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Chapter 12

Forest conservation and development: the role of institutions

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Reflection on all the hard work that has been done over the years for forests and other species-rich habitats in the developing world is bound to induce a certain amount of frustration. Successes have been achieved in a number of settings. However, deforestation throughout the tropics continues at a very rapid pace. Clearly, the conservation strategies employed to date have not been entirely appropriate and effective.

Ideas about what can be done to save biodiverse habitats in the tropics have come and gone with great frequency, indeed. The first conservation efforts, some dating to the early twentieth century, involved replicating natural reserves of the North American or European kind in Africa, Asia, and Latin America. By the 1980s, the shortcomings of this approach had become all too apparent. As a rule, the under-funded park services of poor countries were finding it severely challenging to compel respect for park boundaries among local populations, which quite often had been evicted to create nature reserves in the first place. Escape from the predicament of 'paper parks' seemed to come in the form of integrated conservation and development projects (ICDPs), which are known in some places as initiatives for community-based natural resource management (CBNRM). These involve the promotion of economic activities that are environmentally sound as well as remunerative for local communities, quite often in buffer zones surrounding officially designated reserves. Almost from the beginning, the difficulties of designing and successfully implementing ICDPs were recognized.[1] With time, awareness of these difficulties has increased, so much so that at least some conservation organizations currently are demonstrating a keen interest in seeing what can be salvaged of the national park model.

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The scholarly literature has not always been a source of consistent guidance about solutions to tropical deforestation. For example, initial enthusiasm for ICDPs was fueled by a two-page article published in a prestigious scientific journal less than a year after Francisco ('Chico') Méndes, a union leader in the Brazilian Amazon who advocated using forests for the sustainable harvesting of rubber and other non-timber products, was murdered by two young cattle ranchers. The article described a case study, carried out in northeastern Peru, that appeared to demonstrate that environmentally sound extraction of non-timber products can be much more rewarding than either logging or clearing the forest to make way for crop and livestock production.[2] Although the case study's investigators acknowledged some of its limitations,[3] [4] the conclusion that 'without question, the sustainable exploitation of non-wood forest resources represents the most immediate and profitable method for integrating the use and conservation of Amazon forests'[5] strengthened the impulse that Méndes's murder had created for ICDPs during the late 1980s and early 1990s. Only with time was further research to reveal that the harvesting of non-timber products never has been very remunerative, at least for forest dwellers, and is unlikely to become so. Thus, it would be risky for the future of tropical forests to hinge on the promotion of this activity.[6]

No less than writings in other fields, the economic literature has been enlivened by active debate over the driving forces of tropical deforestation. This debate continues to this day, not even the firm conviction of the Brundtland Commission that rural poverty and environmental degradation are mutually reinforcing[7] having escaped critical scrutiny. It has been shown, for example, that the well-to-do (e.g., soybean farmers colonizing the Brazilian Amazon) sometimes are responsible for tropical deforestation; also, it is not unheard of for deforestation to occur as living standards rise in the countryside.[8]

If initiatives aimed at forest conservation are less successful than many would like these to be, it is not because unambiguous findings in the economic literature are being ignored. Such findings are few and far between, which is only to be expected because deforestation happens mainly for one reason here and for an entirely different reason there. That literature addresses various causes and, at the end of the day, offers no panacea. However, a recurring theme of economic analysis is institutional – the nature of individual or local control of forest resources, to be specific.

Property rights and resource development

For most economists, the case for strong property rights could hardly be more compelling. For one thing, the lack of formal ownership makes it impossible for land to be used as collateral for a loan. As a result, there is no access to the bank credit that often is needed to undertake land improvements, including the application of conservation measures. Furthermore, resource users who enjoy all the prerogatives of ownership avoid the sort of insecurity that impedes resource conservation, which usually yields returns only with the passage of time.

Statistical evidence that attenuated property rights help to accelerate the clearing of tree-covered land in the tropics has been accumulating for at least ten years. It has been found, for example, that agricultural colonists in the Amazonian lowlands of eastern Ecuador are especially likely to deforest parcels that have not been adjudicated.[9] One reason for doing so is to strengthen informal agricultural use rights, which predominate in the institutional vacuum that characterizes many agricultural frontiers. In a more recent study, a cause-and-effect relationship has been found between the lack of formal land tenure, on the one hand, and deforestation, on the other, in a cross section of tropical countries.[10]

The linkage between secure ownership and forest conservation should not be exaggerated. Research carried out in Brazil highlights the circumstances under which incentives for land-use conversion are overpowering, certainly more potent than the incentives to conserve forests that are reinforced as property rights in tree-covered land come to be universally respected. In particular, the returns to 'mining' an ecosystem, first by extracting timber and then by farming and ranching in a depletive fashion, greatly exceed the returns to ecosystem management in previously inaccessible areas where roads are being constructed and land is cheap.[11] Mining dominates management in these areas regardless of the ownership regime.[12]

It is also true that strengthening property rights does not eliminate all discrepancies between the interests of resource users and those of society as a whole. For example, even an agricultural colonist with secure property rights will neglect biodiversity loss and other environmental impacts of land-use conversion entirely. With environmental values not internalized, decisions about the replacement of forests with cropland or pasture will be based solely on clearing costs and the relative commercial returns of forestry and agriculture. This is a classic externality problem, or market failure.[13]

Something else to recognize about ownership is that its benefits are never achieved for free. To adjudicate and to enforce property rights, scarce talents and capacities for administration and policing are required. These talents and capacities are in particularly short supply in the tree-covered hinterlands of Africa, Asia, and Latin America. At an extreme, no attempt at all is made to establish property rights, which brings about a state of 'open access.' A resource owned by no one – that is, a resource that anyone can use in any way and at any time that he or she wishes – tends to be depleted. This is because any positive value of the resource (i.e., any difference between the value of whatever can be extracted, on the one hand, and extraction costs, on the other) comprises a clear signal to a competitive group of users to increase exploitation of the resource. Thus, exploitation increases up to the point where the value of the open-access resource is dissipated entirely. Examples of this outcome include excessive fishing on the high seas, where no sovereign nation has a claim, and excessive grazing of pastures that no one happens to own.

Between open access, at one extreme, and private properties owned by individual firms and people, at the other extreme, institutional options exist. Among these is common property – a form of resource tenure in which a group, not an individual agent, is the owner. This turns out to be a ubiquitous arrangement in the forests of Africa, Asia, and Latin America.

The common property option

From a purely economic standpoint, common property, like any tenurial arrangement, involves a balancing of two categories of costs. The first category comprises all the expense and effort involved in the establishment and maintenance of property rights. The second has to do with negotiations within the ownership-group over the internal management regime – that is, rules of access to be obeyed by all members of the group. With private property, in which all ownership is vested in individuals, the second category of cost can be said to be negligible,[14] while the first category, as mentioned already, is often very sizable. With common property, defining ownership is less troublesome. However, there has to be more bargaining among members of the group holding property rights over the management regime. This bargaining is costly, sometimes very much so.

Whether common property makes more sense than private property or vice versa depends on the relative magnitudes of the two categories of costs, and on the value of resources as well.

Nobel laureate and economic historian Douglass North contends that, over time, the expense of administering private ownership has fallen relative to resources' scarcity values. In addition, individual ties to local communities that traditionally have owned and managed common properties have weakened. As a result, individual claims on resources have proliferated, more often than not displacing group claims.[15] Before the invention of barbed wire, for example, establishing private ranches in drier parts of the western United States was infeasible. This is because grassland values compared poorly with the cost of demarcating property lines with fences made entirely of wood, which locally was very scarce. But once barbed wire became available, vast sections of the open range were incorporated in private ranches.[16]

While the findings of North and other economic historians of a general tendency toward private property is hard to dispute, circumstances still exist under which the benefits of privatization, which include improved capture of resource values as well as the avoidance of transaction costs, are outweighed by the costs of same. For example, access remains entirely open to environmental resources of vital importance, including the air we breathe. Likewise, common property is a viable option in many settings. In particular, it makes sense where natural resources have local value, where this value does not compare all that well with the expense of apportioning resources among individual agents, and where these agents find it fairly easy to strike a bargain concerning the internal management regime.

As Elinor Ostrom and her collaborators have shown, these circumstances are far from rare in the developing world, including its forests.[17] They find that the prospects for common property are good where local groups perceive, or can be brought to understand, that forests are important, commercially or otherwise, and that the benefits of resource protection exceed the costs. Another facilitating factor is a history of local collective action, which creates a legacy of trust that keeps transactions costs to a minimum. It is also helpful for the forest not to be very large. Otherwise, one supposes, the scarcity value of forest resources does not compare favorably with the cost of warding off interlopers and monitoring group members' compliance with the internal management regime.

Why common property can fail

The findings of Ostrom and others who carry out systematic empirical investigation that is well grounded in economic theory demonstrate that there is space in the world for tree-covered

common properties. However, their research also makes clear that group tenure is not a universally superior, or even universally viable, option. For example, common property is difficult to establish where local populations have little prior experience with collective action, as is the case along agricultural frontiers populated primarily by recent migrants. Since people such as these have little or no reason to trust one another, the trouble and expense of bargaining over an internal management regime usually turn out to be prohibitive. Also, market circumstances can change in ways that are detrimental to the arrangement. Furthermore, governments can undermine group tenure in various ways.

Before turning to the impacts of government policy, which feature prominently in analyses of the break-down of common property, the challenge posed by problematical market conditions merits examination. This challenge was clear in the case of extractive reserves – areas set aside for groups engaged in the harvesting of non-timber products – which Chico Méndes and others advocated during the 1980s and early 1990s. As indicated above, there are a few tropical forests where non-timber extraction is commercially viable. In the floodplains of the Amazon River and its major tributaries, for example, useful species, like *aguaje,* are not too widely dispersed and access to major urban markets, such as Belém and Manaus, is relatively good.[18] But in most places, the earnings associated with the harvesting of non-timber products are much more modest. A case in point is the collection of vegetable ivory, a palm product used to make buttons; in northwestern Ecuador, the daily returns captured by individuals who harvest this commodity are no better than the opportunity cost of unskilled rural labor.[19] The same has been true of rubber tapping and other forms of non-timber extraction in the Amazon Basin, both now and in the past.[20]

The commercial prospects of tree-covered common properties used for other purposes are no better. Sustainable management of tropical forests that are sources of timber turns out not to be very profitable.[21] Neither does nature-based tourism hold much promise, mainly because – aside from a few unique places, like Costa Rica's Monteverde Cloud Forest Biological Preserve – sites with tourism potential have little or no scarcity value.[22]

Especially unpromising from a business standpoint are efforts to make use of the biodiversity that is a primary characteristic of tropical forests. Among others, Mark Plotkin, an ethnobotanist, has taken pains to document what indigenous shamans in places like the American tropics know about skin rash treatments, the curare extract used as a muscle relaxant, and other

medicines derived from jungle plants.[23] However, economic analysis does not indicate that the biological inputs to pharmaceutical research are of great value. The most widely cited study indicates that, as locations for the collection of specimens to be used in biomedical investigation, most tropical forests are worth a dollar or two per hectare; even the most valuable sites, which feature unusual endemism and also are under severe threat, are worth no more than $20 per hectare.[24]

Needless to say, commercial values are not all-encompassing, especially for people dwelling in tree-covered hinterlands whose contacts with outside markets are sporadic. For them, goods and services obtained from the forest and consumed locally – including food, livestock fodder, and medicinal plants – can be of fundamental importance. When this is so, local interest in conserving forested common properties that do not appear to yield much marketable output tends to be quite strong. Nevertheless, this interest is not always decisive, particularly if – as Poteete and Ostrom emphasize – community-level institutions are being undermined by public policy and the interventions of governmental agencies.[25]

The subversion of local institutions happens in various ways. Sometimes, the assault on common property is direct and obvious, involving official usurpation or displacement. However, group tenure also perishes due to the suffocating effects of national policy. Put in place ostensibly to protect local communities and their members, accumulating laws and regulations complicate decision-making at the local level, quite often to the detriment of the natural environment.

Direct, frontal attacks on local institutions were obvious during the era of European colonialism. But in the middle of the twentieth century, the source of subversion shifted to national capitals in the developing world. Nationalization of Nepal's village (*panchayat*) forests in 1958 is illustrative in this regard. Apparently failing to distinguish between open access (to repeat, the complete absence of ownership) and common property, officials in Katmandu decided that all tree-covered land needed to be taken over by the government. Had the public sector actually spent money on management and controlling access, environmental benefits might have accrued, although the injustice of taking village resources without compensation would have had to be redressed. But management never occurred. Neither was access controlled. Accordingly, all the results of nationalization were negative. Forests in which villagers previously had some

sort of ownership stake – imperfect though it might have been –were converted into a truly open access resource, one that villagers had virtually no reason to conserve.[26]

As recent events in Zimbabwe suggest, direct usurpation of local institutions is not entirely a thing of the past. However, it is much more common nowadays for subversion, which is often unintentional, to take an indirect form. This is certainly true in Ecuador, where group tenure has been officially recognized since passage of the 1937 *Comunas* Law. Interestingly, few communities in the northwestern part of the country have relinquished common property, even though the 1994 Agrarian Law made it possible for them to do so. The economic sense of this decision has to do with the returns of managing forests in large, unified parcels, as opposed to the 50-hectare plots traditionally awarded to the beneficiaries of land distribution initiatives. Nevertheless, forestry returns have been diminished, in part because the 1937 Law obliges every *comuna* to replace its entire governing *cabildo* annually. The discontinuity in local leadership that this creates has exposed forest communities to business practices that are unfair, uncompetitive, or both. Accusations that community leaders have been bribed to accept logging agreements that stipulate low prices and weak environmental controls are common in northwestern Ecuador. Although specific evidence of local malfeasance is difficult to come by, it is undeniable that stumpage values are very low in the region, averaging just a few dollars per cubic meter of standing timber.[27] As a rule, logging takes place with little or no attention paid to containing environmental damage.

The deleterious impacts of giving local communities control over the resources that surround them while simultaneously interfering with their internal governance and limiting their decision-making prerogatives are no less clear in El Salvador than in Ecuador.

Traditional group tenure, of the sort recognized by the latter country's *Comunas* Law, had absolutely no legal status in the former country for nearly 100 years. In 1882, as coffee production and exports were starting to take off, El Salvador abolished common property. The enlargement of private estates that ensued provoked conflict in the countryside, which intensified during the twentieth century. Several thousand people were massacred during a peasant uprising in the 1930s. And in October 1979, after several years of mounting violence, a group of reform-minded military officers seized power. Shortly afterwards, they stated their commitment to achieving a 'new economic and social order' by means of comprehensive agrarian reform and related measures.[28]

The reform program, announced in March 1980, specifically targeted the economic base of El Salvador's rural elite. A limit of 150 hectares was placed on what any single individual could own, with land in excess of this limit subject to state expropriation. To make sure that former owners did not gradually reacquire the land lost because of agrarian reform, expropriated tracts were assigned to cooperative associations, which were forbidden to sell their holdings.[29]

During the years to come, agrarian reform was impeded by political corruption and instability, not to mention a bloody civil war. In addition, economic conditions were inauspicious, a sharp, global recession driving down prices for coffee and other commodities. Of the 320 cooperatives that had been created in 1980 and 1981, 28 were already defunct by 1982 and another 21 were in danger of abandonment.[30] A truer test of their viability was to come after peace accords were signed, in 1992.

By and large, cooperatives' performance in recent years has been disappointing. Although these entities possess one-fifth of all the prime farmland in El Salvador, which is the most densely populated country on the American mainland, approximately 25 percent of these holdings were not being cultivated during the middle 1990s.[31] In part, poor performance is the result of political interference during the early 1980s, such as favoritism for members of the ruling political party.[32] But this is not the entire story. Restrictions on the choices that cooperatives were allowed to make, which again were put in place to preempt the reversal of agrarian reform, prevented cooperatives from taking full advantage of commercial opportunities. Flatly prohibiting the sale of cooperative land foreclosed access to financial markets, which discouraged the sort of investment needed to enhance or to maintain farm productivity.[33] Commercial viability was further impaired by laws and regulations influencing cooperative governance; these interfered with the sort of quick decision-making required for success in the marketplace.

There is one other way that public policy militates against the success of community-level resource management, which is to subsidize goods and services that substitute for the output of common properties. This is often a problem for rural communities attempting to manage traditional irrigation systems. Needless to say, convincing farmer-members to pay for operational and maintenance expenses and capital amortization is next to impossible if water tariffs in competing public systems do not fully cover these costs. By the same token, it is beyond the realm of possibilities under these circumstances to raise tariffs enough to finance the

conservation of forested upper watersheds, even though this may be required to avoid shortages of irrigation water.[34]

Local institutions and environmental values

At times, the scholarly debate over community-level institutions for resource management in the developing world has been polemical. Often passionate, defenders of common property get particularly exercised when no distinction is made between that tenurial arrangement and open access.

Economists are largely responsible for the confusion. Significantly, the very title of the article containing a seminal analysis of the over-exploitation of resources owned by no one contained the term, common property, not open access or some other synonym.[35] Nearly a half century after this mistake, misuse of vocabulary still occurs. In some, though by no means all, textbooks on economic development and environmental economics, common property takes the blame for what are really problems of open access.

Along with Daniel Bromley, Elinor Ostrom deserves much credit for bringing clarity to the debate over local institutions for natural resource management, including appropriate care in the definition of key terms and variables. Rarely if ever do serious analysts mischaracterize common property; as a result, light is being shed on the circumstances under which it is a satisfactory – even best possible – way to resolve ownership issues. As indicated in this paper, group tenure, which by definition involves development and adherence to an internal management regime, can be a superior alternative not only to open access but to private property as well. That is, members of the group can find their respective shares of internalized resource values and transactions costs superior to what each of them would receive if resources were divided among private holdings. The latter rewards, of course, would be diminished by the costs of establishing and enforcing a regime of private property.

If common property can be – not necessarily is, but can be – a viable or desirable arrangement, the question remains why any outsider should care. Obviously, a simple sense of justice or altruism is offended when collective action by historically marginalized communities in the developing world is thwarted. However, there is another consequence of suppressing local institutions, which is that an institutional vacuum is created that can have far-reaching environmental impacts.

The environmental pay-offs that can arise when local institutions are reinforced, not suppressed, are evident in northern Guatemala, where tree-covered land is being cleared very rapidly. It turns out that forests are under the least threat in the *Zona de Uso Múltiple* (ZUM), where the national government has awarded 25-year concessions for sustainable timber management to thirteen communities and two private firms. The annual deforestation rate in the ZUM is just 0.2 percent, which is comparable to natural forest loss caused by storms and lightning fires and not greatly above measurement error. The annual rate in nearby national parks is twice as high – 0.4 percent.[36]

Along with encouraging better management of timber resources, recognizing the ownership rights of forest-dwelling communities can create environmental benefits of international significance. This possibility is illustrated by an agreement still being negotiated that involves fifteen communities of Mayans, all belonging to the *Asociación Oxlajú Tzuul Tag'a Maya Q'eqchi'*, who have migrated in recent years to northern Guatemala. Under the terms of the agreement, these communities will receive pipes, pumps, and other machinery needed to extract groundwater for drinking purposes. In exchange for this machinery, which have a combined value of $857,500, the indigenous communities, which achieved legal recognition only after the peace accords that brought an end to Guatemala's long civil war were signed in 1996, will agree to maintain tree cover on approximately half their holdings, which total 30,000 hectares or so. Dividing the total expense by half this area yields $57.17 per hectare, which by the standards of many projects is not a great amount to spend for the sake of forest conservation.[37]

The success of community forestry concessions in northern Guatemala and the possibilities raised by the agreement to protect forests in return for potable water machinery indicate the sort of environmental conservation resulting if local institutions exist. Or perhaps the lesson is best expressed negatively – environmental benefits can never be captured if there are no such institutions, as was the case in northern Guatemala before the peace accords were signed. In an institutional vacuum, any outside agency or group hoping to conserve biodiverse forests would have to bargain individually with the thousands of families that have settled in the region. The combined cost of reaching and monitoring all these agreements would be huge, much larger in all likelihood than the benefits of conservation.

Avoiding the suppression of local institutions, then, is not just a matter of social justice. Keeping these viable is a necessary condition for securing environmental gains, gains of significance beyond the local level. Healthy institutions may not be sufficient. But the price that is paid around the world if local communities are routinely disenfranchised needs to be universally recognized.

Footnotes

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3. Peters, C. (1990): "Population ecology and management of forest fruit trees in Peruvian Amazonia" in A. Anderson (ed.), Alternatives to deforestation, New York: Columbus University Press.
4. The site used in the Peruvian case study is located near a sizable urban market for the *aguaje* (*Mauritia flexuosa*) fruit and other jungle products. In addition, it is in a floodplain where *aguaje* is unusually plentiful. Thus, the case study does not offer a representative view of the current economics of harvesting non-timber products throughout the Amazon Basin. Furthermore, the price declines that would be caused by a major expansion of this activity were not analyzed. Analysis of the magnitude of these declines would have to be undertaken before the adoption of a conservation strategy predicated on non-timber harvesting. These limitations are surveyed in: Southgate, D. (1998): Tropical forest conservation, New York: Oxford University Press, pages 45-49.
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14. In the real world, of course, this second category of costs – relating to inter-agent negotiations within the ownership unit – never really reaches zero. Consider, for example, the negotiations that must occur within a firm holding private property that happens to employ two or more people.
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19. Southgate (supra note 5), pages 49-56.
20. Browder (supra note 7).
21. Southgate (supra note 5), pages 59-82. Rice, R., C. Sugal, S. Ratay, and G. Fonseca (2001): "Sustainable forest management," Advances in Applied Biodiversity Science, 3, 1-29.
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34. The disincentives for efficient management of community irrigation systems in northern Ecuador created by subsidization of public systems are currently being investigated by Fabián Rodríguez, a doctoral candidate and advisee of mine at Ohio State University.
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37. More information about the conservation initiative in northern Guatemala can be obtained from Georg (Jorge) Grunberg, an Austrian anthropologist and long-time Guatemalan resident. His email address is *grunberg@guate.net*.