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Institutional Dynamics:
The Evolution and Dissolution of
Common-Pool Resource Management

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INSTITUTIONAL DYNAMICS: THE EVOLUTION AND DISSOLUTION OF
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SECTION I: INTRODUCTION

Institutional arrangements for the management of common-pool resources are created and evolve in particular settings. A full understanding of the evolution and survival of such arrangements thus requires dynamic analysis of case studies. The framework presented in Oakerson (1986) may be applied recursively to examine dynamic sequences of change. Thus responses to exogenous shocks in one period become part of the existing set of institutional arrangements in the next, affecting the subsequent path of evolution in institutional arrangements.

The dynamic sequences of change in the management of forest resources in Niger (1884-1984) and land resources in Thailand (1850-1980) are the theme of the paper. By applying the model in Oakerson (1986) iteratively, changes in both individual strategies and decision-making arrangements may be made endogenous. The approach is applied at both the local and supra-local levels.

In both cases exogenous changes in population and market opportunities combined to make the common-pool resource more valuable.

The response to growing scarcity was the search for new arrangements to more effectively manage the resource.

In each case the behavior of the state was important in affecting the choice of new arrangements. In the Niger case, especially in the colonial period, the lack of accountability of the government to constituencies of resource users meant that new socially inefficient arrangements could be maintained. In Thailand in spite of the general lack of democratic forms of government, indigenous regimes provided new arrangements which better served the interests of the resource users. The key difference between the two cases is, however, not merely the type of regime and degree of its accountability to those whom it governed. Elite Thai decision makers shared in the gains created by the provision of the new property relations. Their interests affected the innovation possibilities.

Given the existing constitutional structures in each case, basic changes in institutional arrangements relevant to resource management required action by the central government. The local arena is, however, also important in shaping the interpretation, enforcement, and operational meaning of the new and existing arrangements. In the Zinder (Niger) Woodstock case extra-legal arrangements are becoming increasingly relevant as well. In the Thai case traditional patterns of the exploitation of land resources were retained in spite of the lack of official sanction and eventually legal compromises were introduced which served to officially recognize actual practices. Formerly extra-legal arrangements were officially sanctioned.

The changes in institutional arrangements occurred within and were linked to the ongoing evolution in the system of resource exploitation. The evolution of each system will be briefly described.

In the Zinder Woodstock, case, during the first half century of relative abundance (1884-1935), the Woodstock was subdivided on a de facto basis into the following parts:

1. a series of small local common properties around settled areas;
2. an undifferentiated common property resource composed of all remaining undeveloped bushland; and,
3. a de jure statewide commons for one tree, Acacia albida. This species is justly renowned and protected for its agroforestry properties (Pelisser 1979; Weber and Hoskins 1983, 9-15).

At the beginning of the 40-year period of rough equilibrium (1935-1974), colonial legislation imposed a de jure common property status on the 15 most valuable tree species (including A. albida). Management authority was centralized for the protected species at the colony level. A small force of forest guards, assisted by local informers, was established by the colony to enforce these rules in rural areas. But enforcers were so few as to be relatively ineffectual in those places they did patrol. In other areas, the forest service simply did not make its presence felt. Non-protected (rough) species remained a common property resource, management of which was left to evolve in light of local concerns. Given extensive undeveloped bushland in the immediate vicinity, few residents of the Zinder area

perceived any real scarcity of wood, or any real reason for Woodstock management.

In the final 10-year stage of relative scarcity (1974-1984), the 15-species common property remained a state concern and off limits to unauthorized users. In consequence, rough species were nearly destroyed, and pressure, generated by the demands of a growing population, mounted on protected species. An attempt to organize common property village woodlots failed, because the technical forestry package was inadequate, commons regulations remained inchoate, and rules governing management were never specified. Though it is fair to suppose more elaborate common Woodstock management regulations might have arisen as local people perceived wood shortages, such rules were not developed because the post-independence state maintained the preemption and centralization of management authority. One result has been the recent emergence of individual attempts by peasants to assert personal rights in the trees growing on their own land.

In the Thai case, the development of a reliable market for surplus paddy production in the 19th century made land valuable. As a result disputes over land ownership became endemic, inducing a series of innovations in institutional arrangements resulting in the privatization of arable land in Thailand. Ultimately in the early 20th century a cadastral survey land titling system was established through national legislation. This law was the culmination of successive attempts to reduce or resolve land disputes.

For land rights in Thailand, neither jointness nor excludability posed prohibitive problems, given the fixed, immovable character of

land and the technology available for excluding others, as well as for exploiting it. Divisibility posed no theoretical problem, but was the heart of the issue in efforts to firm up land titles to parts of the original commons as rice cultivation spread in response to world market demand.

Pressure for privatization was the result in both the Zinder and the Thai cases. It should be stressed, however, that in the Zinder Woodstock case, privatization by peasants is far from a foregone conclusion. Effective subdivision of the Woodstock commons into discrete, individually-controlled units remains legally impossible and highly problematic today. In the Thai case, continued management of land as a common property resource was improbable, given the combination of factors at work. The world market impact on the local economy during the 19th century stimulated the replacement of usufruct cultivation with intensive exploitation of private arable land.

In addition to examining each of the case studies within the Oakerson framework, the Thai case is explicitly (and the Zinder case is implicitly) analyzed in a simple supply and demand model of institutional change.

In the supply and demand model, the demand for institutional change arises when some gain cannot be captured under existing institutional arrangements.¹ Changes in relative factor or product prices, changes in the size of markets, changes in technology, and changes in the fundamental decision rules of government are among the important variables that create disequilibria in the existing institutional arrangements. Whether change will occur depends, however, on the

supply of institutional change—the willingness and capability of the fundamental institutions of government to provide/permit new arrangements. The capability depends in part on the cost of institutional innovation which in turn depends in part on the stock of existing knowledge on the design and operation of institutions. The willingness to provide new arrangements also importantly depends on the private benefits and costs of providing change to the agents who are in a position to do so, the elite decision-makers of government. Thus the existing set of institutions and initial distribution of power will have an important impact on the kinds of new institutional arrangements which are supplied.

Institutional change then arises through the interactions of the demand for and supply of change in dynamic sequences. The institutional response in one period becomes part of the initial conditions in the next, thus affecting the subsequent path of change.

Institutional innovations in both Zinder and Thailand contrast with those reported by McKean in her analysis of Japanese woodlots. In Zinder the French colonial state sought to impose a commons management. Because management was so ineffective, peasants have recently attempted informal privatization. By contrast, in Thailand the state, major landholders, and peasants all pressured for privatization. In the Japanese case, local village decision-making authority and tradition facilitated continuing effective local management of the village's common woodlot despite changing circumstances, for more than three centuries. Although in the Thai and Zinder cases, new rules to exclude potential users of the resource were

officially adopted (Thailand) or attempted on a de facto basis (Zinder), in the Japanese woodlot case the rules governing inclusion in the group of those who had rights to use the commons were instead retained and refined.

SECTION II: WOODSTOCK MANAGEMENT IN THE SAHEL

In the arid West African Sahel, around Zinder, Niger, changing patterns of Woodstock management illustrate institutional evolution as population pressure mounted, supply and demand conditions for wood as a renewable resource changed and excess demand emerged, and various actors attempted to deal with the problem.

Before Woodstock abundance gave way to scarcity in the Zinder area, trees were managed "passively." People simply allowed natural regeneration to reclaim fallowed fields. Though their usefulness was recognized, trees were generally taken for granted because supplies more than met demand. Trees on village lands (typically one to two square miles in all) were apparently dealt with as a common property resource, but access and use rules were probably very loose given the abundance of wood at that time.

As colonial foresters perceived wood scarcities elsewhere in the French West African empire, an important part of the Woodstock was declared by colonial government fiat to be a common property resource, subject to management at the colony level. This imposed management system has since proven to be largely ineffective, and Woodstock capital is under increasingly serious threat.

As a consequence of institutional stalemates within the forest service and the national government, some peasants are now moving, often by formally illegal means, to privatize parts of the Woodstock. For them, this now appears to be the cheapest option to preserve dwindling wood supplies against complete destruction.

On the basis of Woodstock supply and demand relations, the century can be divided into three distinct periods:

1. relative abundance - 1884-1935
2. equilibrium - 1935-1974
3. increasing scarcity - 1974-1984.

SECTION II.1: RELATIVE ABUNDANCE, 1884-1935

Resource Attributes

The physical attributes of the resource and techniques for controlling and exploiting it remained roughly constant throughout the three periods. The full description provided here will thus not be repeated for the two later periods. The local Woodstock is clearly a renewable resource, composed of all the woody vegetation in the area (Thomson 1983, 167-71). It can be exploited on a sustained-yield basis by various users for different purposes, so long as demand does not cut into Woodstock capital and impair the process of efficient renewal. The limiting condition here on joint use is set by the productive

capacity of a given Woodstock. This capacity may be gradually enriched; it may also be impaired by overcutting.

Exclusion is feasible, unless patrols are mounted (which they have not been), only within an area which can be enclosed by traditional fences. Such areas will usually be of limited size because thorn fences require substantial investment of labor. The Bugaje agro-silvo-pastoral communities are exceptional in that they collectively invested in fencing. Each community was subdivided into a variable number of quarters or sections, organized over time as new groups arrived in a village and took up land. Within each quarter, families resided on their own fields. Each family managed its land as a separate enterprise. But the residents of each quarter jointly maintained a common fencing system which separated all the quarter's fields from its fallows (Nicholas 1962; Thomson 1976, 261-64).

Decision-making Arrangements

Rules and institutions governing Woodstock use during this initial period of excess supply were appropriately simple. People planted and owned privately at least two tree species, the baobab (Adansonia digitata) and the date palm (Phoenix dactylifera), because they produced valued foods. A third species, Acacia albida (Hausa: gawo, pl. gawuna) was protected by the fiat ruling of Tenimun, sultan of Damagaram from 1851-1885. This tree has long been prized and selectively cultured in many Sahelian arable areas. It fertilizes the

soil, recycling leached nutrients. It also fixes nitrogen and facilitates cereal crop up-take of phosphorus (National Academy of Sciences 1983, 13). Tenimun reportedly had those who cut the gawo put to death (Salifou 1971, 7).

All other tree species formed an open access resource which anyone was at liberty to exploit. Trees were relatively plentiful during that period (Thomson 1983, 169-71). People viewed them more as a nuisance to cultivation than as a valuable good, even though they recognized that leaf litter and wood ashes sharply improved soil fertility.

The Woodstock could have been subdivided by allocating discrete portions to individual owners of land where trees grow but this was never done. This would have modified traditional rules, which instead separated land tenure from tree tenure, and permitted overlapping property rights and different systems of effective control of land and Woodstock resources within the same piece of real property. As noted, some peasants are now trying, a century later, to effect this change. During the period of relative abundance, however, divisibility remained a moot point because wood was freely available and off-field supplies more than met demand.

Interactions

The interactions which resulted remained largely non-conflictual because different demands for the good were not yet competitive (supply exceeded demand). Indeed, the only time when use rules might have

resulted in conflict involved the Zinder sultan's fiat ruling against cutting Acacia albida. It is not clear from available data whether people generally accepted the sultan's assertion of authority in this matter as legitimate. At the end of the period, which came midway through the colonial era (1899-1960), wood was still plentiful. Much unexploited bushland still existed in the Zinder area. People continued to found new hamlets in unsettled regions.

Outcomes

Interactions changed little. The dynamics of wood production and consumption appear to have varied little during the entire period. We have no information about the extent to which cutting of gawo seedlings was policed and punished under the pre-colonial regime. Under the early colonial government, presumably little would have been done along those lines. The impact of consistent population growth was yet to be felt. In this case, the supply of forest products generated by passive management of the Zinder-area Woodstock (regular following after brief periods of extensive cultivation, plus large areas of uncultivated bush) covered demand. The need for active management of a renewable resource was not yet perceived by local residents.

SECTION II.2: EQUILIBRIUM, 1935-1974

Attributes of the Resource

During the first half of this 40-year period, Woodstock users still did not interfere with each other in exploiting the common property. Demand could still be satisfied. Nor did exclusion conditions change: barbed wire appeared in the area only after 1960, and then only in small amounts financed by foreign donors. The Woodstock was potentially divisible, but economic considerations militated against division. Demand for wood did not yet justify the investment in fencing or patrols to enforce exclusion. In most of the Zinder hinterland, wood was not sold until well into the 1960s.

Decision-making Arrangements

Existing legal (forestry code rules) and political constraints, which might have hindered subdivision by individuals, were not tested at this point. Somewhat larger units, based on either quarters or villages, might have served as appropriate levels at which to devise common resource management efforts when scarcity became apparent toward the end of the period, if state-imposed rules emasculating local organization had been relaxed. As it happened, most villages had lost their power of independent activity as the result of colonial, and then independent regime efforts to establish controls over major forms of

organization in rural areas. Villages (or quarters within them) had no authority to enforce sanctions against violators of locally-devised use rules. In practice, few such rules appear to have been made.

The year 1935 saw the founding of the French West Africa forest service, charged with overall responsibility for managing the Woodstock. A few French tropical foresters had concluded that deforestation trends then becoming apparent, if unchecked, would threaten and perhaps destroy the resource. In accord with the metropolitan French forestry tradition, which vested in the forestry department relatively extensive controls over the exploitation of the Woodstock outside national domain lands, the colonial legislation simply arrogated to the colonial regime authority to regulate wood use in the colonies. Because colonial subjects--the vast majority of the population in the Sahelian colonies--had at the time no effective political or legal recourse against these centralizing initiatives, and little power to force colonial officials to take account of local conditions, individual rules included in the French West African Imperial forestry code reflected precious little sense of the realities of local agricultural production and Woodstock management systems. Small forestry agencies were set up by French administrators in each colony to implement central policies elaborated through a bureaucratic process and imposed through the colonial administrative hierarchy.

This legislation defined far-reaching changes in the regulation of Woodstock use. First, it provided for creation of state forests, subject to exclusive forest service control concerning Woodstock and land use.

Second, and much more important, this legislation centralized in the forestry service the authority to regulate the exploitation of the 15 most valuable species of trees outside, as well as inside, the state forests. New regulations prohibited cutting live specimens, or lopping branches above the height of 10 feet without an authorization (provided free by the forestry service if trees were destined for personal use) or a cutting permit (sold to the holder if the wood was to be harvested for sale). Other provisions of the forestry code left intact local customary rights to exploit non-protected species.

This restructuring of controls on Woodstock exploitation amounted, on one level, to a simple broadening of the prerogative to protect valuable trees first asserted in the area by the pre-colonial sultan Tenimun. Those who wrote the code provisions clearly foresaw the day when wood would become a scarce and valued commodity. They sought to set up rules to reduce consumption, or at least shift demand from valuable to rough tree species.

On another level, however, the French West African imperial forestry code formalized control over the commons. The French code removed, or drastically restricted, what had hitherto been fairly broad local-level discretion in dealing with Woodstock management. While little, if anything, had been done along these lines before 1935 because wood was plentiful, the option of developing local management solutions presumably existed before forestry code legislation eliminated the prerogative. As a result of the forestry code, devising new local political solutions to management problems became a much more difficult and expensive process. While most regulations outlined above

were sporadically enforced at best, villagers recognized foresters' authority to control Woodstock use. Very few if any attempted to establish alternative controls on access and use. The independent state of Niger inherited and maintained the common property framework institutionalized in the forestry code imposed by the French.

Interactions

With the creation of the forestry code, and the formalized, colony-level commons, a whole new series of interactions gradually arose. Nothing changed until the forestry service managed to patrol an area. Once it did, and forest guards began to impose fines, new patterns of behavior arose. As a result peasants may have left more trees on fields than they otherwise would have. However, aware they would not subsequently be allowed to cut protected species without special forester-issued authorizations, they may have done a more systematic job of surreptitiously destroying seedlings.

As pressure mounted, some who feared fines for harvesting live trees on their own land, because they would be blamed for any trees illegally felled on their fields, cut the wood they needed in remaining areas of bush. Some cut surreptitiously on others' land. In the early years after independence, a landowner who found someone cutting on his property began to warn the culprit that he would reveal the violator's name to the forest guards. The landowner was willing to reveal the violator's names to avoid being fined by the forest guards.

To assist with identification of code violators, foresters hired local informants. Often these men were traditional policemen attached to canton chiefs. Peasants soon realized they could bribe the informants to steer a touring forester away from a fresh stump. A number of people adopted this strategy, calculating that it would in most cases be far cheaper to bribe than to pay the fine.

A new interaction may be noted: peasants who were caught by a forest guard did what they could to reduce the fine. This appeared to local people as a process of bribe bargaining, because almost all were illiterate and few knew what actually became of the money. In any case, few receipts were issued by enforcing officers (Thomson 1977, 64-71). It is highly likely that most forest guards profited illegally from their power to fine forestry code violators.

Because they perceived no need, people planted very few trees until at least the mid-1960s. At most, some planted in courtyards or gardens, where trees could be protected against animal and human damage. In courtyards, some planted shade trees; in gardens, fruit trees such as mangos, guavas, and date palms usually predominated. But none planted trees in fields or did very much to preserve natural-regeneration seedlings there. Because others might cut without permission what fieldowners planted or protected, investments in future Woodstock supply made little sense. This did not eliminate the potential for investments to renew the Woodstock once available wood supplies no longer met demand, or perhaps even earlier, when shortages began to appear. But the new rules of the game made investments in augmenting the stock of trees much more problematic.

This is particularly unfortunate when silvo-agriculturalists would willingly preserve certain seedlings on their fields to fertilize soils and improve harvests if they felt confident they could trim, lop, or cut trees as needed. Such is not the case however. Farmers unwilling to risk trees eventually overshadowing crops, or attracting birds which would destroy ripening millet and sorghum, will simply eradicate seedlings rather than leave themselves with no recourse if they end up with too many trees on their fields.

Limited questionnaire data from the area (Thomson 1982) and in-depth interviews during 1971-72 strongly suggest that most landowners accepted the proposition that foresters control the use of trees on lands villagers own and farm. This division of authority over the two resources which reflects traditional land and tree property rules in some African areas means that they will not often be managed as an integrated renewable unit.

Outcomes

Up until the very end of this intermediate period of relative equilibrium between the supply and demand for Woodstock products, the patterns of resource exploitation and mismanagement which flowed from the structure of decision-making arrangements had little direct effect on peoples' lives in the Zinder area, in either equity or distributional terms. The price of wood did begin to rise slowly in Zinder, the regional center, and a firewood market arose in some rural

settings, supplementing the existing markets in building poles. But shortages did not really appear in the rural area surrounding Zinder. Furthermore, people did not really see the Woodstock destruction caused by their actions, whether through direct cutting of mature trees, or deliberate destruction of seedlings.

SECTION II.3: RELATIVE SCARCITY, 1974-84

The landscape has changed somewhat since the early 1960s, but few places are totally cleared of trees. Instead, one still finds rather impressive stands of A. albida (gawo), in particular, and in scattered, interspersed sites, other protected and rough species. Everywhere the scrub bushes Guira senegalensis and Combretum micranthum appear, apparently indestructible and forever a part of cultivated fields.

Resource Attributes

In general, the limits of jointness have been reached throughout the Zinder area. Few indeed are the places where everyone can find the wood they need. Instead, each person's harvesting reduces the amount available for other people, increases the time they spend harvesting, and adds to the general over-exploitation of the Woodstock.

Exclusion through fencing remains largely impossible, because neither foreign nor adequate local materials are available at

reasonable cost. Those who use branches from protected thorn trees (A. albida, A. Senegal, A. scorpioides, etc.) risk fines at the hands of roving forest guards.

In a few special situations the resource can in fact be subdivided, e.g., through garden and compound enclosures. Such plantings have increased recently. Fenced village woodlots have also been created in some communities since 1974, as a matter of state policy, through foreign-financed projects.

Decision-making Arrangements

The introduction by the central government and donor organizations of common property village woodlots on a trial basis, beginning in 1974 in the Zinder area, changed, ever so slightly, the character of rules governing Woodstock exploitation. The new system involved for the small one-to-four hectare plots fenced with foreign assistance-financed barbed wire, the creation of a new set of formal and working rules. The land for woodlots was "donated" by villagers. Often the burden fell on the village headman, as the individual possessing the most land, and thus best able to bear the loss of cropland or fallow "for the common good."

Formal rules specified by foresters supervising implementation of these projects were minimal: within the project context, village volunteers, in exchange for token wage payments (equivalent to about half the then daily rate for field labor), were to clear land, fence

the plot, excavate planting holes and plant seedlings (mainly exotic neem and eucalyptus, poorly adapted to plantation forestry under local arid conditions). They were then to cultivate peanuts or other leguminous food crops (to insure weeds would not smother the newly planted tree seedlings) and generally watch over the plot.

No formal agreement defined the system of distribution. Forest guards who supervised creation of the woodlots asserted that the lots were "for the villagers" and the wood produced there "belongs to the villagers." Villagers remained skeptical about these statements. Many assumed the woodlots really belonged to the government or to the forest service, which they feared would claim the wood when it wanted to, without further compensation for villagers' efforts (Thomson 1980).

As far as the rest of the woodstock was concerned, common property rules remain unchanged. The forestry code, as interpreted by local forest guards, still provides for centralized control over use of protected species. Remaining rough species are exploited subject to local use regulations, often highly informal in nature.

Interactions

Because villagers conclude that the new woodlots will benefit the government, not them, their strategy is simply to minimize inputs. In most cases they kill off seedlings by benign neglect: when the fence collapses, or when animals work through it, they do nothing to protect trees. Most trees die quite quickly, if not from overbrowsing, then from drought.

As far as protected species go, little has changed from earlier periods, although in some villages, illegal use of wood growing on others¹ fields may have increased. In any case, many villagers are beginning to perceive the growing wood shortage.

Some react as usual, allowing the cutting to occur because they feel that the trees do not belong to them. A second class of landowners, frightened about fines, try either to stop illegal cutting on their land or to identify responsible parties so they would be able to escape paying unjust fines by naming the real violators. Finally, some individuals have begun to defend the trees on their fields when they have the chance, simply by chasing off would-be cutters and asserting a personal right to the trees by virtue of ownership of land on which they grow.²

Within this smaller group of individuals intent on changing the previously accepted local working rules of wood use, some take cases to village moots, or before canton chiefs. To prevent destruction of trees on their fields, others stand up to cutters authorized by the forestry service to harvest wood for commercial use. In neighboring areas, individual field owners have begun to take authorized woodcutters before the arrondissement forester, to inquire why the latter allow cutters to chop down trees on their fields. The foresters generally reply they never authorize cutting trees on fields, but only in the bush. But the bush has for all practical purposes been destroyed throughout the Zinder area.

Around Zinder, some field owners have begun during this period to make use of the Qur'an, considered for this purpose to be a magical

fetish, in order to identify timber poachers and wood stealers, and force return of their property. A few even go so far as to place a future Qur'anic prohibition on all unauthorized harvesting of wood on their fields by other individuals, despite the fact that this conflicts with recent national-level prohibitions on such use of the Qur'an.

The village woodlots, as presently organized, are a fatally flawed experiment in commons management. Those who established them failed to address the most fundamental concerns of putative producer-users: they gave no effective guarantees of property rights to the latter, nor did they provide any information about distribution of trees or wood produced. Users legitimately concluded they would derive no or at best little benefit.

Attempts by individuals to police wood on fields, and thus in effect to establish private property rights over those trees, represent efforts to parcel out the commons. It is not yet clear what these efforts will produce, if anything, by way of code changes.

Outcomes

State-organized attempts to reforest through a program of village woodlots have demonstrated once again to Zinder-area villagers that such efforts will not help them, at least as presently organized. They remain highly suspicious of both the technical feasibility of woodlots and eventual distribution of any wood produced. For villagers, collective woodlots amount to a losing proposition unless they receive

pay equivalent or better to the going rate for field labor for the time they put in.

As for the rest of the Woodstock, investment possibilities are stalemated. This leaves everyone worse off, because reduction of the Woodstock increases the risk of soil erosion and reduces the likelihood that soil fertility will be reconstituted through natural regeneration. As people press relentlessly on the remaining trees, the costs of fuel and building materials rise rapidly. At the same time, women use more and more animal droppings and crop residues for cooking fuel. The supply of organic matter available to restore soil fertility has dropped off sharply. Failure to increase wood supply to keep pace with rising demand in turn translates into a significant lowering of living standards in Zinder rural areas.

SECTION III: DEVELOPMENT OF PROPERTY RIGHTS IN LAND IN THAILAND

Among the Western developed nations there is a centuries-old tradition of well-defined and enforceable private property rights in land that allow the owner to exclude others from using the land, pass it on to his/her heirs, pledge it as security against financial liabilities, and within limits (set for instance by zoning regulations) use the land as he sees fit. That system of property rights took centuries to develop and is still evolving.

Comparable systems in much of the less developed world today are usually of more recent origin. In many countries during much of the

19th century (and more recently in some cases), the rights to land were usufruct rights. With the rise of commercial agriculture, this system of property rights often proved to be inadequate. Some of the inadequacies were a consequence of the common property nature of the usufruct land rights. Because in a usufruct system land rights were use rights and did not apply to the stock, the individual user had an incentive to take the flow of services from the use of the renewable resource into account over a shorter planning horizon than he would if his property rights extended to the stock, the ownership of the resource itself. Because of the temporal insecurity of land rights, cultivators had an incentive to overuse the resource because if they took the effects on the future resource service flow into account they could not be sure that they would be able to capture the gains from stinting.

Commercial agriculture and more profitable opportunities for the sale of the produce from farming the land were generally associated with a rise in the value of land and increase in the rate of return on land clearing and development activities. Because of the development of a reliable market for output in excess of subsistence production, the clearing of additional land and investments in leveling, draining, and otherwise developing the land became more attractive. In order to fully capture the gains from the investments as well as the capital gains from the appreciation in relative land values, the land developer needed a mechanism whereby he could exclude others from using or taking possession of the land. Under a usufruct rights system the ability to exclude was contingent on nearly continuous use. Such use conflicted

in some cases with the fallow-rotation system that was used to maintain soil fertility.³ The developer might also want to capture some of the gains by using his land as collateral—an unattractive option to a creditor wanting security if the ownership rights were conditional on continued use by the debtor. Because land often became open-access property once it was left idle for a period of time, the common property aspect of the system created disincentives for the socially optimal level of investments in land development during a period in which, setting aside the prevailing property rights system, the economic returns on those investments were in fact increasing.

The generalized case described above applies to a number of Asian and African countries during the 19th and 20th centuries. The specific changes in the decision-making arrangements and interactions among the parties that occurred in Thailand will now be described as a case study.

In Thailand the opening of the economy to increased participation in international trade, population growth, and generally favorable terms of trade for agricultural export products led to an appreciation in land prices (see Table 1). For the 19th century period, there are numerous accounts indicating that the expansion of the rice-export economy was accompanied by an appreciation in real land rents and prices (see Feeny, 1982). For the 20th century period, the qualitative and fragmentary quantitative evidence is supplemented by data on land prices derived from mortgage transactions. The data again document the overall appreciation in real land prices and reveal a pattern in which appreciations in the terms of trade are accompanied by an upward trend in real land prices (for a discussion of a simple general equilibrium

TABLE 1 Economic Change in Thailand, 1860 to 1942

Average Annual Percent Rate of Change

<u>Period</u>	<u>Terms of Trade</u>		<u>Period</u>	<u>Real Land Price</u>	<u>Period</u>	<u>Rice Exports</u>		<u>Period</u>	<u>Population</u>
	(1) ^a	(2) ^b				<u>Quantity</u>	<u>Value</u>		
			(3) ^c		(4)	(5)		(6)	
1865-67 to 1912	1.41	1.55			1864-1910	4.43	5.64	1860-1910	0.85
1912-1925	-3.39	-1.92	1915-1925	-0.31	1910-1925	1.78	4.14	1910-1942	2.08
1925-1940	6.31	6.69	1925-1940	2.58	1925-1940	-0.85	-3.80		
1865-67 to 1940	1.52	1.95	1915-1940	1.41	1864-1940	2.84	3.41	1860-1942	1.33

^aExport price of rice divided by import price of white shirting.

^bExport price of rice divided by import price of grey shirting.

^cLand price deflated by price of rice; similar trends are revealed when the land price is deflated by the price of manufactured goods.

Source: Feeny (1982), pages 17, 20, 21, 33, 127-131.

TABLE 1 Economic Change in Thailand, 1860 to 1942

model which generates this prediction, see Feeny, 1982). The increasing value of land in turn led to disputes over land ownership which induced changes in the property rights system, ultimately culminating in the privatization of land rights. The major changes in the system of land rights are summarized in Table 2.

Under early 19th century monarchy, the system of property rights in land in Thailand was essentially one of usufruct rights. As long as the cultivator continued to use the land, he (or she) had the right to exclude others from using it, to sell it, to pass it on to heirs, or to use it as collateral to obtain a loan.⁴ The maintenance of the rights depended on the payment of land taxes. In addition, if the land was not cultivated for more than three consecutive years, rights were forfeited. Operational rules thus provided for serial jointness.

The provisions created temporal uncertainty in the security of the usufruct land rights in Thailand. Insecurity of long-term rights were especially of concern to homesteaders who wanted to be sure that they could reap the gains of having cleared the land for cultivation. In a monsoonal rain-fed agricultural system, land use was not always predictable and any lapse in use could be preyed upon by acquisitive neighbors and officials.

Over the first half of the 19th century, there was a gradual increase in the degree of commercialization of the Thai economy.⁵ As a consequence jointness became more problematic. During the fourth reign (1851-1868) land rights were made more formal through the issuance of title deeds based on paddy land tax receipts, a change in operational rules. In 1867-68 titles for paddy land for which the tax

TABLE 2 MAJOR CHANGES IN THE THAI SYSTEM OF PROPERTY RIGHTS IN LAND,
1850-1954

Period	Institutional Change
Early Nineteenth Century	Usufruct rights, existing system
1867-1868	Title deeds issued based on the area harvested
1882-1883	Title deeds issued based on the area owned
1880s	Standardized forms and procedures prescribed in an effort to reduce land disputes
1892	Comprehensive land law enacted with provision for title deeds and use of land as collateral
1901	Torrens system of land registration instituted and cadastral surveys conducted
1936	1901 law amended to allow for ownership based on registration with the Land Department of claims on unsurveyed lands
1954	New land law enacted providing for a variety of documents and levels of security of land rights

Source: Feeny (1984).

was based on the area harvested were introduced. In 1882-1883 for some major Central Plain rice producing provinces, titles based on the area owned rather than harvested were introduced. Thus, by paying taxes on land not currently in use, ownership rights could be maintained.

Titles could be obtained by presenting to officials the tax receipts for the previous 10 years. Documents were also available to give

cultivators of newly cleared areas the rights to exclude others from developing the land for three years, at which time rights were forfeited if the area had not been developed.

The appreciation of land prices continued and inadequacies in the property rights system became apparent. Frequent land disputes occurred. Conflicts over ownership of the same piece of land became endemic. During the 1880s the government responded by issuing standard forms and prescribing standardized procedures. Although the administrative changes represented improvements, the lack of a central place for land records meant that more than one set of titles could be issued for the same piece of land. With increased commercialization disputes became increasingly frequent.

The response was another change in operational rules, the passage of a more comprehensive land law in 1892. It created nine types of land, including land held by religious institutions, royal land, residential land, agricultural land, land used for mining, forest and jungle land, and waterway land. The agricultural land category included three types of orchards and gardens, upland land, two types of paddy land, and garden lands. Provisions were made for transferable title deeds which could be used as collateral and there were documents and procedures for the registration of such transactions. Homesteading provisions were included as well as procedures for converting old documents into the newly created ones. The 1892 land law replaced the earlier rather ad hoc system with a more comprehensive one.

However, major deficiencies in the legislation and its administration remained. The continued lack of central land title offices and precise descriptions of the boundaries of the land in question meant that disputes over ownership could not be easily resolved and land could not be unambiguously identified. These problems became very conspicuous in the Rangsit area (to the northeast of Bangkok, a major commercial rice exporting region in the Central Plain) during the boom of the 1890s when a number of very bitter land disputes arose. Confictual interactions dominated once the limits of jointness had been reached. As a result, the Royal Survey Department was diverted from its work on mapping and in 1896 began cadastral surveys, initially concentrating on the Rangsit area but later expanding into most of the major rice exporting areas in the Central Plain.

In 1901 a new set of operational rules were formally introduced; the Torrens systems of land titling with central provincial land record offices and cadastral surveys was formally adopted. From 1901 to 1909, 11 land record offices were established. By 1909-10, 593,069 title deeds had been issued in the Central Plain (637,001 for the whole kingdom), and the area surveyed was 1,605,000 ha (1,671,000 ha for the whole kingdom). The work was carried out by European experts (mainly on loan from the Indian Civil Service) who, in addition to conducting the survey work, also provided training to the Thai staff.⁶

The system was incompletely realized. A lack of diligent record keeping and administration reduced the benefits. Not all farmers obtained or were able to obtain the proper documents for land which they held. Areas outside the Central Plain were especially incompletely served by cadastral surveys.⁷

In 1936 the 1901 law was amended to allow for the registration of claims on unsurveyed land. While claims on apparently unclaimed lands were traditionally registered with the village headman, the 1936 law required registration at the Land Department. The 1936 law represented a compromise between the elaborate European cadastral survey system of the 1901 law and the incomplete implementation of that system. The compromise was extended in 1954 when a new comprehensive land law was enacted. It provided for a variety of land documents that give different levels of security of land rights. Occupation certificates are issued by village headman and commune leaders and allow the holder to temporarily exclude others from using land as long as it is being developed. Reserve licenses issued by district officers also give rights for temporary occupation subject to utilization. Exploitation testimonials (again issued by district officers) confirm that utilization of previously reserved land has taken place and confer rights that are transferable and inheritable. Finally, full title deeds issued by cadastral survey and providing for the recording of land transactions are issued by officials in the provincial capital. Greater security in land rights thus comes at the expense of higher transaction cost (both formal and informal). The 1954 code is the basis of the current system of land rights in Thailand.

Even within the parameters of the compromise embodied in the 1954 code, the system is still incomplete. Ingram (1971) reports estimates for the late 1960s, of the area covered by three types of land documents. Only 12 percent of the area had full title deeds, 4 percent had reserve licenses, 18 percent had exploitation testimonials, and 65 percent had no formal legal documentation at all.⁹

The incomplete realization of the system of private property rights in Thailand, especially in upland areas, is creating disincentives that hinder efforts to intensify cultivation in the face of a rapidly shrinking land frontier. Recent World Bank reports have pointed to situations in which socially profitable investments in land development are being underexploited in favor of continued extensive cultivation systems such as swidden agriculture. The reason for the lack of intensification is often not that farmers are unaware of the higher rates of return on more intensive land development but that they lack the means to obtain secure property rights. Thus they make investments in land clearing that have only marginal returns and in the process contribute to soil erosion. During the first few years, however, the marginal returns exceed those initially available with more intensive modes of cultivation that require larger investments in land development. The outcome is clearly suboptimal from an efficiency point of view. Because these farmers are generally members of the lower income group in Thailand, equity is also not well served.

Disputes over conflicting claims to the same piece of land played an important role in stimulating the government to develop more systematic and elaborate systems of private land rights in Thailand. The creation and actual operation of that system also had distributional consequences. Although in general the pre-existing rights of cultivators and homesteaders were formally recognized under the new system, differential access to formal procedures and the ability of powerful government officials to manipulate land records did allow elites in some cases to obtain ownership of land which under the

traditional system would have been controlled by homesteading cultivators. A striking example of this occurred when the Siam Canals, Land and Irrigation Company successfully evicted 29 previous occupants in an area along the east bank of the Nakorn Nayok River to the northeast of the company's Rangsit development scheme. In reviewing the records of the dispute in 1916, Prince Rabi, the then Minister of Agriculture and former Minister of Justice, concluded that the courts had incorrectly found in favor of the company and its powerful investors. The previous occupants first brought their grievances before local administrative officials and after obtaining no satisfaction took their case before the court. They provided various certificates of occupancy and land tax receipts as evidence of their prior rights. The company had, however, been able to use its superior access to government officials and procedures to have the titles for the land issued in the company's name.¹⁰ Given the high level of political connections of the company and its allies, there was little that could be done in this case to protect the original occupants.

Although the outcome was in this case somewhat atypical, the process by which external arrangements and third-party dispute settlement were brought to bear was not. Initially disputants typically approached local administrative officials who attempted to resolve the dispute. As mentioned above, their ability to do so often depended upon the precision and accuracy of the land records; thus the evolution of more precise documentation and record-keeping systems. When disputes could not be settled at the district level because the parties were intractable or the records were incomplete or inaccurate

(whether through deliberate manipulation, carelessness, or negligence), the provincial courts were then employed to resolve the dispute.

Today, intra-familial manipulation of the system has allowed some heirs to gain at the expense of others.¹¹ The traditional system of equal inheritance by all surviving children is frequently subverted by more literate and knowledgeable siblings, resulting in a clash between the use of the modern system and traditional inheritance practices. The central government through its provincial courts has become increasingly involved in the adjudication of local disputes which in former times would have been settled by local officials.

The trend has two important implications. First, common people can use the court system to inhibit arbitrary behavior on the part of officials. This advantage, however, comes at the expense of a higher level of transaction cost than in the traditional system.

Conflicts in frontier areas today share many characteristics with those of the earlier period. First, conflicts have served to focus the attention of the Thai government on providing cadastral surveys. A recent World Bank project in Thailand is specifically aimed at extending the cadastral survey. Second, differential access of claimants in land disputes to the Thai bureaucracy, the imperfectly competitive political arena, has distributional consequences. We have already seen that, in the early 20th century period, elites were sometimes able to successfully manipulate the system. Similarly, today, especially along the mountain slopes in northern Thailand, ethnic Thais are often able to obtain legal claim to lands previously cleared and occupied by non-Thai minorities.¹²

In the Thai case, the appreciation of land prices led to an increase in the demand for a more systematic set of procedures for defining property rights in land. The government in fact responded to the demands and gradually a new system of property rights evolved. What factors contributed to the willingness and capability of the government to supply the institutional change?

In part the new system evolved as a practical solution to the land disputes that became so common as land became more valuable.¹³ The cost of supplying a new set of institutions was lowered by the availability of European systems and officials—by the existence of a stock of knowledge and practice on the organization of property rights in land. Over time that system was increasingly indigenized. The feasibility of creating private property rights in land in Thailand was enhanced by the concomitant development of a provincial court system. In 1892 the Ministry of Justice was created, in 1896 the Law of Provincial Courts was promulgated, and in 1908 the Law of Courts of Justice transferred control of the provincial court system from the Ministry of Interior to the Ministry of Justice.¹⁴ Both Thai officials and foreign experts were engaged in drafting modern civil and criminal codes. Although it has never been vigorously exploited in Thailand, a better cadastral system also gave the government an enhanced land tax revenue base. Finally, private and social interests coincided. Members of the elite, primarily government officials, participated in the land boom and benefited from the more secure system of property rights in land. They had an incentive to supply the new system because they too would share in the gains.

In the case study one can see that, given the initial common property nature of usufruct land rights and the growing incentive to exploit land resources for commercial agriculture, the existing set of decision-making arrangements generated sub-optimal outcomes. The existence of the unexploited gains and resulting land disputes fed back into the system producing a series of reasonable administrative changes. At first simple and inexpensive remedies were tried. When the outcomes were still far from satisfactory, more elaborate and expensive solutions were attempted. A new system of property rights evolved and is still evolving. In this case, a system of private property rights (even if less than ideally implemented) was the solution to the common property resource management problem. While manipulation of the property rights system by elites for their private gain occurred and continues to occur, in the majority of cases the new system provided more secure rights in arable land to the party who actually cleared and cultivated it. Ownership rights that did not depend on continued use and that were more precisely defined provided cultivators with the assurances necessary to make investments in land development privately profitable. In short, the new system of property rights reduced the divergence between the private and social rates of return on land development.

The discussion may be briefly summarized in the framework provided in Oakerson (1986).

Resource Attributes

Arable crop land lends itself to excludability; thus the creation of boundaries marking areas for exclusive private use was not prohibitively expensive. Arable land is also divisible. Finally, at low levels of population density, much arable land may be left idle. Jointness may be maintained sequentially.

Decision-making Arrangements

From the mid-19th century on, land rights and disputes were adjudicated under operational and legislative rules imposed by the Thai government on existing usufructory rights. Both local administration officials and the national government were involved in specifying and enforcing the rules governing land use. Over time local customary rules increasingly conformed to the national laws as interpreted through the provincial court system. The national laws, however, were also formally modified to reflect the lack of a complete cadastral survey and the long-standing Thai tradition of homesteading on unoccupied lands.

Interactions

Under the traditional usufruct system and in the environment of a largely subsistence economy with a low population density, there was

limited competition in land use—in the interactions among cultivators. The usufruct system allowed the cultivator to exclude others from using land currently in use. But given the abundance of land and limited outlets for surplus production, there was full jointness and/or little rivalry in the use of waste land.

As the property rights system gradually evolved, individuals made use of the new government-established institutional arrangements to enhance the security and precision of their land rights. Many people, influential and otherwise, shared in the gains. Differential access to the use of the institutional arrangements did, however, affect the outcomes in terms of who obtained land rights to various tracts of land in a minority of important cases.

Outcomes

The development of more secure property rights in land did, however, underwrite increased intensification in land use, greater investments in land development (the bunding and leveling of fields to promote the use of transplant varieties instead of the broadcast planting of paddy), and the increased use of land as collateral.

At another level, that of the system as a whole, the result was an evolution of institutional arrangements, changes in the rules through which individuals interacted. The outcome of the efforts of the landowners to more securely define their rights in land was a gradual evolution of new legislative rules and operational regulations resulting in the privatization of rights in arable land.

SECTION IV: CONCLUSIONS

From the two case studies, several propositions concerning the dynamics of common property management emerge. As Oakerson (1986) stresses, understanding the dynamics of institutional change involves assessing the opportunities for individuals to learn from the consequences of their actions. The recursive nature of the evolution of systems is evident in both cases. An understanding of change also requires examination of the ways in which existing institutional arrangements constrain or enhance the ability of individuals to make adjustments in the decision-making arrangements. In both the Thai and the Zinder cases, under existing constitutional structures, innovations in institutional arrangements designed to ameliorate common-pool resource management problems required action by central government. In both cases peasant farmers in general have limited access and influence in the political system and few instrumentalities of local government or local association. Nevertheless in the Thai case the demands of landowners for innovations in the property rights system were largely met. This appears to be due to the fact that elite and peasant interests largely overlapped on the issue of land rights.

In both cases, privatization of a common property resource makes sense because the costs of organizing collective management are extremely high and effectiveness of collective management problematic. Privatization does, however, risk inequality at the subdivision stage when control over the resource itself is allotted to particular individuals. If this is a one-time allocation, with no easy mechanisms

to rectify maldistribution, inequities can pose a serious problem. It should be noted that maintaining common property institutions in no way avoids equity problems. They are simply pushed back a step. They reappear when annual or other increments of production from the resource are harvested and distributed to users. Distribution rules specify who gets what, when, and how. The potential for inequity inherent in such regulations and practices is substantial.

Second, commons management depends on a situation of perceived scarcity; on the legal possibility, i.e., legal authority, to manage a resource, or at least the lack of a legal prohibition on local efforts to manage it; and some comparative advantage sustaining common property status for the resource rather than privatization, e.g., prohibitively expensive fencing which makes it reasonable to jointly hire a few guards to protect the resource for everyone.

Effective commons management depends on:

1. Local capacity to experiment with joint management forms as production-consumption relations deteriorate and resource shortages appear;
2. Low political and economic costs of collective organization to manage the commons.

In the Woodstock case, the state forester lives so far away from most users that they do not consider him a reasonable source of authorization. Besides, nothing guarantees he would consider it his duty to meet a demand in this sense. The national system of common Woodstock management thus failed and still fails to function.

Furthermore, Zinder-area villages have no authority for, and little tradition of, collective management of any kind of resource. The ethnic Hausa who inhabit this region tend to be highly individualistic in orientation, and show little interest in state-organized groups. Collective action groups which could be readily altered to effectively manage a commons just do not currently exist. Given the existing institutional arrangements and cultural norms, the transaction cost associated with collective management in this setting are high. Much the same can be said in the Thai case, also described as a setting in which highly individualistic behavior generally prevails. In such settings privatization may minimize transaction cost.

Thus, in Zinder illegal privatization efforts appear critical as indicators of a fundamental change in user perspective. From being producers for their own consumption only, the users in these cases have begun to become producers of wood for sale as well.

Third, population pressure, world or local market opportunities, and changing production technologies will influence the type of management structure local people will prefer. These trends shape the demand for new institutional arrangements.

Finally, effective decision-makers must perceive that organizing the management enterprise is worthwhile, i.e., that it will benefit them in a personal manner, either directly or indirectly. Incentive compatibility, the congruence of the interests of the individual decision-maker and of those affected by his decision, appears to be essential.

FOOTNOTES

¹The specific model employed here is described in more detail in Feeny (1982, 1984); see also Ruttan and Hayami (1984) and Hayami and Ruttan (1985).

²It should be noted that there is a long tradition in West Africa of a distinction between property rights in land and in the trees that grow on that land. In part the distinction may be a result of the fact that property rights in land were acquired through the investment of the labor necessary to clear the land and bring it under cultivation. Thus analogously the person who invested his labor in cutting a tree had acquired ownership in the wood, even if he did not own the land on which it was grown.

³Furnivall (1909) provides an example of the conflict between fallow-rotation systems and usufruct rights in lower Burma in the 19th century.

⁴In a usufruct system of land rights, the act of selling land transfers the use rights from the original user to a new party who in the process obtains the original holder's right to exclude third parties. In many instances, it is the investments in clearing the land that are being "sold." Thus, the purchase price compensates the original owner for improvements in the land.

⁵The trends in commercialization in the Thai economy over the 19th and 20th centuries are discussed in Ingram (1971) and Feeny (1982). Developments in the Thai property rights system are discussed in Feeny (1982, 1984).

⁶

After 1909 the Royal Survey Department was transferred back to its original mapping duties and the rate of increase in the surveyed area plunged. The number of title deeds on file (primarily in the Central Plain) did, however, continue to increase; the rate of increase of title deeds on file for the whole kingdom was 4.69 percent per year over the 1905-06 to 1941 period.

⁷After 1909 there were a number of minor changes made in the system. Administrative procedures were changed and fees were instituted on land transfers. Restrictions were placed on the sale of public lands in 1916 and 1919 with the intent of curbing land speculation. Finally, in 1938-39 a new schedule of agricultural land taxes was established.

⁸See Engel (1978, 156) and Yano (1968, 853 and 856).

⁹Ingram (1971, 266); see also Feeny (1982), Johnson (1969), Hooker (1975), Gisselquist (1976), Engel (1978), Kemp (1981), Yano (1968), and Chalermrath (1972). Reasons for the incomplete coverage include the lack of a complete cadastral survey as well as the unwillingness or inability of farmers to obtain formal documentation of their land rights. The overwhelming constraint appears to have been

the incomplete coverage of the cadastral survey supplied by the government.

¹⁰Primary documents relevant to this case are found in the Thai National Archives, Sixth Reign, Ministry of Agriculture Documents 5/1-5/12; see also Feeny (1982).

¹¹See Engel (1978).

¹²See Kunstadter, Chapman, and Sabhasri (1978).

¹³

Unfortunately archival and other records provide little evidence on the individual strategies employed among the competing parties involved in disputes over land use. Some of the limited available evidence is discussed in Engel (1978) and Feeny (1982); see also Kemp (1981), Chalermrath (1972), and Yano (1968).

¹⁴See Engel (1978, 24-29).

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