to privatize such common property regimes, their role in providing collective goods and services (infrastructure) needs to be taken into account. Breaking up the cooperatives might endanger these necessary underpinnings of rural activities and land conservation (Fureng 1988, p. 12). For that reason, internal reforms that specify rights and duties and give more responsibilities to individual users ought to be considered as an alternative to individual titles.

7.2 FROM COMMON INTERESTS TO COMMON PROPERTY

The reasons for seeking common property solutions rather than private property solutions to tenure insecurity problems within common property regimes were considered in the previous section. Here we examine group titling in traditional common property regimes and internal reforms of cooperatives that maintain their common property character.

GROUP TITLING IN TRADITIONAL COMMON PROPERTY REGIMES

Where a traditional common property regime functions well as a resource management system, but encroachments from outsiders threaten to disrupt the mostly informal arrangements, group titles may be an appropriate instrument for increasing stability and tenure security. Group titling may be an adjunct to a broader strengthening of group institutions, where its objective might be not only to increase tenure security but also to facilitate access to credit for the group as a whole.

One type of group title is the *village land management contracts* that have been proposed for sub-Saharan Africa. Such contracts were proposed partly because of the limited technical and financial capacities of African states to undertake sophisticated land registration programs nationwide and partly to accommodate land management to the common property character of landownership. Falloux and Rochegude (1988, pp. 18-19) describe a dynamic movement, encouraged by governments and funded by donor agencies, to create associations at the village level that could assume partial or total responsibility for land management. The new land system would operate through contracts agreed on by village committees and government agencies, clearly specifying the financial, fiscal, and operational responsibilities of each party. In some areas, villagers want only to define and demarcate village lands in order to avoid conflicts with neighboring villages. In others, villagers may want to mark out the territories of extended families, but not necessarily those of the nuclear family or the individual. As Falloux and Rochegude (1988, p. 19) note, "the goal must be to harmonize the new land laws with the wishes of the village."

Group ranches in Maasailand are another example of a group titling approach. They were a component of a World Bank livestock development project in Kenya implemented from 1968 to 1974 (World Bank 1981a). In this project, "imaginative schemes were designed or adapted to meet the requirements of different ethnic groups (the pastoralist Maasai, Somali, Boran, and Galla; the heretofore agriculturalist Taita; the commercial, mostly European, ranchers) in regions with diverse ecological conditions" (ibid., p. iii). The division of tribal grazing lands into group ranches was a major component of Kenya's land adjudication legislation.

The group ranches are more than traditional grazing communities with registered group titles. The group ranch constitutes a new social formation for the Maasai and a new mode of political action through decision-making and enforcement by a committee of elected

representatives. The project evaluation report of 1981 notes several difficulties with the scheme (World Bank 1981a, pp. 37-44):

- The membership criteria were not very clear. Initially, household heads (primarily males) were expected to register for membership, but no rules governed membership for the second generation (inheritance, succession).

- The boundaries of the group ranch were not effectively enforced by the state or by the group itself, which wanted some flexibility for adapting to regional variations in rainfall. This lack of strict enforcement reduced the respect for the group titles and the security they offered. Non-Maasai squatters invaded group ranch lands, and the government failed to evict them.

- The failure to specify clearly who was allowed to apply for credit created considerable uncertainty and fear among the poorer members, who feared that the better-off members would exploit the system for their own purposes.

- There was considerable uncertainty about individual grazing quotas.

- The boundaries of the group ranches did not always coincide with traditional boundaries, so conflicts arose between the group ranch structures and the pre-existing structures.

A third example of group titling efforts is the *Amerindian reserves* in northwestern Brazil, which were established under a World Bank agricultural development and environmental protection project (World Bank 1991c). Besides its ethnic objective of protecting the Amerindian population, the project aimed to strengthen and preserve a working traditional land management system. The project provides interesting insights into the possibilities and problems of group titles.

The project was one of five approved between 1981 and 1983 to support the Northwest Integrated Regional Development Program (Polonoroeste) in Brazil. Among the program's goals was to "ensure that the development of the Region was consonant with the need to protect its land resources, ecological system and indigenous communities" (World Bank 1991c, p. iii). The Amerindian protection project tried to achieve that goal by regularizing the Amerindian areas through identification, delimitation, adjudication, physical demarcation, and registration. The share of the Amerindian population living in demarcated reserves in the program area increased from about 18 percent in 1980 to 85 percent in 1989 (ibid., pp. 19-20). What became clear by the time of project completion, however, is that physical demarcation is a necessary, but not sufficient condition for protecting the Amerindian reserves (ibid., pp. 20 and 34-35). Protection against squatters and illegal logging and mining has been difficult because of the profitability of these activities and the size of the area, and neither the government nor the indigenous agency (FUNAI, National Indian Foundation) has assumed responsibility for implementing and managing the project. Either

disincentives to entry by outsiders, such as an absence of public physical and social infrastructure in the surrounding areas, or the ability to prevent and punish invasions is required to ensure protection of such areas. Also needed is a way to establish clear and permanent boundaries.

What lessons can be derived from these examples of common property titling? One is that the difficulties related to the enforcement and protection of group property rights against other claims must not be neglected. Such difficulties may arise because state agencies and other institutions in many developing countries do not have the needed funds or managerial capability or because there is a political bias against indigenous communities. Another lesson is that if the common property regime has to prevent not only encroachments by outsiders but also internal overuse of land resources, the mechanisms of internal governance in the newly titled common property regimes are of crucial importance (the problem of defining rights to credit in the Maasai group ranches is an example).

REFORM OF COOPERATIVES

We have seen that cooperatives in the collectivist design of the socialist tradition have not worked (section 5.3), and yet a precipitous breakup of such cooperatives might endanger collective goods and rural infrastructure, including land conservation works. Are there possibilities for the internal reform of cooperatives? Any reform would have to specify the rights and duties of members of the group and improve the structure of incentives so that members could reap the fruits of their efforts. Establishment of exclusive use rights for members would probably be required or perhaps even the transfer of full landownership to members. The cooperative might even need to be designed with the exclusive objective of providing collective goods or services, such as marketing, construction and maintenance of rural infrastructure, or land conservation measures (McBride 1986, pp. 87-101). In any case, the direction of reform should be determined by the participants, since they are probably best able to evaluate the costs and benefits of various institutional solutions under local conditions. But whatever the precise institutional solution, appropriate rules and mechanisms for internal governance are critical.

7.3 FROM COMMON INTERESTS TO STATE PROPERTY

For a transfer from common interests to state property, arguments presented in section 6.3 are relevant here as well. Government failures related to bureaucracy, special interests, corruption, and so on make any move toward state ownership of agricultural land questionable. The issues involved in state ownership of land are elaborated in the following chapter.

8. LAND TITLING IN AN ENVIRONMENT OF STATE PROPERTY RIGHTS OVER LAND

This chapter examines tenure insecurity problems on state-owned lands and the implications for land titling. There are three options for reform of property rights on state-owned land: a change to private ownership, a change to group ownership, and reform of the structure of rights and duties within the institution of state property.

8.1 FROM STATE INTERESTS TO PRIVATE PROPERTY

The economic justification for government intervention in natural resource policy is usually market failure—the failure of the ordinary exchange of goods and services in the marketplace to allocate resources adequately. Dudley (1990, pp. 110-11) distinguishes four cases in which this problem may occur:

1) natural monopolies, such as those of local distributors of electricity or water;.

2) externalities, such as putting smoke in the air or dumping waste in the river;

3) collective consumption goods, such as national defense or public health; and

4) common resource pools, such as fish in the ocean.

He notes that while the marketplace is unlikely to provide effective or efficient allocation under these conditions, turning the problem over to the government creates difficulties as well. Dudley identifies four areas of government failure:

1) bureaucrats looking out for their own concerns rather than the public interest;

2) special interest influences determining resource allocation;

3) lack of information provided by prices; and

4) gerrymandering, corruption, and/or egomania—"who will guard the guardians?" (ibid., p. 111).

Applied to agricultural land, the four market failure situations provide a weak case for state ownership. Land is not a genuine collective good or common resource pool (it may well be partitioned). Other land-related environmental goods may require state intervention (for example, biodiversity) or even state ownership (for example, forest reserves, national parks). But the problems of government failure weigh heavily in countries where state institutions are weak (De Soto 1989; Lawry 1990, pp. 419-20; and World Bank 1991a) and may seriously reduce the benefit of state ownership of resources (see also section 9.2).

In cases where the state owns the land in name only (where the land is de facto nonproperty), particularly in squatter and frontier development areas, it would certainly be better to legalize or title informal individual interests (see section 6.1, on the titling of informal individual interests to land, especially the Thailand case study by Feder et al. 1988).

Settlement or resettlement schemes also involve land titling on state-owned lands (though sometimes the property of private or communal owners was expropriated first). The best known example is probably the Transmigration Program in Indonesia, the largest government-sponsored voluntary settlement scheme in the world (World Bank 1988, p. iii). Under the program, millions of people were moved from the densely populated inner islands of Java, Bali, and Lombok to the less populated outer islands of Sumatra, Kalimantan, Sulawesi, and Irian Jaya.

Settlement schemes are immensely complex projects, and their justification and success depend on a variety of factors, of which land tenure is only one. Once a decision has been made to settle a certain area, individual land titling will be required to ensure sustainable land use by individual, nonindigenous farmers or families of possibly very different origins. And since settlement schemes take place in land rights vacuums, guidance by the government will be important to avoid disputes and conflicts. An evaluation of a settlement project in Malaysia found that individual landownership was "a major factor in the success of land settlement both in attracting and retaining settlement [because of] the powerful incentive that potential ownership of . . . land conveys to landless . . . rural poor, particularly when this is backed up by social infrastructure" (World Bank 1985c, p. 63). In many respects, the analysis of land titling under these conditions would be comparable to that applied in section 6.1 to an egalitarian initial setting of individual smallholders (frontier, squatter situation).

8.2 From State Interests to Common Property

Whether common property is a viable solution to tenure insecurity problems on state-owned land depends on the nature of the problem and the extent to which the state exercises its property rights.[3] For tribal people on land that is legally state property but whose

3. For an analysis of whether informal traditional common property regimes on state-owned lands should be transformed into private property systems rather than formal common (continued...)

tradition of common property resource management is still fairly intact, the appropriate solution may be a group title. (This issue was addressed in section 7.2, which examined the possibility of group titling in traditional common property regimes located on public lands as in the case of the Amerindians in the Amazon region; see also Riddell 1986, p. x.)

In some settlement schemes, relocated people have also been given group titles. In the Malaysian settlement project mentioned above (World Bank 1985c), there were several indigenous tribes living in the settlement area who did "not have a notion of land ownership, but rather the idea of the right to cultivate certain areas—a concept which would be hard to reconcile" with the settlement project (ibid., p. 53). The tribes were resettled and provided with compensatory land.

8.3 From State Interests to State Property

In discussing land titling in an initial setting of state property rights over land, the question remains whether solutions, such as the mixed Chinese one described in section 5.4, in which exclusive individual or group use rights are provided on land that remains state property, are viable in the long run. Mixed ownership need not be confined to socialist countries.

An interesting example is the stewardship program introduced in a regional development program in Central Visayas, Philippines. With the goal of increasing rural incomes, the program established systems of resource management (World Bank 1983, p. 2), including rehabilitation and conservation, to arrest the degradation of farm, forest, and fishery resources, and institutional changes, to support the decentralization of responsibility for economic development programs. The state owned most of the land in the Central Visayas region, and land tenure for the occupants was quite insecure (World Bank 1983, p. 9). This led to short-term, low-cost production strategies and to the deterioration of natural resources. To counteract these negative effects, the stewardship program granted leases to the occupants of public lands that provided them with use rights for twenty-five years, extendable to fifty, on condition of compliance with a resource management plan.

While the success of such an arrangement depends to a great extent on the terms and stability of the contracts, public choice theory (Mueller 1989) would suggest skepticism about state ownership of agricultural land, even in the form of a mixed rights system, given the probably harmful influences of bureaucracy, special interests, corruption, and the instability and arbitrariness of many governments. And the establishment of a mixed system of property rather than complete abolition of state property (or the expulsion of illegal occupants from

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3. (...continued)
property regimes, see the analysis of the relative merits of common property regimes and private property regimes in section 7.1. On the desirability of creating new common property regimes, see sections 6.2 and 7.2.

public lands designated for erosion control or conservation of biodiversity) probably implies that the state plans to exert some control over land use—to interfere with or attenuate private or group use rights.

Preliminary investigations of the stewardship program in the Philippines indicate that there are considerable problems with the program's design and implementation (World Bank 1989b, p. 24). The stewardship contracts are heritable within the twenty-five-year limit, but since they are not otherwise transferable, they are not a bankable instrument. A major weakness has been insufficient control of compliance with the resource management plan. Also, registration targets were assigned to regional directors, leading to careless certificate issue. In addition, the scheme gave insufficient attention to support services.

9. THE IMPORTANCE OF THE STATE AND THE ROLE OF GOVERNMENT

This chapter investigates the role of the state and its institutions in making land titling work as an instrument of environmental policy. While land titling for land conservation, based on property rights economics, might appeal to those seeking to reduce state intervention in economic and environmental policy, it must be recognized that property-rights- or market-oriented environmental policies rely fundamentally on state involvement in specific spheres (Tietenberg 1990, pp. 26-30). If land titling is to support land conservation, the state has to provide specific infrastructural services and a strong and impartial legal framework. The state also needs to remove distortionary incentives and provide farmers with an enabling environment that goes far beyond clear property rights.

9.1 INFRASTRUCTURAL SERVICES

EFFECTS ON COSTS AND BENEFITS OF LAND TITLES

Land titling will achieve its environmental objective of land conservation only if there is a state land administration unit capable of providing the infrastructural underpinning needed for the clear delineation, recording, and transfer of land rights. The land administration infrastructure influences both the costs and the benefits of land titles from a farmer's point of view. Figure 7, based on Anderson and Hill (1975, pp. 164-68), explicitly addresses the benefits and costs of property rights. The quantity axis measures definition and enforcement activities, such as fencing or the bureaucratic costs of obtaining a land title. A fall in the price of these activities (the result, for example, of the introduction of barbed wire in the past century) shifts down the marginal costs function and increases exclusion activity. The marginal benefit curve, representing the derived demand for exclusion, moves out when the value of the land asset and the competition for the resource increase. Farmers choose Q_E definition and enforcement activities, where the costs equal the benefits of these actions.

The presence of some basic socioeconomic forces and developments, such as population growth, land scarcity, and land degradation, that increase the need for specified and exclusive land rights (see chapter 3) does not alone guarantee the success of land titling activities. An inadequate land administration infrastructure and an inefficient bureaucracy can make the process of obtaining, maintaining, or transferring land titles so cumbersome and expensive that the costs exceed the benefits. Smallholders might then be better off with informal land rights and, possibly, some land degradation.

In Guatemala, for example, all title registrations and transfers must be entered manually into the General Property Registry at one of only two offices in the country, a

time-consuming and costly process (USAID 1987, p. 24). Since registry personnel are paid according to the value of the property processed, poor smallholders are often forced to suffer long delays, adding to their costs. As a result, smallholders engage in informal transactions of doubtful security—prior claimants can, and do, return and demand their land. Since smallholders cannot afford a court battle over possession, they are often forced to either abandon their farms to the claimant or attempt to purchase the land (Development Associates 1982, p. 9).

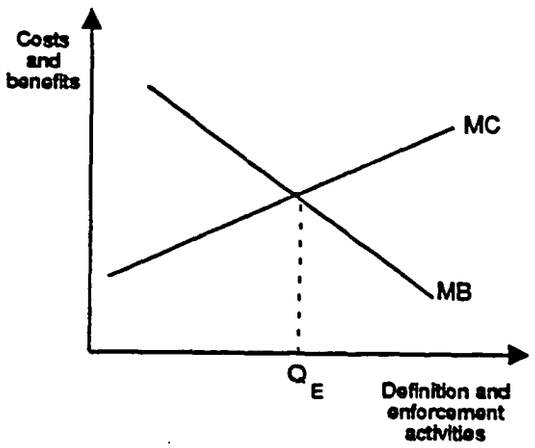

Figure 7: Costs and benefits of land titles

Ecuador provides another example of cumbersome and expensive land administration (Stringer 1989, pp. 18-24). A simple land transaction requires the seller and the buyer to deal with several public and private institutions and to pay a host of taxes. Land titles are contracts prepared either by the Agrarian Reform Institute or by private lawyers and formalized by notaries. The legal conditions for the recognition of a title or land transfer are numerous and sometimes ambiguous. Stringer (ibid., p. 22) describes the typical steps in the title transfer process for a 3-hectare parcel:

1) A request for authorization of the land transfer, signed by seller and buyer, must be presented to the Agrarian Reform Institute, accompanied by numerous other documents—a map of the property, a copy of the seller's title as recorded at the canton registry, a declaration by the neighbors that they do not want the parcel.

2) The petition must go to the Records Department in the Agrarian Reform Institute, which examines it for compliance with conditions stipulated in the law, and then to the Department of Land Sales Authorizations for review. If the papers are in order, the petition is sent to the director of the Agrarian Reform Institute in Quito. If the director approves the sale, the petition retraces its steps within the Institute and then goes back to the petitioners.

3) The buyer and seller must then hire a lawyer to write a contract, which has to be formalized before a notary.

4) The buyer has to pay a transfer tax, a national defense tax, a potable water tax, a provincial tax, a land tax, legal fees for the lawyer and the notary, and registry fees. The seller has to pay a capital gains tax. For the hypothetical 3-hectare plot of land, these taxes would amount to nearly 20% of the sales price.

5) The contract becomes a valid legal title when it is taken to and legally entered onto the canton property registry.

These are examples of some of the ways an inadequate land administration infrastructure can increase the costs in both time and money of a land title. These same inadequacies can also reduce the benefits of land titles (increased tenure security, better access to credit, leading to improved incentives—and ability—to invest in land conservation). If these inadequacies and other weaknesses (unqualified staff, outdated registration techniques, poor quality of maps and cadastres) are severe, a land title may not provide the intended benefits. A study of the land tenure situation in Ecuador found official land records to be far from reliable—roughly 20 percent of the land records studied listed the wrong owners (Boster et al. 1989, p. 62).

What are some of the factors that influence the state of the land administration infrastructure in developing countries? Given the relationship between budget allocations and level of development, the quality and availability of land administration services are likely to decrease with decreasing income in developing countries, other things being equal. (The World Bank (1991d) provides a good overview of administrative capacity problems that affect environmental policy in poor countries; see also Kamugasha 1989.) Also important are the lasting effects of the land administration system introduced by former colonial powers—for example, whether based on codified law or common law (Barr 1985). The structure of government, in particular whether it is federalist or centralist, may also affect the provision of infrastructural services (McEwen 1985, pp. 7-9). In centralist states, the land administration services are less likely to be available all over the country. In federal states, these services are usually provided at the provincial or state level, so they may be better adapted to local conditions; also, local participation and monitoring may lead to improved performance.

How to Improve Land Administration Services

As an infrastructural service, land administration is clearly a state function, and in most developing countries, these services need to be extended and to be made more efficient (Forsyth 1990; on ways to improve institutional performance, see Israel 1989; or Holstein 1989, pp. 7-8). In particular, these services must be made more available to farmers in remote areas. The development and extension of cadastral and other land administration services may be very expensive for many developing countries, which have many other pressing investment needs. A good case can be made for more development assistance for the purpose of building up land administration capabilities.

Defining appropriate land information tools for land administration and renewable resource management is a complex process that depends critically on a thorough knowledge of user needs. Because ecological, institutional, and socioeconomic conditions are so diverse, few generalizations can be made about the technology—and the level of sophistication—to be applied in land information systems. (For further information on the technicalities of land information systems and land administration, see also World Bank 1990c; Dale and McLaughlin 1988; Lawrence 1984; and Simpson 1976.)

In a study on land information and remote sensing for renewable resource management in sub-Saharan Africa, Falloux (1989, p. 27) comes to conclusions which are also relevant for other developing regions. Participation of local communities is essential to program planning and system design. Education, training, and technical assistance require particular attention. Financial commitment by developing countries, though perhaps small initially, should increase through cost-recovery schemes, with self-sufficiency as a long-term goal. International financing may have a key role to play in strengthening developing countries' capabilities in land administration and land information systems. Donors should follow a demand-driven approach; they should concentrate not only on technical issues, but on institutional, legal, and financial concerns as well, and they should coordinate their efforts with other donors and with related activities in the developing countries.

9.2 Legal Framework and Institutional Environment

The institutional environment also affects the costs and benefits of titling, but at a more general or fundamental level than the availability of specific land-related infrastructural services. By institutional environment we mean a broad, overlapping framework of the general political and bureaucratic structures within which economic action takes place, a framework that encompasses institutions as both the rules of the game and as organizations (Van Arkadie 1989, p. 153; see also Israel 1989, p. 11).

To be effective, a property-rights policy requires that there be fundamental rules governing the exchange of property rights and an authority with the power to enforce the rights. Sometimes communities can provide these functions (see the discussion of common

property regimes in chapter 7), without the need for official state institutions. But where land is scarce, population density fairly high, and economic activities integrated in a wider market exchange, informal enforcement of property rights becomes difficult and costly (De Soto 1989, pp. 151-72). The state needs to step in, to establish and enforce the fundamental rules governing property rights and their exchange. "The enforcement of property rights depends on power, and economies of scale in the use of violence frequently give a single agent—the state—a monopoly over the legitimate use of violence" (Eggertsson 1990, p. 59).

Because of institutional weakness, instability, and insecurity, however (De Soto 1989; World Bank 1989a and 1991a; and World Commission 1987, pp. 308-47), governments in developing countries often provide neither a reliable legal framework nor low transaction costs. Armstrong (1991) has identified the following problems in the legal and institutional environment in sub-Saharan Africa:

- domination of the state by a small, highly privileged, and powerful elite of civil servants, army officers, and politicians whose primary concern is to maximize individual power, privilege, and wealth;
- a strong network of patron-client relationships and a power structure at great variance with the formal structure;
- a lack of clarity in decision-making and a lack of stability of postings;
- chronic instability in administrative direction—decisions tend to be erratic rather than systematically managed;
- a public service tradition that is the exception rather than the rule at all levels (public employees see themselves as—and are perceived to be—authority figures rather than "servants of the public," and their behavior tends toward direction and control rather than facilitation and support);
- a lack of effective central coordination within and between institutions, and a lack of vertical communication within institutions;
- a tendency for bureaucratic wheels to turn only under extreme pressure.

Analyses of the state in large parts of Latin America and Asia have reached similar conclusions. (Some of these same patterns—usually in milder form—also infect the bureaucracies of industrialized countries, but they do not represent the standard.) De Soto (1989, pp. 189-229) argues that the governments of highly regulated Latin American states are dependent on elite groups, which are themselves sustained by state privileges; that economic agents in the region's administered economies are subject to overregulation and arbitrariness in decision-making; and that the bureaucracies increase the costs of transactions rather than reducing them. In a special survey of India, the *Economist* (1991a) came to very

similar conclusions. Subramaniam (1990, pp. 385-98), drawing on country surveys on public administration in Asia, the Middle East, Africa, and Latin America, notes several similarities across these regions: arbitrariness in governing, weak or subordinate position of elected bodies, interventionist economic policies, and bureaucracies drawn from a small urban professional middle class and unrepresentative of the population.

What is the effect of the institutional environment on land titling? For one thing, an environment of *arbitrariness* and *instability* creates a generally uncertain and risky environment for farmers. In an environment where the fear of expropriation is high or several legal titles exist for a specific plot of land, a land title may not provide tenure security or incentives for land conservation. If the legal system cannot confer the needed properties on land titles, then land titling will not have much effect on conservation.

Institutional weakness and instability are particularly damaging if land titling is accompanied by redefinition of land rights. Any redefinition of rights will be opposed by those whose rights are being extinguished or diminished. The danger of increasing tenure insecurity, which is already inherent in any attempt to redefine rights, will be intensified when institutions are weak and unstable.

A *biased legal system* also diminishes the effectiveness of land titling. A property-rights-oriented land conservation policy demands an impartial legal system able to guarantee the property rights of smallholders or indigenous people, not only the interests of a relatively small group of urban elite or large landowners. Instruments such as group titles for indigenous people to head off encroachments by outsiders (see section 7.2) will work only if the state is committed to enforcing these property rights.

A government's *inability to reduce transaction costs* may block many of the positive impacts of land titling. Weaknesses in land administration infrastructure are one case in point (see section 9.1). Overregulated land markets are another (see section 4.2).

What is needed in many developing countries is better governance through reform of the state and its institutions. According to Landell-Mills and Serageldin (1991, p. 14), good governance depends "on the extent to which a government is perceived and accepted by the general citizenry to be legitimate; committed to improving general public welfare and responsive to the needs of the citizenry; competent in assuring law and order and in delivering public services; . . . and equitable in its conduct, favoring no special interests or groups." Several conditions help to foster these characteristics (ibid., p. 15):

- political accountability and the possibility of changing leadership by peaceful and democratic means in case of misconduct,
- bureaucratic accountability of public agencies and officials through formal and transparent processes for monitoring their actions,

- an objective and efficient judiciary that administers the law impartially,
- freedom of association and organization enabling the intended beneficiaries of government programs to participate effectively in determining and meeting their needs,
- freedom of information and expression, as a prerequisite for accountability and responsiveness [of officials] to the needs of the public, and
- fostering efficiency within public institutions by enhancing technical and management capacities and improving organizational arrangements.

Governments can at the same time be democratic, accountable, impartial, and strong—despite the perception that democratic nations in the developing world are weak, unable to resist the influence of special interests, and therefore unable to provide an unbiased legal system and a strong institutional environment. The *World Development Report 1991* (World Bank 1991b, pp. 132-33) challenges the hypothesis that authoritarianism yields better governance than democracy: "During the 1980s, . . . severe disenchantment with authoritarian regimes set in. Now it is better understood, that such regimes are no less likely [than democratic ones] to yield to the interests of narrow constituencies. Few authoritarian regimes, in fact, have been economically enlightened. Some of the East Asian [economies] are the exceptions, not the rule. Dictatorships have proven disastrous . . . in many economies."

There are, of course, enormous problems of instituting these criteria for better governance. Reforms have to be implemented against often fierce political opposition. Streamlining the civil service sometimes threatens a considerable portion of the work force with unemployment. It is the task for external aid and finance agencies to promote institutional reform and development (World Bank 1984 and 1991a); external agencies must help strengthen the public institutions.

9.3 Removal of Distortionary Incentives

Whether land titling creates adequate incentives for environmentally beneficial behavior depends on whether other distortionary incentives are present. Experience in developed countries shows that clear and undisputed land rights do not alone guarantee adequate land conservation measures; severe environmental degradation is not uncommon despite secure tenure. An important reason for this is that national governments have in many cases created a distorted incentive structure. Two different aspects should be distinguished here. One is the price distortions in agricultural input and output markets and their effect on the use of farmland. Another arises from the fact that land is not just an agricultural input, but a collection of other land-related environmental goods as well (natural habitats, protected forest for erosion control) that, as collective goods or positive externalities,

are unpriced. What effects does land titling have on these other environmental goods attached to land or specific land uses?

Price Distortions of Agricultural Inputs and Outputs

Today we know much about environmentally detrimental incentives in developing countries (Repetto 1988; Lutz and Young 1992). Policies in many countries not only fail to reflect the real cost of land and natural resource use, but actively encourage more rapid environmental degradation than would occur through unfettered market forces. These policies create distortions that artificially increase the profitability of activities that result in serious natural resource degradation. These distortions cover a wide range of subsidies, fiscal incentives, and market interventions.

Agricultural prices are often depressed in developing countries because exchange rates are overvalued or because output prices are fixed below market levels (Repetto 1988, p. 5). By turning the internal terms of trade against agriculture, such policies reduce farming's profitability, lowering the derived demand for agricultural land and depressing land prices. Consequently, returns on investment in farmland development or conservation are also reduced, as are farmers' incentives for terracing, irrigating, or otherwise improving or conserving their land. The agricultural policies of many industrialized countries, which heavily subsidize agriculture, leading to oversupply, are also responsible for reducing agricultural prices on world markets and for depressing land prices. (The way agricultural income and land are taxed also has an important impact on land use; however, this complex topic is beyond the scope of this study. See Strasma et al. 1987; and Skinner 1991.)

Thus, in a broad sense, depressing agricultural prices decreases the incentives for land conservation (see section 4.3 on the functions of the land market for land conservation). This means that the potential benefits of land titling are also reduced, even where conditions are otherwise favorable, because land titling will not boost the incentives for land conservation to the level they would reach with undistorted prices (Repetto 1988, pp. 5-8).

Distorted prices on the input side as well—because of government subsidies—mean that farmers get even more false signals because the scarcity of many resources is not fully reflected in their prices. Environmental degradation is encouraged by many of these subsidies: on water for irrigation, leading to overuse and salinization; on pesticides, damaging flora and fauna and creating health risks; on fertilizers, leading to nutrient overload in soils and in rivers and streams; and on mechanization, promoting land clearing and frontier development.

What are the implications of input subsidies for land titling? If secure land titles enable farmers to make long-term investment decisions and to get access to the credit needed for investment, their investment decisions are likely to be distorted as well if input prices are distorted. Subsidies on variable inputs, machines, irrigation works, or land clearing may induce misdirected or excessive investments that have harmful environmental impacts. The

environmental impact may be even worse if farmers are not prevented from externalizing the costs of land degradation (for example, downstream costs of excessive fertilizer use or land clearing).

Removing distorted incentives will improve both land conservation and economic efficiency. Reducing government subsidies will also help to reduce budget deficits, avoiding the need for tradeoffs between development and environmental objectives.

Land-related Environmental Goods

While this study focuses on conservation of agricultural land, we ought to consider at least briefly what land titling means for other land-related environmental goods (natural habitats, scenic views, forests with protective functions against erosion) since sometimes land titling is expected to benefit these as well (De Soto 1989, pp. 244-52; Forsyth 1990).

Among the value components of land are some that directly benefit the land users—soil as the agent of plant growth, trees as raw materials—and others that benefit neighbors, downstream residents, or society as a whole—vegetation cover for erosion control, natural habitats for rare species. The latter are mostly *collective goods* or *positive externalities*, for which the producers are not generally compensated. If individual land users find land use alternatives that are more profitable than these, they will destroy or not produce these positive externalities, even if the resulting resource use pattern is inferior from the perspective of society as a whole (Pearce 1989, pp. 14-17; Wachter 1990, pp. 20-28, 58-68; see also section 2.3). Take the case of a farmer who receives title to a parcel of land on which there are trees that serve as erosion control for downstream farmers. If the trees have no direct value for the owner, or the owner cannot internalize the benefit of those trees to other farmers, the owner is unlikely to protect them.

In terms of property rights theory, this has to be interpreted as a case of *incomplete delineation of property rights* to scarce resources, that is, a situation where some valued properties are left in the public domain (Barzel 1989, p. 13; Eggertsson 1990, p. 39). If the adverse environmental effects of land titling are to be avoided, land titling needs to have an environmental safeguards component (land titles with clearly stipulated environmental duties for the entitled, or more sophisticated land titling that includes rights over trees and the like), or the government needs to establish an environmental policy independent of land titling. The type of environmental safeguards that are needed will depend on the ecological or land conservation objectives—from sustaining soil as a productive basis for agriculture, to multiple resource use objectives in terms of both agriculture and conservation of natural habitats, or to priority for nature conservation.

9.4 CREATION OF AN ENABLING ENVIRONMENT

Removing distorting incentives is only one step toward enabling land titling to contribute to land conservation. The state must also provide farmers with an enabling environment. In previous chapters, land titling was sometimes assessed to be unnecessary or even detrimental (see section 7.1 on titling in traditional common property regimes). But a number of situations were identified where land titling indeed could promote land conservation (for example, registration-oriented land titling in an environment of individual interests in land). In these situations, however, land titling will often be only a necessary, but not a sufficient condition for land conservation. Two of the most critical elements of an enabling environment are poverty alleviation and supportive policies.

POVERTY ALLEVIATION

Poverty-induced environmental degradation is a serious concern (World Commission 1987). Land titling will not have a significant effect on land conservation behavior if people cannot afford to adopt a long-term planning horizon (see section 3.3 on the discount rate). Rural poverty is a complex problem, and a wide range of measures are needed to help solve it, including population control, rural development activities, availability of alternative income sources outside agriculture, and reform of policies that are biased against rural areas. Appropriate laws of succession are also needed to prevent the breakup of land into many small, inviable holdings.

One issue should be highlighted here, however, and that is the need for land reform in areas where land distribution is highly inequitable, such as large parts of Latin America. The justification for land reform from a land conservation perspective has already been presented, as have the difficulties (section 6.1). In the past, major redistributive land reforms were possible only after major crises, such as wars or social revolutions. We must also recognize that the ability of states to execute redistributive land reforms may be wanting (see section 9.2). Where such reforms were implemented, in many cases "it took high-handed governments to carry this out: in Taiwan, a dictator (Chiang Kaishek) imported from mainland China; in Korea, a government carried along by a wave of public anger at collaborators with the Japanese colonizers; in Japan, the American occupation army. The nice democratic government of the post-1945 Philippines lacked the power to knock landlords' heads together; the country has paid the price since" (*Economist* 1991b, p. 16). Nevertheless, at the end of the twentieth century and under the threat of environmental depletion, land reform must be seriously reconsidered.

SUPPORTIVE POLICIES

One of the most important roles of land titles is to provide access to formal *credit* markets. However, if credit market conditions prevent a large proportion of small farmers—even if they have formal land titles—from getting access to credit, then the potential effect of land titling on conservation is reduced.

In a study on land tenure and land titling in Panama, Moquete et al. (1986, pp. 109-11) found that titling by itself, even under conditions that should favor a conservation effect (registration-oriented titling of smallholders), did not seem to have much impact on investment or land conservation behavior. The investigation found no positive correlation between possession of a legal title and investment, productivity, or land conservation activities. An important reason was that the title did not improve access to credit for smallholders because the banks considered the administrative costs of loans to smallholders to be too high and because they were unwilling to increase credit to agriculture, which they considered less profitable and more risky than other sectors (ibid., pp. 52-57).

In a study of a titling project in the Colinas region of Honduras, Fandiño et al. (1986, pp. 14-15) reached a similar conclusion. They also discovered that discrimination against smallholders came not only from banks but also from the government agency responsible for the titling project: landholdings of less than 5 hectares were not even titled. In another study of land titling in Honduras, Nesman and Seligson (1988, p. iii) argue that

> whereas previous studies have suggested that agricultural development programs are constrained by insecurity of tenancy, this study shows, that a tenure security program not combined with systematic efforts to deliver key inputs, especially credit . . . has little impact. . . . Previous studies . . . assumed that because titled farm land was more productive than untitled land, granting titles . . . would result in increased productivity. This study suggests that titled land may well be more productive independent of title status, or that the title is one element in a causal chain of factors that result, over time, in greater productivity.

What actions should the government take to improve access to credit for rural smallholders? A common approach has been to set up subsidized credit programs, based on the belief that the rural poor cannot afford to pay market interest rates, and that formal lenders are too cautious to lend to smallholders and informal lenders too exploitative. Most of these cheap credit programs have failed, however (World Bank 1990a, pp. 65-67), becoming transfer programs for the nonpoor instead of the poor because of patronage and corruption (ibid., p. 66). Moreover, governments often have overregulated the financial sector as a whole by setting artificially low caps on interest rates. These regulations have damaged the financial sector, made rationing necessary, and failed to expand credit to the poor. The problem of interest rate regulation and credit rationing was also diagnosed in the above-mentioned case of Panama (Moquete et al. 1986, p. 54).

Furthermore, artificially low interest rates distort the allocation of resources. Studies of formal subsidized credit programs have found arrears ranging from 30 to 95 percent (World Bank 1990a, p. 66). In any case, experience shows that the poor are willing to pay market interest rates: they borrow routinely on the informal market, where rates are frequently very high.

Since cheap credit programs and credit market regulations have damaged rather than helped the poor, the first task for governments is to correct damaging credit market regulations. But this is not sufficient; there have to be additional measures. To expand the poor's access to credit, governments need to support the development of new financial institutions and innovative credit programs which do not subsidize the interest rate, but are adapted to the needs of the poor by reducing the transaction costs for both lenders and borrowers (World Bank 1990a, pp. 67-68). The private sector also needs to play an important role in this process.

Other ways to improve the enabling environment for land conservation are *education* and *extension* in the field of *land conservation technologies*. Locally applicable technologies have to be made accessible to those who work the land through extension services (Anderson and Thampapillai 1990; World Bank 1991e). Anderson and Thampapillai (1990, p. 26) suggest that

> information on erosion and related phenomena should be included in agricultural extension programs and should focus on a menu of ecologically sound and economically viable farm and soil practices. The menu should be delivered in combination with improvements in the availability of key inputs . . . . Apart from specific information on soil management and conservation, raising the overall level of education in rural areas is also desirable. Education has an important place in sensitizing individuals to their environment.

The general direction of needed policy reform is less and less contested. While governments ought to be "doing less of what they should not be doing . . . , they will be called on to do more of what they must do and to do it better—making the tangible and intangible infrastructure investments that underpin a healthy private sector and ensuring social and economic justice [and environmental protection]" (Summers 1991, p. 2). The state should disengage from productive activities, but reemphasize its crucial responsibilities for the provision of public social and infrastructural services and in creating an enabling environment (Landell-Mills and Serageldin 1991, p. 8; Conable 1991).

10. LAND TITLING FOR LAND CONSERVATION: KEY ISSUES AND CONCLUSIONS

It should be clear by now that the issue of land titling for land conservation is complex and that land titling itself is neither good nor bad. Whether it is good or bad very much depends on the circumstances and the ways in which land rights policies are implemented. Even the pressures of certain basic socioeconomic forces and developments—population growth, increasing commercialization of agriculture, land scarcity, land degradation—that increase the need for specified and exclusive land rights do not always call for or guarantee the success of land titling activities. This chapter addresses six key findings on the possibilities and limitations of land titling for land conservation. Each is discussed in turn below.

FINDING 1:
PRIVATE PROPERTY RIGHTS REGIMES ARE NOT THE ONLY ALTERNATIVE

As was shown in chapter 5, resource and environmental economics in the neoclassical tradition tended to simplify reality to equating property with private property and classifying everything else as nonproperty. Recommendations for land titling were usually made with the insecurity of individual freehold interests in land in mind. One of the objectives of this study was to integrate other property rights arrangements: common and state property. While state property over agricultural land was found to be inappropriate for sustainable farmland management (see section 8.1), the institution of common rights to land, prevalent in many traditional societies, must be considered seriously (see chapter 7). It must be recognized that they often are very sophisticated systems, well adapted to local ecological and socioeconomic conditions. The different agricultural systems based on individual landholding, common property, and state property over land give rise to different tenure insecurity issues, and individual freehold land titles are not always the appropriate solution.

FINDING 2:
INFORMAL LAND RIGHTS REGIMES DO NOT ALWAYS CALL FOR LAND TITLING

Land titling is not always required where formal, legal land rights are missing. In certain parts of the developing world, particularly in Africa, traditional land management systems based on informal rights still function fairly well (see section 7.1). There is ample evidence that land titling may not be necessary where peasants have secure, though informal, land rights; the system is flexible and adaptable to changing socioeconomic conditions, and an understanding of land titling is lacking. "Prophylactic" land titling in these settings has

mostly failed. This does not mean that one should romanticize traditional land management systems and ignore the pressures put on them by modern developments. A need for land titling and registration arises when there are growing uncertainties about the application and effectiveness of indigenous systems to control land use and land transactions. This takes place most often when there is confusion about which are the legitimate authorities with power to control land use and land transactions, and where land values and pressures on land are rising.

FINDING 3:
WHERE LAND TITLING IS NECESSARY, IT IS NOT SUFFICIENT

Land titling for land conservation seeks not only to increase tenure security, but also to improve access to credit and to foster the development of land markets (see chapter 4). There is strong evidence that the credit and land market objectives are not simply additional, independent aspects of land titling but that the success of land titling depends on the interaction of these factors as well as on the existence of an enabling environment (extension, education in land conservation technologies, rural infrastructures; see section 9.4).

In some situations, increasing the security of tenure is all that is required. For certain traditional common property regimes, where land still is a pure natural resource (see section 2.1) and the traditional land management regime is working fairly well, but where encroachments by outsiders constitute a threat to the existing system, increasing tenure security by group titling may be sufficient (see the example of the Amerindian reserves in section 7.2). However, where investments in the land make it a capital good, the linkages to credit, land markets, and other supportive factors become crucial. A land title by itself obviously does not provide sufficient incentives for land conservation if it does not provide access to credit or guarantee an adequately functioning land market or other aspects of an enabling environment.

FINDING 4:
BOTH REGISTRATION OF RIGHTS AND REDEFINITION OF RIGHTS HAVE THEIR PLACE

We defined the term "land titling" in this study to mean the registration or certification of existing land rights (section 2.3) designed to increase the security of these rights, to improve access to credit, and to foster the development of land markets (chapter 4). Yet throughout this study, we have seen that simple registration of existing informal land rights is more the exception than the rule. Many land titling initiatives attempt to redefine rights. Is it possible, from a resource management perspective, to draw some general conclusions about the desirability of redefinition-of-rights-oriented land titling?

The study identified two approaches for explaining the rationality of property rights over natural resources. According to the first approach, property rights over natural

resources evolve in an adaptive way in response to socioeconomic conditions, ecological factors, and other changes. It is argued that with increasing resource scarcity, property rights change endogenously toward greater specification, and institutions are developed to maintain the resource services. According to this approach, the state should not interfere in land rights. Its role is to legalize existing rights, enforce them, and provide a legal framework for disputes settlement and the exchange of property rights. In contrast, the structuralists argue in terms of institutional blockages, power, and market imperfections. They argue that the unequal distribution of wealth and landownership in many developing countries and other structural barriers constitute a severe hindrance to local adaptive strategies. Therefore, they argue, existing land rights arrangements need not be rational and well adapted for sustainable land use, and that intervention in land rights directed toward better land management is justified.

Neither approach can be accepted or rejected absolutely. This study found that some attempts to redefine rights based on structuralist arguments were justified (for example, redistributive land reform in a "Latin American" agrarian structure), while others (for example, privatization of traditional common property regimes that are well adapted to local conditions) were not.

Attempts to redefine rights involve the added burden of transactions costs, and these must be taken into account. Transaction costs arise from the change from one property rights arrangement to the other (costs of extinguishing former rights, of establishing new rights). These transaction costs may be very high indeed, given the politically charged nature of efforts to change land rights in developing countries, whose economies are largely agrarian. Therefore, attempts to redefine land rights must be well justified and designed, and provisions must be made for effectively pushing through the change of rights and establishing new ones. But the redefinition of rights should not be considered taboo.

FINDING 5:
THE LEGAL SYSTEM AND THE INSTITUTIONAL ENVIRONMENT ARE IMPORTANT TO THE SUCCESS OF LAND TITLING FOR LAND CONSERVATION

The institutional environment is crucial for a land-titling-oriented land conservation policy because it largely determines the costs and the benefits of land titles for those who are to receive titles. An appropriate institutional environment increases tenure security from land titles by providing political and judicial stability, a framework for the settlement of disputes over land rights, and effective enforcement of property rights. At the same time, it reduces the costs of land titles by providing an efficient land administration infrastructure with simple procedures for obtaining and keeping a land title, by efficiently implementing land titling projects, and by reducing the need for private enforcement of land rights. What is needed are strong, respected, and impartial state institutions that provide for the efficient establishment and enforcement of efficiency-enhancing "rules of the game." Since these conditions

are frequently absent in the developing world (sections 9.1 and 9.2), efforts toward institutional development and a redefinition of the role of the state in development are needed.

FINDING 6:

ENVIRONMENTAL SAFEGUARDS AND AN UNDISTORTED INCENTIVE STRUCTURE ARE ALSO NEEDED FOR LAND TITLING TO BE ENVIRONMENTALLY BENEFICIAL

Whether giving title to land really provides environmentally beneficial incentives for those who work the land depends on whether there are other, distorting incentives, such as distorted prices of agricultural inputs and outputs (section 9.3). An incomplete delineation of property rights over natural resources also creates problems—the titling of agricultural land may have other, adverse environmental effects if positive externalities attached to land or to specific land uses are not taken into account. Therefore, for land titling to be environmentally beneficial, misleading signals must be corrected. Today we know much about environmentally detrimental incentives in developing countries, particularly in the realm of agricultural and forestry policies. Input subsidies, depressed output prices, environmentally damaging land tax policies (rewarding large landowners for leaving their land idle, for example) all require reform. Sometimes regulatory interventions may be needed, such as agro-ecological zoning to protect fragile lands with protective functions, or the banning of specific land uses.

All of these issues—environmental policy, agricultural policy reform, the role of the state, land reform, institutional development, enabling environment—place this discussion right in the middle of the general debate on sustainable development. Clearly, land titling for land conservation must be integrated in a coherent strategy of sustainable development, of which it is but one element.

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