**Chapter Two**

**2. Contemporary Theoretical Approaches to Environmental Sociology**

**Introduction**

Environmental sociology, Buttel (2003) observes, has gone through two distinct stages since its emergence in the 1970s as a discrete disciplinary area. In the first stage, the major theoretical task was to identify a key factor (or a closely related set of factors) that created an enduring ‘crisis’ of environmental degradation and destruction. More recently, there has been a significant shift towards another task: discovering the most effective mechanism of environmental reform or improvement which will help ‘chart the way forward to more socially secure and environmentally friendly arrangements’.

In this chapter, we will be discussing two major approaches to the environment and society that were conceived with the first of these problematic in mind, and then proceed to an overview of two contrasting perspectives, reflexive modernization and ecological modernization, which address the second. Then, we will turn to what has probably been the most enduring, and at times rancorous, debate in the field, the realism–constructionism debate.

**2.1. Explanations for Environmental Degradation and Destruction**

In accounting for the causes of widespread environmental destruction, two primary approaches stand out: the ecological explanation as embodied in Catton and Dunlap’s model of ‘competing environmental functions’, and the political economy explanation as found in Alan Schnaiberg’s concepts of the ‘societal-environmental dialectic’ and the ‘treadmill of production’.

2.1.1. ***Competing functions of the environment***

The ecological basis of environmental destruction is probably best described in Catton and Dunlap’s own ‘three competing functions of the environment’. Catton and Dunlap’s model specifies three general functions that the environment serves for human beings: supply depot, living space and waste repository. Used as a supply depot, the environment is a source of renewable and non-renewable natural resources (air, water, forests, and fossil fuels) that are essential for living. Overuse of these resources results in shortages or scarcities. Living space or habitat provides housing, transportation systems and other essentials of daily life. Overuse of this function results in overcrowding, congestion and the destruction of habitats for other species. With the waste repository function, the environment serves as a ‘sink’ for garbage (rubbish), sewage, industrial pollution and other byproducts. Exceeding the ability of ecosystems to absorb wastes results in health problems from toxic wastes and in ecosystem disruption.

Furthermore, each of these functions competes for space, often impinging upon the others. For example, placing a garbage landfill in a rural location near to a city both makes that site unsuitable as a living space and destroys the ability of the land to function as a supply depot for food. Similarly, urban sprawl reduces the amount of arable land that can be put into production while intensive logging threatens the living space of native (aboriginal) peoples.

In recent years, the overlap, and therefore conflict, among these three competing functions of the environment has grown considerably. Newer problems such as global warming are said to stem from competition among all three functions simultaneously. Furthermore, conflicts between functions at the level of regional ecosystems now have implications for the global environment.

There are several very attractive features to Catton and Dunlap’s competing functions of the environment model. First and foremost, it extends human ecology beyond an exclusive concern with living space – the central focus of urban ecology – to the environmentally relevant functions of supply and waste disposal. In addition, it incorporates a time dimension: both the absolute size and the area of overlap of these functions are said to have increased since the year 1900. And the model recognizes the increasing globalization of environmental dangers, and the rising prominence of output or waste-related elements as opposed to input or production-related ones. At the same time, there are problems with the model. As is the case with the urban ecology of Park and the Chicago School, there is no evidence of a human hand here. It says nothing about the social actions involved in these functions and how they are implicated in the overuse and abuse of environmental resources. Above all, there is no provision for changing either values or power relationships.

2.1.2. ***Political economy explanation: the ‘societal–environmental dialectic’ and the ‘treadmill of production’***

Within environmental sociology, probably the most influential explanation of the relationship between capitalism, the state and the environment can be found in Alan Schnaiberg’s book, *The Environment: From Surplus to Scarcity* (1980). Drawing on the strands of both Marxist political economy and neo-Weberian sociology, Schnaiberg outlines the nature and genesis of the contradictory relations between economic expansion and environmental disruption.

Schnaiberg has depicted the political economy of environmental problems and policies as being organized within the structure of modern industrial society, which he labels the treadmill of production. This refers to the inherent need of an economic system to continually yield a profit by creating consumer demand for new products, even where this means expanding the ecosystem to the point where it exceeds its physical limits to growth or its ‘carrying capacity’. One particularly important tool in fuelling this demand is advertising, which convinces people to buy new products as much for reasons of lifestyle enhancement as for practical considerations.

Schnaiberg portrays the treadmill of production as a complex self-reinforcing mechanism whereby politicians respond to the environmental fall-out created by capital intensive economic growth by mandating policies that encourage yet further expansion. For example, resource shortages are handled not by reducing consumption or adopting a more modest lifestyle but by opening up new areas to exploitation.

Schnaiberg detects a *dialectic tension* that arises in advanced industrial societies as a consequence of the conflict between the treadmill of production and demands for environmental protection. He describes this as a clash between ‘use values’; for example, the value of preserving existing unique species of plants and animals, and ‘exchange values’ which characterize the industrial use of natural resources. As environmental protection has emerged as a significant item on the policy agendas of governments, the state must increasingly balance its dual role as a facilitator of capital accumulation and economic growth and its role as environmental regulator and champion.

Caught in a contradictory position as both promoter of economic development and as environmental regulator, governments often engage in a process of ‘environmental managerialism’ (Redclift 1986), in which they attempt to legislate a limited degree of protection sufficient to deflect criticism but not significant enough to derail the engine of growth. By enacting environmental policies and procedures that are complex, ambiguous and open to exploitation by the forces of capital production and accumulation (Modavi 1991: 270) the state reaffirms its commitment to strategies for promoting economic development. the ‘treadmill of production group’2 has addressed the application of the treadmill of production to a Third World context. Ignoring the negative environmental impacts that the treadmill has produced in less developed regions, the leaders of Southern nations, in concert with the governments and corporations of the North, have sought to reproduce industrialisation as experienced by the First World. The primary mechanism for achieving this is the transfer of modern Western industrial techniques from North to South (Schnaiberg and Gould 1994: 167). However, as Redclift (1984) and others have noted, this transplant has become largely unsuccessful both in economic and environmental terms.

Dependency on global markets has made economic development a risky venture for many Third World nations, especially where these markets can easily be decimated by the appearance of new, low-cost alternatives elsewhere in the world. Furthermore, development schemes require an expensive infrastructure of roads, hydroelectric power dams, airports, and so on, which must be paid for by borrowing heavily from Northern financial institutions. Such projects often fail to produce the expected level of economic growth while at the same time causing massive ecological damage in the form of flooding, rainforest destruction, soil erosion and pollution.

The treadmill of production explanation has the advantage of locating present environmental problems in the inequities of humanly constructed political and economic systems rather than the abstract conflict of functions preferred by human ecologists. This brings it closer to the orbit of mainstream sociological theory than the more idiosyncratic approach advocated by Catton and Dunlap. At the same time, as Buttel (2004: 323) has observed, the concept of the treadmill is unique insofar as it is based in sociological reasoning but, at the same time, features a key or penultimate dependent variable – environmental destruction – that is biophysical. In Buttel’s judgment, this makes it ‘the single most important sociological concept and theory to have emerged within North American environmental sociology’.

As Schnaiberg himself has recognized, the treadmill of production has not achieved the paradigmatic status within environmental sociology that he would have liked. Buttel offers several possible reasons for this. First, political economy especially that with a neo-Marxist hue has been somewhat overshadowed in recent decades by other theoretical flavors, notably postmodernism and cultural sociology. Second, treadmill theory has remained somewhat static, wedded to a manufacturing economy in a neo-liberal era in which Western economies seem to have shifted towards new information technologies, financial services and entertainment. Another reason may be simply that the notion of the treadmill is no longer very new or, in spite of what Schnaiberg believes, very controversial. To actually shut down the treadmill, of course, *would* be quite radical, but as an analysis of industrial and consumer society the model seems rather obvious, something that might not have been the case thirty years ago.

2.2. **Theories of Modernism and Environmental Improvement**

Strongly driven by empirical and ideological developments in the European environmental movement, by the practices and institutional developments in some ‘environmental frontrunner states’, and by developments in private companies, some European social scientists began reorienting their focus from explaining ongoing environmental devastation towards understanding processes of environmental reform. Later, and sometimes less strongly, this new environmental social science agenda was followed by US and other non- European scholars and policy analysts. By the turn of the millennium, this focus on understanding and explaining environmental reform had become mainstream, not so much instead of, but rather as a complement to, studies explaining environmental deterioration.

Theoretically speaking, two recent models stand out here, both normatively charged, late modernist prescriptions emanating from Germany and Holland. These are Beck’s ‘risk society thesis’ and Mol and Spaargaren’s ‘ecological modernization’ (EM) theory. The two approaches have often been pitted against one another, insofar as the latter is intended to transform economy–ecology contradictions into win–win situations, while the former claims that our efforts to reform industrial society in the face of an apocalyptic eco-societal crisis are Herculean, if not futile (Blowers 1997; Desfor and Keil 2004: 62). At the same time, the two approaches share an important commonality: the expectation that an ‘environmental state’ will eventually emerge, where environmental protection is a basic responsibility (Fisher 2003: 9–10).

2.2.1. ***Risk society thesis***

As we begin the new millennium, probably the most influential attempt to update modernism has been Ulrich Beck’s ‘risk society thesis’. The term “Risk Society” is a neologism coined by German sociologist Ulrich Beck, in his book *Risk Society: Toward a New Modernity*, first published in German in 1986 and translated into English in 1992. There is a long-standing tradition in intellectual thought of choosing society labels—e.g., Acquisitive Society, Open Society, Affluent Society, Civic Society, Post-Industrial Society, and so on—to capture the dominant theme or spirit of an age.*.* Beck’s “Risk Society” is just such a label; its intent is to underscore his position that society, in this era of advanced (late) modernity, is dominated by the ubiquity of risks, not only as the dominant consciousness of the age but also as the challenge that threatens to overwhelm societies. But “Risk Society” is also a theoretical frame that describes a transition from early to late (reflexive) modernity. In addition to naming the contemporary age, therefore, it provides a diagnosis of its dynamics and underscores its uniqueness from its predecessors.

Beck’s thesis starts with the premise that Western nations have moved from classical to reflexive modernization. For Beck, classical modernization is characterized by a politics centered on material progress and the distribution of wealth and prosperity (‘goods’). The central issue in ‘industrial’ or ‘class’ society is how socially produced wealth can be distributed in a socially unequal way while at the same time minimizing negative side effects (poverty, hunger). Beck argues that, in the “Risk Society,” the concern is no longer with the distribution of “goods” but with the distribution of “bads”—namely, the realization of untoward risks. Risk has become the organizing principle of late modernity: individuals and institutions focus on the prevention, minimizing , channeling, management, allotment and avoidance of potential dangers and hazards produced as part of modernization, notably pollutions.

Beck defines risk as "a systematic way of dealing with hazards and insecurities induced and introduced by [modernization](http://en.wikipedia.org/wiki/Modernisation) itself”. Here, it demands a constant engagement with the future and in so doing, it shapes the present: it is ‘something which has not happened yet, which frightens people in the present and therefore they might take action against it. Risk is not catastrophe; if catastrophe happens it is a fact, an event’ (Boyne 2001: 57). As such, the risk society is not defined by oil spills or nuclear meltdowns; it is defined by their possibility, and how we might, as a society and as individuals, respond to this potential.

Beck draws a sharp distinction between calculable hazards and incalculable risks. People have always faced hazards such as illness, death and social upheaval. But the risks of late modernity – Beck uses global warming, the greenhouse effect and the thinning of the ozone layer as exemplars – are unique. Contemporary risks are set apart through:

* *Origins:* Beck argued that whilst humans have always been subjected to a level of risk - such as [natural disasters](http://en.wikipedia.org/wiki/Natural_disasters) - these have usually been perceived as produced by non-human forces. In late modernity, risks (such as pollution, chemical spills newly discovered illnesses) are generated by society. They arise through the failure of social institutions (most notably science) to control the risks that are inherent to new technologies. Chemical spills or radiation poisoning are more than a by-product of industrialism and capitalism; they are consistent with the logic of industrial capitalism and modernization.
* *Scope and effect:* The world today faces the possibility of apocalypse. Even those risks that fall short of the complete annihilation of humankind, or the environment, display an unprecedented reach.
* They transcend time: their effects are not limited to present generations, and indeed may only be fully experienced by people who have not yet been born ((e.g. The 1986 Chernobyl nuclear accident in the Ukraine). These risks are global, extending far beyond the surrounds of any one factory that might produce them; they cannot be limited to the territory of a particular state.
* Due to the ‘boomerang effect’, those who generate risks cannot export them elsewhere and escape them – the threat will rebound. Rich people are no more able to protect themselves from some of the key dangers that define the modern world than are the poor: as Beck phrases it, ‘hunger is hierarchical, smog is democratic’, ‘Nuclear contamination is egalitarian and in a sense “democratic”. Nitrates in the groundwater do not stop at the director general’s tap’ (Beck 1992: 109). Many risks (e.g., nuclear fallout) do not respect class boundaries; everyone is, therefore, equally at risk. This argument suggests that wealthy individuals whose [capital](http://en.wikipedia.org/wiki/Capital_%28economics%29) is largely responsible for creating [pollution](http://en.wikipedia.org/wiki/Pollution) will also have to suffer when, for example, the contaminants seep into the water supply. This argument may seem oversimplified, as wealthy people may have the ability to mitigate risk more easily by, for example, buying bottled water. [Beck](http://en.wikipedia.org/wiki/Ulrich_Beck), however, has argued that the distribution of this sort of risk is the result of [knowledge](http://en.wikipedia.org/wiki/Knowledge), rather than wealth. Whilst the wealthy person may have access to [resources](http://en.wikipedia.org/wiki/Factors_of_production) that enable him or her to avert risk, this would not even be an option were the person unaware that the risk even existed.
* Further, the risks have the potential to ‘induce systematic and irreversible harm’ (Beck 1992: 22). This harm is often incalculable and can be neither insured against nor compensated for: there is no possibility of returning a person, culture or place to the state it was in before the event occurred. In short, instrumentality and rational control, fundamental organizing principles of modernity, have been undermined in the emerging society.
* *The difficulties of identification:* Smoke billowing from factory stacks was once a visible indication of the destructive environmental effects of industrialization. In effect, no specialist knowledge was needed to identify them. Today, people cannot rely on their senses to foresee or avoid danger. A ‘cloud of radiation’ does not look like a cloud, nor can we look up into the sky, see the ‘ozone hole’, and walk around it. Risks are invisible, they cannot be smelt, heard, touched or tasted; for Beck, they are ‘unknowable’ to lay people and are identifiable only through sophisticated scientific instrumentation.

Another important feature of the risk society is concerning the role of science where he claims that the past monopoly of the sciences on rationality has been broken. Given that risks are undetectable, people are reliant on experts. On the one hand, risks are not detectable by human senses and so science is necessary in order to identify the existence of risk. On the other hand, the legitimacy of science is increasingly challenged. The rules and proofs of science are at odds with the incalculable nature of risk, its systemic sources and its global and temporal reach. It can be difficult to establish a relationship between an adverse health or environmental outcome and the practices of any one individual, factory or corporation, at least to a level that meets recognized scientific, legal or statistical standards of proof. This has the effect of rendering monitoring and prosecution difficult. This shows an ambiguous and ambivalent relationship where science becomes ‘more and more *necessary*, but at the same time*, less and less sufficient* for the socially binding definition of truth’ (Beck 1992: 156). In Beck’s risk society, expert knowledge is relied on, critiqued and appropriated in ‘a dialectic of expertise and counter-expertise’ (Beck 1992: 30).

Finally, attributing social change to risk is a fresh and powerful argument of Beck. A reflexive risk society – more commonly referred to as ‘reflexive modernization’ in Beck’s text – has emerged as the consequence of a society built on science and industry. People and institutions are suspicious of industries and earlier modes of production and management (Boyne 2001). This creates new political alignments as class has lost much of its relevance. This dissolving of social class does mean that the social actors are “individualized,” thrown on their own without the collective identity of social class and confronted with risk conflicts, which by their origin and design, resist any individual treatment. ‘Global environmental problems’ such as the greenhouse effect and the thinning of the ozone layer are key illustrations of this. A consequence is that an environmental ‘sub politics’ emerges where people organize collectively around new risks rather than previous socio-economic allegiances. These concerns build coalitions between individuals who may not otherwise have worked together. Actions are no longer bound to traditional political processes and people’s concerns are no longer centered purely on the ideals of progress – either techno-scientific or social. In a risk society, unprecedented risks are interlocked with significant social change.

**Implication for environmental politics: ‘Sub politics’**:- The theory of risk society in essence could be reduced to providing insight into two groups of questions. The first addresses the incapability of late modern societies to cope with the consequences of modernization. Institutional failures are said to render modernist ‘advances’ such as mass production, factory farming, nuclear energy or gene technology beyond controllability. Hence, the apparatus of modernism is simply unable to cope with its own consequences. The second main contribution of Beck’s work is to suggest significant institutional innovation as a pathway out of the lethargy and failure of modern societies to cope with these self-imposed consequences. Although many writers have accused Beck of being pessimistic and merely descriptive in his approach (Dingwall, 1999), and although the key innovative argument of the risk society thesis does indeed lie in its conceptual and explanatory content, Beck’s work has explored in detail (and optimism) the possibilities for grassroots sub politics on the part of communities, NGOs and environmental campaigners, etc. to act as a new force in society, and as a new social control of the corporate sector. Since the traditional institutions of modern societies – most notably political institutions – are increasingly failing, Beck proposes a need for a whole range of new institutions, strategies and actors.

To conclude, in comparison to Ecological Modernization theory, Beck is openly critical of modernity and its attendant risks. Nevertheless, he concludes that modernity ultimately has the capacity to solve the problems it produces.

2.2.2. ***Ecological modernization***

In what we might call – following the late Fred Buttel (2003) – the social sciences of environmental reform, ecological modernization stands out as one of the strongest, best- known, most used and widely cited, and constantly debated concepts in this body of literature. The notion of ecological modernization can be seen as the social scientific interpretation of environmental reform processes and practices at multiple scales. From the launching of the term by Martin Janicke and Joseph Huber around 1980 and its insertion into social theory by Arthur Mol and Gert Spaargaren around 1990, ecological modernization has been applied around the world in empirical studies, has been at the forefront in theoretical debates, and has even been used by politicians to frame environmental reform programmes in countries including Germany, the Netherlands, the UKthroughout the world, including Asia (especially China, Japan, Korea, Vietnam and elsewhere), North America, Latin America (especially Brazil, Argentina, Peru, Chile), as well as the wider European continent (including Russia) and China.

By ecological modernization, Spaargaren and Mol mean an ecological switch of the industrialization process in a direction that takes into account the maintenance of the existing sustenance base. Cast in the spirit of the Bruntland Report, ecological modernization, like sustainable development, ‘indicates the possibility of overcoming the environmental crisis without leaving the path of modernization’. The model is based on the work of the German writer, Huber (1982; 1985) who analyses ecological modernization as a historical phase of modern society. In Huber’s scheme, an industrial society develops in three phases: (1) the industrial breakthrough; (2) the construction of industrial society; and (3) the ecological switchover of the industrial system through the process of ‘super-industrialization’. What makes this latter phase possible is a new technology: the invention and diffusion of microchip technology.

Ecological modernization rejects the ‘small is beautiful’ ideology inspired by Schumacher (1974) in favor of large-scale restructuring of production–consumption cycles to be accomplished through the use of new, sophisticated, clean technologies (Spaargaren and Mol 1992a: 340). Unlike sustainable development, there is no attempt to address problems of the less developed countries of the Third World. Rather, the theory focuses on the economies of Western European nations which are to be ‘ecologized’ through the substitution of microelectronics, gene technology and other ‘clean’ production processes for the older, ‘end-of-pipe’ technologies associated with the chemical and manufacturing industries.

In contrast to Schnaiberg’s ‘treadmill of production’ perspective, capitalist relations of production, operating as a treadmill in the ongoing process of economic growth, are treated as largely irrelevant (Spaargaren and Mol 1992: 340–1) According to Udo Simonis (1989), a German environmental policy analyst, the ecological modernization of industrial society contains three main strategic elements: a far-reaching conversion of the economy to harmonize it with ecological principles, a reorientation of environmental policy to the ‘prevention principle’ (seeking a better balance between stopping pollution before it happens and cleaning it up later on) and an ecological reorientation of environmental policy, especially by substituting statistical probability for ‘prove-beyond-a-doubt’ causality in legal suits against polluters. Unfortunately, little is said about the social and political barriers that are likely to be faced in trying to implement these strategies, especially in countries other than Germany and the Netherlands where the environment is a major priority.

Ecological modernization thinkers are to be commended for attempting to stake out a reasoned position between ‘catastrophic’ environmentalists who preach that nothing less than de industrialization would suffice in saving the Earth from an ecological Armageddon and capital apologists who prefer a business-as-usual approach. Alas, the ecological modernization perspective is hobbled by an unflappable sense of technological optimism. All that is needed, they suggest, is to fast-forward from the polluting industrial society of the past to the new super-industrialized era of the future. Yet, the silicon chip revolution, which is the basis of this super-industrialization, is by no means environmentally neutral as the theory of ecological modernization suggests. Furthermore, it is worth remembering that nuclear power was also touted as a ‘clean’ technology until its more undesirable features became known.

More recently, Mol and Spaargaren have offered up a revisionist version of ecological modernization theory. The initial debates of the early 1980s, they caution, ‘should be understood as an overreaction directed at the dominant schools of thought in environmental sociology and the environmental debate in the late 1970s and early 1980s’. In particular, ecological modernization theory, they insist, was originally meant to challenge the notion put forward by both neo-Marxists and counter-productivity thinkers such as Rudolph Bahro and Barry Commoner that the modernization project was in its death throes; that the widespread environmental and ecological deterioration of the time was *prima facie* evidence of this; and that things could be salvaged only by fundamentally recognizing the core institutions of modern society.

Today, Mol and Spaargaren claim, these initial debates have become less relevant. Significantly, capitalism itself has evolved in a greener direction. For example, market-based instruments such as tradable pollution credits have displaced previous strategies that emphasized heavy-handed state regulation and enforcement. Furthermore, ecological modernization theorists themselves have incorporated critical comments from the earlier debate, reforming and refining their analysis of social change. For example, they now claim to present a more nuanced position regarding capitalism, interpreting it ‘neither as an essential precondition for, nor as the key obstruction to, stringent and radical environmental reform’. Whereas the initial debate was frequently waged with neo-Marxists, now Mol and Spaargaren confide that they are making ‘new theoretical alliances’ with them against their common foes – postmodernists and social constructionists. Political economists and ecological modernizationists, they argue, converge and agree in their criticism against strong social constructionism and in their view that environmental problems have a ‘real’ existence. Both can be considered as branches of the modernist project, assuming a firm stance against postmodern analyses of environmental problems and solutions.

2.3. **A Major Controversy: the Realism vs. Constructionism** **Debate**

After having raged for a decade the ‘constructionist–realist’ debate has recently begun to settle, with proponents and opponents alike acknowledging that these sometimes sharp exchanges have become repetitive and counterproductive. Let us look at the debate to some extent.

As Freudenburg (2000: 103) has noted, ‘more than any other subject in the discipline in environmental sociology, social constructionism has found fertile ground as well as fierce criticism’. However, social constructionists are routinely pilloried for allegedly denying that the Earth is under siege from a host of environmental hazards ranging from nuclear power leaks to global warming. This is a grave misrepresentation. Only a ‘false reductionism’, Wynne (2002: 472) says, can construe constructionist accounts as claiming that environmental risks do not exist or that natural reality plays no identifiable role in producing knowledge about these risks. What constructionists are actually saying is that we need to look more closely at the social, political and cultural processes by which certain environmental conditions are defined as unacceptably risky, and therefore, contributory to the creation of a perceived ‘state of crisis’. As Thompson (1991) has noted, environmental debates reflect the existence not just of an absence of certainty but rather of *contradictory certainties*: several divergent and mutually irreconcilable sets of convictions both about the difficulties we face and the available solutions. Not surprisingly, this multiple and contradictory uncertainties argument irritates constructionist opponents who see it as lending tacit support to those who would deny the existence of environmental problems for their own selfish economic or political reasons. For instance, social constructionists have been criticized for perverting the force of sociological understanding and ignoring the ‘reality’ of the environmental crisis. The noted conservation biologist Michael Soulé has condemned social constructionism as an academic ‘fad’ whose rhetoric ‘justifies further degradation of wild lands for the sake of economic development’ and whose relativism ‘can be just as destructive to nature as bulldozers and chainsaws. For example, Williams (1998: 486) cites the actions of the Western Fuels Association, a US industry trade group, in reprinting and distributing articles that express uncertainty about specific scientific issues related to global warming, as evidence that powerful social interest groups will exploit any weakness created by constructionist expressions of scientific uncertainty.

By contrast, a more ‘reflexive realist’ view asserts that ‘the physical destruction of the environment can be empirically measured and scientifically monitored, thus avoiding an extreme form of naïve constructionism’ (Picou and Gill 2000: 145). Furthermore, critics charge that the conflicting uncertainties approach that has been adopted by constructionists privileges a contingent of ‘rogue’ scientists over the ‘responsible’ majority. For example, it is alleged that there is currently a unanimous scientific consensus that the Earth is heating up and that this global climate shift is primarily due to humanly produced greenhouse gas emissions (see Oreskes 2004). The small handful of scientists who dissent from this view, it is argued, are not legitimate because they are firmly ‘in the pocket’ of various corporations, state officials and anti-climate change interest groups who simply do not want to make the costly policy changes that would be required to comply with international accords such as the Kyoto Protocol (Buttel *et al*. 2002: 23).

Indeed, for opponents of Kyoto, the vital strategic task is allegedly to keep the public believing that there is no consensus about global warming in the scientific community. And here, it is said, is where constructionists näively betray the environmental cause by encouraging this ‘fiction’. In reply, constructionists argue that bestowing *absolute* certainty solely on the basis of a scientific head count is surely perilous. After all, scientific consensus once dictated that the Earth was flat and that the primary source of disease was ‘vapours’. In the case of global warming, the debate is by no means closed. One survey by Dennis Bray and Hans von Storch (2005) of the German Institute for Coastal Research found that as many as a quarter of the 500 international climate researchers who responded to their survey still were not fully convinced that human activity is responsible for the recent rise in global temperatures.

Although there was sometimes acrimonious debate between the [constructivist](http://en.wikipedia.org/wiki/Social_constructivism) and [realist](http://en.wikipedia.org/wiki/Philosophical_realism) "camps" as we was in the foregoing section, within environmental sociology in the 1990s, the two sides have found considerable common ground as both increasingly accept that while most environmental problems have a material reality they nonetheless become known only via human processes such as scientific knowledge, [activists](http://en.wikipedia.org/wiki/Activist)' efforts, and media attention. In other words, most environmental problems have a real [ontological](http://en.wikipedia.org/wiki/Ontology) status despite our knowledge/awareness of them stemming from social processes, processes by which various conditions are constructed as problems by scientists, activists, media and other social actors. Correspondingly, environmental problems must all be understood via social processes, despite any material basis they may have external to humans. This interactiveness is now broadly accepted, but many aspects of the debate continue in contemporary research in the field.