This "neofunctionalism" was further criticized for its crude use of the concept of "carrying capacity," which uncritically assumed that there are given limits to human population density, despite extensive and growing evidence to the contrary (Behnke and Scoones 1993). The assumptions, moreover, that a given subsistence population could be analytically bounded also posed difficulties, as did the short time-scales of research over which arguments for long-term adaptation were made (Orlove 1980).

So too, neofunctional cultural materialism, as championed by anthropologists like Marvin Harris, has been overturned, often simply through rigorous field research. Harris, for example, argued that the cow became sacred in India because of the ecological value of its protein provision and agricultural traction power (Harris 1966). Highly inconsistent data and questions of cause and effect in cattle protection undermine any such simple explanation (Simoons 1979; Freed and Freed 1981). Do adaptive uses lead to taboos creating surpluses or does the surplus of animals lead to adaptive uses? As adaptation researcher Alexander Allard (1975) once insisted, the worst cultural ecology in this way represents little more than "just so stories" (p. 69).

Another ongoing criticism of cultural ecology centers on the degree to which it has been, and remains, parochial in its outlook, focusing almost exclusively on underdeveloped rural contexts. In an urbanizing and interconnected world, such a focus seems out of step with contemporary concerns and the globalizing realities faced by the same local producers that cultural ecologists claim to understand. By largely ignoring first world contexts and urban localities, cultural ecology is arguably increasingly less relevant.

Most problematic, the thrust of some cultural ecological argument explicitly naturalizes and, by implication, legitimizes what can be seen as contingent social behaviors and practices, recalling the socially and politically disturbing features of determinism. If the Native Americans of Bennett's Northern Plainsmen fill an "adaptive niche" by living at the edge of subsistence, scavenging at the periphery of the larger economic and ecological system, the implication is that such a status is natural, and not the result of land seizure, political marginalization, discrimination, and decades of exploitation (Bennett 1969).

The politics that both make up and constrain the daily life of such people, who are perpetually engaged in social and ecological conflicts over subsistence, are little in evidence in this work. This disinterest in resource politics, in the end, often makes it difficult for cultural ecologists to explain the outcomes they observe in the world. Even where truly visionary cultural ecology has called attention to looming development-driven crises, as cultural ecologist William Denevan did with remarkable insight for the Amazon as early as 1973, the limits of the approach, like that of hazards, are established by the absence of theoretical tools to address the larger political and economic climate.

_Beyond land and water: the boundaries of cultural ecology_

These limits are perhaps no more clearly seen than in Between Land and Water, Bernard Nietschmann's groundbreaking study of social and ecological change along the Miskito coast of Nicaragua. Nietschmann was a naturalist and by all accounts a lover of sand and sea, but with a strong interest in the workings of culture and a commitment to the scientific study of development problems. In 1968 he departed for a small community of Miskito Indians in the village of Tashapauini on the Pearl Lagoon in the Caribbean coast of Nicaragua. Equipped with all of the robust tools and theories of cultural ecology, having been trained at the University of Wisconsin by William Denevan, a senior researcher in the field, Nietschmann intended to study subsistence strategy and change along the coast. The study would be extensively quantitative and would involve careful measurement of crops and game, with an eye towards exploring energy inputs and outputs, especially in terms of the harvest of green turtles, which were crucial components of Miskito subsistence and livelihood: classic cultural ecology.

Nietschmann's extensive and detailed quantitative conclusions are complex. His work concluded that the Miskito depend on hunting and fishing as key supplements to crop subsistence, since they provide dependable food security and consistently productive yields. Specialization by individuals in hunting or fishing, he maintained, was in part a result of expensive equipment costs and because mastery of the complex knowledge required was difficult (Nietschmann 1972). Similarly, Nietschmann recorded the complex and sophisticated systems that governed sharing of meat catches, examined in terms of the cultural role of redistribution in the reproduction of the social order and availability of proteins (Nietschmann 1973). All of these bear the traditional marks of cultural ecology's questions and answers.

But _things were not in homeostatic order, by any means_. The monetization of the local economy had redirected flows of exchange and harvest of hunted wild animals. Specifically, the trading of sea turtle meat and other products, though a practice dating from at least the early seventeenth century, had radically accelerated in recent years. This brought with it a breakdown of social reciprocity, an acceleration of harvest, and decline of turtle resources. This decline fed a spiral of overexploitation and capitalization with serious social and environmental implications (Nietschmann 1973).

Ultimately, Nietschmann concluded, the fundamental problems of Miskito subsistence and the emerging livelihood crises along the coast were not related to the metabolism of the internal ecological system — the governing system imagined to be so important in systems approaches of cultural ecology — but the broader global market. As he explains in a compelling narrative account of his life in the field, _Caribbean Edge_:

These green turtles, caught by the Miskito Indian fishermen off the eastern coast of Nicaragua, are destined for distant markets. Their butchered bodies will pass through many hands, local and foreign, eventually ending up in tins, bottles and freezers far away. Their meat, leather, shell, oil, and calipee — a gelatinous substance that is the base of turtle soup — will be used to produce goods for more affluent parts of the world.

(Nietschmann 1979, pp. 173–4)

Concerned not only about the lives and livelihoods of the Miskito, with whom he had developed a strong rapport, but also for the turtles themselves, Nietschmann began to ask new and pressing questions. How much more overextraction might be expected before the Miskito respond economically or politically to their position in Nicaragua's political economy? Did struggle lie ahead? Could Miskito systems of production function with one foot in subsistence and the other in the market?
Evidence on the relationship between social conflict, markets, and turtle population decline was clear, especially in terms of traditional systems of reciprocity:

Tension is growing in the villages. Kinship relations are strained because of what some villagers interpret as stingy meat distribution. Rather than endure the trauma caused by having to ration turtle meat, many turtlemen prefer to sell all of their turtles out to the company and return to the village with money, which does not have to be shared. However, if a Miskito sells out to the company, he will probably be unable to acquire meat for himself in the village, regardless of kinship or purchasing power... the situation is bad and getting worse. Individuals too old or too sick to provide for themselves often receive little meat or money from relatives. Families without turtlemen are families with neither money nor access to meat. (Nietzschmann 1979, p. 186)

Nor would the political imperatives and entanglements of Miskito livelihoods in Nicaragua end there. The Nicaraguan Sandanista government of the 1980s, during their protracted conflict with US-supported guerrillas, enacted price controls and land seizures throughout Miskito territory, which further highlighted the marginal position of the community both within the global economy as well as within their own national polity (Nietzschmann 1989). Nietzschmann was compelled to address these issues, and would do so both as a researcher and as an activist apprenticed to the Miskito community.

The limits of progressive contextualization Though this struggle would drive research for the rest of his life (he died in 2000), the tools of Nietzschmann’s science did not seem to fit the range of questions he faced. Even as he had walked through a physical doorway, Nietzschmann had hit a conceptual wall. Restricted to research tools like organismism, function, adaptation, and equilibrium, further understanding could not cross the barrier point where markets meet subsistence and where the same local populations carry out the creation and destruction of the environment.

Cultural ecology offered one more conceptual instrument for understanding such complexity. Andrew Vayda (1983), writing in the early 1980s, proposed that explanation of people–environment interactions follow a path of “progressive contextualization,” where human–environment interactions are explained “by placing them within progressively wider or denser contexts” (p. 265). The predicament of the Miskito, and communities like them, can be best explained by describing the changes and conflicts in their production system, while slowly refocusing the analytical lens to understand the social context of decisions, the economic context of those social systems, and the political context of that economy. Nesting local interactions within larger and larger scales, Vayda argued, leads to an understanding of driving processes in an empirical and inductive way.

But to describe, in an ad hoc and ultimately atheoretical fashion, does little to explain, to answer the question why, and reveal underlying and persistent processes. Why are turtles declining? Because of overfishing. Why is overfishing occurring? Because of changing markets. But why are markets changing? And what is the overall relationship between markets, state authority, local power, and ecological cycles of production and decline? The interactions between state institutions, coercive social
relationships, commodity markets, subsistence, and natural resources were dynamics that required new theoretical tools and categories, not simply fuller description. This is especially true if the analyst wants not only to describe changing human–environment interactions, but to change them as well.

So too, the political role of the researcher in representing and interacting with the groups with whom they work had so far received little discussion in human–environment study. What are the obligations of the researcher to the researched? What are the inherent power relations that create problems in that relationship? Who can speak for whom? To whom is research speaking? To what end? These issues, though inherent in the work of hazards researchers and cultural ecologists, had received little serious attention. They would require far more elaboration before practical and progressive work might be done.

Like many researchers before him, Nietzsche was beginning to do what we now call political ecology. He had argued that Miskito articulation with global political economy had simultaneously created reconfigurations of social systems governing redistribution, cultural standards governing resource management, and environmental systems governing the populations of wild species. He had found change, but not the change he thought he would find. And as in Humboldt’s observation of pearl fisheries, Sauer’s anxiety over commercial economies, and White’s examination of “irrational” flood policy, the theoretical tools to explain why such changes occur, which might help to steer both research and activism, were not yet fully formed.

Taking the plunge In sum, the general argument I am presenting here, insofar as the history of several fields can be used to draw any coherent lesson, is that critical politics in environment–society research are not at all a new thing. Indeed, from the very origins of evolutionary theory, through the complex social and ecological revolutions of the late nineteenth century, into the era of technocratic intensification and urbanization, researchers have continued to articulate a relatively coherent program of political ecological research. This work, from the anti-authoritarianism and anti-commercialism of Kropotkin and Sauer to the local rationalism of White and Netting, has consistently interrogated the logic of local production, the value of local knowledge, the environmental costs of regional and global change, and the power-laden impacts of socio-environmental change (Figure 2.2). As I have tried to show here, however, the consistent problem has been the absence of an integrated set of critical concepts, methods, and theories from which to explain problems and upon which to build alternatives.

Such critical tools, however, lie close at hand. And in the explosive political and ecological events of the 1970s and 1980s, these would find articulation in the increasingly formalized field of contemporary political ecology.
bull, long treasured and outbred for profit, was biologically extinct. The trees, once harvested, had died. The land had been reclaimed for marginal food crops. Modern development had made local people more destitute and had depleted much of the region’s environmental resources and faunal biodiversity. A project intended to decrease outmigration from the area had increased it, forcing more independent producers into low-wage labor (Sainath 1996).

What had gone wrong? Clues to the failure of the system can be found by employing the principles of hazards and cultural ecology. Viewed in this light, the periodic hazard of drought in South Asia has resulted in traditional risk-reducing breeding systems that balance production and survival in livestock species. The traditional use of marginal fodder resources produced consistent and steady regional milk exports from the region, if not large ones. Land management was thus traditionally well integrated with climate variability. So too, stud bulls were commonly treated as community and village property to optimize access to key resources as well as production levels, while diversifying genetic stock. Plantation choices mixed food as well as feed crops, depending on community grazing lands for livestock inputs. The result was a system where milk production in Indian grasslands was roughly a remarkable 1.85 tons per hectare, compared to a global average of 0.137 (Crott 1980; George 1990).

From this point of view, the project directors in Orissa did everything wrong. By introducing an American stud animal that was ill-suited to the climate, they all but assured its decline during periods of environmental stress. Insisting on purity of the genetic material, they slaughtered all local stud bulls so as not to dilute the breeding program. Producers who grew both food and fodder on their allotted lands had their vegetables torn from the ground (Sainath 1996). Despite historically communal breeding systems, animals were privately dispensed, as was fodder-producing land. The fodder tree species choice, Lascaea leucophylla, while a productive species, is not suited for all environments (Hocking 1993). So from a cultural ecological point of view, as well as from that of hazards adjustment, the project was poorly designed; indeed it was insane.

But the larger questions still loom. Why did the development authorities make the decisions they did? Why were local practices dismissed? Who sponsored foreign high-yielding animals, ones that required high levels of purchased inputs? Who benefited from this program in terms of animal and semen sales, international consultancy fees, and administrative salaries? How does the state’s relationship with non-state actors and global markets direct the choices made? Does this represent a larger development trend in the articulation of local production systems with globally distributed and marketed trees and animals? How did independent landowners become landless workers? Who claimed their abandoned farms? These questions, hallmarks of political ecology, remain.

As with Nieschmann’s Maskito, the tools of cultural ecology and hazards, though crucial for describing such ecological systems and problems systematically, are insufficient for asking and answering the pressing multi-scale questions of development-era environmental change. The emergence of a wide range of crucial theoretical concepts in recent decades – drawn from common property theory, green materialism, peasant studies, feminist development studies, discourse theory, critical environmental history, and postcolonial theory – constitute a new and robust toolkit to directly tackle these questions. They together form the eclectic equipment of political ecology.

Common Property Theory

One of the first and most essential contributions to a contemporary political ecology is common property theory, which rests on the understanding that fisheries, forests, rangeland, genes, and other resources, like many of the environmental systems over which struggles occur, are traditionally managed as collective or common property. Indian pastures, like Nieschmann’s turtle fisheries, White’s rivers, and Humboldt’s pear beds, are all complex ecological systems that are difficult to divide into individual units of ownership – to “exclude” in the language of economics – owing to their spatial and temporal variability. But where private benefits are accrued at a cost to the group, there is a potential to overgraze rangeland, pollute rivers, overextract fish, and otherwise use resources unsustainably. Clearly many of the environmental systems of interest to cultural ecologists and other environmental analysts seem to fall into this broad category of vulnerability. Moreover, since the possibilities for environmental degradation under these social and ecological circumstances are high, problems like declines in pearl beds or turtle populations might be explained as tragic outcomes of failures in collective management.

Local management structures, rooted in local knowledge of such environmental systems, however, commonly provide rules of use that maintain subsistence and renewal of these community resources. Community managed resources in fact thrive around the world. A widening international interest in the operation and function of these rule systems emerged in the 1970s and 1980s, an interest that was concurrent with the rise of contemporary political ecology.

This body of research grew out of a response to the conventional wisdom in the West, wisdom rooted in the premise that private gains might hold sustainable ecological costs, and which held that collective use of resources tended inherently towards abuse and degradation. Codified into a socio-economic theory — “The Tragedy of the Commons” — this conventional wisdom insisted that only centralized regulation or privatization could solve the dilemma of collective resources (Gordon 1954).

“Picture a pasture, open to all,” Garret Hardin begins in his classic statement on the question:

It will be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal war, poisoning, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally however comes the day of reckoning, that is the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy. (Hardin 1968, p. 1244)

Robert Wode presented it with greater clarity. The choice facing community resource users is:

either to cooperate with others in a rule of restrained access or to not cooperate. The argument is that each individual has a clear preference order of options: (i) everyone else abides by the rules while the individual enjoys unrestrained access (he "free rides" or "shirks"), (ii) everyone, including himself, follows the rule ("co-operates"), (iii) no one follows the rule; he follows the rule while no one else does (he is "suckered"). Given
this order of preference, the stable group outcome is the third-ranked alternative, unrestricted access to all in the group. The second-ranked alternative, with mutual rule-bound restraint, is more desirable. But this is not stable equilibrium, because each individual has incentive to cheat and go for the first ranked alternative (unrestricted access to all but him). Even if it turns out that no one else follows the rule, his cheating at least ensures that he avoids his own worst alternative – following the rule while no one else does. (Wade 1987, pp. 97–8).

Under this logic, individuals, assumed to be seeking individual benefit, will invariably take as much as possible from collective resources. Since the costs of that extraction, in reduced returns due to overgrazing, overfishing, or overcutting, are shared between all members of the community whereas the benefits are accrued alone, the inherent logic is to continue and indeed to accelerate individual extraction. When enough individuals behave in that fashion, environmental destruction is inevitable. The only options are centralized coercion or privatization. In the first case, a state entity, exogenous to the group, forces stocking rates on the herders, fishers, or woodcutters. In the latter case, the commons is divided into pieces and distributed between individuals, so that overuse of the resource will be immediately felt by the perpetrator and can be individually rectified.

The argument for the tragedy of the commons is tidy, internally coherent, persuasive, and meritorious given its assumptions. And using rational choice theory and game theory – where logical individual actions are modeled in anticipation of the actions of others – various scenarios of this sort can be tested. Consistently they seem to produce the same result. Failure occurs where individuals seek personal benefit in environmental systems and costs are “externalized” to the group.

But empirical evidence compiled for the last three decades shows less support for such a model, and time and again evidence of collective stewardship appears in the management of resources ranging from fisheries from Maine to Turkey, pastures from Morocco to India, and forests from Madagascar to Japan. While “tragedy” theory suggested failure, the literature was filled with “exceptions,” locally organized techniques, rules, and decision-making structures that organized extraction, defined user communities, and maintained harvests and yields. The empirical record on common property management is far too large to survey here, but the accumulated case material is impressive (see National Research Council 1986; Feeny et al. 1990; and Burger and Grofsheld 1998).

The search during the 1970s and 1980s for an alternative theory, therefore, became imperative for international and comparative social science research. How to account for these successes? When do they work? What makes them fail if and when they do? The theory that emerged would challenge the basic assumptions of the “tragedy” thesis, first by suggesting that commons users are not isolated decision-makers but in fact live in communities where they can mutually monitor and communicate, and second, that the tragedy “game players” can watch outcomes unfold and adapt their decisions in later “rounds of play.” Following the pragmatic tradition of institutional economics, this alternative theorization suggests that in fact myriad solutions to the problem exist, if conditions allow for negotiation and iterative observation of outcomes (Commons 1990).

Success of collective management, theorists maintain, is a result of the fact that such commons are not unowned (legally, rei nullius) but are in fact commonly held property (legally, rei comunes) (Cirincione-Wanstrup and Bishop 1975). Failure of collective management, by contrast, merely represents failures in the specific structure of rules that govern a collective property, by virtue of increasing scarcity or value of the resource or alterations in local social structure and culture. Recovery of sustainable management is a task of drafting new and better rules, not one of slicing up the commons into private bits, nor imposing strong-arm central authority (Ostrom 1990, 1992; Ostrom et al. 1993; Hanna et al. 1996).

Again for problems like those facing the Miskito, where broader economic forces were transforming the harvesting of traditional resources, this approach provides some useful lessons. Overfishing of mobile resources, like sea turtles, is by no means an inevitable or even a common outcome of collective ownership and management. Communities like the Miskito had sustainably harvested such resources for generations, through clearly defined systems of land sanction, redistribution, inclusion, and exclusion. Explanation for the failure of the sea turtle fishery lies, therefore, in the problem of how the rules work, and whether they can adapt to socio-economic change: the Miskito, as rational decision-makers, might yet craft new rules.

In this way, most responses to the “tragedy of the commons” took the question on its own terms, proving empirically that given the opportunity to negotiate and given the proper structure of rules, degradation was by no means the inevitable result of collectivity. Rational choice, therefore, was used to form an apparently apolitical theory of environmental commons.

Other critics were bolder, however. They held that the increasingly capitalized economies were radically altering the social and political circumstances of the players of these commons games. Indeed, as Mulkavin phrases it, the entrance of commercial enterprises and market-oriented social economic systems produces some like that of the Miskito results in the appropriation of communal capital away from locals and into the hands of elites, non-residents, and other distant parties (Mulkavin 1996). The “tragedy of the commons,” moreover, by placing the fault of degradation at the feet of disempowered local communities, actually disguises and supports this outcome. This observation would become fundamental to political ecology.

An apolitical theory of the commons, therefore, though attractive, is inadequate. Multiple scales of power and diverse players acting on local commons are unexamined and the multi-scale structure of the economy unacknowledged. The broader historical trajectory of socio-economic change is ignored. Moreover, by continuing to insist on the apolitical nature of the problem, such approaches to the common property problem reinforce the normative assumptions of rational choice “tragedy” approaches. Practical action is limited to internal “rule crafting,” which does not challenge the more fundamental economic forces at work. A more ambitious and explicitly political thesis would be required, drawing on materialism and political economy.

Green Materialism

In the same year that Peter Kropotkin returned from Siberia to begin his work as an activist and philosopher, 1867, Karl Marx published the first volume of his three-volume masterwork Capital, cementing what would become a parallel but distinct line of environmental investigation emerging in philosophy and economics: Marxist
materialism. For Marx and Engels, who observed the industrial revolution with both awe and concern, the degradation of the environment was a fundamental feature of capitalism. The politics of the environment was, therefore, linked to the politics of class struggle, industrialization, and capital accumulation.

Though Marxist philosophy and economics are complex and provide a range of tools, two key precepts in particular would later have a great influence on the development of political ecology. The first is the assertion that, according to Marx, social and cultural systems are based in historical (and changing) material conditions and relations — real stuff. Following from a long line of philosophers, including the Greek philosophers Epicusurus (c. 341 BCE) whose work was the topic of Marx’s doctoral thesis, materialists challenge the notion of idealism, which holds that philosophy, consciousness, and ideas are the engines of history, constituting the world and its transformation. In contrast, the materialists argue that the way humans interact with the world of natural objects provides a “base” upon which law, politics, and society are founded and around which they are given form. As production and the relations of production (social relationships that govern how objects, food, and goods are made, harvested, and assembled) change, society changes as a result (Foster 2000). Such a notion echoes Steward’s concept of the “culture core” described above.

The second key notion is that capitalist production (a specific and recent kind of production) requires the extraction of surplus labor and nature. As that extraction increases in intensity, contradictions emerge that provide barriers to further growth, bringing a possible end to capitalism. For materialists, environmental degradation is therefore inevitable in capitalism but also one of its fundamental weaknesses (O’Connor 1996).

**Materialist history**

This materialist view of history lends itself to investigations of the relationship between nature and society. If forms of social organization are rooted in production (how things are made), they are, by implication, ultimately explained by how people use nature. For many materialists, this has meant a broad, general, and all-encompassing theory of history, explaining how one society transforms into another. For these historians, the central concept in understanding such change is the “mode of production.” Simply put, a mode of production is a combination of key social and material elements; these elements are constant, and include labor, technology, and capital, but their interrelationships, combination, and recombination are in constant flux, leading to differing ways of making a living from nature, and changing organization of society across history and over space. In a pre-capitalist mode of production, for example, a shoemaker owns his own capital/equipment and makes shoes, selling the finished product to buyers. In a capitalist mode of production, on the other hand, the machinery of shoe manufacture is owned by a capitalist; workers do not own that equipment, and have nothing but their labor to sell, being paid for time spent making shoes that belong to the owner. The transformation from one system to another is driven by internal changes and “contradictions” in the system, leading to ongoing historical struggles that create new ways of organizing labor and nature (Althusser and Balibar 1970). Contradictions are elements in the systems whose relationships to one another are necessary but inherently at odds, eventually leading to crisis, fracture, and collapse. Materialists assert, for example, that because surplus value must be constantly extracted from workers and from the soil to landlords and commodity traders, the conditions (human health, soil quality, nutrients) required to maintain that production cannot be sustained, leading to a crisis, and possibly socio-economic change.

Where one mode of production encounters another — kin-ordered subsistence like the Nicaraguan Miskito encountering global turtle markets, for example — a process of “articulation” follows. The two systems struggle, forming a hybrid outcome in which producers may have one foot in global markets and another in subsistence production exchange systems (Hindess and Hirst 1975).

Many theorists in this area are quick to point out that there is no teleological end (inevitable trajectory) for all of this social change and interaction. In the words of Hindess and Hirst (1975), a “theory of modes of production involves abstract and general concepts — the concept of modes of production and social formation, of ideology and of politics of the state, and so on — but there is no general theory of modes of production” (p. 5). Even so, most theorists tend to see the power of global capitalism as so great as to dominate the process so that inequalities are created and tend to persist between capitalist powers and the pre-capitalist peripheries with which they articulate (Emmanuel 1972; Peet 1991).

For political ecologists, such a theory has many attractions. When Nietschmann’s producers in Nicaragua, for example, encounter regional and global markets, we might be able to predict the inequalities in power and exchange that result from their “articulation” with a capitalist mode of production. Such imbalances can further be interpreted in terms of changes in labor and exchange relations (reciprocity versus markets) and in the manner and mode of environmental extraction (craft fishing versus intensive harvesting of turtles), potentially leading to crisis. This approach expands common property theory appreciably, linking the process of accumulation with the encroachment and dismantling of traditional commons. Indeed, Marx’s own argument on accumulation was predicated on his careful observation of the commons of the Scottish highlands appropriated by elites in the nineteenth century (Marx 1976).

Even so, the role of the environment in human affairs remains somewhat vague in this formulation, since humans are portrayed as “promethean,” capable of endless manipulation of natural systems as economies advance. It is unclear how the environment might influence history in such a general account. Other, more specific materialist efforts at analyzing ecological influences on the character and trajectory of society have been attempted, however.

**The case of Oriental despotism**

In perhaps the most prominent example, Karl Wittfogel argued that the roots of “Oriental despotism,” epitomized by those Byzantine, Asian, and bureaucratic states like historical China, lay in the establishment and maintenance of agriculture. Though a vociferous anti-communist theoretician, his thesis attracted the attention of Marxists and non-Marxists alike with its apparently far-reaching and explicitly materialist
foundation. Writing in 1957, Wittfogel maintained, in classic materialist fashion, that the problems of production must be solved through political organization. Agricultural production systems in arid places, which depend heavily on big irrigation systems, must therefore require immense centralized bureaucracies. Thus, the political history of many of the world's great centralized states, particularly in Asia, can be explained as a simple result of the problems of water management.

This "hydraulic society" argument was attractive for a number of reasons. Self-perpetuating, totalitarian rule was a matter of political concern in the darkest days of the cold war and Wittfogel seemed to provide compelling scholarly explanation of global political structures. In this regard, the argument was especially attractive for Marxists, who held to materialist political philosophy but rejected the totalitarian communism of the Stalinist and Maoist states in the Soviet Union and China. How did utopian socialism turn into oppressive military bureaucracies? The apparent answer, Wittfogel suggests, is the deep historical roots of totalitarianism in "agronomicalism." Materialism, in this way, provided an explanatory excavation of Marxism; China is oppressive because of environmental history, not revolutionary precepts. The thesis was also of interest to materialist historians who had long puzzled over the different economic trajectories of the great empires of Asia and those of Europe. The West, with its rain-fed agriculture and smallholdings, by implication, developed feudalism and eventually private property, emerging as the triumphant capitalist center of the twentieth century.

Attractive as the thesis was, it was fundamentally flawed on both empirical and theoretical grounds. Empirically, detailed comparative and case-based research followed the publication of Oriental Despotism for the next several decades. The evidence, though sometimes contradictory, clearly demonstrated that large irrigation systems do not necessarily require central authority for management and can be managed by collective decentralized producer associations as effectively as centralized bureaucracies (Ostrom 1992). Furthermore, there is no evidence of an empirical association between large irrigation systems and centralized authority either in contemporary cases or ancient periods (Butzer 1976; Hunt 1988).

Theoretically, the hydraulic society thesis was also deeply flawed. Oriental Despotism follows a long tradition of Orientalist scholarship, which first assumes that "Eastern" civilizations are essentially different from those in the "West," and then proceeds to explain why that is so (Said 1978). In the process, the explanation serves to reinforce the artificial hierarchy of colonial thinking, where the traditionally colonized and dominated communities of the East (India, China, Arabia) are naturally inferior, bound in changeless tradition, and given to despotic rule. Such societies can only be changed and liberated by forces intruding from without — benevolently extending the enlightened advantages of the "West." Such colonial ways of thinking carry sweeping and problematic assumptions about the superiority of Euro-American society and culture. As Wittfogel insists: "nowhere, to our knowledge, did internal forces succeed in transforming any single-centered agrarian society into a multi-centered society of the Western type" (Wittfogel 1981, p. 227).

The hydraulic society thesis is, therefore, similar to many Eurocentric theories of history (Aston and Phlupin 1985); it is both empirically untenable and politically problematic, since it ironically embraces and reinforces the very colonial hierarchies that critical scholarship claims to spur (Blaut 2000).

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**Box 3.1 The Intellectual Politics of Wittfogel's Oriental Despotism**

Karl Wittfogel's Oriental Despotism is an ambitious, frustrating, thoughtful, and vastly reductionist account of the roots and character of Asian civilization. In this book, subtitled "a comparative study of total power," he lays out his well-known carefully structured argument that despotic civilization in Asia, to which Soviet and Chinese communism are heir, is the result of traditions of bureaucratic control mandated by the management of large-scale irrigation systems. Despite wide-ranging empirical and theoretical flaws (Hunt 1988), the book is influential, especially amongst modern global economic historians.

Wittfogel was a scholar of tremendous intellectual and personal complexity. Associated with the Frankfurt school of social theorists, he drew upon the work of Marx (modes of production) and Max Weber (formation of bureaucracy) to analyze Asian society and history as an apolitical, scientific, and objective endeavor, as is evident in the tone and approach of Oriental Despotism. Wittfogel's career, however, bears testimony to the degree to which any scientific practice is rooted inevitably in a personal biography, enmeshed in broader political processes. As a refugee from Hitler's Germany, Wittfogel sailed to New York in 1934 to foster the Chinese History Project at Columbia University with the support of the Institute of Pacific Relations (IPR) and the Rockefeller Foundation. With the Nazi-Soviet pact of 1939, Wittfogel became disillusioned with Marxism, later moving to the University of Washington in 1949, where modernization studies centered on Asia were burgeoning during the cold war. As McCarthyist anti-communism heated up, such institutions became the target of government attention (Ulmen 1978).

When confronted with accusations that he was a communist sympathizer, Wittfogel was quick to decouple his colleagues and protest vigorously concerning his anti-communist credentials. Especially egregious was his denunciation of Owen Lattimore, a prominent Asianist, prolific and talented scholar, former friend, and fellow socialist. Under subpoena before the US Senate McCarran Committee, formed by Senator Joe McCarthy in 1950 and charged with investigating the IPR and other academic organizations that might be "subversive," Wittfogel repeatedly denounced Lattimore, insisting that he was not only subversive but, more importantly, naïve concerning the social and political character of Asian "feudalism." Lattimore, he charged, had been led by his subversive communist ideology to totally misanalyze the character of Chinese agrarian society and state power (Ulmen 1978, pp. 289-94). This was the beginning of an ongoing attack on Lattimore that ultimately ended in the destruction of his career (Newman 1992).

It was in the midst of this struggle that Wittfogel completed Oriental Despotism, his own treatise on Asian environment and power, which was finished in 1954 and published in 1957. Clearly Oriental Despotism and Wittfogel's other works are more than ambitious attempts at a comprehensive account of human-environment systems. They sit at the center of ideological and personal struggles that rippled at the core of academic freedom and political identity during the cold war. Wittfogel's journey, though marked by academic achievement, is also marred by personal and ethical tragedy, a testimony to the fact that apolitical ecology is ultimately impossible.
But the failure of Oriental despotism as a universal materialist thesis does not detract from the overall greater materialist project. Even critics of the thesis admit to the importance of the linkage between production and the social systems of management they necessitate (Hunt 1988). Extensions of the broad argument to United States water management and the accumulation of bureaucratic agency power in the management of irrigation in the rural west, for example, has proved a productive line of thinking (Worster 1985).

The inadequacies of the hydraulic society thesis do provide, however, a cautionary tale for how political ecology must proceed as a way of explaining things. To avoid mistakes of reductionism, it needs to operate less from the universal and more from the particular, explore the context as well as the conditions of power, and eschew any simple narratives of social difference rooted in single-variable explanations. All the same, it must do so with a serious dedication to the material underpinnings of social life.

Dependency, accumulation, and degradation

Despite the shortcomings of some historical materialist research, materialist theory provided great explanatory purchase during the cold war period, and began to expose many of the more glaring sources of global inequality. Most compelling was the concept of dependency, first thrust onto the world stage by Latin American economists in the 1960s. For dependency theorists, the marginal conditions of the world’s poorest nations were directly the result of the terms of trade established during the colonial period, when most colonized countries were forced to produce primary products, rather than more valuable industrial and craft goods. This was most notably the case in India, where a tradition of textile production was shunted aside by colonial authorities, who desired cheap cotton from Indian fields, but no competition in finished goods for textile mills in Manchester. These relationships hardened into a perpetual economic order of underdevelopment where, as Peet (1999) explains, “real power was exercised from external centers of command in dominant (‘metropolitan’) countries. Dependence continues into the present through international ownership of the region’s most dynamic sectors, multinational corporate control over technology, and payments of royalties, interest, and profit” (p. 107). Even years after colonialism, and even where these poorer states are sovereign and control their own economies, their position in global trade remains disadvantaged as capital is accumulated elsewhere.

This holds implications for explaining ecological transformation in the contemporary world, and for exploring the relationship between economics and ecology. This linkage is built into materialism in a fundamental way since, as noted earlier, Marxist economics is based on the notion that capital accumulation requires the exploitation of both labor and nature.

For Marx, value comes from labor. Yet capitalists, he points out, make a handsome living without laboring in their own factories. The surplus— the difference between the value of the capital and labor put into a commodity (like a shoe, umbrella, or car) and the value accrued by the factory owner— must come from somewhere. The system of production under capitalism, Marx explains, is ordered so that workers, technicians, and engineers perform extra labor, the balance of which goes into the pocket of the owner, a non-worker. The same goes for nature; by expropriating nature’s capital and underinvesting in restoration or repair of impacted ecological systems, capitalist firms squeeze surplus from the landscape, even and especially where commodity prices are falling and profit margins are tight. Moreover, the extraction of both labor and nature are simultaneous and interlinked. For crop production, for example: “all progress in capitalist agriculture is the progress in the art, not only of robbing the laborer, but of robbing the soil; all progress in increasing the fertility of the soil for a given time, is a progress towards ruining the lasting sources of that fertility” (Marx 1967a, p. 506).

The same applies for forestry and other land uses. For environmental industries, the rate and intensity of extraction must always outpace that of restoration. “The development of culture and of industry in general has ever evidenced itself in such energetic destruction of forests that everything done by it conversely for their preservation and restoration appears infinitesimal” (Marx 1967b, p. 248).

Tied to the concept of dependency, a pattern begins to emerge. Not only are the Miskito tied into a global economy where they are disempowered, they live within a Nicaraguan state system where they are most marginal, and where new demands for capital can only be met by exploiting their local natural resources, sea turtles. And though the Nicaraguan state at the time was ostensibly Marxist, it exists on the dependent periphery of a global exchange network, unable to establish favorable terms of trade. As accumulation continues, sea turtle overexploitation continues, social stratification increases, and the system becomes unstable.

Finally then, green materialism insists that such ongoing pillage of the environment must ultimately result in a political response. Just as the exploitation of labor leads to a labor movement, the exploitation of nature must result in an environmental movement (O’Connor 1995). In capitalism’s excesses, therefore, lie the seeds of more sustainable and equitable practices. The way these dynamics play themselves out in contemporary politics has, in recent years, gained a great deal of attention. Authors like Ted Benton (1996), John Bellamy Foster (2000), and James O’Connor (with the journal Capitalism, Nature, Socialism) all champion a materialist approach to contemporary environmental movements. This has arguably developed into its own distinct school of research into the political economy of nature, with work exploring the politics of water resources (Bakker 1999), of mining (Bridge 2000), and of training the environmental technocratic elite (Luke 1999).

Lessons from materialism: broadly defined political economy

The impact of this line of thinking on political ecology is somewhat more indirect. While not all of contemporary political ecology is explicit in its allegiance to materialism, much of the work at least tacitly assumes many materialist precepts. Among these, the most prominent assertions are that (1) social and cultural relationships are rooted in economic interactions amongst people and between people and nonhuman objects and systems, (2) exogenous imposition of unsustainable extractive regimes of accumulation result in environmental and social stress, and (3) production for the global market leads to contradictions and dependencies.
The degree to which these influences have either expanded or limited the scope of political ecology is a matter of debate. It cannot be disputed, however, that a form of materialism underpins much of political ecology and has motivated much of its research. Many and perhaps most practicing political ecologists would in no way identify themselves as Marxists or materialists. All the same, as the urgent questions of land degradation and human exploitation ignited the concerns of early research in the mid-1980s, materialist tools seemed to fit the bill quite well, and so continue to pervade the general consciousness of the field.

In this sense, almost all research in political ecology is theoretically engaged with what has often been described as a broadly defined political economy. The systems that govern use, overuse, degradation, and recovery of the environment are structured into a larger social engine, which revolves around the control of nature and labor (Altizer and Balihar 1970). No explanation of environmental change is complete, therefore, without serious attention to who profits from changes in control over resources, and without exploring who takes what from whom.

Even so, broad-scale materialist history and theory, attending to the articulation of modes of production and related concerns, did little to explain the specific and peculiar position of primary producers in the contemporary economy, especially local transformations of the environment that accompanied economic and political change. Nor did it provide much in the way of understanding rural primary producers – farmers, fishers, and herders – as important political actors, since most materialist theory focused solely on the potential power of urban working classes. Indeed, traditional Marxism was emphatic on the non-revolutionary irrelevance of the “vacillating and unstable” peasant classes and the disappearance of traditional peasant into rural landlord entrepreneurs and wage workers (Lenin 1972a, p. 27; see also Lenin 1972b, especially chapter 2). Is the role of groups like the Miskito in history simply to become extinct or to wait on their liberation by urban masses? Materialism provided some tools for a nascent political ecology, but not the conceptual apparatus to understand the role of the daily life of producers in environmental history.

The Producer is the Agent of History: Peasant Studies

As it happened, the tools required to address the questions posed by the predicament of agrarian producer groups like the Miskito lay nearby. Investigation of these very dynamics – smallholder integration with broad markets, social unrest in rural areas, and political movements of agrarian communities in the face of coercive power – had become a locus of research activity in the social sciences in the 1960s and 1970s. The academic interest in these communities was not entirely innocent, since the cold war era saw a growing political urgency for understanding the world’s poor agricultural communities. Fear of revolution made even very conservative thinkers interested in small, “backward,” and agrarian places.

This is because revolutionary movements around the world were becoming increasingly rural in orientation. This turns traditional Marxist theory, where the urban working class was thought to be the vanguard of revolution and the peasants bourgeois conservatives, on its head. The Maoist revolution in China, leveraging power of a massive peasantry, mystified both the capitalist West as well as

Box 3.2 Balancing the hatchet and the seed in Blaikie's Political Economy of Soil Erosion

As Piers Blaikie recently explained to me in reflecting on the intellectual context of the early 1980s, which informed his Political Economy of Soil Erosion in Developing Countries (Blaikie 1985), "I characterize neo-Marxist approaches of that time as a Soviet tractor – it produces loads of smoke, is sometimes heavy and cumbersome, but is still hugely powerful and does the work." The book expresses these very strengths and weaknesses. In a remarkably brief 150 pages, Blaikie provides a critique of neo-Malthusan explanations of soil erosion, unMASKS the oversimplifications of technocratic solutions for complex ecological problems, and still has time to offer a sweeping theoretical account of what perpetuates rural soil erosion: capital accumulation by elite class interests. He further bluntly asserts that (1) soil erosion is only brought into check when it challenges systems of accumulation, and that (2) this doesn't happen very often.

With a background in geography with geomorphology and citing his influences as the radical development pragmatists Robert Chambers and Alain de Janvry, Blaikie was working in the 1980s, along with Nepali colleagues, to extend neo-Marxist thinking to serious environmental development problems. The initial monograph, "Centre and Periphery and Access in West Central Nepal: Approaches to Social and Spatial Inequality," was not widely published (maybe because of its title) and so led to the later volume. The structuralist explanation that resulted is terrifyingly compelling and elegant. Filled with boxes, arrows, and flow charts that came to define explanation in political ecology, Political Economy of Soil Erosion graphically lays out causes and effects of erosion in Africa and Asia, showing that households make land-use decisions in broader economic contexts and that state policy in the postwar development era has made huge withdrawals from the soil bank of the rural poor to serve the interests of wealthier people in distant cities.

Twenty years later, Blaikie explains that Political Economy of Soil Erosion does not fit well with his current, advisory and activist foci. Having moved to advocacy and paid policy work, radical critique of this kind has become more difficult, since "he who pays the piper calls the tune." Political Economy of Soil Erosion and an earlier book, Nepal in Crisis (Blaikie et al. 1980), both severely interrupted Blaikie's career as an international consultant, getting him temporarily banned from travel to Nepal, even while it did much to promote his career as an academic. Balancing criticism and effective policy intervention — weighing political ecology's hatchet against its seed — is demonstrably difficult. Blaikie's relationship to Marxism is also marked by ambivalence. He explains:

since PESE I remain a modernist, albeit a more modest one . . . a credible return to a structuralist approach now seems both implausible and undesirable . . . Anyhow, Marxism is thoroughly out of favor and is considered arcane and deeply flawed in most quarters. Also, PESE has since been criticized for having treated environmental politics rather cursorily, something I plead guilty to — it simply was not intended to be that kind of book. Still, my current interests in political ecology draw upon many Marxist ideas, although at a recent seminar I was roundly criticized for abandoning a classic Marxist approach and for letting the comrades down.