

The Commons and its "Tragedy" as Analytical Framework:
Understanding Environmental Degradation

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The "tragedy of the commons" has become a metaphor for a persistent and severe contradiction in the interaction of natural systems and social systems. Maximization of individual interests in the use of "open access" common natural resources eventually degrades the commons to the detriment of all individuals. The classic formulation was based on the destruction of grazing resources on the village commons because of a local societal failure to control individual access (Hardin, 1968). But the problematic of the commons is broader and richer than the well worn tragedy metaphor. Preservation or regeneration of the commons – whether at the local, nation state or global level – raises complex, enduring questions of institutional political economy and social values which transcend traditional political-administrative and disciplinary boundaries.

Scientific knowledge about the degradation of the natural world is increasing exponentially. But the complex relationships between particular social systems and their natural environments lags behind. For both natural and social scientists concerned with preservation of biological diversity and the material base on which societies depend, understanding these relationships in South Asia constitutes an exciting and pressing agenda. The purpose of this collaboration between the SSRC and the Smithsonian is to begin elaboration of that agenda.

For the social scientist, the most challenging proposition from the very notion of "ecology" is the existence of unalterable linkage-dependencies within systems. Social scientific discourse tends to focus on discrete entities at the expense of interconnections: the social system of a village, the politics of a state or ethnic group, the administration of a particular policy. The unit-of-analysis problem has exercised social scientists, but largely within the boundaries set by social-political definitions of units: the village, district, state, nation. The challenge for social scientists is to consider conceptualizing alternative units of analysis in terms of systems defined by ecological dynamics rather than by administrative or social arenas of behavior. This conceptual enlightenment is more subtle, and probably more important, than our overt dependence on the technical knowledge output of scientific investigations.

An ecological system confronts human populations as both a given and a variable; societies adapt to ecological pressures, in either planned or unplanned ways, and struggle to alter others. These social dynamics take place within limits; in the classic formulation, "nature bats last." It is a source of "tragedy" that societies – large and small – frequently do not collectively recognize these limits until catastrophes occur, and frequently fail to alter behavior even after the emergence of clear evidence of natural limits and constraints. If natural scientists can clarify the limits, the contributions of social scientists lie in specifying the social, political and economic dynamics which generate pressures on those limits and constrain or block responses. As area scholars, we believe these dynamics must be situated in terms of specific history, culture, social and political institutions and indigenous meaning

systems. At a pragmatic level, accurate mapping of social-natural interactions should provide a base for better policy, or at least a means of minimizing unintended consequences. But social scientists do not exercise power, delusions and temptations of policy analysts notwithstanding. Fortunately, the problem of the commons presents intellectual questions that are not dependent on the instrumental utility of the answers.

Conceptualizing The Commons

Conceptualizing a boundary between private property and unincorporated terrain, creating an analytical space defined by collective use rights as a "commons," has certain attractive theoretical features. A powerful paradigm for explaining decay in the natural properties of such a bounded terrain has emerged in the notion of "the tragedy of the commons" (eg., Hardin, 1968; cf. Ostrom, 1986; Shiva, 1986). Reactions to an earlier formulation of "the commons" (Herring, et al., 1986) as an analytical framework for understanding environmental degradation raised three potential problems. First, is the concept not ethnocentric, loaded with inappropriate connotations derived from its long association with European thought and history? Secondly, is the concept not politically biased toward methodological individualism (and specifically "rational actor" models) and thus conservative political solutions (eg, authoritarian political practice and privatization)? Thirdly, is the "commons" not already a historical curiosity, not a current reality, in contemporary South Asia? In each case, the answer to the query is negative, but interesting issues are raised for consideration.

The first objection on grounds of Eurocentrism fails to appreciate the complexity of the concept of property, particularly in the Indic context. Indeed, much of the conflict over "the commons" is ideologically a conflict between alternative meanings of property. An appropriate appreciation of indigenous conceptualizations of property entails recognition of a socially defined (and disputed) "bundle of rights" (Baden-Powell, 1892:V.I, p216, passim; Herring, 1983) to patches of the physical surface of the planet. Such rights are hierarchically ordered. The making of market society entails the long historical process of collapsing differential use rights into a system of ownership in which individual private property rights are bounded only by the prior claims of the state. Karl Polanyi termed the commoditization of nature a central element in the "great transformation" to market society: "What we call land is an element of nature inextricably interwoven with man's (sic) institutions. To isolate it and form a market out of it was perhaps the weirdest of all undertakings of our ancestors (Polanyi: 1944/57:178)." In Polanyi's formulation, pre-market economic relations, norms and outcomes were "embedded" or "submerged" in social relations generally. As Polanyi correctly noted, the extraction and elevation of market-driven dynamics from their social mooring produces significant social conflicts and centrally involves the state. There is nothing "natural" about market society.

There is to my mind no historical question about the reality of stratified use rights in common lands in South Asia. The structure of these rights was an adjunct of broader social institutions such as caste, service obligations, temple maintenance, kinship systems and the like. Baden-Powell (1892: I, 219) approvingly cites Campbell's Essay on Indian Land Tenures:

"In the greater part of world the right of cultivating particular portions of the earth is rather a privilege than a property—a privilege first of the whole people, then of a particular tribe or a particular village community, and finally of particular individuals of the community. In this last stage land is partitioned off to those individuals as a matter of mutual convenience, but not as unconditional property; it remains subject to certain conditions and to reversionary interests of the community, which prevent its uncontrolled alienation, and attach to it certain common rights and common burdens."

In the subcontinent, the existence of superior over-arching rights such as zamindari did not preclude the simultaneous operation of subordinate, often collective, claims to use rights underneath the top layer. Indeed, the complex institutional structure of land tenure systems stands as evidence for the multiplicity of overlapping rights to the same physical patch of soil. The European feudal ideal of nulle terre sans seigneurs was never fully achieved in South Asia; where it was approached, seigneurial rights were encumbered by subordinate rights and claims.

More importantly for ecologists, vast tracts of forest land remained outside the net of property relations until the late 19th Century. Chatrapati Singh (1986:2) estimates that until the end of the last century, "at least 80 percent of India's natural resources were common property" and speculates that "even a ratio of 90:10 for common versus private property" is plausible. Analytically more important than any numerical ratio is the historical reality of the struggles set in motion by attempts of the state to redefine and manage a commons

previously defined by local usage (eg. Guha, 1985; K.S. Singh, 1986; Cravedt, 1987). The colonial state's marriage of revenue/developmental imperatives (plantations, logging) with an emerging scientific discourse of forest management and conservation established both an internal dialectic of policy debates and a continuing confrontation with local societies' definitions of the commons.

Colonial law was meant to simplify, collapse and locate concretely the bundle of rights in land with the objective of creating property rights approximating fee-simple ownership on the British model (e.g., Logan, 1887:I, 670-696). Simultaneously, vast tracts were "reserved" for the state on the claim that unused "waste" land had traditionally been "the property of the state" (Baden-Powell, 1892: I, 236). In this transformation, the use rights of subordinate strata depended more on the capacity to exert local power than on legal tradition or inertia of custom. The extent to which common property rights survived the great transformation, or were established de novo in its teeth, is an empirical question with regionally differentiated answers.

Institutionalized village commons date at least from the Laws of Manu (200 B.C. or thereabouts). Manu specifies the precise area for indivisible common pasture lands for both villages and towns (Ayyar, 1976:83). Moreover, the ancient concept of private property (swamya, swatwa) presupposes an open-access commons in the sense of res nullius (that which belongs to no one); for Manu, the most fundamental ideas of property were contained in the axiom: the field belongs to whoever clears it from jungle (Baden-Powell, 1892:I, 127; Ayyar, 1976:76). This Lockean notion (pre-Locke, of course), together with Manu's strictures on grants of ^{un}utilized lands by the King, implies a view of nature as potential resource,

where labor expenditure permits the transformation of a common res nullius into individual use rights subject to general approval by royal authority. Once claimed, property became subject to conditions of use and alienation enforced by a village community. Only in cases of dispute between or within villages did Manu posit the need for intervention by central authority (Ayyar, 1976:82). Lest the "commons" become a vehicle for a second romanticization of village republics, it must be stressed that the village commons implied, as far back historically as can be traced, locally variable rules for inclusion and exclusion, related to a strict division of labor and rights by caste (jati) membership.

Village common lands and claims of common use rights to forests persist despite the transition to market property systems throughout the region. Terms such as shamilat and khas¹ continue to connote village commons. N. S. Jodha, in a path-breaking empirical analysis, has documented the importance of "common property resources" to the village poor in India (Jodha, 1986). His survey found that the economic benefits of using the commons were greater for the village poor than were the benefits of government programs targeted for their welfare. Moreover, as one would expect, these common resources were under intense pressure from powerful people in the village who were attempting to privatize the land, often successfully. Philip Oldenburg (1986) has demonstrated the use of village common lands in the process of land consolidation (chakbundi) in contemporary Uttar Pradesh. Gadgil and Iyer (1988) stress the effectiveness of local institutions in Kamataka in protecting sacred groves and small forests even in the face of state opposition. The near universality of village commons, and pressures for their privatization, is documented by Schenk-Sandbergen (1988:1.2),

based on her own research and secondary analysis of classic anthropological studies.

The increasing scarcity of village common land is of course a major source of pressure on undeveloped land as desperate villagers attempt to challenge the state's claim on reserved areas. The positing of claims to use rights in both the village commons and in unincorporated forests, however fragile those claims may prove to be, is thus rooted in both tradition and practice in India.

In the classic formulation of "the tragedy of the commons" (Hardin, 1968), the tragedy was the failure of collective social institutions to prevent the externalities of private maximizing behavior from ruining a common resource to the detriment of all individuals in the local social system. In this sense, the "tragedy of the commons" is simply another, though one of the most dramatic, of examples of what Sartre calls "counter-finality": the unintended negative consequences at the collective level of individually "rational" decisions. The problem of the commons is the nothing more than a particularly poignant illustration of the necessity of coming to terms with a fundamental dilemma of social life: certain collective goods can be achieved only through interference with a Hobbesian (or Kautilyan)² world of individual maximizing behavior. There must be rules. It is in the theoretical elaboration of the sources, nature, and enforcement of those rules that the tragedy paradigm generates the most contentious issues.

The traditional association of the tragedy of the commons with conservative political theory lies in a) the person of its promulgator, Garrett Hardin, b) the

individual maximizing assumption about human nature, which denies community, c) popular extension in applications such as "triage" and "lifeboat ethics" applied to the "third world" (cf. Moss, 1977, and Bamet, 1978), and d) the two traditional solutions to the "tragedy:" Leviathan and vigorous creation of exclusive private property rights in land. None of these associations fatally contaminates the concept.

The ad hominen argument seems unworthy of discussion. The usefulness of "rational-actor" assumptions regarding human behavior is too complex to address here (cf. Herring, 1980), but some preliminary comments are appropriate regarding the communitarian solution to the tragedy problem. On the capacity of communities of "traditional" or "ecosystem people" (Klee, 1980:1) to regulate use in conserving ways, there is considerable debate. While hunting, gathering and fishing communities may indeed impose limits to conserve their commons, slash-and-burn agriculturalists and frontier-expanding peasants with "ax and plow" are more problematic. In all cases, the capacities of small communities to conserve their local ecosystems for "sustainable yield" are bounded by limitations on expansion to mitigate the effects of a very modern force: population increases (cf Jodha, 1985). Unless the commons can expand to create a constant opportunity/person ratio, pressure on local norms of conservation will increase.

As we move from conservation of usable resources to preservation of an ecosystem, the boundary conditions become more stringent and the examples more rare. Thus the tragedy-of-the-commons perspective may indeed become increasingly relevant even in situations in which local institutions have evolved to protect elements of the environmental base; claims by the state and population pressures

may destroy the conditions under which traditional conservation norms could be enforced (for examples, Murton, 1980: 87, 91, 93). Whatever the validity of models based on individual maximization as a characterization of human nature, community as a normative construct presupposes certain minimal material and political conditions rooted in the local and national political economy. It is not accidental that individual maximization models of human behavior coincided with the establishment of market capitalism.

The theoretical solutions to the tragedy dilemma are likewise insufficient to disqualify the model; it seems clear that there are alternatives within the framework of the tragedy paradigm. The original tragedy model assumed that no cooperative strategies would emerge among shepherds maximizing their individual gains from a common pasture. As a consequence, one solution is that of Thomas Hobbes (and Kautilya): a powerful state which could enforce its will on subjects for their own good. This solution is of course not unknown in environmental preservation: protection of the "Silent Valley" tropical rain forest in South India was clearly the act of an elitist and authoritarian government acting contrary to the clearly expressed democratic voice of inhabitants of the region (see Herring, et al, 1986:3-4). The problem with that solution in political theory is the absence of a guarantee, or even a likelihood, that the state will not behave in the same self-seeking, social-disregarding manner as individuals. The environmental profligacy of modern nation states of authoritarian bent certainly confirms the possibility. The state itself is driven, often captured, by interests which typically run counter to environmental values. But even with relative autonomy, Leviathan must be fed. Pressures for taxation revenue and hard

currency earnings have abetted environmental degradation throughout the subcontinent (eg., McCarthy, 1987).

That strong states may err, or run amok, is the argument for democracy as a protector of society's environment. Under democratic conditions, at least a cybernetic corrective possibility exists. Positing strong individual private property rights as a bulwark of democracy, and simultaneously as a corrective to the tragedy of the commons, the property-rights school comes down heavily on the side of harnessing individuated property interests to environmental protection. In the original "tragedy" paradigm, no rational shepherd would degrade his/her own land by overgrazing, and therefore the division of common pasture into individually owned plots would avert the destruction of a common resource (cf. Ostrom, 1986:8).

The problems with the property-rights solution are two internally, and one externally. Internally, property rights are useful only for insuring that the level of exploitation does not measurably degrade the resource any further than the value of the short-term benefits of exploitation. Conservation will, even in the best-case scenario, be limited to the very loose constraint that degradation does not interfere with market rationality. Market rationality, in turn, will only incidentally coincide with ecological "rationality" (compare Singh, 1976; Desai, 1987; Nadkarni, 1987). Ecosystems are large and complex; individually rational behaviors (diversion of surface water, draining of wet lands, clearing of forests, etc.) still offer the likelihood of counter-finality in a broader context. The property-rights solution may work fairly well in closed, bounded systems in which conservation and exploitation interests coincide, but still

requires some collective political authority to define and maintain boundaries and prevent externalities. As importantly, human lives are short in terms of the evolution of ecosystems; it is difficult to imagine a fit between short-term interests and intergenerational "rationality," or justice, being generated by the market (Nadkarni, 1987: 360-61 et passim). The external critique is of course that in modern South Asia, as in much of the world, individuated property rights exclude whole classes of society, with unacceptable human costs and political dynamics which challenge the solution itself.

There is a third possible solution to the tragedy problem: cooperation and social learning. Because of the rational choice base of the tragedy paradigm, much work has proceeded in the game-theoretic vein of prisoner dilemma situations in which cooperation, though desirable to all agents, is ruled out by pursuit of interests (Ostrom, 1986; e.g., Gadgil et. al., 1984). In the real world, prisoner dilemma situations are rare, however powerful the original logic. As Axelrod (1984) and others have argued, in repeated games cooperation becomes a live possibility, even within the game-theoretic paradigm which offends many social scientists on other grounds. Evolution of social institutions can be thought of as a series of repeated games in which conflict produces self-correcting change.

More concretely, there is no a priori reason, even in theory, to expect that shepherds would not recognize impending disaster and evolve rules and enforcement mechanisms to preserve their common livelihood base. There are clear empirical examples in India (Gadgil and Iyer, 1988; Murton, 1980). Elinor Ostrom (1986) likewise provides examples of small-scale social systems which have overcome the

tragedy of the commons in exactly this manner. As discussed briefly above, conserving rules may, however, succumb to pressures arising from inside or outside the local system. Moreover, social learning in the real world is of course subject to blockages of concentrated power and stratified interests, just as Habermas (1973) notes for social rationality in general. Cooperative institutions are for the same reasons difficult to create and maintain (Herring, 1983:263-64). Nevertheless, the social learning solution disarms theoretically the ideological-partisan critique of the tragedy paradigm, and opens an important problematic: under what conditions do ecologically friendly social learning and Institutional change occur?

The argument to this point is that the "camions" framework is not hopelessly contaminated by Eurocentrism or sectarian political-ideological ramifications, but is an exemplar of the problem of counter-finality which inevitably confronts society. Well-meaning and rational individual behavior may aggregate to produce unintended and catastrophic consequences. Such consequences can occur as classic "market failures" or as social institutional failures. Social learning through political processes may mitigate the inexorable quality of the tragedy, but two caveats are necessary. First, concentrations of power can block the process. Secondly, the interest-driven model even under optimal conditions offers little protection for nature per se, but rather for conservation of nature already employed as an economic resource, opening the question of what has been termed the "deep ecology" perspective.

Social Ecology vs. "Deep" Ecology: The Instrumentalist View of Nature

The logic in the tragedy-of-the-commons literature has depended heavily on a conceptualization of the "commons" as used resources of nature. That is, the value of the commons is instrumental. This notion carries over in the dominant policy language of "common property resources;" the natural is valuable insofar as it constitutes a resource, something to be exploited. Grazing lands have value because they form the foundation for livelihoods. This instrumental and utilitarian view of nature in market economics is shared by the Marxian tradition (eg. Marx's Grundrisse, "Chapter on Capital"). Conservation of the instrumental value of natural systems constitutes a critical agenda for analysis of the commons problem in concert with developmental policy issues in South Asia. But these questions presuppose a nature already appropriated and altered for human use.

For the ecologist, a deeper set of questions concerns the conditions under which some parts of the natural environment not be used at all, not simply used in conserving ways. This is a second order notion of commons, the common physical world which supports a full complement of species and not merely our own. Even the most "rational", conserving use of pastures for sheep would be ruinous to the global commons if all forests were converted to pastures. The critical role of forests in the global biological system is well understood; the more challenging political proposition for deep ecologists is to demonstrate the value of relatively small components of larger ecosystems. The only utilitarian argument which ecologists can bring relies on the specter of uncalculated risk; in destroying systems that are poorly understood, potential use values may be sacrificed unknowingly.

In the case of the Sunderbans mangrove swamps in Bengal, for example, estuaries provide breeding grounds for some 400 species of fish, some of which are of commercial- importance in an international commons—the ocean (Rainboth, 1987). At our present level of knowledge, it is difficult to calculate the risk of environmental perturbation in terms of depleting an international common property resource. How much risk is justifiable? Would the answer change if the only risk were to the functional equivalents of the snaildarter—i.e., commercially useless species? Certainly the politics of preservation would change. Is there justification for preservation of evidently "useless" species when the material gains from limited exploitation are demonstrably large? Does anyone really believe that the next wonder drug may come from some yet-undiscovered fungus inhabiting a tropical rainforest, as was argued by proponents of saving Silent Valley? The logic of conservation depends on the commercial value of that which is to be conserved; the logic of preservation must be rooted in more politically tenuous values of aesthetics, ethics, or risk.

The tension between an instrumentalist view of nature and an idealist argument for the value of nature per se shadows the tension between the comoditization of market society and pre-market or extra-market sources of values. When value is measured by use, priced in markets, nature depends for its preservation on extra-market valuation in the moral economy tradition.³ In the absence of market power, effecting such valuation depends on political power and authority. The insights of Polanyi's Great Transformation (1944) remind us that the transition to a market-dominated world is incomplete, and inevitably so. Societies of various ideological tendencies continue to constrain, bound and

contravene particular market-driven outcomes. Much of contemporary politics, inside and outside the environmental sphere, concerns boundary demarcations between what markets can decide and what they cannot, or at least should not.

If we expand the notion of commons to include the biological systems which support a full complement of species (and not merely our own), the usefulness of the "tragedy-of-the-commons" formulation lies in its explicit confrontation with the contradictions outlined above. First, whereas there may be small-scale solutions to the tragedy problem with regard to instrumental uses of nature, preservation of nature in a "useless" (primordial or at least steady state) requires the identification (and mobilization) of interests to compete with those of individual gain and survival. Given the level of human destitution in South Asia, this dilemma is difficult to resolve even in social (normative) theory; practical politics raises even more severe dilemmas. Though the poor are often seen as the greatest threat to fragile ecosystems, they are more importantly the first victims of environmental degradation (Agarwal, 1985; C. Singh, 1986). More problematic than the poor are the powerful. Their social connections and access to bureaucracy are major obstacles to the preservation of economically attractive zones. It is here that the Leviathan solution arises, but manifests its problematic character. States of the South Asian region are indeed "soft" (in Gunnar Myrdal's memorable formulation), but only in a selective sense. A reversal in the interests served by softness and hardness seems to be a necessary, but not sufficient, condition for reversing the dynamics of environmental degradation.

Leviathan as metaphor conveniently links will and implementation in one actor. States of the subcontinental region lack the autonomy, unity and capacity, not to mention the values, to resolve contradictions on the side of nature. Even under non-democratic regimes (eg, contemporary Bangladesh), a strong state is hard to come by. The permeability of (especially) the local state to powerful interests bent on exploitation is a pervasive phenomenon in South Asia and the source of significant environmental degradation. States demonstrate both vertical and horizontal incoherence; as the lower levels of the state ramify into society, they become less and less distinguishable from society, much as blood vessels ramify into capillaries and finally disappear into tissue. Neither political will nor capacity can be assumed in assessing solutions to the tragedy dilemma.

In sum, the tragedy of the commons in South Asia is a more serious case of "counter-finality" than even the original theoretical model implied. This is true because the potential solutions present severe difficulties in the concrete social settings of the region and because one must distinguish common property resources from the environment generally as a commons. In the case of natural resources already employed, these are opportunities for the linkage of environmental preservation/regeneration with strategies for economic development focused on secure livelihood for the most desperate citizens (cf. The World Commission on Environment and Development, 1987). In the Silent Valley resolution, some pressure for drowning the valley was released by promising jobs in the construction and maintenance of a research institute in the area. Likewise, genuine land reform can relieve land hunger which drives invasion of fringe areas of reserves⁴ and simultaneously reduce some blockages to cooperation

and institutional change. Food for Work programs can be targeted for relieving pressure immediately surrounding fragile areas. Technological change of the most simple sort—improved village stoves, alternative cooking fuel sources—can marginally relieve deforestation pressures. The severity of the contradiction between livelihoods and conservation is a function of market dynamics in the existing context of skewed distribution of assets and extreme pauperization. Though some environmentally progressive change is possible within that configuration, given significant alteration of political dynamics, substantial progress would seem to require quite fundamental rethinking of the relative values of growth per se, social justice and political democracy.

The Sunderbans of Bengal: Tragedy Averted?

The fate of the mangrove coastal wetlands bridging Bangladesh and India's West Bengal has been intertwined with a central dynamic of human history: the pressure to carve livelihoods and habitats from nature. In the Sunderbans (etymologically either "beautiful forest" or forest of sundri trees, more likely the latter), this transformation has been going on for centuries (Eaton, 1987; Richards and Flint, 1987), progressively reducing the forest's extent. As in much of the subcontinent, increased pressures on agricultural land and available jobs threaten encroachment on a natural system which state authority seeks, however ambiguously, to preserve. Unlike the forests inhabited by tribals in the region, where the conflict is between utilization of an existing habitat-cum-common-property resource and historically novel statist claims to conservation and management, the remaining (and shrinking) mangrove forests have become an object of conflict between social forces seeking an extension of livelihoods on the one hand and a state which seeks to limit that process on the other.

The ecological and economic functions of the Sunderbans have been described as follows (Seidesticker and Hai, 1983:71):

"The vegetated tidelands of the Sunderbans are the only source of timber, firewood and other forest products in the region, but they also function as an essential habitat, nutrient producer, water purifier, nutrient and sediment trap, storm barrier, shore stabilizer, aesthetic attraction and energy storage unit. The drainage ways and estuaries serve as a transportation net, major fishing area, and nursery area for many coastal and ocean fisheries."

Although ecological systems are often thought of as producing (even if poorly perceived) "public goods," it is crucial to note their role in preventing public bads (though protection is of course a public good in theory, and indeed the archetypal one). The function of the Sunderbans as a "storm barrier" is critical given the colossal devastation of cyclonic storms in coastal Bengal. Complete destruction of the coastal forest wetlands would have rendered agriculturalists and their property even more insecure.

The preservationist strain in official policy is of relatively recent origin, dating from the 1870's. The colonial state operated before then on a commercializing and revenue logic which recognized the value of controlled reclamation of "wasteland" by agricultural entrepreneurs. That logic gave way incrementally to protection of a diminished core of forest, managed for sustained yield and state revenues (Presler, 1987; Bhattacharyya, 1987). The Sunderbans is now managed as a limited access commons, managed for what Americans would call "multiple use." Limited access proves difficult to maintain in practice because of the limited capacity of the local state. Conservation has not been completely effective, even in the diminished core, but at least the full tragedy implications of unlimited destruction by "ax and plow" have been averted by an ecologically benevolent but porous Leviathan.

The danger to the Sunderbans as an ecosystem arises not only from proximate sources which are quite familiar, but also from distal sources about which we know too little. The easiest conflict to monitor and control, though not to reverse, is the bunding imperative that historically allowed farmers to exclude salt water from paddies with a resulting decrease in salinity and soil quality which threatens the Sunderbans' flora (Cowan, 1928: 203). Gathering of timber, forest products and fish may pose a threat to the carrying capacity of the system, but there are limitations to our understanding because of gaps in the social scientific and natural scientific literature. Much of the exploitation of the forests is illegal (McCarthy, 1987), and therefore cannot be precisely measured. More importantly, we do not have a precise notion of the regenerative capacity of the forest, especially in the face of deteriorating hydrological conditions. Thus, even the problematic concept of "sustainable yield" of timber is difficult to employ empirically. Further encroachment for rice farming – the historic threat – and shrimp culture utilizing new technologies both threaten the system in more fundamental ways.

Distal pressures on the forest emerge from the incapacity of the international political system to resolve conflicts over water as a common resource. The Farraka barrage in India has certainly altered the hydrology of Bangladesh in a negative fashion, but the precise effects on coastal forest ecology are difficult to ascertain. In addition, major alterations of the nation's hydrology, driven in part by external advice and aid, are occurring through massive bunding (embanking for flood control and drainage) schemes which privilege rice over fish and rest on an uncertain empirical base in terms of

ecological effects (Herring, 1985; Rainboth, 1987). The Government of Bangladesh is engaged in baseline data collection for a major simulation of the hydrological system, but the results will be a long time coming. Even more distal geological processes may threaten the existence of the coastal wetlands through dynamics beyond the control of any human institution (Snedaker, 1987). Pressures for import-substituting development of timber and pulp resources, or export earnings from shrimp and timber are difficult to ignore at the regime level, given the chronic hard currency shortage, debt-servicing difficulties and position of Bangladesh in the international economy (Sobhan, 1982; McCarthy, 1977).

The Sunderbans is a local commons in the sense that it is an arena for conflict between private interests (some very powerful, some quite humble) and the state. The national state's proprietary claims entail restriction of use rights at odds with the interests of the local rentier state: the gaining of material rewards for granting selective expansion of use rights. The Sunderbans is an important part of a global commons not only because of its well publicized position as home of the endangered Bengal tiger, but because of the importance of its estuaries as breeding grounds for fish which inhabit the Bay of Bengal, the presence of unique flora and fauna and the importance of mangrove wetlands as an endangered ecological system worldwide. In this sense, the deterioration of the forest is an illustration of the perverse ecological consequences of sovereignty claims by nation states which inhabit a global commons. In a somewhat ironic twist, the same dependency relations which produce so supine a state vis-à-vis international actors and put pressure on environmental integrity in general have helped preserve the Sunderbans precisely because of its importance in conceptualizations of a global commons by powerful international actors.

At another level, the social process of restricting access to exploitation of the Sunderbans entails a conflict between deep ecology and social ecology. Adherents to the values of deep ecology resist any human interference with the functioning of natural systems. Biological diversity takes precedence over conceptualizing, and managing, nature as a "resource," whether common or private. Social ecologists are concerned with establishing a fine line between interests of preservation of nature per se and the legitimate interests of human populations in using their environment for livelihoods and habitats. Official policy in the region leans toward the social ecology perspective, though there are undercurrents of deep ecology in pressure for human population control. Whether that line can be maintained depends on the capability of the local state on the one hand and the carrying capacity of the natural system on the other. On both matters, a great deal more needs to be learned. Nevertheless, it seems clear that economic pressures emanating from above the national state because of its position in the global economy and social pressures emanating from below (through both pauperization and greed) threaten further deterioration in the ecological integrity of the Sunderbans.

The Sunderbans has made the transition in perception and practice from waste to exploitable resource to endangered ecological zone worthy of protection – from open access commons to privatized property at the margins to a limited access commons at the shrinking core. The essays which follow treat the details of that process. The final section of this essay raises broader questions for the analysis of the survival of the Sunderbans and for environmental protection in general.

The Broader Research Agenda: Phenomenology and Political Economy of the Commons

The complex relationships between the meaning systems and natural environments of South Asia have only begun to be explored. The substantial literature on economic development and policy-oriented issues is only beginning (with the exception of the long-standing forestry management discourse) to deal with questions of how commercial, agricultural or industrial demands can be balanced with conservationist concerns (eg. Nadkarni, 1987). Typically lacking in this perspective is systematic attention to cultural variation over time and space. This instrumentalist discourse has enjoyed a privileged status due to its patronage by governments and agencies promoting a particular kind of economic development (Eaton in Herring et al., 1986). Central to this worldview is a conceptualization of nature as a bundle of "natural resources;" its value is measured by prices of products.

Despite the seemingly pragmatic and scientific language of policy studies, ineffective or counter-productive policy is typically traceable to miscalculation of prevailing attitudes and interests. We know very little of a systematic nature about the sources of preservationist or commons-regarding values in South Asian cultural traditions. What do indigenous meaning systems make of nature (prakriti)⁵? "Wild" animals may have one value in myth, song, and religious practice and quite another when confronted as "pests" threatening agriculture⁶. The Sunderbans may be perceived as a rich and valuable ecosystem or simply a useless swamp (Bhattacharyya, 1987). Where do environmental values rank in the face of competing values - "development," individual opportunity,

employment, hard currency earnings? Reciprocally, how do natural processes provide a language and metaphors for understanding social relations – as in Kautilya's "law of the fishes" or the term for an exploitative big man in the village in Bangladesh – freshwater shark (raghab buwal)?

A second problematic is what we might call the moral economy (see ftn. 3) of the commons: what are the prevailing notions of the rights, limits, and responsibilities entailed in private and common property? What is held to be the public interest in the commons? How do people conceptualize inter-generational justice with regard to a natural heritage? How are the short-term and particular interests of an existing generation desperate for jobs and material welfare balanced against the interests and rights of future generations? What moral logic governs the distribution of costs in environmental externalities?

Chatrapati Singh (1986: 1) has argued that in the traditional Hindu conceptualization of nature as "a living organic force, like man, violence against nature constitutes adharma" ("injustice," or unrighteous action). But as in the case of all values, the behaviorally relevant meaning is situational, not given or primordial. Despite celebration in the great tradition of dharma and ahimsa, Singh goes on to document systematic adharma vis-à-vis nature in which the benefits accrue to the state and powerful groups, the costs to "the rural poor, the tribals, and the flora and fauna of India (ibid)." Perceptions of value, like the consequences of action, are interest-mediated, and thus class-differentiated; the need for integration of phenomenological and political economy perspectives is clear. As Lukacs noted:

Nature is a societal category... whatever is held to be natural at any given stage of social development, however this nature is related to man and

whatever form his involvement with it takes, i.e. nature's form, its content, its range and its objectivity are all socially conditioned (Lukacs, 1923:234).

Political economic analysis is about the dynamics of interests within structures. Environmental degradation is driven by a complex interaction of the variable power of individuals with structurally-given interests mediated by incentives and constraints of a state. Public incentives and programs – social forestry, flood control, chemical-intensive agriculture, manure-methane plants, import-substituting pulp and lumber programs, etc. – all affect the dynamics of ecological damage, preservation and regeneration. Public policy toward alleviation of rural poverty directly affects encroachment on the commons driven by subsistence pressures affecting marginal classes (eg Desai, 1987). Simultaneously, disappearance of the local commons of the village degrades survival strategies of the rural poor. As a first cut, we need to make an inventory of the policies which alter dynamics affecting the environment, with careful attention to the political sources of support for and opposition to those policies. In this analysis, the interests of the state as such require interrogation.

Core concepts of political economy come into play here – structures which differentiate interests, democracy, and a collective good. By way of illustration, we may consider two major environmental movements in recent Indian experience which highlight this intersection, and anchor ends of the continuum. In the Chipko (tree-hugging) movement, local pressure was generated to prevent despoliation of a collective economic resource – the forest. Democratic expression of interest-driven local values coincided with environmental preservation. In the Silent Valley movement in Kerala, the opposite dynamics

occurred. Local mobilization was for development of a hydroelectric project which various elite preservationist groups, national and international, saw as a threat to a supposedly pristine and unique tropical rain forest.

In the Chipko movement of North India, rural people, especially women, have banded themselves around trees to protect them from destruction by government and commercial agencies. An explicit concern of the forest protesters was that "protection" of the forest by the state was a cruel hoax: "They have swept the jungle clean" (Omvedt, 1987:29-30). The movement highlighted the growing conflict between competing political interests, and behind them, competing world views. One position reflects those interests associated with an aggressive cash economy; the other those associated with a rural subsistence economy. While the former emphasizes commercially valuable trees such as pine, teak, and eucalyptus, the rural economy is dependent upon an older, indigenous forest whose biomass products have supplied rural society with most of its household needs - fuel, fodder, fertilizer, building materials, herbs and clothing (Eaton, in Herring, et al., 1986; Agarwal, 1985).

In the Silent Valley controversy of South India, a similar antinomy of perceptions was manifest. The plan for damming the Kantipuzha and flooding the valley represented to local organized interests only jobs, irrigation water, hydroelectric power and lucrative contracts. Conservationists evoked the aura of a primeval rain forest, one of the last remaining in the Western Ghats; they cited cytological evidence of rapid speciation underway in the area and called for preservation of the habitat of its known endangered species (principally the lion-tailed macaque) and potentially numerous undocumented species (cf. Nayar,

1980; Vijayachandran, 1980). Well organized proponents of the dam won the definitional struggle; the State legislature debated an issue of "man versus monkey" controversy and essentially voted against the monkeys. The narrow escape of Silent Valley from inundation resulted from a peculiar niche in India's federal political system which allowed a central government adopting the environmentalists' meaning and value system to override local democracy.

These two polar cases make several points about the political economy of environmental protection. First, there is no institutional guarantee of substantive outcomes friendly to the environment. Local democracy and decentralization have become totems of development literature, and clearly can be legitimized on other grounds. But when livelihood competes with preservationist values, as in the Silent Valley case, local democracy may exacerbate pressures for despoliation. Malabar is a neglected area within a neglected state. Even after significant land reforms, underdevelopment and destitution characterize a high percentage of the population. Moreover, Kerala is striking as a State of high literacy and advanced politicization; popular interests are typically represented, often in a militant fashion. The second point is that local democracy is more likely to be a force for conservation in the social ecology sense rather than preservation in the deep ecology sense. The Chipko participants were protecting their own livelihoods; the Silent Valley project threatened no existing livelihoods and promised to generate 15,000 new ones. Recent moves toward decentralization and popular control of local administration in Bangladesh (Blair, 1987; Herring, 1985) can be expected to put more rather than less stress on the Sunderbans.

At a pragmatic level, environmental protection typically depends on a two-stage movement in moral economy and public law. First, the commons must be recognized as a collective good. We need to understand the sources and extent of that conceptualization in traditional and contemporary thought in the subcontinent. Secondly, management of the commons must often proceed in conflict with immediate interests, and thus depends on an argument for higher-order values that are poorly received, whether because of ordinary interest politics or for lack of sophisticated understanding of the science of ecology.⁷ Changes in public law and the ceaseless struggle for implementation must likewise be understood as a dynamic intersection of interests, power and values. The issues of "political will" and popular understanding are thus interconnected; changes in environmental consciousness must incorporate popular meanings even as policy must often transcend them. The best-case scenario for South Asia's environment is a genuinely strong state which derives compliance on environmental issues from real political legitimacy rooted in a vigorous developmental commitment to alleviating destitution and expanding opportunities for the marginalized. The political base of such a regime under existing conditions in the region is difficult to conjure.

The Commons as a Problematic

In common usage, the "commons" connotes a physical space of open and collective access, either as res nullius or as community-defined property. This essay has argued that the concept must be broadened significantly to capture the wide range of phenomena important to analysis of the intersection of social and natural systems. These meanings can be disaggregated as follows:

a) The Commons as Physical Space: Whether as the residual from claims of private property or from common practice, spaces have been defined historically

as legitimate use objects of bounded communities. The commons in this sense has been the object of pressure for privatization. Privatization of the commons has produced results which are dubious in terms of environmental preservation and social justice. Institutional rules for conservation (less likely, preservation) may or may not emerge from the relatively small communities which claim this type of commons. Such rules as exist will hold only within specifiable boundary conditions; both destitution and greed put almost inexorable pressure on rules regulating the commons. Crucial to analysis in this vein is the understanding that social delineation of a commons inevitably involves rules of inclusion and exclusion from opportunities, presenting the basis for conflict within and between social groupings. In modern political systems, maintenance of local commons depends on nodes of public authority at higher levels.

b) The Commons as Arena: The notion of "public" property resolves nothing, but introduces a subsidiary set of conflicts around the issue of defining the public and determining its collective "interests." Reserved forest lands are a commons in not being private property, but the legal definition of reservation for a public purpose merely introduces a conflict between the state's historically contingent claims and those of inhabitants and users of the forests. The issue of common purpose, management for a common good, and claims akin to common-law use rights define antagonists in an arena in which the commons is both the object and arena of contest.

c) The Commons as Ideological Force: From the perspective of privatization ideology, the tragedy of the commons constitutes evidence for the superiority of private-property systems for the conservation of "natural resources." For what we might term "traditionalists" (eg. Klee, 1980), common interests in the conservation of the environment in pre-market settings provide a store of

techniques and an ideology of non-market rationality in which social appeals for preservation or regeneration of the commons can be grounded. The radical content of the commons ideological framework is the direct confrontation with the "natural" or inevitable logic of markets as arbiters of the future of natural and social systems. Grounded in pre-market or non-market conceptualizations of nature, the commons perspective asserts the legitimacy of extra-market claims on the dispensation of the surface of the planet.

d) The Commons as Global Interest: The argument that environmental concerns are literally global in scope presupposes standing for those far removed from particular environments. The argument for preservation of biological diversity is rooted in a notion of interest which is planetary and species-wide. It is only by this enlargement of the legitimate social arena by appeal to a global commons that North Americans can presume to have a stake in the fate of tigers in Bengal.⁸ Rights and obligations in the use and preservation of a global commons raise genuinely new issues for international politics.

e) The Commons as Tragedy: The tragedy paradigm formalizes the popular caution: that which is everyone's concern is no one's concern. While not inexorable, the logic of uncoordinated pursuit of interests (read anarchy) threatens that which is a common interest. Recognition of the potential tragedy inherent in this logic is the grounds for institutional innovation and new political practice from the local to international levels. As neither of the traditional solutions – Leviathan and privatization – guarantees conservation, much less preservation, the well-worn tragedy metaphor is a vehicle for energizing a broader discussion of alternatives.

Economics and ecology derive from a common etymological root; oikos is both home and household.⁹ Aristotle's household was in effect a firm; its management, and the laws (nemos) of management, could constitute the subject for a science. But oikos is also home, and the home of each species is dependent on others in a natural pattern; this pattern, discernible by reason (logos), is likewise the subject of a science. That one species attained that capacity for subjugation of others through technological change and enhanced reproductive capacity made the home of all species dependent on the management techniques of individual and collective households of humans. In both the dominant and Marxian traditions of economics, nature attains value insofar as it can be transformed into commodities for use and exchange. Through some reconceptualization of nature as an exhaustible, hence scarce, stock, and expanded conceptualization of "externalities," social ecological values can be integrated into the market logic of value residing only in factors of production and products. Integration with a deep ecological perspective remains problematic, dependent on a reevaluation of the concept of value itself. Since natural laws of ecology are not mutable, the socially and historically contingent "laws" of economics must be recognized as such.

Notes

1. In Bangladesh, "khas" (reserved) lands and ponds can still be identified legally and are one source of compensation to farmers who lose land through bunding (embanking) operations (Herring, 1985). As is common throughout the subcontinent, village "commons" are frequently under the de facto control of locally powerful people, but have a legal and ideological basis for reassertion of collective control.
2. In the Artha Sastra, Kautilya notes: "The means of ensuring the pursuit of philosophy, the three Vedas, and economics is the Rod [wielded by the king]; its administration constitutes the science of politics... On it is dependent the orderly maintenance of worldly life... If not used... it gives rise to the law of the fishes. For the stronger swallows the weak in the absence of the wielder of the rod." From Marguerite S. Robinson (1988: frontispiece). The doctrine of matsya-nyaya, which Robinson calls the "law of the fishes," implies that in the state of nature, anarchy prevails, providing justification for a strong state. So strongly is the state associated with "the rod" (danda) that Kautilya calls the science of kingship dandaniti.
3. A totem of peasant studies, the moral economy tradition opposes "moral" not to immoral but to amoral; that is, economic relations are judged not by canons of market rationality, but by socially constructed notions of right and wrong, acceptable and unacceptable. For the briefest possible summary, Herring (1980).
4. On the importance of poverty-alleviation programs generally for environmental protection, Desai, 1987. Land reforms have in India have had in some cases unintended negative environmental impact, since reserves protected by "feudal" elites for hunting were divided among agriculturalists or deeded to a more obliging state. For example, see Centre for Science and Environment, 1986:8-9.
5. Pakriti has far too metaphysical a meaning to carry the common meaning of "nature." It means the original or natural form, or primal substance, and is usually opposed to purusa, or world of the spirit. Akhil Gupta tells me that villages he worked with in Uttar Pradesh called everything outside the village proper "jungli," including cultivated fields. Val Danniel reports in "Tea Talk in Sri Lanka" (1985 ms.) that the "jungle" (Katu) had come to connote dangerous wildness in the minds of plantation Tamils, presumably standing as metaphor for the dangerous and uncivilized nature of Sri Lanka after the emergence of ethnic pogroms. We really lack, to my knowledge, a systematic treatment of indigenous meanings of the "wild," of nature.
6. In recounting evil omens in Malabar, Logan (1887: Vol. 1,211) mentions "the sight of a serpent, cat, iguana, bloodsucker, or monkey crossing the road, or vociferous beasts or birds such as jackals, dogs and kites [in addition to] a eunuch, a ruffian, an outcast, vomit, excrement, stench, any horrible figure, bamboo... " He also reports (ibid, p. 217) that a remedy for the widespread fear of the evil influence of snakes was to maintain in

the compound an area of "waste" which "is left to nature to deal with as she likes" (note the gender). The implication would seem to be that human beings must atone for the destruction of the snakes' environment at least symbolically by recreating jungli conditions in the household's compound.

7. In the debates surrounding the Silent Valley protection bill in the Kerala Assembly, the word "ecology" was used and then challenged as to its meaning. No one could give a coherent account, but it was finally decided that it must have to do with pollution. Since the hydroelectric scheme threatened no pollution, the deep ecology position of the Kerala Sastra Sahitya Parishad was effectively delegitimized in the dominant view of the legislators. Working in Palghat district at the time of the controversy, I can affirm that ecological values were even more weakly perceived and appreciated by local organizations. The perception that ecological protection is a "luxury," unaffordable in poor societies, was clearly evident in Kerala and is a theme in "North-South" disputes on the environment.
8. Even the Reagan administration, which has taken a privatizing and national sovereignty position on numerous international issues which posit a "global interest," argues that there are indeed global interests in the environment. In the most recent statement of principles of U.S. foreign policy, there is reference to "the world's heritage of living natural resources - its tropical forests, its reserves of biological diversity, its wild plants and animals" threatened by "the products of our industrial civilization." Recognizing "new frontiers of international responsibility and cooperation," the State Department explicitly champions a "leadership role" for the United States. Fundamentals of U.S. Foreign Policy (Washington, D.C.: United States Department of State) March 1988, p. 42 ff.
9. This point has almost certainly been made by someone previously, but I know of no source. Aristotle's dependence on nature as a model for human relations and societal organization is developed in the Nichomachean Ethics.

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