
HOT TOPICS: GLOBALIZATION AND CLIMATE CHANGE

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Considering climate change and globalization together as a research topic can illuminate the structures and processes of both. Globalization and climate change theories can be categorized as economic, political, and cultural on one dimension, and on another dimension as emphasizing the conflicts between the global and national/local levels, the dominance of the global, or the hybrids and pastiches created by mixing the global and local. Climate change, as an issue that creates and is created by a global sense of the world, is bound up in both its analysis and its policy proposals with the same issues that confront globalization theorists. The proliferation of theories and analyses in globalization and climate change reflects the emerging nature of both areas of social scientific thought. Activities and “flows” are changing too rapidly to be satisfactorily categorized and mapped. Moreover, there are no clear advantages to one form of action, since all phenomena are multifaceted, with bundled positive, neutral, and negative characteristics. However, the very explosion of ideas and proposals reflects the energy and willingness to seek future directions that will bring increased well-being for both humans and the environment.

In separate literatures, globalization theorists invoke climate change as part of a vague and black-boxed globalized environment, and climate change analysts both blame globalization for environmental problems and attempt to mobilize support for environmental causes through appeals to global citizenship and responsibility. Although globalization has enabled climate change to become a point of debate and climate change has contributed to the definition of

globalization, neither contains the other. Climate change has strong ties to the cultural aspects and issues of globalization (especially in the domain of science), but more local economic and political issues play large roles in the debates about the sources, consequences, and possible policies of climate change. The concepts relevant to globalization often gain definition from the ways they are revealed in more concrete problem spaces, and climate change, as a global problem par excellence, reveals the shape and mechanisms of globalization as well as defining potential responses.

In this paper I want to discuss the links and distinctions between global climate change and globalization in their economic, political, and cultural dimensions. My argument is that considering climate change and globalization together as a research topic can illuminate the structures and processes of both.

The paper first discusses and maps current globalization theories, then theories about climate change. For each topic, theories fall largely (but not purely) into economic, political, and cultural categories. Within each of these categories, a theory may characterize conflict between globalism and nationalism/localism, a domination of global over national or local institutions, or the formation of global-national-local hybrids or pastiches. These theory maps will allow me to draw some tentative conclusions about the relationship between globalization and climate change, and the implications for climate change activities.

Approaches to Theorizing Globalization

Two widely cited definitions of globalization are those of Robertson and Giddens. Giddens (1990:64) defines globalization as “the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa.” Robertson’s definition includes both the compression of the world and the intensification of consciousness of the world as a whole and focuses on globalization as a “massive, two-fold process involving the interpenetration of the universalization of particularism and the

particularization of universalism” (Robertson 1992:100). Robertson criticizes Giddens for thinking of globalization as a *consequence* of modernity and asserts that, in contrast, globalization is a general condition that *facilitated* modernity. However, both definitions of globalization refer to connections at a distance and the relationship of things at difference scales. Both the structure and process of globalization are viewed in different spheres of the social.

Two ways to classify approaches to globalization form a 3x3 matrix (Table 1). (I will later use this same matrix to categorize views on climate change.) The first classification is that of the social sphere: economics, politics, and culture. The second classification characterizes the *relationship* of globalization to nationalism or localism: the national and local resist the global, the global dominates the local, or global and local coexist as hybrids or pastiches. Table 1 shows examples of the intersections of these two classification schemes. I will discuss the two dimensions generally, then in more detail, organizing my discussion according to the intersections under each column heading, while recognizing that no example is purely in one category in either axis.

Table 1. Dimensions of Globalization and Examples

	Economic globalization	Political globalization	Cultural globalization
Global versus national or local	Nationalization of multinational industry	Resistance to WTO, jihad	Separatism of native groups
Global domination in content/form	Flexible specialization, capitalist crisis	Transnational social movements, standard state forms	Commodification of local cultures, McDonaldization
Hybrids and pastiches	Western goods sold at bazaars, risks	“Global village,” global “-scapes”	Blended musical forms

Theorists approach globalization as a process and a product within the broad spheres of social life: economic, political, and cultural. The economic approach focuses on the increasingly global nature of capitalism, with multinational companies, international markets, and a transnational financial system. A second, politically oriented strain of globalization theory examines its relationship to nationalism, using globalization to illuminate the changing role and power of the nation-state, particularly since the end of the Cold War. A third approach examines the broad cultural implications of globalization. None of these approaches is exclusive, of course, but typically one dimension is seen as dominant, if not determinative.

A second way to categorize globalization theories is on the basis of whether they emphasize *differences* between globalization and something else (global versus local, or global versus national) or the *interpenetration* of global and local or national elements. The emphasis on differences tends to draw boundaries and describe conflicts, while the emphasis on interpenetration tends to describe ways in which the global swamps the local or elements from global/national/local become compounds or mixtures.

Globalization of the Economic System

Economics dominates many discussions of globalization. Most globalization theorists focus on global economic forms and organizations (e.g., multinational firms) as replacing national and local economic activities, and the diversity of markets and goods that result from the introduction of global products and forms to localities. Nations and locales may resist global economic flows (e.g., by nationalizing foreign business or forbidding American fast food restaurants) or come to be dominated by them (e.g., as multinationals seek new markets and countries seek economic development).

Countries may resist or be unable to participate in economic globalization forces. Economic development theorists explore the factors involved in managing the process, along with the reasons for persistent non- or under-development. Easterly's (1999) recent analysis of the resistance of countries to World-Bank-style development demonstrates the error of targeted, single strategies for development, such as investments in machines, education, population control programs, and providing foreign aid. He focuses on countries that show no positive results after decades of foreign investment – countries that have resisted development. Such countries, he says, lack *incentives* such as good governments and economic institutions would be able to provide; notably, he does not neglect the role of luck in economic development.

Theorists such as Piore and Sable (1984), Wallerstein (1974, 1983), and Harvey (1990)¹ focus on globalization as associated with capitalism. Capitalism's growth orientation, exploitation of labor, and technological and organizational dynamism lead to overaccumulation. Increasingly, this overaccumulation is managed by absorption through temporal or spatial displacement. Temporal displacement comprises exploring future uses and speeding turnover of goods, while spatial displacement involves finding new geographic or other spaces for production and consumption. Managing overaccumulation in these ways results in a trend away from Fordist production to what Piore and Sabel call flexible specialization, meaning decentralized technologies that can produce a range of products for different customers (e.g., specialty steels). Piore and Sabel contrast the hegemonic Fordist system to flexible specialization and speculate that the latter may come to be dominant. Both, however, are global systems. Harvey sees an increasingly diverse mix of global economic systems, reflecting expanded market coordination, changing composition in the workforce, an "extraordinary efflorescence and transformation in financial markets" (Harvey 1990:194), and a weakened but still powerful state.

In Wallerstein's analysis of the economic world system, national and local *contribute to* the global because they are part of it. Since Wallerstein's basic viewpoint is of a global system, globalization is his starting point; the results are his focus. He sees the global economic system as having reached a crisis, brought upon by the internal contradictions of capitalist civilization: dilemmas of accumulation, political legitimation, and the geocultural agenda (Wallerstein 1983). He foresees "explosions in all directions," economic/political/cultural disorder followed by a reordering of some type—perhaps neo-feudalism, democratic fascism, or decentralized and egalitarian world order.

The third type of economic globalization theory sees the advent of global goods at local markets (Abu-Lughod 1997). Equally, global "bads" such as global environmental problems (Yearley 1996) and global risks produced by industrialization (Giddens 1991, Beck 1992, Sachs 2000) arrive at all national and local places. For example, localities experience the threat of nuclear fallout, sea level rise, air pollution, and industrial runoff—all products of the global industrial system – although the localities themselves have not produced nuclear bombs nor emitted vast quantities of greenhouse gases nor initiated industrial plants.

Political Globalization

Globalization is often seen politically in opposition to nationalism. To the extent that the modern nation-state has close ties to the economic system, the political and economic are intertwined, but governance can be examined as at least a semi-autonomous category. Some analysts celebrate the triumphs of the local in the face of globalization (e.g., Abu-Lughod 1997, Watson 1997) or warn of the dangers of new ethnic localisms (e.g., Barber 1995, Kaplan 1994). Many theorists describe dominance of globalization processes or, at least, major accommodations of national and local political institutions. Hybrids and pastiches of political institutions also exist, part global, part national.

Focusing on the conflict between the state and global governance organizations, Mann (1993) sees the nation-state as actually strengthening its role on the international scene. As international bodies such as the United Nations and the European Union attempt to coordinate various national interests, the national actors have important powers to change or veto proposed actions. Moreover, local ethnic forces (Barber 1995, Appadurai 1996) can assert themselves and be real (irrational and terroristic) dangers to the world order. The protests at World Trade Organization (WTO) meetings are an example, as are the terrorist attacks on the United States in September 2001.

Meyer (1999) points to the domination of globalized forms of the nation-state. Modern states are isomorphic, have the same organizations, and “are constituted and constructed as ultimately similar actors under exogenous universalistic and rationalized cultural models” (Meyer 1999:137). Similarly, Thomas and Meyer (1984) see the dominant global system as constructing isomorphic systems such as education for citizenship, citizens with rights to improved welfare, the family as part of the political order, and the political roles of scientists and professionals as agents and legitimators of the state.

Also emphasizing the theme of global domination in the political dimension, Hobsbaum (1990) sees globalization’s emphasis on competition as undermining the ability of states, particularly Western liberal democracies, to protect and provide for the welfare of their citizens. More and more, elites are choosing to opt out of their nationally based solidarities with poor and disadvantaged in their own nations, joining their counterparts in global and more affluent groups, resulting in “global rich” and “global poor.” Globalization is not the only threat to state protective power (fragmentation of states is another), but it is perhaps the most serious. Supranational economic forces (e.g., McDonaldization) and institutions (e.g., banks) operate with little reference to the state, and electronic communications have rendered state

boundaries irrelevant (see also Appadurai 1996). The role of the state in redistributing wealth among its citizens has been greatly weakened, with nothing to take its place. Galtung (1997:190) takes this argument further, saying that a globalized world will hold “larger domains for structures and cultural meanings” that “imply thinner scopes and more reliance on least common denominators. ... Here are no Greeks, no Jews; no women, no men: we are all one in Coca-Cola.”

Agreeing, Stuart Hall (1997) proclaims that the new globalization is American. The manifestations of globalization are world organization, global environmental problems, and world markets. However, with the decline of nations and nationalism, “one can see a regression to a very defensive and highly dangerous form of national identity which is driven by a very aggressive form of racism” (Hall 1997:26). That is, globalization has created its own reactionary forces (Wallerstein 1999).

Appadurai (1996) exemplifies the view of global culture as a melding of formerly localized processes, now globalized. He describes a global system that is constituted, not by nations any longer, but by five elements that flow into and around each other: groups of people (ethnoscapes), technology (technoscapes), capital (financescapes), communications (mediascapes) and images (ideoscapes). He sees globalization as “a deeply historical, uneven, and even *localizing* process” that “does not necessarily or even frequently imply homogenization or Americanization” (Appadurai 1996:17).

Globalization of Culture

There are, as for economics and politics, three ways to relate global culture to local cultures. First, global and local cultures may compete in specific places; separatist ethnic groups resisting “tourism” is one good example (see Friedman 1990 on the Hawaiian Ainu). Second, globalization may mean that all culture

becomes global, a melding of local cultures. This implies cultural imperialism, American culture being the most frequent nominee (Ritzer and Malone 2000). In another form of global domination, global culture may mean the organization or structure of many cultures, so that the content differs but the commodification processes and systems remain similar for each culture; one manifestation of this theoretical perspective is the “culture follows structure” argument. Third, global culture may simply be one additional culture, to be examined alongside national and local cultures, with no particular hierarchy involved; one can pick and choose from global, national, and local products (and identities).

Robertson (1995) asserts the persistence of resistance to globalization by summarizing the arguments against cultural imperialism, citing four counter-factors: (1) “global” messages are notoriously subject to differing hearing and interpretations in various localities; (2) global organizations are tailoring their messages and products to different locales; (3) national symbolic resources are increasingly available to international markets; and (4) cultural flows from developing countries to industrialized countries are copious. Ritzer (2000) details resistance to American cultural imperialism in the form of the Slow Food movement, protests against opening new McDonald’s restaurants, and so on.

Anthony Smith (1990) discusses cultural imperialisms. The current model, he says, is eclectic, unity in diversity; we can expect a standard production-and-consumption system with watered-down “folk” content from many national and local cultures. Ritzer and Malone (2000) elaborate on the standard production-and-consumption system, part economics and part culture, that the United States exports in the forms of McDonaldization, credit cards, Disney Worlds, “eatertainment” establishments, and shopping malls. Hall (1997), in consonance with this analysis, declares that the international language is English, and American culture is everywhere.

Robertson (1992, 1995) sketches the outlines of a global world that is highly diverse yet highly conscious of its holistic character. He stresses the simultaneity of the global and local Robertson (1992:100). Modern transportation and communication enable people everywhere to see places around the world as easily as places next door to them—and to experience different cultures, environments and conditions (even—or maybe especially—war and famine) via print and electronic media. The McLuhan phrase “global village” captures this sense of the world as a small place where most people are aware of their neighbors. Under globalization, says Robertson, people realize that the world holds more “others,” who are experienced as highly diverse yet virtually present.

Hannerz (1990, 1997) argues that world culture “is marked by an organization of diversity rather than by a replication of uniformity” (Hannerz 1990:237). Late Western capitalism “exports culture to peripheral countries.” Global homogenization may happen by gradual saturation, although local cultures will reshape Western culture to their own needs. The cross-national network of social relationships is the organizing impulse that connects diverse local cultures. “Cosmopolitans,” people who take on roles in many cultures (unlike the “locals” who want to stay at home wherever they go), help to provide coherence to the world culture.

Abu-Lughod (1997), in response to Hannerz, rejects a simplistic core-to-periphery analysis. On the one hand, developing countries contribute more equally to global hybrids, such as in the melding of Western rock music and Bedouin “dancing horse” patterns (cf. Garcia Canclini 1995 and Pieterse 1995). On the other hand, developed niches occur in many places around the globe, for example, Tunis, with its Gucci and couture sweatshops and its modern Census office. Watson (1997) details the ways in which local and national cultures domesticate the McDonald’s restaurants that arrive in various East Asian cities.

Seeing global and more local cultures as pastiches, Featherstone (1990:2) speaks of global culture “in terms of the diversity, variety and richness of popular and local discourses, codes and practices which resist and play-back systemicity and order.” Far from giving us a universally homogenous culture, globalization defines a space in which the world’s cultures rub elbows and generate new meanings and understandings. Featherstone and Lash (1995:2) delineate a world in which “international social, political and cultural (for example, the media) organizations are standing alongside and beginning to replace their national counterparts.” They see every culture in the mix, so that it is possible to discuss Americanization, Europeanization, Japanization—and even Brazilianization.

Contributions of Theorists to Understanding Globalization

Globalization theorists have explored a wide range of possible social relations resulting from contemporary processes and products of globalization (including the possibility that globalization is not unique in history nor so pervasive as is usually thought; see Hirst 1997 and Henwood 1999).

The economic analyses allow us to see (and perhaps counter) the implications of a global economy, including the disadvantages to workers of flexible specialization (e.g., uncertain, intermittent work; greater mechanization), the inequalities of global trade, and the continuing domination of core economies.

As nation-states continue to be established, they use the established state forms whether or not their history and culture allow these forms to be successful; furthermore, poor and new states struggle for (or against) the “benefits” of economic development. The politically oriented insights of globalization theory help us to understand these processes and (hopefully) to see ways to improve global well-being. Also, globalization theories add to explanations of global social movements such as those concerned with the

environment, feminism, and implications of “free” world trade; in order to be successful, such social movements must espouse valid transnational (global) principles yet relate them to what’s happening in each locale.

In the cultural dimension, globalization theories provide descriptions and insights about how the process of identity formation is changing. Hannerz’ (1990) characterization of “cosmopolitans” and “locals” is one example; these ideal types of identity are polar responses to globalization. Friedman’s dichotomous types (1990) include *les sapeurs* in the People’s Republic of Congo, who combine Paris fashions with local status, and the Hawaiian Ainu, who exemplify cultural separatism. Another view is that of Robertson (1992), who analyzes how people constitute their identities by connecting to global-level groups on the basis of, e.g., gender, profession, interest in humankind (perhaps in social movements), or economic group. A third possibility is Stuart Hall’s vision of individual identities being formed out of bits and pieces of national and ethnic cultures in a kind of bricolage. A relatively pessimistic view is taken by Castells (1997: 365), who sees the “dissolution of shared identities” and the rise of nonsocial identities in “basic instincts, power drives, self-centered strategic calculations” and power-hungry remnants of state structures. The future of resistance identities, such as the women’s movement, religious groups, and environmental movements, is uncertain.

Approaches to Theorizing Climate Change

Global climate change, or “global warming,” as it is sometimes termed,² is simultaneously an exemplar of globalization and a type of universalization that transcends globalization. It may be the result of capitalism/consumerism (an economic dimension), modernity (a political/governance dimension), or science itself (a cultural dimension).

The scientific narrative about climate change usually begins with Svante Arrhenius, a Swedish chemist who at the turn of the twentieth century hypothesized that increasing levels of carbon dioxide in the atmosphere would cause Earth's climate to become warmer. But it was not until after World War II that general and specific factors enabled scientists to investigate the link between carbon dioxide (and other radiatively active gases) and changes in Earth's climate. The scientific factors include improved and expanded measurements, and advances in computational power. During the postwar period, countries were actively seeking international scientific cooperation, which resulted in a global network of atmospheric observing and measurement stations under the newly formed World Meteorological Organization (WMO). In 1958, the International Geophysical Year, David Keeling began measuring the level of carbon dioxide in the atmosphere over Mauna Loa; this record clearly showed rising levels. Meanwhile, computer models of the climate system were being developed, first of the atmosphere, then the ocean. By the 1970s the US Department of Energy and other agencies were sponsoring climate model runs of increased atmospheric carbon dioxide. The 1980s and 1990s showed increasing levels of research, at both national and international scales. The central scientific organization in this area, the Intergovernmental Panel on Climate Change (IPCC) was formed in 1988 under the auspices of the United Nations Environment Programme and the WMO.

But these scientific activities unfolded in a historical context of globalization. After World War II, the United Nations was organized and the Bretton Woods system of international finance came into being. After the beginning of the Cold War, the United States sought national security through international scientific and political cooperation. The stage was thus set for political, economic, and cultural globalization (led, in the "free world," by the United States) and for scientific investigations of climate change (and other "global" problems).

Most discussions of globalization that include the environment as a topic include climate change in a list of global environmental changes, such as the ozone layer, biodiversity, sustainable development, pollution and overfishing in the oceans, and acid rain. Although he acknowledges and maps the diversity of environmental organizational types, Castells (1997) treats these problems and their associated groups together as “the Environmental Movement” and points to its influence on governance, corporations, and individual identities as environmentalists. Further, the environmental movement is a prime example of the network society, with “a direct correspondence between the themes put forward by the environmental movement and the fundamental dimensions of the new social structure, the network society” (Castells 1997:122). These themes include a love-hate attitude toward science and technology, which are simultaneously the source of many environmental problems and the source of information about them; control over space and an emphasis on locality; control over time in a “glacial time” perspective; and a view of the global unity of species and matter as a whole.

However, Miller and Edwards (2001:3) argue that climate change “can no longer be viewed as simply another in a laundry list of environmental issues; rather, it has become a key site in the global transformation of world order.” The new regimes and institutions constructed around the issue of climate change are extensive, reaching from science to policy to grassroots movements and raising hotly debated questions about whose knowledge is used and who speaks for Nature.

Climate change too can be analyzed in the three-by-three matrix used in the discussion of globalization (see Table 2).

Table 2. Dimensions of Climate Change.

	Economic aspects of climate change	Political aspects of climate change	Cultural aspects of climate change
Global versus national or local	GATT, ITO, NAFTA, etc. v. national environmental standards	Modern bureaucracy clashes with national traditions, e.g., Chipko movement	Concern for global climate v. issues of responsibility for the problem and equity between nations
Global domination in content/form	Capitalist world system mires some nations in poverty & vulnerability to climate change	Transnational social movements, standard state forms, "ecological modernization"	Western science and scientists define the problem & solutions
Hybrids and pastiches	Emissions trading systems, ecological economics, sustainability	Green parties seek to reduce emissions	"Local knowledge" added to scientific knowledge

Economic Globalization and Climate Change

In the economic dimension, climate change and other environmental issues raise questions about the values of the capitalist production system and its tendency to favor here-and-now benefits over delayed but more uncertain benefits (the so-called high discount rate). The capitalist system is global, and the logic and operating principles of this global system swamp any local, traditional economies it may come in contact with. Free trade, universal access to markets, and economic efficiency are the explicit pathways to Western/Northern-style prosperity and well-being. Furthermore, capitalist enterprises produce both goods and environmental degradation. The world cannot have the good life without the bad environment. Finally, the production of

environmental bads is a direct function of the capitalist need to use “free” resources in order to accumulate capital (Saurin 1996, Wallerstein 1999). Efforts to “value” the environment (e.g., the “polluter pays principle”) are steadfastly resisted or, when resistance is futile, such costs are passed on to consumers. Wallerstein (1999) opines that the need of capitalist enterprises for free natural resources is so great that environmental economics is contributing to the fall of capitalism. Governments can and are buying time by such strategies as shipping wastes to a politically weaker South and constraining growth in newly industrializing countries. But eventually there are only three options: (1) force businesses to pay all costs, resulting in drastically reduced profits; (2) make governments pay, resulting in large tax increases and probably a profit squeeze from reduced consumption; or (3) do nothing and face various ecocatastrophes. In this discussion, it is difficult to separate climate change from other environmental issues, especially those considered “global.”

Tied to issues of economic globalization is the concept of sustainable development, which includes climate as one feature of the world that should not be degraded for future generations. Redclift (2000) articulates three views of the links between economic growth and sustainability.

1. They may be more or less compatible, recognizing the need for international regulations protecting endangered species and ecosystems.
2. They may be totally incompatible; as Daly (1992:200) says, “sustainable growth is an oxymoron.”
3. Their compatibility may depend on how we define such crucial variables as “wealth,” “the needs of future generations,” and “economic efficiency”; certainly we need to switch priorities and put sustainability first.

All three views recognize that unchecked economic globalization will continue to exacerbate (if it does not cause) problems such as

climate change, indoor pollution, household and industrial wastes, water availability, air quality, and extinction of species. However, only the second view holds that economic growth is the cause of many global problems. According to this view, we cannot manage our way out of climate change (and other global environmental problems); we must dismantle the capitalist system and re-become just another of Nature's species in a world of multiple mutual dependencies. The first and third views retain capitalist institutions and processes. The first view leaves economic change in the driver's seat; either climate change regulations are add-ons or – in the view of economists such as Ausabel (1990) – the fact that people are accumulating wealth and technoscientific knowledge will allow them to mitigate or adapt to whatever climatic changes may come. The third view is more aggressive about tinkering with the present system, putting sustainability ahead of profit as the primary criterion for making choices. This reorientation may be accomplished through ecological economic principles, which are based on the writings of Mancur Olson, Kenneth Boulding, and others; environmental goods such as clean air, water supplies, forests, scenery, and biodiversity must enter the market system and be valued so they are not degraded. Alternatives to the calculation of gross domestic products include the net national product (NNP), which subtracts depreciation costs from nonrenewable resources (Solow 1991); the new economic welfare (NEW) approach, which subtracts items such as the unmet cost of pollution and the disamenities of urbanization (Tobin and Nordhaus 1972); and the Genuine Progress Report, which discounts the cost of products that result from environmental degradation (Cobb, Halstead and Rowe 1995). (See Yohe and Cantor 1998 for other examples.)

Political Globalization and Climate Change

Global political issues under the label of “modernity” have been held up as the all-purpose cause of climate change. In the political dimension, the global and national are almost conflated. Indeed,

the global modern has also created the nation-state; nation-states are constituted and organized according to a global template (Meyer 1999), which includes an environmental ministry or agency. Modernity substitutes centralized technocratic governance and institutional engineering for traditional systems of all kinds. Specific governing principles accompany this replacement: utilitarianism, free markets as productive of the highest human welfare, and rational actors. This is the political system that reinforces globalization and allows unchecked greenhouse gas emissions, especially from energy production and land-use change, two primary mechanisms of both modernization.

The governance accompaniment to “sustainable development,” which focuses on changing the present system, is ecological modernization. In this view, a great mistake of modernity was to define the environment (Nature) as external to human societies and their production/consumption systems. The “human exemptionalist paradigm” (HEP), which expresses the assumption of most social theorists up to the 1980s that humans are exempt from natural constraints, needed to be replaced with a “new environmental paradigm” (NEP) that encompasses humans and their natural environment together (see Catton and Dunlap 1978, 1980). One reaction to this insight is “de-modernization theory” (Spaargaren 2000), an aspiration to a green society of small communities that live in harmony with nature and the natural climate. Another is ecological modernization, which seeks to update modernization by including the environment (for example, clean air and water) along with other factors of production and the costs of environmental damage along with other costs of production. This is ecological economics, but it has strong implications for modern governance. In essence, we can repair this mistake of modernity by enlarging modernity to including the management of environmental resources as well as societies. Ecological modernization posits the potential for controlled, sustainable growth that can yield both economic prosperity and no environmental damage (as expressed in the slogans “win-wins,”

win-win-wins” [the “triple bottom line”], and “pollution prevention pays”). In climate change, ecological modernization is the theory that underpins proposed policies like emissions trading schemes and tax breaks for renewable energy industries and technologies.

The formation and organization of the modern nation-state have overturned the culture and customs of native peoples, many of whom had lived sustainably on their land. That is, modernization upsets the balance of natural and social systems, and causes environmental degradation of all kinds, including greenhouse gas emissions. Scott (1998) details the modernist horrors of villagization in Tanzania and Russia as well as modernist cities such as Brasilia. Davis (2001) provides a recent example of this view, with the added force of colonialism. He analyzes the devastating results of bringing India and China into world markets; the forcible breakdown of various traditional systems resulted in massive starvation and death when severe droughts occurred. Specific climate change examples focus on the inequalities of the world-system, now intensified by climate change. Industrialized countries are responsible for the historic emissions that are the cause of the steep rise in atmospheric greenhouse gases. But the resulting climate change impacts will largely be felt in the tropics, where most of the poor and non-industrialized countries lie (see, for example, Agarwal and Narain 1991). Here the global modern swamps the national/local, with negative results for the environmental and the already-poor. Boehmer-Christiansen (2003) shows that a proposed global transition to “green” fuels and technologies in order to mitigate climate change will similarly and disproportionately disadvantage poor groups and nations. Sachs (2000), in discussing the prospects for sustainability, notes that economic and political globalization, with an “openness” that few poor nations can exploit, fosters a new colonization of Nature; as poor countries fall into debt, they are forced to sell the products of “free” natural resources. O’Brien and Leichenko (2000) dub this situation the “double exposure” of the poor to economic globalization and to climate change.

Another facet of the political dimension is that social and political theorists have taken the nation-state to be both the unit of analysis and the unit of governance in the nineteenth and twentieth centuries (Vogler and Imber 1996). “Realist” views of the anarchy in the international sphere assume that no global authority will gain legitimacy in governing environmental matters. International relations (IR) theory, having been dominated by (neo)realism, views all global environmental changes, including climate change, as items on the international agenda – and secondary items at best, after the perennial items of war, security and national self-interest (Saurin 1996). International institutionalists, such as Paterson (1996) add extra-governmental institutions to the mix, while retaining the focus on political processes.

With regard to the environment, countries have achieved international agreements codified in treaties and conventions, but implementation has fallen far short of what is envisioned in, for example, the UN Framework Convention on Climate Change (1992). Redclift (2000) calls this a crisis of authority, since organizations such as the United Nations lack legitimacy necessary for implementation, monitoring, and enforcement. Furthermore, international agreements depend upon individual nation-states to implement the terms of the agreement. However, the nation-state may in fact be too small to effectively meet global environmental challenges and too big to implement appropriate policies at local levels.³ Saurin (1996), among others, noting that global is *not* a synonym for international, calls for new institutions capable of dealing with the ordering processes involved in the scale, spread, complexity, and dynamics of global environmental changes.

Cultural (Scientific) Globalization and Climate Change

Science is the principal cultural element involved in climate change issues. Science is associated with larger issues of knowledge production and use. And, indeed, relegating science to the cultural

realm, along with fashion, film, and fast food, runs the danger of minimizing its close interrelationships with both the capitalist system and modern governance.⁴ Beck (1992[1986]) uses the concept of the risk society to integrate the three dimensions I have separated into analytic categories. Risks are the “*wholesale product of industrialization*”; they are revealed by scientific investigation, which also promises their resolution; and they prompt a “*reorganization of power and authority*” in the attempted political management of both politicized nature and society (Beck 1992[1986]:21 and 24).

Nevertheless, science plays a special role in global climate change related to the problem itself and to the nature of scientific knowledge and its uses. Science has constructed the problem and constructed it as a global problem with at least some human causes in the emissions of so-called greenhouse gases. As a scientific issue, climate change was “discovered” by advances in scientific understanding and methodology, and computational capacity, as outlined earlier.

Of course, these scientific methods and conclusions are the subject of intense debate. Perhaps the measurement of greenhouse gases does not represent the global atmosphere; there is uncertainty about emissions of greenhouse gases, particularly from land-use changes; the models, because they are global models, cannot be verified and may neglect important processes; and the current warming trend may be unrelated to human activities and more dependent upon sunspot cycles, for example (see Edwards 2001, Norton and Suppe 2001). The issues of “globalizing science” relate to generalizing from localized experiments or data; Jasanoff and Wynne (1998) provide an account of the processes and issues involved in globalizing climate change science.

Global climate change is global in its very nature, unlike earlier problems with far-ranging relevance. Pasteur’s work, for example, had global relevance, because wherever contagious disease is

present his constructs can be applied. But Pasteur did not need to collect data on a global system like the climate system but rather to replicate his experiments and hygienic practices at multiple locations. In contrast, the global climate system must be considered as a whole. Storms in the Pacific Ocean drive much of the weather that much of the world experiences. Emissions of carbon dioxide go into the stocks of the whole atmosphere.

Science is indispensable in discussions about global climate change. “The debate over environmental change is in large part a battle in the social construction of knowledge and meaning which is fought out in a global arena” (Saurin 1996:81). Indeed scientific research has made it possible for people to think of the globe as a symbol of a common humanity. The picture of the Earth from space (the “big blue marble”) has evoked descriptions of its fragility, its limited resources, and human dependence. Associated images of Spaceship Earth and Gaia (the sense of the whole Earth as a living being) join earlier images of Mother Earth with powerful, global messages to “protect” the Earth and “Love your Mother.” These are global images, cultural constructions that provide the appropriate settings for global climate change discussions.

But global climate change has more localized and differentiated sources and impacts as well. Rich industrialized nations are largely responsible for increasing concentrations of greenhouse gases in the atmosphere, especially when historical contributions are accounted for; these same nations are likely to experience only mildly negative impacts from climate change, at least over the course of the next century. However, poorer but industrializing nations (such as India and China) are contributing an increasing share of global emissions; these nations, however, are likely to experience more severe consequences of climate change. Given this lumpiness, questions arise about whose knowledge counts and how any knowledge will be used. Prescriptions from industrialized nations, such as advice to less industrialized nations on “clean development” and technology-dependent “solutions,” are likely

to face skepticism. Calls for development assistance without the strings of capitalist institutions may well fall on deaf ears. The current state of negotiations on climate change exhibit many features that a neorealist would recognize, with self-interests dictating outcomes rather than a game-theoretic recognition that cooperation may bring advantages for all.

Globalization and Climate Change: More Heat than Light?

What is the relationship between globalization and climate change? Economic, political, and cultural globalization are deeply implicated as the causes of climate change and our knowledge about it. In each dimension, analysts have suggested both “more” and “less” to meet the challenges of climate change. Milton (1996) suggests that “the global environmental debate encapsulates the tension between ‘globaling’ and ‘deglobalizing’ tendencies identified by Robertson” – that is, we should either promote globalization as the best way of protecting the environment or dismantle the global economy and allow localities to control their own resources. In the economic sphere, capitalism may either be expanded to account for the input costs of and damages to the environment, or be superseded by another economic system. In the political sphere, modernist governance needs to extend itself to manage the environment along with social systems or retreat to locally sustainable governments. In the cultural sphere, science needs to specify methods to mitigate and to adapt to more fully characterized climate changes, or to lose its hubris and make space for local knowledges and for moral and ethical approaches to the issues raised by global climate change.

Climate change, as the limit case of globalization gone wrong, provides a site where economic, political, and cultural/scientific issues can be debated. Climate change globalizes the environment by specifying the connections among what happens in specific places and the whole climate system. Nongovernmental organizations and institutions have gone a certain distance toward

including multiple knowledges and North/South viewpoints. The Intergovernmental Panel on Climate Change, although dominated by industrialized-nation scientists, has come to conclusions not in the interests of their nations. The United Nations Environment Program and Development Program have had some modest success in providing assistance to poor nations who are not well adapted to current climate variability and who face further problems under long-term climate change. Still, there is little indication that industrialized nations are preparing to overhaul their systems of producing energy and goods, and little indication of systematic planning for adaptations that will be necessary.

The focus of my research is global climate change as a site from which to analyze the possibilities for global consensus and action. In this broadly conceptualized research area, cultural approaches within globalization theories that link global and local views of desirable human and human/Nature relationships are the most promising. How identities are formed from global, national, and local elements and how effective collective institutions (like epistemic communities [Haas 1992]) are constructed—these are crucial questions in determining the possibilities for globally shared values as the basis for policy and action. The political and economic realities of globalization are established constraints and possibilities, but social action is located in the abilities of social movement organizations and individual actors to see clearly and take advantage of various points of attachment. This is a view that can draw from and extend the theoretical insights of Robertson (1992, 1995, 2001). Another fruitful avenue is indicated by Castells, who sees social movements as having two main agencies: prophets (both “good” and “bad”) and “a *networking, decentered form of organization and intervention*” (Castells 1997:362) that actually distributes cultural codes in the globalized informational society.

The proliferation of theories and analyses in both globalization and climate change reflects the emerging nature of both areas of social scientific thought. Activities and “flows” are changing too

rapidly to be satisfactorily categorized and mapped. Moreover, there are no clear advantages to one form of action, since all phenomena are multifaceted, with bundled positive, neutral, and negative characteristics. For example, global policy on climate change could benefit all nations on average but leave specific groups mired in poverty and at risk of climate change impacts. However, local initiatives, while empowering stakeholders and taking advantage of local knowledge, may be limited in resources and subject to countervailing activities elsewhere (as when forests are spared in one place but cut down in another). Nongovernmental organizations can work across national boundaries on sustainable development programs but be undermined by local and national governments. “Green” communities reduce their emissions of greenhouse gases and serve as models for other communities; they may also be marginalized and powerless to effect change in larger political spheres.

If this is an incoherent assemblage of activities, it is also a vibrant and plurivocal one. Climate change forums have provided venues for many voices to be heard on a global stage, and climate change concerns have galvanized scientific research, policy debate, and local action. Sonnenfeld and Mol (2002) point to innovations in the form of supranational environmental institutions, market-based environmental regulatory instruments, and the rise of engagement from a global civil society. Guston (2001) analyzes boundary organizations in environmental policy and science, including three climate change studies.

Still, there are important contradictions to be sorted out. An overwhelming majority of people want a less degraded environment, and seemingly at the same time everyone wants more goods and energy to improve the world’s standard of living.⁵ Governments pay lip service to improving or protecting the environment, but “the unpalatable implications” (Held et al. 1999:410) of many environmental policies mean that few effective ones have been enacted and implemented. International institutions

or nongovernmental organizations may be more matched to the scale and complexity of climate change, but they do not have the power “to force compromises, extract significant concessions from participants or take independent action” (Held et al. 1999:411).

Although it is tempting to resign oneself to expect the reproduction of existing power structures in the debate about climate change, history contains examples of large social changes against the expectations of the powerful; social revolutions that resulted in democratic governments constitutes an obvious example. Perhaps future large-scale changes in the economics, politics, and culture related to climate change will become objects of widespread social scientific study, as the rise of the nation state is now.

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Notes

¹ Havey focuses on culture, but includes a relevant discussion of the globalization of the economic system.

² Most physical scientists who perform climate change research think "global warming" a reductionist term, since climate change includes a multitude of possible changes, up to and including increased frequency and intensity of storms, species dislocation and the disruption of the Atlantic Ocean's "conveyor belt," the Gulf Stream.

³ This idea is attributed by Mol 2000 to Lash and Urry, attributed by Saurin 1996 to Raymond Williams.

⁴ In this analytic scheme, fashion, film, and fast food are relegated to the economic sphere as the products of capitalism.

⁵ Wallerstein (1999:5) suggests that "a lot of them simply segregate the two demands in their minds."