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by

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COMMON PROPERTY RESOURCES IN A GLOBAL CONTEXT

Abstract

The "global commons" is a metaphor. Metaphorically, all of the earth's resources are held in common by this and future generations, to be used and abused as we and our heirs see fit. Yet "the commons" metaphor may also be seen at a less global level, and less metaphorically. In much of the developing world, common property provides a complex system of norms and conventions regulating individual use rights to a variety of natural resources, including forests, grazing lands, fisheries and water resources.

This article will examine both macro-level issues of the commons, and micro-level cases, with emphasis on developing countries. Macro-level issues involve problems of international governance, while micro cases involve local management of natural and human resources. While much previous attention has been given to international governance, such as the Law of the Sea Treaty, or the Montreal Protocol on chloroflourocarbon emissions, this article will also give particular attention to local resource management.

Common Property Resources in a Global Context

C. Ford Runge

"When reason argues about particular cases, it needs not only universal, but particular principles."

St. Thomas Aquinas

The Commons as Metaphor and as Reality

The "global commons" is a metaphor. Metaphorically, all of the earth's resources are held in common by this and future generations, to be used and abused as we and our heirs see fit. Certain resources (or problems) are more obviously cases of "the commons" than others, such as air (and air pollution), oceans and water (pollution), some land areas, such as Antarctica, and a variety of migratory species. Many discussions of global environmental problems, notably global climate change and biological diversity, effectively employ the metaphor to draw attention to the common future of the earth's species and biosphere.

Yet "the commons" metaphor may also be seen at a less global level, and less metaphorically. In much of the developing world, common property provides a complex system of norms and conventions regulating individual use rights to a variety of natural resources, including forests, grazing lands, fisheries and water resources (1). Even in developed countries, many natural resources have at least some common property characteristics, such as rivers and streams, public parks, and wildlife areas.

These "micro-level" examples of common property have important implications for the "macro-level" issues of global climate change, biological diversity, deforestation, and air and water pollution. Until appropriate institutions can be found to manage resources at the micro-level, macro-level problems will not be solved. These institutions must reinforce the capacity of societies to manage their common natural resources.

This article will examine both macro-level issues of the commons, and micro-level cases, with emphasis on developing countries. Macro-level issues involve problems of international governance, while micro cases involve local management of natural and human resources. While much previous attention has been given to international governance, such as the Law of the Sea Treaty, or the Montreal Protocol on chloroflourocarbon emissions, this article will also give particular attention to local resource management.

Today's micro-level common property, especially in developing countries, closely resembles the institutions which dominated the early stages of European economic development, where institutional rules specifying joint use by a village or other well-defined groups prevailed as a form of resource management for at least 1000 years. With the forced enclosure movements of the 15th and 16th centuries, the common property typical of early Western Europe declined, although it did not disappear. Many localities maintain complex arrangements of joint tenancy. Common property institutions continue to be observed, for example, on Swiss grazing lands and elsewhere in Europe (2, 3).

Although common property has proved to be a stable form of resource management in some traditional societies, the combination of population growth, technological change, climate and political forces has destabilized many existing property institutions. A fundamental issue in much of the developing world is the degree to which resource mismanagement has actually been caused by common property arrangements. This view is widely associated with the "Tragedy of the Commons," in which common resource management is cited as the cause of overuse. In the Sahel and southern Africa, for example, serious misuse of resources has been alleged to be the direct result of traditional common property institutions (4, 5, 6).

In response, Western economic consultants and planners have called for the imposition of private property rights (7, 8). Similarly motivated private property schemes have been attempted throughout the developing world. Many, perhaps most, have failed to stop overuse, and in many cases may have contributed to even more rapid degradation of resources and increased inequality in already unequal distributions of wealth. Not unlike the European experience with enclosure (9), lands formerly held in common are often transferred to individuals (such as high-ranking government bureaucrats) who can exercise influence in the allocation of use rights. These individuals have then failed to manage these resources effectively (4). Despite this record, such policies are often supported by those who argue on theoretical grounds that individual incentives inevitably lead common property to be mismanaged.

An alternative perspective is now emerging from empirical research. It identifies a number of reasons why common property may be as viable as private property on grounds of both efficiency and equity. Rather than

representing an atavistic arrangement of rights which inevitably results in inefficient resource use, much value may lie in existing common property institutions, as well as in new institutional arrangements with common property characteristics. In many cases, these institutions may play a key role in the effective management of scarce natural resources, complementing and combining with private rights at the local level.

If this view is correct, the successful attempt to build local-level institutions with common property characteristics suggests greater optimism regarding the "global commons". Clearly, "privatization" of global common property is problematical, and nationalization is likely to lead to conflicts and charges of imperialism. Thus, some form of common property management, or international regime, must be found. If it is not, then the global commons is doomed to the same tragic fate predicted for all forms of common property.

Common Property as an Institution

As an institution, common property is to be distinguished from free and open access, where there are no rules regulating individual use rights (10). Often, what appears to the outside observer to be open access may involve tacit cooperation by individual users according to a complex set of rules specifying rights of joint use. This is common property.

Empirically, it is crucial to distinguish between open access and common property if appropriate policy is to be formulated. Problems of open access arise from unrestricted entry, whereas problems of common property result from tensions in the structure of joint use rights adopted by a particular group. These tensions may arise from a variety of complex causes, including population pressure, changes in technology, climate, or

political forces. Too often, these causes have been confused, and the problem ascribed simply to the "Tragedy of the Commons" (11), in which the misuse of resources is attributed to the institution of common property itself.

In international politics, many problems of governance involve the fact that no common regime for managing resources exists. In this sense, the resource may be held in common by the world's people (e.g., the ozone shield), but is not owned jointly, since well-defined property rights for individuals or countries do not exist. Many such problems are thus issues of open access, not common property.

It was Garrett Hardin's 1968 essay, "The Tragedy of the Commons", that served both to popularize the concept of common property, and to confuse it with open access (11). Hardin's essay brought it to the forefront of resource economics, and made it a popularly recognized metaphor. Unfortunately, Hardin characterized the commons as a situation of completely open access to a resource. Under such conditions, the marginal private benefit to any individual of additional resource use would always exceed that individual's share of the marginal social cost. This would constitute a powerful incentive for individuals to "free-ride" and would lead to overuse of the resource and its eventual degradation. The only alternative was some type of public coercion, especially through the state. In spite of the identification of the metaphor with Garrett Hardin, it was not original or unique to him. Hardin himself attributed his central thesis to the nineteenth century British economist, William Forster Lloyd, and references to the notion of common property may be traced as far back as Aristotle (12).

Few essays have been as influential as Hardin's, and few ideas so quickly and widely disseminated. A cursory search of bibliographic data bases reveals over 720 citations to the essay in the biological and social sciences. Most articles citing Hardin unquestioningly accept the validity of his view, although the distinguished economic theorist, Partha Dasgupta, has noted that "it would be difficult to locate another passage of comparable length and fame containing as many errors" (13).

Given the wide acceptance of the commons metaphor, it was surprising that when researchers did empirical work on the outcomes of common property regimes, they encountered surprising results. Common property did not necessarily lead to resource degradation. Dahlman found that English common field systems were relatively stable both institutionally and ecologically, and that they did not result in resource degradation. When they passed out of use it was as a result of factors other than the common property regime itself (14). Examples of contemporary, stable common property systems in Europe were examined by other scholars (2, 3). Other empirical contradictions to the "tragedy" paradigm were demonstrated for Andean grazing (15, 16, 17, 18, 19); African range and forest resources (4, 20, 21, 22, 23); and Japanese fields and forest (24, 25). Still additional case studies of relatively successful common property systems were presented in a recent National Academy of Science volume (26).

At the national and international level, increasing evidence of cooperation to resolve commons dilemmas of air pollution (such as acid rain) or water resource management (such as the Law of the Sea Treaty), question whether the "tragedy" metaphor is apt even at the level of international organization. In reality, the problem of common resource

regimes appears to be finding cooperative solutions to their management. This institutional reality is complex and unlikely to be fully illuminated by metaphors, however useful they have been in drawing attention to such problems.

It is most useful to consider the commons, whether at the micro or macro level, as a set of management problems in which, as Aquinas argued, particular principles of resource management are applied to particular cases. Two macro-level cases will be considered here. The first is global climate change and its relationship to biological diversity. The second is the management of Antarctic resources. Two micro-level case are then presented. The first is forest and fuelwood management in Highland Nepal, a particular case giving rise to the global problem of deforestation. The second is deforestation in Ecuador. While many other instances could be reviewed, these provide useful examples of how, in particular cases, management solutions are or are not being developed which employ common property institutions as part of the answer to jointly-held resources.

Global Climate Change and Biological Diversity

Without question, the global climate is held in common by all living creatures. However, since there are no well-defined property rights over climate, it is an open access resource, or in effect, an open dumping ground for CO₂, methane, and other "greenhouse gases". While the long term impact of the rapid conversion of hydrocarbons to energy and gases is necessarily based on computer-assisted conjectures, it is a cause of increasing concern.

Global climate change has emerged as "the" environmental issue of the '80s. While many politicians have jumped into the general debate, few have

been willing to commit themselves to specific remedies with negative implications for their constituents, such as gasoline taxes or reduced individual automobile use. In this respect, nations have shirked any responsibility for managing the "climate commons". It is easier to point skyward and make dire predictions than to look earthward and change a way of life that has come to depend vitally on hydrocarbon fuels including huge annual consumption of coal, oil and plastics. On November 6, 1989, for example, both the U.S. and Japan refused in a 70-nation meeting on global warming even to accept targets for reductions in carbon dioxide by the year 2000. The U.S. is the principal source of CO₂ in the world, producing 23 percent of the total, according to United Nations statistics (27).

Yet scientific evidence and various computer simulations of global climate change certainly give cause for concern. In brief this evidence suggests that greenhouse gases given off primarily by burning of wood, coal, oil and decomposition of organic matter have led to levels of CO₂ and methane that may more than double by 2050. The predicted result will be to trap heat from the sun in a blanket of gas, raising the earth's temperature, leading to potentially dramatic changes in climate. Since green plants consume CO₂ and give off oxygen, destruction of forests will reduce the capacity of the global environment to absorb and recycle these gases.

Once one has absorbed the enormity of the possible changes, and sifted through the confusing and still debated science, a key question emerges: what can be done to manage the "climate commons", assuming the most dire predictions are accurate? Ultimately, global problems arising from excessive consumption of hydrocarbon fuels will not be solved by

jetting off to another international conference on global warming or by planting a few trees. Nations, states and individuals must take responsibility for changing what may be described as an industrial way of life, which began with the widespread use of coal and oil in the 19th century and has accelerated ever since.

Two key dilemmas must be directly confronted if the issue is to move beyond rhetoric. First, what alternatives to hydrocarbon fuels exist that will support levels of living even remotely comparable to those at present? Second, how is national and international responsibility for this issue to be shared by developed and developing countries, and by the rich and poor within countries, when rapid economic growth remains a general objective? The first question immediately raises a painful set of choices. Under current technology and prices, oil, gas and coal remain by far the most attractive sources of power for automotive, industrial and individual use. Only if their price were to rise dramatically to truly reflect global environmental damage would more benign alternatives such as solar and wind energy become widely attractive. And even with widespread adoption of such "soft energy paths", maintaining total energy use at present orders of magnitude will require another major source of power. The only available alternative at present is nuclear power. Much higher energy prices, substantially lower standards of living, or nuclear power: is it any wonder that many prefer to keep the discussion on a metaphorical plane? Yet actual policy improvements must grapple with precisely these issues if real progress is to be made.

The second dilemma is at least as challenging as the first. When developed countries (which continue to account for by far the lion's share

of per capita hydrocarbon fuel consumption) decry the burning of rain forest countries such as in Brazil or Ecuador, the immediate response from the South is:

"Why should we adopt any different approach to our development than you did? You cleared your forests, mined your coal and iron ore, killed your aborigines, and then exploited our oil, coal and mineral resources too. We too want rising standards of living built on economic growth. Why shouldn't we have them?"

To date, no satisfactory responses have emerged from wealthy countries to these counterclaims. And until they do, attempting to promote standards of environmental behavior that have been late in coming (or have yet to arrive) in the rich nations of the North on the poor nations of the South will be unlikely to result in changes of the magnitude necessary to respond to the challenge of global warming.

Related to global climate change is another issue of global common property: biological diversity. The destruction by man of complex ecosystems that support plants, animals, and micro-organisms with potentially important future value again requires national and international initiatives that are far more difficult than simply calling for change. In general, attention has focused on developing countries' rainforests, both because of their ecological complexity and their vulnerability to destruction. However, the issue also has relevance to developed countries, such as the U.S. and Sweden, where agricultural and forestry production methods can threaten the diversity of plant and animal life. Internationally, the destruction of tropical ecosystems is a partial cause of the greenhouse effect.

Biological diversity is global common property, and its management may be discussed at several levels. At one level, the loss of diversity can be treated in economic terms, such as the loss of potential pharmaceuticals or food groups when plant species are lost. At another level the issue is less human-centered: even if no specific use could be found for a plant or animal, ecologists have shown that the web of life is richer and more robust when it is more densely knit. In some discussions, the focus is thus on the interplay of natural systems, such as agriculture and forests. In many developing countries, for example, human settlement of tropical ecosystems has created a vicious circle in which food shortages and fuel shortages are intertwined. Tree-cutting for fuel wood increases erosion on hillsides, reducing soil productivity and crop yields. As fuel wood becomes even scarcer, substitution of animal dung reduces crop fertilization and further lowers yields. Eventually, the landscape is completely denuded, as in parts of Haiti. The common property of biological diversity is also discussed at the level of the gene: the loss of genetic material means that reproductive alternatives are fewer, and successful adaptation to environmental stress is less likely. An example is modern corn-breeding, which while increasing yields, must be very careful not to breed out natural resistance to drought, disease and various pests.

How one approaches the issue of biological diversity thus depends on the level of analysis. At the international level, great attention has been focused on the Amazon region, although responses from Brazil and other countries have tended to follow the pattern discussed above: "You cut down your forests and settled your land, why can't we?" In percentage

terms, it is interesting to note that tropical forest losses in other parts of Latin America, and in Indonesia, the Ivory Coast and the Philippines, may be much greater than in Amazonia. Brazil's Atlantic forests are now reduced to less than three percent of their original size, and forests in Honduras, Costa Rica, Panama, Guatemala and Mexico have fallen victim to slash and burn agriculture and commercial cutting at even greater rates than in Brazil.

In recent testimony before the U.S. Congress (ORNL), scientists from the Oak Ridge National Laboratory concluded that global climate change and deforestation posed major management challenges for international institutions. They noted:

We are led to something of a dilemma or paradox. Rapid economic development by the poorer countries, in addition to solving so many other problems, such as population growth, also may be the best defense against vulnerability to climate change. Economic development depends, however, on increased energy services likely supplied predominantly over the next several decades by fossil fuels, the use of which is a principal driver of climate change (along with deforestation and other regional land-surface changes driven by population growth).

This dilemma only can be resolved by changing the energy system, by providing more energy services with less fossil fuel and by managing the forest resource more productively and stably (28, p. 4).

Antarctica

In a recent edition of this journal (29), numerous articles explored the complex and fragile ecosystems of the polar regions. Unlike climate impacts, the Antarctic is already managed as global common property. A variety of agreements establish international regimes that influence the joint use and exploitation of its resources. Under the Antarctic Treaty System, dating to 1961, a number of Conventions regulate different natural resources on the continent. The Convention of Antarctic Marine Living Resources (CCAMLR), and the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), provide examples of such management. Consider the CCAMLR. Composed of country representatives, acceding nonmember states, and representatives from a variety of international organizations such as the Food and Agriculture Organization (FAO) and the International Union for the Conservation of Nature (IUCN), the CCAMLR meets regularly to provide rules for fisheries exploitation in Antarctic waters. All decisions must be unanimous. Especially important have been decisions reached to regulate krill (shrimp) exploitation in the waters off Antarctica, as well as the development of an observation and inspection system, efforts to clean up debris left by Antarctic explorations, and joint studies of marine mammal and bird populations. While a modest beginning, such measures "are proof that the Convention has in fact the power to reach important and difficult decisions" (30).

Yet conflicts over common property management in Antarctica reveal some of the important tensions discussed in connection with climate change and biological diversity, notably differences between developed and developing countries. Beginning with the Law of the Sea Convention of

1982, Third World nations led by Malaysia argued that the Antarctic Treaty primarily serves the interests of the major industrial powers. Developing nations proposed an alternative, putting Antarctica under United Nations trusteeship as the "common heritage of mankind." In 1989, there were 39 Antarctic Treaty members, making management more exclusive than would be the case under U.N. trusteeship, where the balance of power would shift more to developing countries.

Despite such tension, the Antarctic Treaty System and its associated conventions provide clear evidence that international governance of global common property, while difficult, is possible. As Lee A. Kimbell, director of the Antarctic program of the World Resources Institute in Washington, D.C., recently noted:

Effective implementation of governing measures in Antarctica requires, on the one hand, an underpinning of scientific information and, on the other hand, monitoring and enforcement. These are necessary to verify that applicable standards and criteria are adequate to protect Antarctica's relatively pristine environment, its scientific values, and human safety, as well as to avoid conflicts over activities there. They are also necessary to keep states honest in applying the rules (31).

Forest and Fuelwood in Highland Nepal

When one turns from global management issues to common property institutions at the local level, a similar set of issues arises concerning tensions between the members of a well-defined group. Acharya (32) has recently discussed such tensions in a case study of Jirel Property Arrangements in Highland Nepal. Jirel farmers, who live in the Jiri River

valley in the Dolakha district of Nepal, utilize a variety of complex systems of joint tendency to manage both livestock and forests, contradicting the claims of those who argue that joint use rights are unsustainable.

The Jirel system of common property management is based on local self-governance under the kipat system, which prevailed in the Dolakha district long before the area was annexed to the kingdom of Nepal in the late 18th century, around the time of the American Revolution. In the 20th century, despite general governmental policies of privatization, and modern forest district establishment, the traditional common property system continued much as before. As Acharya notes:

In Jiri, private titles to forests and pastures are rarely held independently by single households. Most (though not all) Jirel own their pastures and forests jointly with other members of their lineage who are the rightful heirs of the same patrimony. Some Jirel households who share the same house, and others who hold some of their livestock and cultivated fields on a joint basis, often find it convenient to keep and use forests and pastures jointly. differences in individual inclination and attitude toward forest and pasture management are generally neutralized by the strong preference for joint ownership of these resources (32, p. 18).

The joint-owners think of their ownership as a form of "share" in the flows of benefits, which are calculated in cattle units. If one of the owners behaves irresponsibly, others protest, and these others may then intentionally over-exploit the resource as a form of punishment;

conversely, good management is rewarded by larger individual "shares". The structure of use-rights is highly differentiated, depending on whether it is forests, cattle, firewood or pasture that are being allocated. Conflicts are resolved through a system in which disagreements are forced to be settled by the larger group, and in which rituals of "enforced friendship" may even be practiced. While in some cases, such disputes cannot be resolved locally, Acharya finds that in general they work remarkably well.

The net advantages of the Jirel systems far outweigh their disadvantages. ...Despite internal demands and external pressures, the Jirel have maintained their resource base quite well. The most striking conclusion of my research is that, even with increased external pressures, the Jirel people have maintained a balance between the use of wood and its sustainable availability in their forests. Contrary to popular opinion, it is not local usages that endanger Jirel forests; local needs and management practices have achieved a remarkable, although certainly not perfect, balance between human needs and wood resources (32, p. 22).

Deforestation in Ecuador

In contrast to an apparently robust common property regime in Nepal, recent studies of deforestation in Ecuador suggest much more serious problems. What is striking is that while Nepal has tolerated, if not encouraged, continued local management of forest resources, Ecuador has attempted to impose management from the "top down" through state power (33).

For example, subsurface resources are government property. With passage of the 1972 Water Law, all water resources were nationalized. Coastal wetlands are "national patrimonies". Similarly, most of the country's tree-covered land is designated as "forest patrimony" or national parks. These claims far outstrip the government's capacity to manage resources or even to ensure that its claims are honored by the public at large. Weak management of Ecuador's public forests is a case in point. No rangers work in the 2,000,000 HA of forest patrimony delimited in the northwestern and northeastern parts of the country and, as of 1987, a mere two administrators, 25 technicians, and 119 permanent and seasonal rangers had been assigned to the 2,100,000 HA of parks in continental Ecuador.

A marked discrepancy between public sector claims on resources and the government's capacity to control access to "its properties" seems to have created a "Tragedy of the Commons". Yet in fact, the origins of the tragedy appear to arise from government attempts at management, and privatization, rather than from common property itself. Private parties interested in forest management, for example, cannot acquire legal interests in tree-covered land, timber concessions having been banned in 1982. Instead, the Ecuadorian Institute for Agrarian Reform and Colonization (IERAC) has only adjudicated a claim for private tenure in a frontier parcel if at least half of that parcel had been cleared. Macdonald (34) reports, for example, that the periodic fallowing scheme long practiced by the Amerindian community of Pasu Urcu, in eastern Ecuador, was abandoned during the 1970s after IERAC agents informed the community that fallow lands could be claimed by agricultural colonists, who were 50 KM away at the time. This and other case studies suggest that

Amerindians respond to tenurial incentives much as do agricultural colonists. As a result, indigenous common property resource management regimes are discarded.

Ecuador's property rights regime is representative of institutional conditions throughout Latin America. In every country with extensive tropical forests, the public sector's claims on tree-covered land far outstrip its ability to manage or to control resources. In effect, the government has institutionalized an open access situation. Throughout the region, deforestation is a prerequisite for formal tenure. Agricultural colonists in the Brazilian Amazon, for example, obtain title in a forested parcel only by clearing a large part of it (35). By the same token, tenure insecurity is a problem in most of Latin America. IERAC's time-consuming adjudication procedures are followed throughout the region by counterpart agencies established in the early 1960s under the auspices of the Alliance for Progress, as de Soto (36) has documented vividly in a case study undertaken in Lima, Peru. Finally, suppression of indigenous groups' tenurial arrangements is the norm.

The assault on forest dwellers' tenure is often direct. The creation of parks and military zones and other forms of resource nationalization renders irrelevant the structure of rights and duties previously developed by the local community. Similarly, recognizing private land claims while ignoring communal claims assures the demise of common property, which is the predominant form of tenure in Latin America's tropical forests. Because it has tended to obfuscate the distinction between open access resources and common properties, the economic literature addressing the Tragedy of the Commons has legitimized this policy approach.

More subtle forms of pressure are often applied against forest dwellers' common property arrangements. In many countries, registering a communal claim requires more time, money, or legal expertise than registering an individual claim. This is an important drawback for indigenous groups, which have limited financial means as well as restricted access to legal services. In addition, when governments state that land uses characteristic of communal tenure regimes are "non-tenurable", those regimes tend to break down. From an individual's standpoint, for example, the net benefits of observing fallowing norms are seriously diminished by laws, such as those that exist in much of Latin America, that make land "improvement" a prerequisite for formal tenure. Because improvement has, in practice, been equated with deforestation, forsaking encroachment on a fallow parcel carries the risk that someone else will assert an individual claim on that same parcel. Anthropological case studies, like the one carried out by Macdonald (34), show that indigenous forest dwellers respond to this risk by forsaking traditional common property arrangements and becoming agents of deforestation.

The solution to these problems is not obvious; they are a function of poverty, of the need for foreign exchange, and of local interest. Policies intended to prevent them may have unintended effects. A ban on hardwood timber exports in Ecuador, while widely endorsed by the international environmental community, was in fact stimulated by Ecuador's domestic furniture industry, which wanted a cheap source of domestic hardwood. By lowering its domestic price, the export ban actually encouraged overharvesting (33). And Ecuador is not alone: U.S. below-cost timber sales have been widely criticized in areas such as Alaska's Tongass

National forest, but local interests have largely prevailed in the name of jobs in an otherwise limited economy.

Conclusion

The "global commons" provides a metaphorical basis for discussing a variety of issues of international governance. In some cases, the metaphor is apt, such as the structure of joint use characterizing the Antarctic Treaty. In other cases, such a structure of rights and duties is absent, as in the examples of global warming. Such macrolevel issues are underpinned by a variety of microlevel cases in which common property management arises as an issue of considerable importance. While recognition of the role of traditional property institutions is growing, many government policies disregard the role these institutions may play, leading, ironically, to a worsening in the condition of the "global commons".

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