Explaining National Environmental Performance:

What Do We Know and What Should We Learn?

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Abstract

Although local, regional, and global institutions are critical to environmental policy success, national governments still arguably are the linchpin. This article examines and assesses the research on national environmental performance in four categories: economic growth and income; regime type, in terms of the level of democracy; the institutional characteristics of regime type; and institutional capacity. The research suggests that economic development and democratic governance are generally associated with environmental policy success, although not for all problems and in all settings. Development creates the conditions for encouraging and enabling societies to respond to environmental problems, while also creating an additional set of challenges for environmental quality. The effects of the institutional characteristics of democratic regimes are unclear, although there is evidence that the new and complex demands of environmental sustainability are managed more successfully within systems having an ability to integrate environmental, economic, and political/social choices. The existing research provides a valuable foundation for additional efforts to understand and explain national environmental performance.

Explaining National Environmental Performance: What Do We Know and What Should We Learn?

As evidence of the consequences of continued environmental degradation around the world continues to accumulate, the issue of the capacities of institutions at all scales of governance grows in importance. The increasing evidence of climate change and its many consequences presents modern society with the most compelling collective action problem of all time. Problems of water quality and supply, desertification, deforestation, soil erosion, chemical use and disposal, urban and regional air pollution, habitat loss, and a host of others pose far more than challenges to the environment. A growing body of evidence suggests strongly that environmental degradation poses direct challenges to economic welfare, global and national security, and political legitimacy and stability, as well as to human health and well-being. Economic development, population growth, and changes in lifestyle and technology will increase these challenges in the decades to come.

Since environmental problems first rose to prominence in the last third of the twentieth century, the nation-state has been the most active scale of governance for addressing such issues. Led by early "pioneers" such as Sweden and the United States, a first wave of national environmental programs among the western democracies created institutions, enacted laws, and built the administrative and technical capacity to respond to a first generation of problems (Weidner 2002). Triggered by the World Commission on Environment and Development in the late 1980s and the Rio Earth Summit of 1992, a second wave of programs emerged in developing countries and transitional economies at the same time that many countries from the first wave were adapting their laws and institutions to a newer set of problems and conditions. Over the last two decades, global, regional, and local scales of governance have become more engaged in responding to and managing environmental problems, but the nation-state still arguably is the most critical

in the long term. Success at global and local scales will be influenced greatly by national environmental commitment, policies, institutions, and problem-solving capacities.

Given the importance of environmental issues and the critical role of the nation-state in addressing them, any variations in levels of performance among countries warrant careful study. If we can determine why some countries are more successful at controlling air or water pollution, more efficient in their use of energy or water, or more effective in protecting natural habitat from destruction, we may be able to determine what factors are associated with environmental success and failure. Why is it that Switzerland and Japan are far more energy-efficient than the United States or Canada? Why was the U.S. a leader in addressing early issues of air and water pollution in the 1970s but has lagged on a range of other consumption and land use issues since then? Why has the Netherlands been recognized as a leader in institutional and policy innovation while facing some of the most pressing environmental challenges of any country in the world? Why are the countries of Northern Europe viewed as being far more successful at addressing environmental problems than those in Southern Europe?

The answers to some of these questions are almost counterintuitive. One might expect, for example, that countries at higher levels of economic development would have some of the worst environmental conditions. After all, industrialization and growth cause more pollution, use more resources, and consume more goods and services. Yet this expectation has been only partly true and in many respects wrong. It might also have been reasonably predicted that less democratic governments would be more successful environmentally than more democratic ones, because the former would be more able to resist public desires for short-term consumption over long-term conservation. In fact, the reverse has generally been true. Evidence on some of the institutional factors also has at times been confounding. One might expect that systems with more environmental activist groups will generally enjoy more environmental policy success. While in specific

countries and in particular circumstances the role of such groups often has been critical, in the aggregate the association between political mobilization and relative policy success is not so apparent (Scruggs 2003; Jahn 1998). Nor does it appear that parliamentary democracies of various stripes are necessarily more successful than their supposedly slower-moving presidential counterparts (i.e., the U.S.) in responding to and managing many kinds of environmental problems (e.g., Vogel 1993; Bernauer and Koubi 2009).

In sum, there is much that we know and much that we do not know about the factors behind environmental policy success, and much of what we thought we knew is probably wrong. The purpose of this article is to review the evidence on national-level environmental policy success, point to the relationships that appear to be more or less valid and useful, assess the limitations and qualifications in what is known, and propose topics for additional research and analysis. The goal is not to add to the empirical literature on this critical topic but to organize, interpret, and assess what evidence exists.

What Is Environmental Performance and Where Do We Begin?

The task in explaining environmental performance at all scales of governance is defining it in terms that are measurable and comparable over time and across units of analysis. There is no one set of national environmental indicators that is comparable to the standard set of measures used to measure economic performance. The closest anyone has come to developing such indicators is the Yale and Columbia collaboration on the aptly-named Environmental Performance Index (EPI), which is discussed later. The EPI is distinctive in providing a comprehensive set of indicators that capture the concept of "environmental sustainability" rather than just its specific components, such as pollution, land use, or energy consumption (Esty, at al. 2005, 2006, 2008). Measures of performance used in other studies are more selective overall and limited in the types of countries included in the analyses. Because more data are available on members of the

Organization for Economic Cooperation Development (OECD), they have been studied more than Asian, developing, and transitional economies (Sonnenfeld and Mol 2006).

Among the studies that focus on environmental outcomes as the dependent variable, there have been two approaches. One looks at environmental conditions at a given point in time. Why is urban air quality better in Finland than Greece? Why do high income countries exhibit fewer incidences of pollution-related illness than low-income ones? This has been the approach taken in most of the EKC ("Environmental Kuznets Curve") research discussed below as well as in the EPI. Another approach is to define the dependent variable in terms of changes in performance over time. This is the approach taken by Lyle Scruggs (2003) in his analysis of environmental performance variations among sixteen industrial democracies. The first approach takes a snapshot of either emission levels or of ambient conditions and assesses the relationships with some set of independent variables. The latter establishes a baseline and relates improvements or declines to the independent variables. The advantages and disadvantages of each for explaining and improving environmental performance warrant attention in the research.

Much of the research focuses not on actual environmental outcomes (either conditions or trends) but on such qualitative measures as activities, actions, or policies. An example is research that uses measures of environmental commitment (e.g., ratifying international agreements or creating a national council of sustainable development) as the dependent variable. Scholars using such measures argue that commitment measures provide a more direct and reliable indicator of environmental values than outcomes, because the latter are often only loosely related to government policies and actions. Critics of using commitment over outcome measures argue that the former are symbolic and do not necessarily translate into improved environmental capacities or performance.

The most ambitious effort to measure national performance is the Environmental Policy Index (EPI), a joint initiative of Yale and Columbia Universities (Esty, et al. 2008).

It builds upon previous work on the Environmental Sustainability Index (ESI) and Pilot Environmental Performance Index (Esty, et al. 2005 and 2006). All three were aimed at providing a data-driven assessment of environmental conditions at a national level. The 2008 EPI assessed 149 countries, based on 25 specific indicators, flowing from five categories of environmental performance: air quality; water quality; natural resources; biodiversity/habitat; and climate/energy. It measures conditions rather than trends over time, so it incorporates natural endowments as well as the results of policies or behavior. In the top ranks were Switzerland, Sweden, Norway, Finland, and Costa Rica. Among large nations, Germany was ranked 13th, the United Kingdom 14th, the United States 39th, China 105th, and India 120th. Although the EPI will not be discussed in detail here, it is worth noting that its conclusions on the relationships among environmental, economic, and political/governance factors are generally consistent with findings of other studies.

On the other side of the equation is the independent variables used to explain differences in performance. These fall into several categories. One set of factors is economic or structural. The central analytical and ideological concern here has been the relationships among measures of economic growth and well-being (such as per capita income) and environmental performance. This concern is weighted ideologically because of the highly contested debates over the compatibility of economic growth, affluence, and competitiveness with environmental protection. This issue has defined the central fault line of environmental politics in the U.S. and elsewhere for decades, and it is at the heart of the concept of sustainability. Other structural factors that have been used as independent variables include the composition of the economy, geographic size, and population density. Except for noting that studies have found that smaller, more densely-populated and urbanized countries tend to often perform better and economic composition has not found to be a major explanation for differences in environmental performance, these variables will not be discussed here.

Most of the other explanations involve political characteristics. A major theme has been the relationship of system-wide democracy to environmental performance. The consensus among nearly all of the studies is that this relationship is a positive one, as discussed below. Among these studies, most rely on various measures of the level of democracy, although one uses an intriguing concept of democracy "stock" instead and finds an even stronger relationship. An intriguing aspect of this research is the light it sheds on the interrelationships among economic and political factors as they appear to influence environmental performance. It appears that economic growth does not improve environmental performance directly but is mediated by the effects of democratic governance, which itself becomes more likely and durable beyond some level of income (Przeworski, et al. 2000).

Levels or stocks of democracy are the most general aspects of political regimes that have been studied. Several more specific political characteristics have been assessed as well. Among the most intriguing (and, it turns out, difficult to evaluate) are the effects of institutional factors, such as presidential-executive relations, systems for election and representation, strength of multilateral governance, legislative organization, and the role of courts. Few specific characteristics have been found to exert identifiable influence. It is at least plausible to argue, however, that the overall configurations of power in systems, in particular the degree to which policy issues are integrated, make them more or less likely to be able to confront and manage environmental and economic trade-offs.

This article reviews what is known about the relationship of these various explanations for national environmental performance in four categories: economic growth and income; regime type, in terms of level of democracy; the institutional characteristics of regime type; and institutional capacity for environmental performance.

1. Economic Factors and Environmental Performance

In the early days of the modern environmental movement (1960s and 1970s), the assumption was that economic growth correlated inevitably and almost linearly with pollution and other forms of environmental degradation. The operating concept was that of limits. Economic growth, increasing population, and new technologies would impose increasing demands on the finite limits of the biosphere (Meadows, at al. 1992; Victor 2008). At some point, the world would run out of clean air and water, natural resources, habitat, species, arable land, and other essentials. It was a vision of "overshoot and collapse, drawn of course from models of simple ecosystems where one species breeds to excess and then experiences a crash." (Dryzek 1997, 36) The solution often proposed was to limit growth and industrialization or to transform the growth process itself.

Yet when economists began to explore the statistical relationships among growth and environmental quality, these visions were not borne out. Focusing almost entirely on specific measures of air and water pollution, these studies found that pollution increases in the early stages of growth but levels off beyond some level of income. In wealthy countries, some forms of pollution eventually decline. The result is an inverted U-shaped curve (the Environmental Kuznets Curve, or EKC) rather than the predicted linear relationship (Grossman and Krueger 1995; Dinda 2004). It appeared that certain forms of pollution could be "decoupled" from growth. This relationship suggested that there was some kind of corrective mechanism that, after an early stage of growth, served to bring pollution down to more acceptable levels. At first glance, such findings are puzzling. Economic growth almost inevitably involves more manufacturing, use of fossil fuels, vehicles, urbanization, water, land and materials use, and other pollution-intensive activity. How could the effects of growth not worsen environmental quality?

A variety of related explanations emerged. Reflecting the post-materialism thesis of Ronald Inglehart (1995) and others, one argument was that as societies develop

economically beyond a certain point, they want a better and healthier quality of life. Polluted air and water, abandoned toxic waste sites, contaminated drinking water, exposure to harmful chemicals, lost recreational opportunities, and species loss are inconsistent with this preference. The other side of the picture is that increasing wealth improves a society's ability to respond to environmental problems. Wealthier countries have more to invest in pollution control, a legal and administrative infrastructure, and the needed technical and scientific resources than less developed ones. In brief, at some stage of development (about $3,000-10,000 annual per capita income in most studies; Dinda 2004, 442), citizens demand and government is able to deliver pollution control and conservation policies (Dasgupta, et al. 2004, 2). One review of EKC studies concluded that "regulation is the dominant factor in explaining the decline in pollution as countries grow beyond middle-income status." (Dasgupta, et al. 2005, 404). The explanation lies not in some form of economic determinism, but in the fact that growth created the conditions under which government could and did intervene (for discussions, see Payne 1995 and Desai 1998, 8-9). Increasing wealth allows a country to accumulate the "environmental protection capital" necessary for acting to protect the environment.

Research related to the EKC hypothesis produced important findings for any discussion of political and governance explanations. A World Bank study stressed the importance not only of per capita income but also of "institutional development, with significant roles for private property protection, effectiveness of the legal/judicial system and efficiency of public administration." (Dasgupta, et al. 2001, 173). The same study also found that more urban and densely populated countries and those with a higher manufacturing share of GDP were more likely to regulate for the environment. This suggests a pattern that is reinforced in later studies—that a sense of problems being serous, worsening, or not being addressed increases support for governmental action, and the sense that problems are under control reduces public concern and thus support.

Overall, the economics research that came out of the EKC hypothesis recognized the critical role of political and governance factors in explaining environmental performance. This perspective was applied to global issues as well, with one study concluding that "A full response to the environmental challenge of globalization will therefore require serious attention to the long-run development of public sector administrative and decision-making capacity and financing mechanisms." (Dasgupta, at al. 2005, 416)

The results of the EKC studies should be interpreted carefully. The dependent variables have focused on a limited number of indicators, largely common air pollutants and organics and metals in water coming from industrial sources. The inverted-U applies less to consumption-related indicators or to pollutants, such as carbon dioxide, whose effects are not immediately apparent and may be shifted to other areas or future generations. The research applies mostly to countries that have undergone some degree of industrial growth, and the findings may not apply for those at earlier or later stages. Finally, as the later studies recognize, the economy-environment relationship is not predetermined; a developing country is not preordained to repeat the patterns of its predecessors. Although it seems clear that some forms of pollution tend to decline with growth, one should be skeptical of there being a "common, U-shaped pathway that countries follow as their income rises." (Stern 2004, 1435). This conclusion in itself is significant; much of the value of this research lies in suggesting policies that allow countries to pursue more environmentally sound growth paths (Panayotou 1997).

Even given it various limitations, this research has made important contributions to explaining patterns in environmental performance and highlighting interrelationships among economic, political, and environmental factors. It has established that economic growth is not necessarily incompatible with environmental protection. Given the inevitably of the growth impulse among modern nations, this is an important finding. It suggests ways in which the social, political, and institutional changes that accompany

economic development may create the context for environmentally beneficial policies. This body of research, which still is evolving, also documents the role of that governance, democratic process, and institutional capacity play in addressing environmental issues.

2. Democracy and Environmental Performance

The relationship between regime type and environmental performance was the subject of concern among environmental advocates in the 1960s and 1970s. The view among many of them was that democratic institutions were incapable of preventing environmental degradation. William Ophuls (1977, 152) was not alone in asserting in *Ecology and the Politics of Scarcity* that "Certainly, democracy as we know it cannot possibly survive." The transition to a "steady-state society" would require government that is more authoritarian, less democratic, more centralized, and controlled by experts.

Contrary to such expectations, the research supports the view that democratic countries generally are more environmentally protective than less democratic ones (Congleton 1992; Torras and Boyce 1998; Barrett and Graddy 2000; Farzin and Bond 2006). This finding has held for several different specifications of independent and dependent variables. Like the EKC research, these findings apply largely to pollution that affects public health, but there is some evidence of democracy's superior performance for indicators related to land use, wilderness protection, and consumption as well, as is discussed below. Although the emergence and persistence of democratic institutions has been associated with per capita income, this democracy-environment relationship holds even when controlling for national income. The theoretical case for democracy rests on the opportunities for citizens to demand action for addressing environmental problems. Voters seeking relief from pollution or objecting to exploitation of resources are able to hold leaders accountable. A free flow of information enables critics of environmentally damaging practices to express their views. In addition, democracies tend to be more

engaged in international problem-solving than non-democratic states. One could also argue that, in a democracy, people are more engaged in deliberating about longer-term issues and effects on future generations than in authoritarian systems. Democracies also provide more effective governance—a more professional civil service, stronger legal system, more accountability, and are less corrupt (Pellegrini and Gerlach 2006).

A brief sampling of this research provides a picture of the basis for this positive relationship. Building on the EKC research, Scott Barrett and Kathryn Gaddy (2000) conclude that a low freedom country can reduce its pollution at least as much by increasing its freedoms as it can be increasing its income per head. Their independent variable is based on two indicators: measures of civil freedom (of the press, assembly, debate, and organization) and measures of political freedom (accountability through free and fair elections). The relationships are strongest with air pollution, which declines monotonically with increased freedom. The results for water pollution are more mixed. Although fecal coliform declines with increased freedom, the levels of biological and chemical exygen demand, nitrates, and cadmium rise, perhaps because they are not directly perceived as threats to public health. In this and other studies, this relationship is not always linear or consistent across indicators (Fisher and Freudenburg 2004).

One of the more thorough analyses of the democracy-environment relationship was published by Quan Li and Rafael Reuveny in 2006. As dependent variables, they selected five indicators of environmental degradation: carbon dioxide and nitrogen dioxide emissions; organics in water; deforestation; and land degradation. For each, they relied on measures of conditions rather than trends. Furthermore, all five focus on human actions that degrade the environment rather than amenities or endowments in a country. The independent variable consisted of two measures of regime type, one continuous and the other dichotomous, to distinguish more democratic from more authoritarian countries. They controlled for several variables, such as per capita income,

level of trade openness, population density, and military conflict, all of which have been hypothesized or shown to be related to differences in environmental performance.

Li and Reveuny's conclusions are statistically significant and consistent across all five indicators: "a rise in democracy reduces environmental degradation and improves environmental performance." (936) More democratic countries displayed less carbon dioxide and nitrogen emissions per capita, lower levels of organics in water, and lower rates of deforestation and land degradation than more authoritarian countries. Although consistent overall, the effects of democracy do appear to vary among the indicators. A rise in levels of democracy has a stronger and more immediate effect on the nitrogen dioxide, deforestation, and land degradation indicators. The effects on the carbon dioxide and water quality indicators were small initially but then increased over time.

Relying on a different measure of democracy is research based on the concept of "democracy stock." The authors of one study argue that the sometimes inconsistent results of earlier democracy-environment studies may be attributed to their reliance on static measures of the *level* of democracy at a specific point, rather than on measures of "the accumulation and evolution of democratic institutions over time." Kevin Gallagher and Strom Thacker use panel data from 1960 to 2000 to assess the relationships between their measure of democracy stock and emissions of sulfur dioxide and carbon dioxide. They find "substantial evidence that a long history of strong democracy can help reduce emissions." (Gallagher and Thacker 2008, 3) This holds true for democracy stock more than levels, which they also analyzed and for which they did not find a statistically significant relationship. "The more democracy stock a country accumulates, the lower will be its emissions of sulfur and carbon, all else being equal." (Gallagher and Thacker 2008, 18) Put simply, they assert that "democracy matters, but only in the long run." They also propose a modification in the typical economy-environment relationship identified in the previous research. In contrast to an inverted-U, as suggested in the EKC

research, they find an S-shaped curve: a decrease in SO2 and CO2 emissions in the early stages of income growth, followed by a growth in emissions and then a second decline as a nation reaches a more advanced stage of economic development.

Another variation on the democracy-environment research adopts a different dependent variable, using measures of *international commitment* to environmental protection rather than outcomes. The problem with using outcomes as the dependent variable, the authors of one study argue, is that outcomes depend on factors that are unrelated to regime type (Gates, et al. 2002; for a contrary view, see Fisher and Freudenburg 2004). Environmental conditions and endowments vary widely across countries for reasons that have little to do with institutions or policies. Even when governments actually do address a problem, it may take decades to see results. Where studies have shown a clear relationship between regime type and outcomes, it has been for such issues as smoke emissions and fecal coliform, for which policy makers exert direct control, results are readily apparent, and voters may monitor government's performance. In contrast, they argue, measures of commitment to international problem-solving provide a more direct indicator of the willingness and capacity to take on environmental problems. To define the dependent variable based on international commitment, this work adopts six measures: the signing and ratification of multilateral environmental agreements (MEAs, using four treaties); membership in international environmental organizations; the extent to which reporting rules under the Convention on International Trade in Endangered Species of Flora and Fauna (CITES) are met; the percentage of national land area under protection status; the existence of a National Council on Sustainable Development; and the availability of environmental information. They hypothesized a positive relationship between democracy level and each measure.

These studies find that democracies exhibit higher levels of environmental commitment for all six measures. Both income and population are positively associated

with environmental commitment, although effects of democracy are significant on their own. Higher incomes are associated with greater commitment, but "there is no reason to presume that the estimated positive effect of democracy simply picks up an effect that might be accounted for by income." (Gates, et al 2002) On their own, the measures of democracy work well as a predictor of international environmental commitment. Further, the degree of democracy influences the level of commitment; countries scoring highest on the democracy scores also ranked highest on the environmental measures. "All other things being equal, therefore, a more democratic world will also be a world with stronger environmental commitment." (Neumayer 2002, 158) As for which of the measures of democracy are most important, they conclude that political participation is the best predictor of international environmental commitment.

The democracy-environment research raises an issue of general importance—the interrelationships among democracy and many other societal outcomes. These include findings that associate democracy with higher economic growth rates; lower infant mortality; increased gender equality; higher measures of human capital and education; and more market-oriented economic policies. The argument made later in this article is that the relationships among environmental, economic, social, and political factors may help in defining an empirical basis for the elusive and broad concept of sustainability.

3. Political Institutions and Environmental Performance

Knowing that democracies are better at protecting the environment tells us little about the effects of specific institutions and practices on environmental performance. Within the more general regime types, is there any evidence that parliamentary systems are more successful environmentally then presidential, separation-of-powers ones? Do different electoral rules, more or less activist courts, or strong sub-national units of

government correlate with strong environmental performance? In brief, as the title of a well-known anthology once asked: Do institutions matter? (Weaver and Rockman 1993)

Answering this question is more difficult than assessing the effects of economic factors and levels or stocks of democracy. Economic and system-wide factors may be captured in a limited number of independent variables; although difficult, one may apply reasonably workable controls for other variables that may explain the outcomes. Moving from economic growth rates or degree of democracy takes us to a more complex level of analysis. It is difficult to isolate the effects of one explanation (e.g., strong sub-national governments) from others (e.g., two-party presidential versus multiparty parliamentary or proportional versus winner-take-all representation). The evidence on the effects of such factors is sketchy, although the findings in this area are intriguing and suggestive.

The short answer to the question posed here is that institutions do matter, but it is difficult to say just how they matter in affecting environmental performance. One of the more surprising non-findings is that parliamentary systems of various stripes do not appear to differ from presidential ones in their overall ability or willingness to respond to environmental problems. The most thorough quantitative analysis is that of Lyle Scruggs (2003) in his study of seventeen industrial countries. He finds no evidence that parliamentary systems performed better than their presidential counterparts; nor do single-party governments deliver statistically better results than coalition or divided ones. Being federalist or unitary or having a bicameral or unicameral legislature does not appear to make a difference. The only specific institutional factor that seems to matter is electoral rules. Proportional representation appears to deliver better performance than winter-take-all electoral rules, probably because the former lowers barriers to access for new parties and allows legislators from multi-seat districts to represent more diverse interests and advocate broader policies than those from single-member ones.

What does seem to matter in Scruggs' study is not any specific institutional factor but the overall configuration of power in a system. In a category labeled "socio-economic institutions," Scruggs attempts to capture the quality of relationships among economic, environmental, and other interests and government and their roles in policy making overall. The primary distinction is that between the more pluralist systems, such as the U.S. or Canada, and the neo-corporatist ones like Germany and Sweden. The findings are striking: "The theoretical and empirical findings of this chapter strongly suggest that countries characterized by strong, centralized interest groups and a more 'consensual' approach to policy making (what are often referred to as 'neocorporatist' institutions) have enjoyed better environmental performance than countries where economic groups are less comprehensively organized and policy making is less consensual." (Scruggs 2003, 123). It appears that the ability to act in structured and collaborative ways provides a means for groups at high levels of policy making to resolve environmental and economic trade-offs and, more importantly, to find ways of integrating competing goals.

Why would corporatism be expected to deliver better environmental results? After all, many in the U.S. argue that confrontation pressures government and industry to set and maintain stringent environmental standards and reduces chances of regulators being "captured" by business. These comparative findings run counter to that argument.

Scruggs proposes three reasons why more corporatist systems may yield better performance. One is the potential superiority of collaborative over adversarial systems in gaining and using information. Systems capable of "ongoing consultation with a variety of interests having specific knowledge of the areas of regulation" (Scruggs 2003, 142) produce better information about options, costs, and the impacts of alternative actions. A second reason is that higher levels of trust and more business engagement allow for more flexibility in implementation. Policy making occurs more as a process of learning than of conforming to set technical standards in the context of legalistic relationships.

Third is the way that producer interests are organized in a more corporatist system. Business interests view environmental choices in the context of broader economic issues and work cooperatively with government and others in reconciling and integrating competing policy goals. Moreover, once business organizations are engaged in policy making, they may support collective action within their industry. The strong industry associations often found in corporate systems may educate members about innovative solutions, provide more accurate information about costs and trade-offs, and help to reduce free riding. This is consistent with several qualitative studies, discussed later, that assert the value of communicative governance through trust, dialogue, and collaboration.

A related qualitative study examines the role of the same institutional factors in explaining why some nations ratified the Kyoto climate protocol and others did not. Why did some countries (Germany, the United Kingdom, Japan, and the European Union as an entity) ratify Kyoto while others (the United States and originally Australia) did not?

Costs and country-specific issues were a factor. Reunification and the collapse of the East German economy, for example, gave Germany ample room to commit to CO2 reductions. Still, cost factors alone did not explain the variations in country responses. Much of it may be explained by institutional factors, especially electoral rules and the number of veto points. In this study, the proportional representation rules used in EU countries and the EU itself "had the effect of amplifying the voices of a minority of voters for whom climate change has been a political priority." (Harrison and Sundstrom 2007, 2) Countries with proportional representation were more likely to support Kyoto. The centralization or diffusion of political authority in a system had the expected effect. Harrison and Sundstrom conclude that "political institutions that diffuse authority and create veto points make it easier for the status quo, and thus those opposed to ratification and mitigation policies, to prevail." (2-3) As the poster child for separation of powers, with its multiple veto points, the U.S. surely affected the findings in this respect.

A revealing aspect of this analysis is the light it sheds on the interaction of institutional factors with public opinion. Institutions matter, but voters' attitudes matter as well. Where voters are attentive to climate issues and support action, their leaders are more likely to ratify. Indeed, "there is no substitute for voters caring enough to demand action by their elected representatives." (Harrison and Sundstrom 2008, 27) Lower voter salience enables anti-climate action interest groups to block change. This conclusion is consistent with findings on the influence of business interests on environmental issues generally. When voters are aware and engaged, however, the effects of factors such as electoral rules and the distribution of power are less important. That the U.S. has ranked last among wealthy nations in public concern about climate change may have been more critical than the institutional effects of separation of powers in shaping the U.S. position.

Sonia Walti's study (2004) of the effects of multilateral governance on environmental performance suggests the complexity of the relationships that are being analyzed. Are federal systems better environmental performers than more unitary ones? The answer in this study is that it depends. Focusing on two air pollutants (NO_2 and SO_2), she finds that the effects of multilevel governance interact with two other system characteristics—income and corporatism. Like the other studies, she finds positive relationships among environmental performance, income, and corporatism. That is, wealthier and more corporatist countries perform better. She also finds that being multilevel (i.e., strongly federalist) correlates positively with environmental outcomes, but the specific effects vary, depending on the level of economic development and the extent of corporatism. In weak multilevel systems, economic development has a more significant effect than corporatism. In a strong multilevel system, such as the U.S. or Canada, corporatism has a larger effect than does the level of economic development.

The explanations for these findings, Walti concludes, lie in the interplay among income, corporatism, and multilevel governance. Both economic development and

multilevel governance correlate with environmental performance. As a consequence, "one can expect the positive effect of high economic development to be greater in countries with strong multilevel structures, where more economic and fiscal resources may be channeled to sub-national levels of government." (606) As for the multilevel-corporatist relationship, previous studies have concluded generally that all interest groups may benefit when there are more access points. This and other analyses at least suggest that environmental interests may have more leverage in multilevel systems and economic interests in more unitary ones. It may be that the former respond more to local concerns, allow environmentalists to monitor implementation, and provide options to environmental groups when one level of government opposes environmental actions.

The experiences of the United States, Great Britain, and Japan over the last four decades are revealing. The conventional wisdom would have predicted that a relatively disciplined two-party system like Great Britain or one-party dominant system like Japan would have responded better to the rise of environmental issues than the presidential, separation-of-powers system of the U.S. In fact, the reverse occurred. In a remarkable burst of legislative action and institutional innovation, the U.S. created a major national regulatory agency and enacted action-forcing environmental laws. Great Britain may have started earlier, but made far less progress through the 1970s than the U.S. Japan bottled up demands for environmental protection for years before local activism and court rulings forced the dominant party to act. Once it did, its authority led to a rapid reorientation of environmental policy. Through the 1970s, David Vogel concludes in his analysis of the three countries, being parliamentary or presidential made little difference, and "the critical determinant was the degree of public pressure." (Vogel 1993, 258-259) Public opinion was more important than specific institutional characteristics.

Still, Vogel points out, the experiences of these three countries in the 1980s does reveal institutional differences. Conservative political regimes took office in the U.S. and

Great Britain (Ronald Reagan and Margaret Thatcher), and in Japan the influence of environmental advocates and agencies declined. Yet the U.S. was more resistant to pullbacks in environmental programs. The primary explanation lies with the "lock-in" effects of the American policy system. With multiple veto points, change is difficult. Once stringent environmental policies are put into place they are difficult to remove, at least in the short run. Institutional lock-in, reinforced by divided party control of the White House and Congress, protected environmental programs from being undone in the 1980s and again in the mid-1990s, during the House Republicans' assault on regulation. At the same time, however, this lock-in effect makes it difficult for the American policy system to adapt and innovate in response to changes in environmental problems and the economic and political conditions under which they are being addressed (Fiorino 2006).

The effects of institutional factors on environmental performance are so complex and dynamic that it is difficult to draw conclusions from the studies sampled here. The available research does focus on economically developed, democratic regimes, so lessons drawn here are limited to that subset of countries. The critical issue is the ability of a system to change in response to new problems and public demands for addressing them. It is difficult to isolate the effects of institutional factors from such variables as public opinion; elite ideology; economic-structural factors, such as reliance on fossil fuels; and so on. The effects also may vary by the stage in the policy process, as is discussed later.

4. Institutional Capacity and Environmental Performance

Taking a somewhat different approach, but still relevant to this discussion, is a body of work that focuses on "institutional capacity" as the independent variable. Much of this research has been conducted under the auspices of the Environmental Policy Unit at the Free University of Berlin (Janicke and Weidner 1997; Weidner and Janicke 2002). Their approach has been to identify the more and less successful countries in terms of

recognizing and responding to environmental problems, then attempt to determine the characteristics that distinguish the better from the lesser performers.

This category research differs from previous ones in many ways. One difference is that the variables generally are not quantified. It does not adopt performance measures or attempt quantitatively to score or rank the countries being analyzed. This work also differs in being more prescriptive than most of the studies discussed above. It also assumes a developmental perspective; whatever capacities a country may have are seen as determining the potential for solving environmental problems over time. Indeed, there is an assumption that changes in problems and in economic, social, and political conditions require constant adaptation of institutional capacities. A strength of this work is the search for a learning model that builds institutional capacity in the face of change.

Institutional capacity is "a society's ability to identify and solve environmental problems." (Janicke, 1997, 1). This stresses the role not of specific policies or instruments but the existence of the "structural preconditions" for solving problems. Political systems develop capacities in the process of reacting to or anticipating challenges or crises. Although governmental capacity obviously is critical, environmental problem-solving requires contributions from other social forces as well. A theme in this research is thus to consider general societal as well as specifically governmental capacities.

Three kinds of structural conditions are key (Janicke 1996, 80). *Informational capacity* describes the extent and quality of the factual basis that exists for identifying and solving problems. This includes there being scientific and technical knowledge, ways of creating and evaluating knowledge, epistemic communities for disseminating and applying knowledge, levels awareness, professionalism of the relevant actors, and the availability of information on environmental conditions. *Participatory capacity* refers to the degree of access to institutions that make decisions, to mechanisms for challenging decisions or influencing policy agendas, and to the openness of decision making forums.

Integrative capacity is the ability to conduct dialogue and coordinate action across sectors, institutions, and issues. It includes internal policy integration (across programs and levels of government); inter-policy integration (across sectors, such as energy or transport); and external integration (among government, the private sector, and NGOs).

Consider how this framework might be applied to the U.S. Because of its wealth, strength of its scientific and technical resources, and range of institutions for evaluating and disseminating information, it would surely rank among the leaders in informational capacity. As an open society, with substantial opportunities for access and participation and free flows of environmentally-related information, it also would stand out in its participatory capacity. However, most observers would view its integrative capacity as limited, for several reasons. Within the realm of pollution control, U.S. environmental policy is highly fragmented, with far less statutory and administrative integration of air, water, waste, and chemicals regulation than most European countries. Among policy sectors (i.e. agriculture, resource management, transportation, energy), it does not compare well with its peers. As a highly adversarial and legalistic environmental policy system with a history of distrust among government, private firms, and NGOs, the U.S. also would rank low in its capacity for external integration. Each of these aspects of the U.S. system has been stressed in the environmental policy literature (Fiorino 2001).

Underlying this theoretical and empirical research on institutional capacity is an observation on and prediction of an evolution in environmental problem-solving. One article identifies four phases that most societies have undergone or will undergo in the process of creating and modernizing their capacities, from pollution control, to pollution prevention, to ecological modernizations, to sustainable development. Such countries as Denmark, the Netherlands, and Sweden have progressed in their evolution, through "far-reaching institutional reorganization in various policy areas to steer integrative environmental policy toward ecological modernization and sustainable development."

(Weidner, 2002, 1351) Other countries have not. A leader in the 1970s, the U.S. has fallen further into the back of the pack, because of weak environmental performance, a lack of global engagement, and limited integrative capacity. Although all industrial nations share this limitation to some degree, the U.S. in has demonstrated more of an ability to "solve discrete technical problems" rather than the "more fundamentally structural problems of an affluent market economy." (Andrews 1997, 36)

Although the institutional capacity research relies on case studies, many of its conclusions are consistent with those from the more quantitative research. It defines economic success and democratic governance as two preconditions for environmental policy results. Effective governance, a strong scientific and technical core, a free flow of information, and opportunities for political mobilization and protest are seen as being positive factors. More importantly, the emphasis on "integrative capacity" is consistent with Scruggs' findings regarding the stronger performance of corporatist policy systems when compared to their more pluralist counterparts. The capacity for evaluating and integrating high level economic and environmental values in the context of broad social goals distinguishes the more from the less successful performers in both sets of studies. Indeed, the institutional capacity research exhibits a clear preference for a "consensus-oriented political culture and a cooperative policy style characterized by intra- and inter-policy cooperation" as the preferred mode for solving problems (Janicke 1996, 80).

The capacity research carries within it a paradox. In this body of work, the catalyst for developing or modernizing problem-solving capacity is a crisis, defined as a threat of a severe loss or even a collapse in the system. This is consistent with the view given elsewhere that systems react to environmental problems when they are perceived as posing a threat to the legitimacy of the system or regime (Dryzek, at al. 2002). Indeed, having high-pollution industries that are "shaken by scandal" may enhance the ability of pro-environmental forces to press for improved policy capacity. Yet this research also

has concluded that consensus-based systems with a high capacity for integration and societal dialogue are most likely to modernize and cope successfully with the newer generation of environmental problems. Vital to institutional capacity is being able to carry out "a mixed strategy of cooperation and conflict" (Weidner 2002, 1365). Systems that can manage this mixed strategy successfully may have an advantage in terms of their environmental and sustainability performance in the coming decades.

What We Know and Should Know About Environmental Performance

Despite the attention given to local, regional, and global institutions in the environmental policy literature, the linchpin in terms of performance still is the nation-state. Global institutions are only as successful as national governments allow them to be. Local and regional institutions are critical and may accomplish much, but at some point they depend on national governments to make major policy choices, direct large investments, and engage in the international arena. Explaining national environmental performance thus presents a set of challenges and opportunities for policy researchers.

There is much at this stage that is known about national performance. It does not necessarily decline as societies grow economically; for many indicators, it may improve. It appears that growth creates the political conditions that make more effective pollution control, and some level of ecosystem protection, necessary and possible. This decoupling of growth from pollution is not inevitable, however. It depends on having the institutional capacity and political support necessary for successful problem-solving. Democracy works best when problems are seen by voters as being salient: air and water pollution, lost species or dying forests, abandoned hazardous waste sites, risky chemicals in commerce, and the like. It works less well for problems that voters do not have to care about in the near-term or whose effects occur outside of their range of concern. C02, which threatens future generations more than the current one and involves a temporal

mismatch of perceived costs and benefits, is an obvious example. Nor are democracies particularly effective when there is no perceived "villain" to blame and hold accountable. That is why the problems from consumption, land use, and transport that involve more than having to impose technology controls have been managed poorly by most nations.

Another lesson of this research is that there is an empirical basis for the concept of sustainability. Environmental progress is not possible under conditions of economic and political failure. Nor, as the evidence suggests increasingly, is it possible to degrade the environment beyond certain limits while enjoying economic success and political stability (Meadows, at al. 1992; Victor 2008). Politics (including social equity), the economy, and the environment should be thought of as three overlapping, interdependent, and mutually-reinforcing systems (Robinson and Tinker 1997). Crisis or failure in one poses challenges for the others. Conversely, having capacity and performance in one creates the conditions under which the others may be maintained. The challenge of sustainability is to sustain each of these systems while maintaining an effective balance among them. The task of modern government is not only to maintain that balance but to actively seek positive relationships among them. For example, climate action policies for the U.S. would not only contribute to reductions in greenhouse gases but yield benefits for energy security, economic efficiency, technology innovation, and so on (Giddens 2009). The same points may apply to other environmental problems.

The studies of institutional factors suggest conclusions regarding the broad issue of environmental sustainability. Conventional environmental politics, especially in the U.S., has stressed the trade-offs between environmental and economic success. National political systems that rank well in studies of environmental sustainability have a greater capacity for integrating economic and environmental goals and policies. In particular the studies by Scruggs and others suggest that some institutional arrangements (that is, neo-corporatist ones) may be more suited to integrating across policy sectors than others.

The institutional capacity research defines "integrative capacity" as one of the core conditions for achieving long-term environmental policy success and adapting over time.

A broader literature also suggests the relative superiority of systems with better integrating capacities. In their study of high-consumption societies, William Lafferty and James Meadowcroft conclude that countries with a positive approach to sustainable development "share a relatively dominant social democratic and/or consensual political culture, which places significant emphasis upon equity, social planning, state intervention in the pursuit of common ends, and which involves neo-corporatist or negotiated modes of decision-making." (2000, 424) John Dryzek observes in his book on discourses (1999, 141) that the "cleanest and greenest" industrial nations share "a political-economic system where consensual relationships among key actors prevail." Comparative studies of innovation reach similar conclusions. Martin Janicke concludes that "a cooperative policy style is good for policy innovation, because innovators are integrated earlier into the decision-making process than is the case in countries with a more confrontational tradition." (1997, 14) Similarly, David Wallace (1995) finds in a six-country study that political cultures that are conducive to dialogue, communication, and information-sharing offer more fertile ground for environmental innovation.

Many other studies have found that the more adversarial and legalistic features of environmental policy making in the U.S. deliver results no better than and often inferior to those of other nations, a finding that is supported by the relatively low rankings of the U.S. in the EPI and the other research cited here (Gunningham, et al. 2003; Kagan 2000; Brickman, et al. 1985; Scruggs 2003; Lafferty and Meadowcroft 2000; Gunningham and Sinclair 2002)). In the transition from environmental protection to environmental sustainability, which arguably should be occurring globally, it appears that some national systems may have an institutional advantage over others. Environmental sustainability requires a different set of capacities than those that are needed for environmental

protection, because of the greater need for integration across sectors, ongoing policy dialogues, and coordinated implementation in operating within a sustainability context.

There is much that we do not know as well. One area for research is the effects of political culture. Managing environmental issues requires collective action. Whether this is in the form of top-down regulation, bottoms up "civic environmentalism," emissions trading, public subsidies, or other mechanism, it involves some form of government intervention in markets and other relationships. Political cultures that are more comfortable with an active state and more communitarian in their values may possess a distinct advantage over more individualistic ones with strong a belief in a limited state. The practical value of research on culture is not in deciding how to change political culture, which is largely fixed, but in determining what structures, policy instruments, and decision-making procedures are best suited to achieving environmental policy goals in any given institutional setting. Strategies may be suited to context and setting.

Another area for research is how institutional arrangements affect performance at different stages of the policy process. Four are worth noting at this stage: the ways in which interests gain access to and shape policy agendas; the ability to establish or change policies, especially those involving diffuse benefits and concentrated costs, as is often true of environmental issues; the capacity for carrying out policies once they are decided; and the ability to learn from experience and revise policy based on that learning. These, of course, correspond to four of the classic stages in policy making—agenda setting, formulation, implementation, and evaluation-revision. It may be, for example, that more pluralist and strongly federal systems offer more access to a range of interests, but are less able to establish social and political consensus on major change. Having multiple veto points and levels of governance thus may promote access but constrain the ability to innovate at a national level. Systems that consolidate power and demonstrate a capacity to integrate across policy sectors also may have more ability to implement environmental

policies once they are determined. When strong environmental policies are adopted, the more pluralist systems may be able to "lock-in" such policies and resist efforts to undo them later. On the other hand, this same feature may make it difficult for the more pluralist systems to adapt in response to new problems or information (Fiorino, 2006).

The research on national performance confirms some of what was expected when environmental issues emerged on policy agendas in the 1960s and 1970s. It also departs from some of those expectations. The relationships among economic, political, and environmental factors are far more complex and possibly more positive than once was thought. This research deserves continued attention. Being able to measure national environmental performance and to formulate, evaluate, and revise explanations for that performance offers both academic and practical value. It may be that what we know is less than what we should know for better institutional and policy design, but it is a start.

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