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Politics of Nature: Interests, Commons
Dilemmas and the State

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Ideas and Interests in the Politics of Nature

In the last two decades, the politics of nature has emerged as an increasingly significant phenomenon at the local, nation-state and international levels, in both rich and poor countries and, increasingly, between rich and poor nations. We should not overlook the historical antecedents of resistance in the form of defensive reactions by peripheral communities, particularly in the colonial world, to environmental degradation entailed in commercial appropriation of natural resources backed by the state, but in recent times the scale, intensity and scope of environmental politics has constituted a qualitatively new phenomenon.

In this evolution, ideas fostered by a new science of ecology have been fundamentally important, though not decisive. Ecology as a knowledge system indicates that there is an objective reality to the interests underlying conflictual ideologies of nature; in a telling formulation "nature bats last." This understanding, though unevenly accepted, provides scientific legitimation for core beliefs of communities long associated with nature: the interconnectedness of natural systems. But that collective long-term objective interest is relevant to political behavior only as interests are processed through cognitive frames and obtain political capabilities. The periodic catastrophes of small communities dependent on nature since neolithic times indicate the limitations of ecological imperatives in a political sense.

Though seldom interrogated, the concept of "interest" dominates political enquiry, explicitly or covertly. It is precisely because of this core assumption that Elster (1985) and the "rational-choice marxists" find the possibilities for integration of apparently opposed frameworks of political analysis. The level of analysis remains problematic, but pluralist, marxian, state-centric and choice-theoretic frameworks proceed from the interests of groups, classes, states and individuals to produce predictions or post-dictive explanations of political phenomena. Whereas some interests are relatively non-problematic (individuals and organizations seek survival; regimes, continuity of rule; states, authority and power)¹, the field of environmental politics

exhibits important singularities with regard to the conceptualization of interests.

Interests in environmental politics are certainly organized around familiar desiderata of survival and aggrandizement, but are simultaneously embedded in a field of extra-individual interests with defining characteristics: extreme uncertainty (and risk) mediated by a technical discourse, temporal distance of ultimate impact, threshold effects (or "tipping points"), irreversibility and counter-finality.

The embeddedness of individual and local interests in a larger public good has been conceptualized through the venerable metaphor of the "commons." Implied is a deeper problematic regarding the conceptualization of common interests: the familiar dispute over the meaning and weighting of that complex of aggregate outcomes covered by the ambiguous concept of "development."

In the dominant discourse on interests (with roots in Marx and Mannheim), ideologies function as rationalizations of interests, not rationales for behavior (Herring 1983: pp 271-274). In a political world dominated by material interests, it is puzzling that nature for itself (as opposed to nature appropriated for human use values) ever wins. The discourse of preservation, rooted in the value of species diversity as elaborated by the science of ecology, constitutes an ideational base for the politics of nature for itself, but remains dominated in most of the world by either a logic of conservation or a logic of "development" which privileges direct and immediate human material interests.

Human interests in nature are most evident in a nature already appropriated for human use; appropriated nature generates livelihoods and use values, as conceptualized in both mainstream and Marxian economic logic. The collective objective (and increasingly subjective) human interest in nature for itself posits ecological imperatives as a public good, independent of use values, introducing the conflict between a conservationist agenda rooted in social ecology and a preservationist agenda rooted in "deep ecology." In the subcontinent, as in much of the world, these alternative ideologies are rooted in different social bases. The best-case scenario for the environmentalist agenda politically is confluence of movements rooted in conservation and preservation to mitigate the accumulation and growth imperatives of dominant classes and the developmentalist state.

This essay will discuss the conceptual literature on interests in commons dilemmas, stressing the role of collective authority represented by the state. Empirical materials from the subcontinental region will be deployed to illustrate points in the argument. Finally, some speculative points on the politics of nature will conclude the discussion.

Common Interests in Natural Systems

Perhaps the dominant paradigm for understanding the politics of intersection between natural and social systems -- the "tragedy of the commons" -- is centered on a short-term individualistic maximizing assumption about human interests and behavior. The "tragedy" model has been a powerful metaphor for organizing much thinking about the persistent and severe, perhaps inevitable, contradictions between pursuit of individual material interests and the integrity of natural systems (Ostrom 1986). That simple metaphor/model has yoked discussion of environmental degradation to issues of collective action and common interest.

Though natural scientists may disagree on the "tipping points" of particular ecological systems, and thus question how close "tragedy" is at any given time, commons situations and commons dilemmas are pervasive in the interactions of societies (of whatever scale) and nature. What is politically disputed is the precise meaning of the common interest posited and the meaning of "nature."

The classic formulation of the tragedy theme was based on the destruction of grazing resources on the village commons because of a local societal failure to ration access (Hardin 1968). Though dominant, that perspective is wanting in several respects: a) its inevitability precludes attention to social learning and small-scale institutional innovation in the face of commons dilemmas; b) the small-scale focus, whether of tragedy or solutions, in turn slights problems of an over-arching authority represented by the state, which may be as much a part of the problem as of the solution; c) the assumption of narrow economic interests as driving behavior, while frequently accurate, slights a rich phenomenological world of alternative conceptualizations of collective interests and the place (or oikos -- home -- whence ecology) of humans in natural systems.

In a deceptively simple and influential analytical move in the "tragedy" logic, maximization of individual material interests was held to produce sub-optimal, perhaps disastrous, consequences for that terrain: "the tragedy of the commons" (Hardin 1968; cf. Feeny et al. 1990; Ostrom 1986; Shiva 1986). But "tragedy" is only a part of the puzzles surrounding the commons. Robert Wade's formulation (1988:184) distinguishes between commons situations and commons dilemmas:

"The exploitation of a common-pool resource is always a commons situation, in the sense that any resource characterized by joint use and subtractive benefits is potentially subject to crowding, depletion and

degradation. But only some commons situations become commons dilemmas: those where joint use and subtractive benefits are combined with scarcity, and where in consequence joint users start to interfere with each other's use."

Properties of scarcity and subtractive benefits are largely properties of particular ecologies, given exogenous human demand. Prevention of escalation from commons situation to dilemma to tragedy is a function of property systems: institutionalized patterns of rights and obligations. Hardin's tragedy resulted not from a failure of common property, but rather a failure to preserve common pool resources precisely because no common property arrangements to limit use evolved. Though the Hardin problematic focuses on disaster, commons situations raise as clearly the potential of collective action to create new institutions in a progressive rather than defensive sense.

At the progressive end of the scale, there are commons situations in which potential benefits of collective action are foregone despite the existence of some common good that could be obtained through collective action. These benefits, such as rationalization of irrigation and grazing, are the subject of Wade's (1988) important investigation in South India. Wade's village institutions do have a defensive component -- prevention of conflict over common resources for example -- but are motivated by concern for improving production possibilities given difficult commons dilemmas.

A second situation analytically is one in which failures of collective action result not simply in foregoing benefits of optimal use of resources, but absolute degradation of the resource in question -- Hardin's "tragedy." Finally, there is the situation, typically not analyzed as a commons dilemma, of failure of collective action to preserve the integrity of nature itself, independent of its human-determined use values.

This final notion of commons introduces a second-order conflict: collective solutions to either of the first two types may actually run counter to solution of the commons dilemma represented by potential conflict between human use of nature and ecological imperatives. To take the simplest example, suppose Hardin's shepherds were able to act collectively not only to preserve grazing grounds but to pool labor to extend grazing into the surrounding forest or wetlands through tree cutting and/or water diversion or drainage. A common objective interest in preserving the surrounding ecosystem, whether or not subjectively perceived, would be forfeited through success in coping with more classic commons situations. Richard Eaton's (1990) study of the expanding frontier of cultivation at the expense of wetland forests

in the Sunderbans² circa 1200-1750 illustrates this process: Islamic "saint-entrepreneurs" made use of symbolic appeals, underwritten by the space provided by superior authorities, to mobilize for collective action which achieved some public good for participants (additional agricultural land) but simultaneously destroyed the Sunderbans in a piece-meal fashion at the margins.

The first two types of commons situations are not particularly problematic for a methodological individualism rooted in marginalist economic analysis of materialist interests. It is true, as Wade concludes, that our models of collective action often lack utility in dealing with real cases.³ Nevertheless, the motivational base of the model is intact so long as we can safely assume material interests as a driving force. Wade shows that collective action to preserve common resources and increase production varies directly with material benefits entailed in the public good.⁴ The second-order commons dilemma requires recognition of interests which are temporally removed, collective in the broadest sense (species-wide), and embedded in the uncertainty of a technical discourse which can be evaluated by a tiny elite. In the logic of methodological individualism, second-order dilemmas are the worst case scenario for collective action.

Second-Order Commons Dilemmas: Conservation and Preservation

The materialist assumption underlying the "tragedy" metaphor may not be wholly without problems, but these pale beside the problems encountered in the meta-commons issue of preserving the natural system in which local commons are embedded. The perception of conservation of a usable resource as a collective good is not nearly so problematic as conceptualizing preservation of ecosystems as a public good independently of their utility as resources. This is the classic Pinchot-Muir controversy of American historical experience, representing the struggle between meaning systems privileging conservation in opposition to those centered on preservation, or the conflict between social ecology and "deep" ecology.

The argument to this point is that the "commons" framework opens rather than forecloses investigation of institutional solutions to 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" (in the specific sense of externalities) or as social institutional failures.

Social learning may mitigate the inexorable quality of the tragedy, but concentrations of power and the familiar dynamics of destitution and greed can block the process. The developmentalist state's cooptation of local political space replaces social learning potential with a prior claim of overarching protection,

rooted in the logic of the tragedy of the commons. Moreover, interest-driven cooperation may offer little protection for nature per se, but rather for conservation of nature already employed as economic resource. From the perspective of ecology, local systems are not only inter-connected, but dependent for their integrity on dynamics beyond their reach.

The logic in the tragedy-of-the-commons literature assumes that 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 in the original paradigm have value because they form the foundation for livelihoods; concrete material interests are identifiable. This instrumental view of nature in market economics is shared by the Marxian tradition.⁵

Conservation of the instrumental value of discrete elements of natural systems certainly constitutes a critical agenda for analysis of commons problems in concert with developmental policy issues. But these questions presuppose a nature already appropriated and altered for human use, and slight the issue of larger systemic effects on local resources. To take but one example, soil conservation locally may be futile in the face of soil contamination from acidified precipitation or water depletion from climatic change or flooding from upstream deforestation.

From the perspective of ecological science, 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 the second-order notion of commons: the common bio-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 in ways that produce political resonance the value of even small components of larger ecosystems. The only material-interest 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; perturbations of ecological systems may backfire at the level of material production possibilities in ways that are at present poorly understood.

By way of example, consider that the Sundarbans 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; 1990). 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 functional equivalents of the controversial snaildarter in the United States -- i.e., commercially useless species? How does the calculation change if unmarketable fish consume vast quantities of mosquitoes which carry malaria? What is the justification for preservation of evidently "useless" species when the material gains from limited exploitation are demonstrably large? How politically viable is the argument that the next wonder drug may come from some yet-undiscovered organism inhabiting a tropical rainforest, even given historical precedents which suggest that the odds are fairly good?

The political argument for conservation depends on the commercial value of that which is to be conserved; conservation law in colonial India was generated by the imperatives of long-term access to forest products for export, military uses and construction of rail nets. The politics of preservation must be rooted in more tenuous values of aesthetics, risk, or species ethics (derived from the reality of species mastery). The tension between an instrumentalist view of nature and an idealist argument for the value of nature per se shadows the tension between the commoditization 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"⁶ tradition. In the absence of market power, preservationist values can become actualized only through a political process which bounds and limits markets.

Karl Polanyi's (1957) work reminds 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 should not (Herring 1990: Chapter 8).

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. The "tragedy" 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 (cf. Elster 1985:24). The problem of the commons is then 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 authoritative interference with a Hobbesian (or Kautilyan) world of individual maximizing behavior.

Property systems are systems of 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. Much of the debate at the intellectual and regime level (e.g. Guha 1990) centers on how much can be assumed about local capacity to manage local commons dilemmas, preventing their escalation to tragedy.

The utility of the Hardin model depends fundamentally on two core assumptions: material self-interests as the motivating force in individuals' use of natural systems and incapacity for social learning. The two are linked in the genre of analysis relying on prisoner's dilemma games. The assumption of "rational-actor" premises regarding human behavior is too complex to address here (cf. Herring 1980; 1989), 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," as in the case of the Sunderbans, are more problematic.

There is evidence on both sides of this debate; the long history of ecological disasters in local commons dating to neolithic times suggests caution in accepting the current almost Narodniki romanticization of the capacity of small communities to counter disaster. Nevertheless, proponents of the materialist individual maximization position occupy the high ground in terms of broader social theory. For example, Bromley and Chapagian (1984) report quasi-experimental results from Nepal which suggest a clear village-level understanding of the concept of "fairness" in utilization of the commons and far less free-riding than is typically assumed. Their summary comment is provocative (ibid. p. 871):

"Observations by anthropologists that Asian villagers do cooperate on resource-use decisions are considered quaint anecdotes of doubtful generality...Economic theory says that individuals will free ride, and therefore any data to the contrary are immediately suspect."

The reality is that both opportunism and cooperation, respect for nature and instrumental uses of nature coexist in societies of all sizes, buttressed by contradictory cultural norms and the structural conflict between economic opportunity and ecology. Though face-to-face communities are capable of employing mechanisms unavailable in single-play prisoner's dilemma games, social learning presupposes political space and insulation of individuals from the pressures of destitution.⁷

These observations suggest a limit to the romanticization of localism current in academic treatments of small communities confronting commons dilemmas. Leviathan in the form of restrictive colonial practices rooted in a new discourse of scientific forestry finally reversed the destruction of the Sundarbans which itself had been accelerated by previous colonial policy incentives for converting "waste" into cultivable (and taxable) land, but piecemeal destruction clearly preceded colonial rule.⁸

The destruction of half the Sundarbans over seven centuries speaks to issues of both values and knowledge.⁹ It is unlikely that any conceivable local institutions could have preserved the eco-system as a whole, since there would be no mechanism for discerning the tipping points and extra-local sources of degradation and no means of exerting extra-local control. Even today, with satellite photography, computer simulations of hydrology, and scientific methods of investigating ecological dynamics, too little is known about the carrying capacity of the system or sources of fatal perturbation of the Sundarbans eco-system (Rainboth 1987; Wescoat 1987). Territoriality of the commons dilemma is thus crucial, in conjunction with available information on systemic limits and threshold effects, as well as the perceptual frame in which this information is embedded.

The demonstrated capacity of small communities to conserve their local natural resources for sustained yield is bounded not only by the problematic of territoriality and second-order commons dilemmas noted above, but also by pressures imposed by 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 of local solutions less relevant. Thus the "tragedy" perspective remains relevant even in situations in which local institutions have evolved to protect elements of the environmental resource 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; Jodha 1985; Gadgil and Iyer 1988).

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 individuating pressures of Polanyi's (1957) "great transformation" may not be inexorable, but are certainly powerful. Colonial policy in the Sundarbans initiated individuation and quasi-privatization through the mechanism of auction, license and selective limitation of wood-cutting and access rights. In general,

historical interaction with a centralizing state and spatially expanding market rendered local institutional arrangements to preserve common resources rear-guard operations, whether of overt conflict or covert evasion and non-compliance.

Defensive Reactions

The literature on defensive reactions derives from unresolved conflicts in what Karl Polanyi called "the great transformation." Polanyi noted (1957:71):

"But land and labor are no other than the human beings themselves of which every society consists and the natural surroundings in which it exists. To include them in the market mechanism is to subordinate the substance of society to the laws of the market."

When Polanyi conceptualized the commoditization of nature a central element in the "great transformation" to market society, he had in mind a process much broader than mere enclosures of the classic form: "What we call land is an element of nature inextricably interwoven with man's institutions. To isolate it and form a market out of it was perhaps the weirdest of all undertakings of our ancestors (Polanyi 1957:178)." In his formulation, pre-market economic relations, norms and outcomes were "embedded" or "submerged" in social relations generally; the extraction and elevation of market-driven dynamics from their social mooring produces significant social conflicts and centrally involves the state (compare Neale 1988). There is nothing "natural" about the market as arbiter of allocative decisions; challenges to market allocative rules evoked the use rights established by custom and common law as bases for opposition.

Commoditization of land as individuated market property -- whether held by the state or reallocated -- has engendered, as Polanyi noted, defensive reactions of local populations threatened thereby, assuming the form of both frontal assaults and non-compliance. Robin Hood mobilized on the issue of challenging the state's novel proprietary claims on forests and game. "Tribal" and "peasant" revolts in India throughout the 19th and 20th centuries were triggered by analogous claims (K.S. Singh, 1986; Guha, 1989).

Indeed, much of the conflict over "the commons" is ideologically a conflict between alternative meanings of property and the rights of states to impose novel proprietary claims. 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. The making of market society entails the long historical process of collapsing differentiated use rights into a system of ownership in which

individual private property rights are generally bounded only by the prior claims of the state.

Stratified use rights in common lands in South Asia were central to broader social organization historically. The structure of these rights was an adjunct of integrative social institutions such as caste, service obligations, temple maintenance, and kinship systems. In his classic work, 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."

Village commons in India date from at least the Laws of Manu (200 B.C. or thereabouts). "Manu" specified 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 unutilized 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.¹⁰ 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).

The effect of colonial law was to simplify, collapse and locate concretely the bundle of rights in land with the objective of creating property rights in the sense of market property (e.g., Logan 1887:I, 670-696; Neale 1988). 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 or evade regulation than on legal tradition or inertia of custom. Contemporary acts of subversion of conservatory law in the

Sundarbans reflect assertion of use rights against the state dating from colonial claims of the late nineteenth century.¹¹¹¹

Rights in agricultural land and village grazing and woodlots retained a complex structure of overlapping use rights (nishtar, etc.) into the contemporary period, though the overall system was clearly moving in the direction of fee simple ownership rights characteristic of market society. Residuals remain in such institutions as the ability of tenants to mortgage use rights to institutional lenders. From the perspective of the meta-commons problematic, it is more important that vast tracts of forest and uncultivated land remained outside the net of individuated ownership until the 19th Century. In the Sundarbans, colonial claims to proprietorship over forests required dissolution of existing zamindari and common law claims through the extension of regulatory and property-entitlement mechanisms by the state (Richards and Flint 1990). Chhatrapati 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.

More important for political analysis than any numerical ratio between common and private rights, which must remain speculative, is the historical reality of struggles set in motion by attempts of the state to claim and manage a commons previously defined by local usage (eg. Guha 1985; 1989; K.S. Singh 1986; Omvedt 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 colonial policy debates on land use (cf. Presler, 1987; Tucker 1984), and a continuing confrontation with local societies' definitions of the commons. This conflict continues today, perhaps most sharply in the resistance of local communities of upstream forest dwellers and the state's claim to develop hydroelectric and irrigation potential through dam construction (CSE, 1986: 99-120).

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, khas and nishtar continue to connote village commons. 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. 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.

Village commons in India reduce income inequality as well as dependency relations between males and females (compare Agarwal 1990:12, passim). These common resources are under intense pressure from powerful people in the village who are 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 Karnataka in protecting sacred groves and small forests even in the face of state opposition. Acharya's study of Jirel forest management (1989) in Nepal indicates a complex variety of property rights from individuated to joint to common, varying significantly over the space of but a few kilometers and over seasonal cycles of production.

The most visible form of aggregate politics of nature in India has been in the mode of what students of peasant politics call "defensive reactions." The "Chipko" movement is archetypal, reflecting long historical continuity of rural protest against the centralization of authority and denial of traditional rights of access to a natural forest system (Guha 1989; see infra). Similar local defensive reactions have occurred throughout India, protesting the state's proprietary claim on local systems which provide subsistence routines (Bandyopadhyay and Shiva 1988: 1224-1225; Raghunandan 1987). The political parallel to the United States is clear; NIMBY ("not in my backyard") movements reflecting local opposition to local environmental degradation have been quite effective in blocking or delaying specific projects, often more effective than national preservationist organizations which focus on lobbying the legislature.

It is in one sense not surprising that destruction of forests, water, grazing, and foraging resources evokes widespread protest from "subsistence" communities whose livelihoods are threatened. Yet collective political protest is in no sense an automatic product of collective deprivation. Collective defensive action is facilitated by perceived common interests in preservation of systems which are held to be in equilibrium with human uses. Pre-Leviathan local systems for managing commons dilemmas, which were destroyed by colonial policy, formed the basis for subsequent collective action. The outcome is clearly the antithesis of the "tragedy" prediction; material interests in nature are recognized and form the basis for collective action to protect common interests.

Property rights in nature should thus not be conceptualized as stable parameters of the Indian social system, but as dynamic outcomes of contested pressures for centralization and privatization, as well as institutional adaptations to new dilemmas and opportunities locally. In this process, ecological consciousness has arguably remained more in the realm of defensive reactions than in the realm of recognition of second-order commons

imperatives (compare Raghunandan 1987).

State and Commons

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 Kautilya¹²): a powerful state which could enforce its will on subjects for their own (common) good. This legitimation is common in environmental preservation: protection of the "Silent Valley" rain forest in South India was the act of an elitist and authoritarian government acting contrary to the clearly expressed democratic voice of inhabitants of the region (see below). Preservation of what is left of the Sundarbans arguably demonstrates the preservationist capacity of centralized administration (e.g. Presler 1987; Blair 1990).

The problem with the Leviathan 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 (cf. Ostrom 1986). The environmental profligacy of modern nation states of authoritarian bent certainly confirms the possibility. States in the real world are influenced, often captured, by interests which run counter to environmental values. Running counter to the solution's assumption of a strong state are the more prevalent conceptualizations in the literature: the "soft" state, the parasitic state, the developmentalist state, and so forth.

But even with relative autonomy and capacity, Leviathan must be fed. Pressures for taxation revenue and hard currency earnings have abetted environmental degradation throughout the subcontinent (e.g., Agarwal 1985: 363-366; McCarthy 1987). Much of the destruction of the Sundarbans was driven by policies of the colonial state to encourage conversion of "waste" to taxable cropland inhabited by industrious and dependent peasants.

Even granted the assumption of a strong state, the probability that such a state may disregard commons requirements is the argument for democracy as a protector of society's environment. The parallel to economic planning is obvious -- centralized states may have Lindblom's "strong thumbs," but lack the nimble fingers necessary to adapt to local conditions (and often the information to do so). Under democratic conditions, at least a cybernetic corrective alternative to state errors 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 as determined by market forces as mediated by the state. 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 wetlands, clearing of forests, etc.) still offer the likelihood of counter-finality in a context which is extra-local and extended in time.

A collective property-rights solution may work fairly well in closed, bounded systems in which conservation and exploitation interests coincide (e.g. fishing, tree harvesting), but still requires some broader collective political authority to maintain boundaries, prevent externalities and mediate disputes among the overlapping commons situations which are inevitable given the interconnectedness of ecological systems. 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 of the property-rights solution 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. Privatization of village commons in India has simply constricted further the survival options of the poorest villagers (Jodha 1986). Whether or not market logic will then direct redeployment of resources in a manner that creates a net increase in opportunities is an empirical question, but there are reasons to be pessimistic on both ecological and social-justice grounds.

Because of the theoretically and empirically problematic character of conventional solutions to commons dilemmas, cooperation and social learning as solutions assume increased relevance. 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 everyone, is ruled out by pursuit of interests (Ostrom 1986; e.g., Gadgil et al. 1984; Feeny et al. 1990). 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. Evolution of social institutions can be thought of as a series of repeated games in which conflict, or recognition of the benefits of cooperation, produces self-correcting change.

As importantly for theory, there is nothing in logic which prevents privatization from meaning devolution to local corporate bodies rather than individuals; as Bromley and Chapagian (1984: 870) note, "the matter of private control over resources refers to the ability to exclude others, not to how many individuals share in the decision making by those not excluded." That extremely large and complex social organizations such as business corporations should be considered individual actors in theory and law whereas villages are a priori held to be incapable of rational action does seem bizarre.

To return to Hardin's case, there is no reason 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 the region (Acharya 1989; 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. Robert Wade's important work on India (1988) persuasively argues that the presumed collective action problem has been overcome in villages in which the collective benefits of managing irrigation and grazing exceed some threshold level (which itself is a function of the local ecology). But Wade's work does not suggest great optimism about the prospects for collective action beyond that motivated by material self-interest in managing resources. In a section of Village Republics termed "the moral basis," Wade (1988: 194-95) writes:

It is striking how little people in these [successful] villages are steered by a sense of devotion or obligation to a non-self-regarding 'cause', such as 'the welfare of the village' or 'cooperative ways of doing things'.

Cooperation thus appears fragile, and may presuppose some threshold of material benefits; even such collectively organized conserving rules as have evolved may succumb to pressures arising from inside or outside the local system. These pressures have much to do with the international economic environment, the distribution of property rights, public "safety nets," and the like. Moreover, social learning in the real world is 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 sustain (Herring 1983:263-64). But cooperation when material benefits are increased is far easier to initiate and maintain than

cooperation on the second-order commons dilemmas, where the threat of "tragedy" is more real.

Once 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 normative terms.

Though the poor are often seen as the greatest threat to fragile ecosystems,¹³ they are more importantly the first victims of environmental degradation (Agarwal 1985; C. Singh 1986). Attacks on preservationist policies as anti-poor may thus be as misleading as pro-growth policies which appear to expand opportunities in the short run. But the greatest distortion in the environment-vs.-growth policy discourse relating to the poor is the projection of desperation as exogenously given and beyond the reach of redistributive policy. Land reform and employment-sensitive technology choices are but two prominent examples. Policies which increase destitution and competition aggravate pressures on fragile environments.

But more problematic environmentally 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.

Leviathan as metaphor conveniently links will and implementation in one (resolute) actor. States of the subcontinental region are indeed "soft" (in Gunnar Myrdal's memorable formulation), but selectively so. Even under non-democratic regimes, 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 (e.g. CSE 1986: 353-382). But most importantly, Leviathan is not a stable configuration; exclusion and control evoke the politics of opposition and evasion.

Real states in the subcontinental region demonstrate not only the permeability and bureaucratic pathologies which generate "softness," but also both vertical and horizontal incoherence; as 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 at the top, nor transmission capacity through the system can be assumed. More importantly, real implementation must take place on the ground, where the local state exhibits the permeability, incapacity and embeddedness characteristics in extreme form.

Because of these political conditions, 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 theoretically possible solutions present severe difficulties in the concrete social settings of the region -- extraordinary levels of destitution, state incapacity -- and because one must distinguish common property resources from the environment generally as a commons. The politics of the environment in the region represent variable levels of intensity, but it is clear that the state in general cannot play the Leviathan role effectively. Indeed, having the state weigh in on the side of preservation may prove counter-productive, so deeply is it compromised in local political perceptions. In the case of "Silent Valley" in South India, the Center's intervention on the side of preservation aided in transforming political dynamics in the direction of local people vs. the state, periphery vs. center and, in a curious twist, Bharat vs. India (see below).

For the conservationist political agenda, there are clearly opportunities for the linkage of natural resource policy to strategies for economic development focused on secure livelihood for the most desperate citizens (cf. The World Commission on Environment and Development 1987). As a concrete example, some pressure for drowning "Silent 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 reserves¹⁴ 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 -- as well as ecologically sensitive social forestry programs can marginally relieve deforestation pressures (Bhattacharyya 1990).

Nevertheless, contradiction between livelihoods and preservation remains as 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, assuming significant alteration of political dynamics, substantial progress would require quite fundamental rethinking of the relative values of growth per se, social justice and political democracy in the context of environmental crisis.

Policy changes of the sort envisioned above are already

supported by political groupings of both the locally endangered fighting defensive struggles against developmentalism (e.g. CSE 1986:353-382) and elite groups influenced by both social ecology rooted in a leftist critique of existing distributive routines and more internationalist understandings of ecological imperatives. Their opponents have the advantages of a legitimating logic of developmentalism and the political power of property on their side. Whereas defensive reactions of the poor resonate with struggles dating from at least colonial times, elite conservationists represent the opening wedge of a fundamentally new ideological framing of environmental issues (e.g. Nandy 1988) in which instrumental deployment of science in the service of enclave growth is challenged.

The history of environmentalism in its preservationist mode suggests that the ideational shift which is just now beginning in the subcontinent is a necessary but not sufficient condition for the solution of second-order commons problems. The social and natural history of the Sundarbans demonstrates this point.

From "Reclamation" to Conservation to Preservation in the Sundarbans: Swamps into Wetlands

The history of the Sundarbans over the past 700 years has been intertwined with a central dynamic of human history: the pressure to carve new livelihoods and habitats from nature (Eaton 1990; Richards and Flint 1990; Bhattacharyya 1990). Transformations of the forests were not merely biological and physical, but were congruent with new forms of community organization and religious identification, property systems, formation of centralized political authority and new contentious cognitive framings of a natural system.

The etymology of Sundarbans itself suggests the ideational ambiguity which is central to preservation. "Sundarbans" may derive from either "beautiful forest" (sundara vana/bana) or, more likely, forest of sundri trees (*Heriteria minor* or *H. fomes*) (cf Yule and Burnell 1903:869-70). Sir William Hunter referred in the first official inventory of the area to "a sort of drowned land, covered with jungle, smitten by malaria and infested by wild beasts..." undergirded by a soil of "evil fertility" (Greenough 1987: 3,9). Fear more than beauty seems to have dominated the perceptions of local users of the forests; woodcutters regularly allocated a share of their produce to fakirs in return for propitiating forest deities. The idea that so dangerous and fecund a place could be endangered by human beings came only in the third quarter of the nineteenth century to colonial authorities, and not without contention in the colonial bureaucracy.

In contrast to forest policy in much of the region, dialogue on the Sunderbans has largely been an intra-elite affair, almost

exclusively among state managers. Unlike other areas of the region, where statist claims to conservation and control evoked collective protest, the remaining (and shrinking) mangrove forests witnessed the cat-and-mouse game of individual non-compliance and evasion in the mode stressed by James Scott (1985).

The preservationist strain in official policy towards the Sundarbans is of relatively recent origin. Before the 1870's, the colonial state operated on a commercializing and revenue logic which recognized the value of controlled reclamation of "wasteland" by agricultural entrepreneurs (Presler 1987). That logic gave way incrementally to protection of a diminished core of forest, managed for sustainable yield and state revenues. The Sundarbans is now managed as a limited access commons, for what American environmental managers would call "multiple use" (logging, tourism, collection of forest products, fishing). 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 the full tragedy implications of unlimited destruction by "ax and plow" have been averted by a ecologically benevolent but porous state.

The ecological and economic functions of the Sunderbans have been described as follows (Seidensticker 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."

These contributions are at great perceptual distance from complaints of "pestilential exhalations" from "rotten jungle and muck" prevalent in colonial thinking. This evolution of perceptions is not unrelated to material processes, but is not entirely explained by them; early attitudes toward the Sundarbans evolved when people were scarce relative to jungles and forest products were much less valuable.

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 rural Bengalis even more insecure than is presently the case.

Precise estimation of the narrowly economic importance of the forest is difficult because of the prevalence of illegal extraction of products. Thomas Timberg (1987) notes that the forest is central to the newsprint and hardboard mills which meet domestic demand and provide export earnings for Bangladesh. The three match factories of Bangladesh alone consume 320 tons of wood a day, much of it from the Sundarbans. Forest products from the Khulna district, mostly from the Sundarbans, were officially estimated in 1982-83 at 88,000 cubic meters of round timber excluding gewa (an abnormally low number, down from a more usual estimate of between 150,000 and 200,000 cubic meters), 113,000 cubic meters of gewa, 317,000 metric tons of firewood (sundri, etc.), 62,000 tons of golpata (for thatching), 4,500 tons of grass, 9.1 tons of fish, 232 tons of honey, 58 tons of beeswax, and 154,000 hantal leaves (for housing construction). These numbers are depressed by their social origin: they reflect only what the state can monitor.

The danger to the Sunderbans as an ecosystem arises from proximate sources which are quite familiar, but difficult to assess empirically; the ecologist's notion of a critical threshold is plausible but hard to identify. The easiest conflict to monitor and control, though not to reverse, is the bunding (embanking) 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, and 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 conservationist concept of "sustainable yield" of timber or fish is difficult to employ empirically.

New technologies and markets pose new threats to the Sunderbans; shrimp now constitute the second-largest source of foreign exchange for Bangladesh. Runoff of agricultural chemicals and pollution from pulp processing threaten the forest system to an extent that is not known. Pressures for export earnings from shrimp, pulp 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 1987).

Distal pressures on the forest emerge from the incapacity of the international political system to resolve conflicts over fresh water as a common resource. The upstream Farakka barrage in India has certainly altered the downstream hydrology of Bangladesh in a negative fashion, but the precise effects on coastal forest ecology remain unknown. In addition, major internal alterations of the

nation's hydrology, driven in part by external advice and aid, are occurring through massive embankment schemes (for flood control and drainage) 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); the entire shelf is sinking.

Rules for collective access to and exclusion from the Sundarbans as a local commons are enforced by a state in conflict with private interests (some very powerful, some quite humble). 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 Sundarbans is an important part of a global commons not only as the well publicized home of the endangered Bengal tiger, but also 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; Leviathans often protect internal interests which run counter to global preservationist interests.

In a somewhat ironic twist, the same dependency relations which produce so supine a state vis-a-vis international actors and put pressure on environmental integrity in general have helped preserve the Sundarbans precisely because of its importance in conceptualizations of a global commons by powerful international actors. External flows constitute between 70 and 95 percent of the annual development expenditures of Bangladesh; external pressures for either export promotion or environmental preservation clearly make a large difference in regime-level politics of preservation.

At another level, the social process of restricting access to 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 try to walk a fine line between interests of preservation of nature per se and the legitimate interests of human populations in exploiting their environment for livelihoods and habitats.

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 Sundarbans.

The conclusions from the Sundarbans case concern both the state as solution to ecologically defined commons dilemmas and the centrality of cognitive and evaluative framings of natural systems. To the extent that the Sundarbans has been preserved, it is because of a perceptual transition from "waste," and later exploitable resource, to endangered ecological zone worthy of protection -- from open access commons to privatized property at the margins to a limited access common pool resource at the shrinking core -- largely through the internal dialogue of state managers.

The state in this process must be conceptualized as both disarticulated and embedded. It is disarticulated by both horizontal and vertical divisions (ministries concerned with fish, agriculture, forests, tourism, planning and export promotion, for example, have different interests in environmental preservation, just as the local rentier state has material interests contrary to proclaimed central state policy). The national state is embedded in an international system which exhibits anarchy with regard to global commons dilemmas and exerts contradictory pressures for both hard currency earnings and environmentally sensitive policies. Both local and national states are embedded in society, from which come pressures for (mainly) relaxing environmental protections.

Politics and the Framing of Natural Systems

Conservation and preservation of the Sundarbans illustrate the importance of ideational shifts in the framing of "nature" and "natural resources." Even the most materialist of explanations of human behavior must acknowledge a perceptual screen between the objective world and "interests" and between interests and behavior (a cognitive map of what will happen if some particular course of action is followed). The Sundarbans could be (and has intermittently been) conceptualized as a dangerous and useless swamp, a source of potential revenue and rice, a natural resource to be conserved, or a rich and precarious wetland ecological system worthy of preservation (e.g., Bhattacharyya 1990; Presler 1987; Seidensticker and Hai 1983).

The complex relationships between the meaning systems and natural environments of South Asia remain to be established. 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 the values and meanings embedded in commercial, agricultural or industrial demands can be reconciled with conservationist and

preservationist framings (e.g. Nadkarni 1987). In particular, roots of conceptualizations of the value of nature for itself are underdeveloped (but see Gold and Gujjar 1989).

The dominant instrumentalist discourse on natural systems has enjoyed a privileged status due to its patronage by governments and agencies promoting a particular kind of growth-centered economic development. Central to this worldview is a conceptualization of nature as a bundle of "natural resources;" its value is measured by prices of products in markets. "Development" retains a core meaning of growth with sector- and class-differentiated costs and benefits; the familiar bifurcation between India and Bharat is reproduced in the seemingly unobjectionable framing of common interests in growth (a larger pie, a rising tide). Bandyopadhyay and Shiva reflect the oppositional view of the process (1988:1224):

"The resource demand of development has led to the narrowing down of the natural resource base for the survival of the economically poor and powerless, either by direct transfer of resources away from basic needs or by destruction of the essential ecological process that ensure[s] renewability of the life supporting natural resources."

Despite the seemingly pragmatic and scientific language of policy studies, ineffective or counter-productive policy is often rooted in miscalculation of prevailing attitudes and interests. We know very little of a systematic nature about the sources of preservationist or commons-regarding values in the operative cultural traditions of South Asia, despite a now-hegemonic internal dialogue among environmentalists which posits equilibrium and eco-sensitivity to "subsistence-oriented" social groupings in India.¹⁵

Chhatrapati Singh (1986: 1) has argued that in the traditional Hindu conceptualization of nature as "a living organic force, like man, violence against nature constitutes adharna" ("injustice," or unrighteous action). But as in the case of all values, the behaviorally relevant meaning is situational, not given or primordial, and typically reflective of dialectical opposition in the same cultural framework. Despite celebration in the great tradition of dharma and ahimsa (nonviolence), Singh goes on to document systematic adharna vis-a-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 (1923:234):

"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 [sic] and whatever form his involvement with it takes, i.e. nature's form, its content,

its range and its objectivity are all socially conditioned."

Political-economic analysis is about the dynamics of interests within structures. Environmental degradation is driven by a complex interaction of individuals with structurally-generated interests and powers mediated by incentives and constraints of a state. Public incentives and programs -- social forestry, flood control, chemical-intensive agriculture, manure-methane plants, export promotion of pulp and lumber, exchange rates, land reforms - - 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 (e.g. Desai 1987). Population growth is not exogenously given, but responds to developmental and social welfare policy.

The configuration of interests in environmental protection and broader development policy does not, in theory, predict effective political action to head off catastrophes or continuous degradation. Political-administrative units, both international and sub-national, do not conform to the boundaries of ecological systems. Risks to a large ecosystem are difficult for individuals to perceive, being typically indirect, uncertain, distant and diffuse. Just as individuals systematically underinsure themselves against catastrophe, believing for understandable reasons that tragedies will befall people other than themselves, it is psychologically easier to underestimate the long-term consequences of multitudes of small acts against nature. The presence of threshold effects, or tipping points, in ecological damage reinforces this dynamic. On the other hand, the benefits of small acts against the environment are immediate and directly appropriated.

Whatever the general validity of the hierarchy-of-needs conceptualization, or the "post-material" values approach to politics in "post-industrial" societies, it does seem that environmental activism other than defensive reactions to protect immediate individual material benefits is concentrated in classes not engaged in a daily struggle for security and survival.¹⁶ Both secure environmentalists and threatened populations encounter significant obstacles in state and commercial interests committed to the instrumentalist view of the natural sphere. Real world Leviathans are engaged in political conflict; despite structural pressures for growth-generating policy, which dominate, in specific instances states in the subcontinent have pressed environmentalist concerns over the objections of well organized local interests.

By way of illustration, we may schematically consider two major environmental movements in recent Indian experience which anchor ends of the continuum. In the Chipko (tree-hugging) movement in North India, local pressure was generated to prevent commercial exploitation of a collective economic resource -- the forest. Local

democratic expression of interest-driven local values coincided with environmental protection, if not preservation.¹⁷ In the Silent Valley movement in South India (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 rain forest.

In the Chipko movement, 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" (in Omvedt 1987:29-30). The movement was a contemporary incidence of a long-standing conflict between competing political interests, and behind them, competing world views (Guha 1989). 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 chir 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 (Agarwal 1985).

In the "Silent Valley"¹⁸ controversy, a similar antinomy of perceptions and values was manifest. The proposal was grounded in as strong a developmental case as one is likely to encounter. Damming the Kantipuzha river would produce hydroelectric power, irrigation (of 10000 hectares) for enhanced agricultural production, and prevent floods and droughts. The project was long standing, identified as early as 1920; it was formally proposed in 1958 by the communist ministry as a technically optimal solution; the valley is very narrow, creating a very high ratio of electricity output to construction cost. Moreover, the area is historically depressed, characterized by severe land pressure, unemployment, and industrial backwardness (as symbolized by electricity use per capita: little more than one-third the state's average, one-fourth the nation's average, and less than 1/300 the North American level).

The plan for damming the Kantipuzha river and flooding its valley represented to local organized interests only jobs, irrigation water, hydroelectric power and lucrative contracts. Opposition came from Delhi (which proved to be politically significant) in a recommendation from the Task Force of the National Committee for Environmental Planning and Coordination, which was itself an outgrowth of the very prominent role played by Indira Gandhi in the path-breaking international conference on the global environment in Stockholm in 1972. The task force rooted its opposition in the precipitous decline of Indian forests and projected climatological consequences.

Though the project had been opposed by the Kerala Forestry Research Institute, local opposition to the dam really began with a report of the Kerala Shastra Sahitya Parishad, the lead organization for the leftist "science for the people" movement which opposed technocratic dominance in development strategy and argued for local knowledge and local participation in issues usually reserved for technocrats. Their report concluded that silent valley had to be spared the dam because it represented 50 million years of undisturbed evolution; a primeval rain forest, the last of its kind in the western ghats; cytological evidence of continuing rapid speciation and uncharted species; some 60 endangered species, principally the lion-tailed macaque, and the scientific puzzle of the absence of cicadas, which in one etymological genealogy explained the "silent" designation. They concurred with scientists from the center on climatological effects of deforestation and challenged the developmentalist logic on its own terms.

Energy use in Malabar was indeed very low, and reflective of the area's industrial backwardness, but the preservationists argued that the state already had surplus generating capacity and exported 60% of its electricity production, as it did most other valuable products; the problem, as with exported food, was less in aggregate production than in distribution of existing production (Parameswaran 1979). Secondly, most jobs generated would be short term and would expand environmental damage (the effect of 5,000 families scavenging for forage for livestock and firewood and the effect of cutting roads into a virgin forest). Local opposition was intense, but limited to scientists, upper-middle class intellectuals and, most powerfully, students.

The counter-attack on the preservationists was broad-based and powerful. As in many environmental controversies, the proponents mobilized their own experts, who made a telling case for the dam. In particular, what are the alternatives for increased energy needs of the population? Wood, the dominant fuel source in rural India, threatened tremendous environmental damage from felling forests, articulate matter, and contribution to the greenhouse effect. Coal-fired electric generation would consume something like 3,600 tons per day for same capacity (120 MW), producing 1,440 tons of ash per day and acid rain (which is also a threat to forests). There would be environmental costs in shipping coal long distances, as well as the destructiveness of intensified coal mining. Nuclear energy has its own potential costs environmentally.¹³ As in the third principle of ecology, there is no free lunch (only trade-offs).

Well organized proponents of the dam -- spearheaded by the Kerala State Electricity Board and engineers' unions -- won the definitional struggle politically; the State legislature debated an issue of "man versus monkey" as well as central state vs. local interests and essentially voted against the monkeys and central

state. Significant internationalist pressure for saving the valley was widely interpreted in the state as evidence that powerful neo-colonialist forces wanted to prevent the industrial development of the periphery. 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.²⁰

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 exacerbates 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 (Herring 1990: Chapter 7). Moreover, Kerala is a state of unusually high literacy and advanced politicization; popular interests are typically mobilized, often in a militant fashion. Had Kerala been a nation-state in 1980, Silent Valley would have been drowned.

Secondly, 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 livelihoods²¹ 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. In the absence of a profound ideational shift in the conceptualization of nature, the potential contradiction between democratic and preservationist values poses one of the most serious dilemmas of political practice for the preservationist agenda.

Interests and norms come together in effective environmental protection, typically through a two-stage movement in moral economy and public law. First, nature as a commons must be recognized as a collective good. Preservation 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 acceptance of imperatives generated by the science of ecology. 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 dialectically related; changes in environmental consciousness must incorporate popular meanings even as effective protection must sometimes transcend them.

The (admittedly improbable) best-case scenario for South Asia's environment is a state strong enough to resist despoliation pressures rooted in greed and short-term horizons and yet responsive enough to find creative solutions to pervasive destitution. The implication is a development strategy far more egalitarian in politics and economics than those currently in place, though the political base of such redirection under existing conditions is difficult to conjure.

Contextualizing the Politics of Nature

The argument of this essay has been that the local-society centering of analysis in the "tragedy-of-the-commons" vein, in addition to its exclusive and narrow emphasis on material interests, fails to encompass the full range of empirical forces in the dynamics of environmental degradation, protection and regeneration. In common usage, the commons connotes a physical space of open or collectively controlled access, either as res nullius or as community-defined property. The classical commons dilemma applies only to the first of these categories (Runge 1986) in a strict sense, though pressures of population growth and state policy may present commons dilemmas for local societies by placing insurmountable pressure on local property rules rationing access.

The concept of the commons must be broadened significantly to capture the wide range of interests important to analysis of the intersection of social and natural systems. Though a particular commons may be bounded physical space, equally critical questions surround the commons as analytical arena and ideological force. 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. As early as the Laws of Manu, it was recognized that local commons overlap; increasing human population aggravates the boundary problem, but an ecological understanding makes it clear that no commons is an island unto itself.

Overlapping boundaries in turn imply the state as mediating agent. State-centric developmental processes accentuate the critical role of the state, which began with novel proprietary claims of colonial rule but was presaged by vedic, puranic and state-craft literature of India long before colonial rule (Raghuandan 1987:545). For second-order commons dilemmas, the overlap is continuous and ubiquitous, whether or not these linkage-dependencies are locally perceived.

As a consequence of Polanyi's "great transformation," local commons have been the object of pressure for privatization and centralization of control. Contrary to Hardin's logic, privatization of the commons has not solved commons dilemmas, even of the common sort, and certainly not of the second-order sort. The inexorable character of Hardin's logic is belied by the

numerous historical and contemporary examples of institutional rules for conservation of local commons. Nevertheless, such commons solutions in the form of rationing rules as exist will hold only within boundary conditions; destitution, greed and statist developmentalism put almost inexorable pressure on local rules regulating the commons. Both destitution and greed are in turn related to rules of states regarding natural resource policy and development strategy.

The state also enters the local commons problematic because local 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; benign neglect is a minimal condition.

States respond to overlapping and second-order commons dilemmas with exercise of eminent domain. Yet the creation of "public" property resolves little, since new political conflicts around the issue of defining the public and determining its collective "interests" are structurally inevitable. 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 forests, as well as conflicts between the relative values of hard currency earnings, employment in the timber industry, international competitiveness of timber firms, and ecological integrity of forests.

These issues are obviously not restricted to poor nations; serious disputes in the Pacific Northwest of the United States around old-growth forests follow exactly this logic.²² Delineating a common purpose, institutionalizing management for a common good, and treatment of claims akin to common-law use rights define antagonists in political space in which the commons is both the object and arena of contest.

In 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" (e.g. Klee 1980), common interests in conservation of the environment in pre-market communities 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 inevitability or desirability of markets as arbiters of the future of natural and social systems. Grounded in pre-market or non-market conceptualizations of nature and society, the commons perspective asserts the legitimacy of extra-market claims on the dispensation of the surface of the planet.

As in the case of an integrated global economic system, the boundary problems in dealing with global environmental interests produce the inevitable tension between authority and sovereignty. At the international level, practices such as the Montreal protocol on CFC's suggest that mechanisms for cooperation may be more readily available on the environmental dimension than on others involving sovereignty claims. International practice is establishing, whatever the normative case, 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. Conventions restricting trade in products of endangered species and rainforest timber, as well as production of CFCs, recognize a de facto global interest in preservation.

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 Bengal's tigers or the Amazon basin. Similarly, debt-equity swaps in which nature is the equity at stake provide both the recognition of global interests in national commons and a mechanism for conservation/preservation. Reciprocally, recognition of the global commons legitimates interests of inhabitants of poor countries in the policies and practices of rich countries. Rights and obligations in the preservation of a global commons raise some genuinely new issues in international politics, but in a larger sense reproduce long-standing conflicts between sovereignty and collective rationality.

The tragedy paradigm formalizes the popular caution: that which is everyone's concern is no one's concern (a mischief begun by Aristotle, but taken out of his context of familial relations). While not inexorable, the tragedy's logic of uncoordinated pursuit of interests 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 institutional and evaluative alternatives.

At the level of social learning and institutional innovation, there is a rich store of experience (cf Feeny et al. 1990). But second-order commons issues are typically beyond the scope of bounded communities; their global form in particular raises not only a question of institutions, but also of meaning systems. Economics and ecology derive from a common etymological root; oikos is both home and household. Aristotle's household was in effect a firm; the laws (nomos) of household management, could constitute the subject for a science of economics. 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 of ecology. 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.

Species mastery then raises the question of contradictions between economics and ecology (e.g. N. Singh 1976). 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 used to refine the market logic of value residing only in factors of production and products (e.g. Desai 1987). Integration of market logic with a deep ecological perspective remains problematic, dependent on a reevaluation of the concept of value itself. Since laws of ecology are real and not mutable, the socially and historically contingent "laws" of economics must be recognized as such. In particular, second-order commons dilemmas necessitate a new epistemology of value as well as a new metric for comparison.

Though the impact of environmental movements in India in aggregate terms has been meager, and largely defensive, the intellectual challenge is profound. Bandyopadhyay and Shiva (1988:1225) bravely conclude that ecology movements in India "are redefining the concepts of economic values, of technical efficiency, of scientific rationality -- they are creating a new economics for a new civilization."

The Politics of Nature

This essay began with a suggestion that in dominant conceptualizations of politics, it is puzzling that nature for itself ever wins. To the extent that the preservationist ideology has power under certain conditions, it seems to be because of special features of the object of politics, specifically:

1. Irreversibility: Because "nature bats last," policies lack the corrigible character of spending priorities or judicial reform. Though literal collapse of ecological systems is rare, alterations of systems forfeit whole elements of the global gene pool at an alarming rate.

2. Threshold effects or "tipping points." The effects of environmental damage are cumulative and may not become apparent until some threshold is crossed, constituting irreversible damage. This possibility introduces an essentially technical discourse which is conflictual, mediated by epistemic communities, but powerful, precisely because of the finality of consequences.

These two characteristics -- irreversibility and imperceptible tipping points -- combine to produce the specter of extreme risk, with no reliable way for folk to technical claims. This configuration means that epistemic communities are of special importance; the analogy to strategic doctrine and defense policy should be apparent. Epistemic communities are both international in scope and present themselves as disinterested; the ideology of science counts. More preservationist policy (leaving aside enforcement) appears than would be consistent with predictions based on aggregation of material interests.

There is however a countervailing politics of risk. Individuals systematically underinsure themselves, believing that catastrophe will always befall someone else. This problem in the politics of nature is exacerbated by the distance of victims in time and space; hence defensive reactions are easier to mobilize than are preservationist movements rooted in deep ecology. In both forms of mobilization and counter-mobilization, the conditions for symbolic politics are especially apparent: epistemic ambiguity, emotionally charged valence issues, fear and uncertainty surrounding extreme risk.

3. Counterfinality: one cannot assume that well-meaning and self-interested individual behavior in accord with interests will produce socially optimal outcomes. The political market-place is no more certain in its production of protection of the natural world than is the economic. The metaphor of the tragedy of the commons is powerful as a legitimating ideology for overarching political authority, but perceived interests of states and catering to material interests of dominant elements of society may render state intervention as much a part of the problem as of the solution.

4. Interdependence of non-obvious, often unknown, natural processes. The first principle of ecology is that everything is connected to everything else. New politics are produced by the incongruity of boundaries within which ecological dynamics operate and units of political or administrative units or arenas. Interdependence presents a new challenges not only for political praxis, but also for social analysis, from the local level to the global.

Precisely because of the location of ecology on the learning curve of the species, the politics of nature internationally evokes understandable resistance in the periphery of the global system; poor nations argue that advanced nations are engaged in a politics of "do as we say, not as we did" which resonates with their experience on issues of trade protection and state intervention generally. The approach to global tipping points in regard to ozone depletion, climate change and deforestation was clearly a function of low (internal) cost industrialization without constraints as practiced in the OECD countries, which have only recently discovered the principles of limits and interdependence,

both of natural systems and of national policies on a global level.

5. The reality of species mastery: This reality creates resonance of preservationist politics with ethics of special responsibility entailed in species mastery, represented in the American tradition by the notion of "stewardship" and in Gandhian ideology as "trusteeship." That an ethics of species responsibility could join a politics of esthetics of nature is reinforced by the emergence of a large section of society in both rich and poor nations of people whose basic material needs on the Maslow hierarchy of needs have been met and are free to become interested in a politics of culture and identity revolving around "who we are and what we are worth" (in Lloyd Rudolph's formulation).

These special conditions do not make the politics of nature unique, but do account for some of its special characteristics. A central lesson from this investigation is that dimensionality of human behavior is vital to evaluation of contending theoretical positions on the possibility of an overarching theory of rational choice as the touchstone of progress in the social sciences. In terms of the methodological base and theoretical foundations of the tragedy of the commons literature, the thin theory of rationality is inadequate, but still telling, often in counterintuitive ways (as in, e.g. Wade 1988). But even in the most materialist conceptualizations of interests, cognitive mediation is crucial, first in definition of interest, and more importantly, of mediation between interest and behavior: given that x is desirable, should I do y or z? That mediation turns on the selective appropriation and deployment of experiences, analogies and beliefs rooted in a folk theory of politics in interaction with a technical discourse which resists independent evaluation -- a theory of politics which remains an exercise more of techne than episteme.²³

Endnotes

1. This is not to say that self-destructive individual behavior, extensively documented in psychology and confirmed by everyday experience, whether conscious (as in martyrdom) or unconscious (as in neurosis), is unimportant, but rather that in at least many aggregate political phenomena, behavior in accord with safeguarding and improving individual interests is dominant. This perception does not ignore the telling arguments of Sen (1978) and Mansbridge (1990: 3-22), but rather follows the most common assumption in connecting interests to politics. Sections of the argument which follows, particularly on the Sundarbans, follow closely my "Rethinking the Commons," Agriculture and Human Values 7:2 (Spring 1990). The paper is a revised version of a presentation at the

Center for Population and Development Studies, Harvard University, March, 1991.

2. The Sundarbans, bridging India and Bangladesh, is one of the last deltaic mangrove forest eco-systems in Asia, the rest having succumbed to rice agriculture. Its current extent is approximately 10,000 square kilometers, or about three times the size of the state of Rhode Island; two centuries ago, the forest was double its present size. The area may be familiar to many indirectly as the home of the endangered Bengal tiger; international efforts through Project Tiger have focused attention on deterioration of the habitat. Because of the familiar problem of unstandardized transliterations (in this case from the Bengali), the word is variously spelled. Questions of etymology further complicate spelling. Yule and Burnell (1903:869) use sunderbunds, reflecting their belief that the origin is in bund, i.e. "mound" or "embankment" (created by tidal action and sedimentation) rather than "forest" (ban/van). Derivations of sunder/sundar are likewise disputed, ranging from sundara ("beautiful") to sundari (the Bengali name of the mangrove, Heriteria minor, sometimes H. fomes) to chandra ("moon" reflecting again the tidal-island theory) to chandra-dip ban (from the name of a large zamindari estate) to chanda-bhanda (the name of an earlier tribe of salt-makers mentioned on a copper tablet dating from A.D. 1136). The "beautiful forest" notion is probably a retroformation, created by current valuations of forests under a pervasive ecological romanticism. Indigenous perceptions were closer to jungal than ban (at least from the implications of Bhattacharyya's 1990 piece). Though the forest system bridges two nations, about 80 percent of the area is in contemporary Bangladesh.

3. The logic of collective action is ambiguous on "small" aggregates. Villages may have more potential for collective action than much smaller aggregates in industrial society because of a) the greater continuity of relationships over time; b) the greater information about the character of other individuals; c) the multidimensionality of relationships, such that "side-payments" and sanctions can be managed in spheres other than that to which collective action directly applies.

4. There is a small puzzle here, which we may note in passing: why do villages seem capable throughout India (and in much of the world) of collective action in cases where there are arguably no material benefits involved? That is, collective religious observances are organized even in villages which fail to act collectively for production bonuses. A materialist explanation can be conjured, but it is clearly an act of conjuring: local belief systems hold that appeasing or pleasing some deity is likely to have greater material benefits than rationally using water.

5. Scattered exceptions may be found in the works of Marx, for example in the discussion of agriculture in Capital Vol I. Raghunandan (1987:546) points to exceptions in Engels' "Dialectics

of Nature." Nevertheless, the weight of the Marxian tradition is clearly as indicated in the text.

6. The moral economy tradition is something of a totem in peasant studies. It opposes "moral" not to immoral but to amoral; that is, there exist social formations in which economic relations and outcomes are judged not by canons of markets, but by socially constructed notions of right and wrong, acceptable, unacceptable and optimal. The roots in Polanyi (1944) are clear; the term is usually associated with James Scott's early work. For the briefest possible summary, and a comparison to a leading critic's theoretical alternative, see Herring (1980).

7. Mohanty's (1987) powerful novel of forest conflict and exploitation illustrates peasant ambivalence concerning the opposed values of forest preservation and the scramble for subsistence in the context of exploitation by state regulators and fellow villagers points to the simultaneous operation of contradictory values and practices.

8. The history of the Sundarbans suggests other limits rooted in territoriality. Incursion on the Sunderbans might well have reached a natural limit independently of colonial restrictions as costs of reclamation accelerated relative to benefits as the soil became progressively more saline and the bunding more difficult, but the fate of other deltaic forests in Asia do not suggest optimism. As timber, fuel and rice prices escalated over time (Richards and Flint, 1987), clearing of more marginal land would have become proportionately more attractive.

9. The lives of Islamic saints on the Sundarbans frontier became "metaphors for the union of agriculture and religion:" the struggle against nature and against the infidels became intertwined (Eaton 1990:8). Eaton notes that in the belief systems of local Muslims, "Allah created Adam out of the earth in order that he might possess the earth and be its master, or malik. In the Bengali version of creation Adam exercised his mastery of the earth by farming it." There is set in motion here one of the central conflicts in the value problematic of conservation and preservation: the meaning of mastery by one species over the fate of all others.

10. Raghunandan (1987:545) notes the case of a ninth-century Pallava king who was given the honorific Kaduvetti (one who clears forests) for presiding over the rapid conversion of forests to cultivated land.

11. See the Special Issue of Agriculture and Human Values VII:2 (Spring 1990) for a full discussion, especially the contributions by Richards and Flint and Bhattacharyya.

12. Kautilya argues in the Artha Sastra that "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 Robinson, 1988: preface). The doctrine of matsya-nyaya, which Robinson calls the "law of the fishes," implies that in a state of nature, anarchy prevails, providing the justification for a strong and interventionist state. So strongly is the state associated with "the Rod" (danda) that Kautilya calls the science of politics, or kingship, dandaniti (a useful corrective rooted in realism to the more usual rajniti).

13. Indira Gandhi once said that "poverty is the worst polluter" (Omvedt 1987:29).

14. On the importance of poverty-alleviation programs generally for environmental protection, Desai, 1987. Land reforms 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.

15. For examples, see Raghunandan (1987). Bandyopadhyay and Shiva (1988:1223) state characteristically: "A characteristic of the Indian civilization has been its sensitivity to the natural ecosystems." Bina Agarwal (1990) appropriately disaggregates "Indian civilization" to locate environmental consciousness in specific social categories (hill people, women) as a consequence of interests generated by position in the division of labor within productive and reproductive systems.

16. Friesema and Culhane (19??) demonstrate that the largest number of legal actions initiated on behalf of the environment in the United States comes not from the peak preservationist groups, but from local communities rooted in the NIMBY (not in my backyard) persuasion.

17. It is unclear how preservationist movements such as Chipko are. Agarwal (1990) locates the preservationist strand of discourse in women, as opposed to men, who show greater interest in the lures of commercial use and the cash economy. But even forest-friendly uses of forests may not be preservationist in the sense of deep ecology. At a minimum, invasive varieties of flora are entailed in uses of forests by humans and domesticated animals. North American wetlands, to give one example, have been fundamentally altered by the invasive loosestrife which takes over ecological niches from

indigenous varieties. *Spartina* grass transferred accidentally by ships from their native niche in New England are destroying salt marshes in the Pacific Northwest, and in the process destroying the oyster industry (NYT 3-7-91). Fragile ecosystems often cannot bear even the innocent trampling of human feet, much less domesticated animals.

18. "Silent Valley" privileges the ecologists' meaning system. The valley presented a scientific puzzle because of the anomalous absence of cicadas -- hence silence. An alternative etymological genealogy implicitly challenged the scientific discourse: "silent valley was held to be a corruption in colonial mispronunciation of Svranda vana, the woods of a legendary princess.

19. For a discussion of the political construction of the technical arguments for and against the project, see Nayar (1980); Vijayachandran (1980).

18. This brief account is based on press reports, interviews with activists on both sides of the conflict, local officials and proceedings of the Kerala Legislative Assembly, in addition to sources cited in the text. In the debates surrounding the Silent Valley protection bill in the Kerala legislative assembly, the word "ecology" was used and then challenged as to meaning. No one could give an answer, and it was finally decided after consultation with a dictionary that "pollution" was at issue. Since the hydroelectric project threatened no pollution, the deep ecology position of the Kerala Sastra Sahitya Parishad was effectively delegitimized in the view of the legislators. I was working in the district in question at the time and can confirm that local views were equally unaffected by ecological values in local organizations pressing for the dam. The perception that ecological integrity was a "luxury," unaffordable in poor societies, as expressed in the legislature, is a familiar theme in "North-South" debates on the global environment. The interest of Delhi in increasing electric power production was clear, given the production bottlenecks and discontent -- both urban and rural -- at power outages. But the Kerala project was small in terms of national energy consumption and Indira Gandhi, returned to power in 1980, had no political problem in embarrassing the newly-installed communist government of Kerala (which had long promised the project).

21. A partial exception was a small group of people involved in illegal drug cultivation near the valley. Natural reserves have often been the cover for uncontrolled and anti-social elements, a point explicit in the colonial authorities' interests in converting the Sundarbans to peasant fields.

22. As in the "Silent Valley" case, the mobilization of symbols around preservationist values boomeranged politically. The designation of the spotted owl as a threatened species under the Endangered Species Act saved some old growth forest from

destruction, but simultaneously engendered a human needs vs. birds construction of the politics. Bumper stickers reading "Save a Lumberjack, Shoot an Owl" or "Lumberjacks are an Endangered Species" symbolized the growth-preservation trade-off as perceived by local loggers. Approximately 6 million acres are currently under federal and state protection, at an estimated cost of between 20,000 and 100,000 jobs in the timber industry.

23. For a useful discussion of the distinction, drawing on Marglin, though in a different context, see Agarwal 1990:24.

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