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Northeast Asian Environmentalism: Policies as a Function of ENGOs

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This article presents a comprehensive, unprecedented analysis of environmental nongovernmental organization (ENGO)-related impacts in Japan, Korea, Taiwan, and China. We analyze the effects of ENGOs on four types of environmental policies, using data from government agencies, environmental organization networks, and public policies/legislation. The results from this quantitative approach show that for Korea and China only, policies are strongly predicted by ENGO creation. Further, ENGOs can undermine their own agenda if they do not sufficiently balance the interests of the public and the government.

Key words: ENGO, environmental impact statement, environmental policy, Northeast Asia

Introduction

This study contributes to the literature on environmental policy formation, expanding our understanding of environmental law and policy-making as a whole. We survey environmental policies in Japan, South Korea (henceforth Korea), Taiwan, and China, focusing our attention on these four nation-states because of their varying levels of development, democracy, legal institutions, and environmental activism. At the same time, all four nation-states have well-established "green growth" and sustainable development policies, high levels of scientific and technological competence, and intraregional connections with each other (Shapiro, 2009, in press). Accordingly, the meta-objective of this article is to compare Japan, Korea, Taiwan, and China to provide crucial insights and lessons.

The nation-state is the unit of analysis, and environmental policy is the dependent variable. The primary explanatory variable is the environmental interest group, also known as environmental nongovernmental organizations (ENGOs). We attend to the role of ENGOs in the process of environmental policy-making for several reasons. First, such groups can help mitigate the costs of environmental degradation that occurs in the process of economic development (Lempriere, Stanbury, & Vertinsky, 1996). Second, ENGOs are a legitimate part of the environmental policy-making structure and have experienced both rapid growth and decline over the last half century, as shown in

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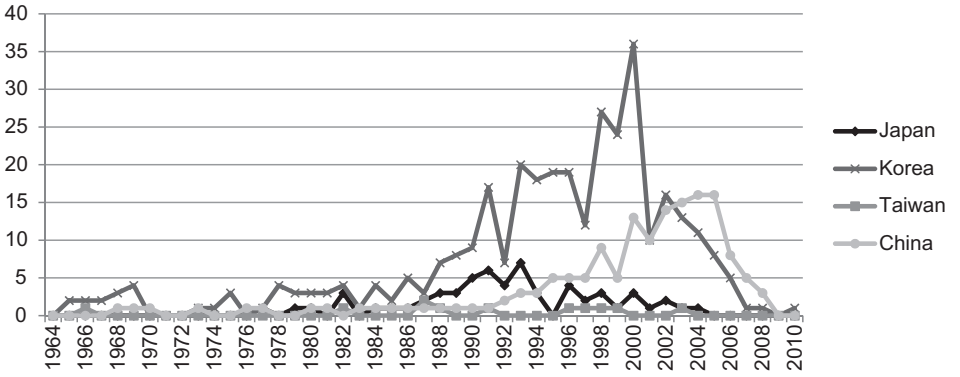

Figure 1. Number of ENGOs created each year

Figure 1 for Japan, Korea, Taiwan, and China. ENGOs are also potentially active participants in the "iron triangle" relationship between legislators, the bureaucracy, and interest groups,[1] which fosters exclusivity in the policy-making process. As such, we acknowledge the common misperception that the interests of ENGOscan be fully conflated with the public's interests; that is, there is not equality in interests (Zywicki, 2002). This presents a direct challenge to the view that the collective interests of citizens are autonomous from government control (Diamond, 1999).

This article quantitatively analyzes the effects of ENGOs on four types of environmental policies, using a unique collection of data. Particular care is taken to rule out spuriousness, so we account for the simultaneous effects of environmental catastrophes on the growth of both ENGOs and environmental policies. To this end, in the next section, we first outline the literature on the role of ENGOs and detail our research goals and hypotheses. The section afterward presents the quantitative data, the empirical model to which they will be applied, and the results of the statistical analysis. In the final section, comparisons across nation-states are made and policy prescriptions are offered.

Literature Review and Hypotheses

Not all environmental policies are necessarily a function of ENGOs. We begin this section with an outline of the environmental policies that are designed to draw in public involvement. Evidence from Northeast Asia is also presented. In the following subsection, hypotheses are offered about the relationship between ENGOs and environmental policies.

EIS-Related Legislation and the Evolution of ENGOs

Since its inception in the United States under the direction of Keith Caldwell, the National Environmental Policy Act (NEPA) has swept the world and become a customary rule of international law. Nearly every country has since instituted some version of NEPA, whose ultimate goal is to foster productive harmony between humans and the environment. That is, the act envisions sustainable

economy and, in the case of developing countries, sustainable development (Ashford & Caldart, 2008). It also represents an attempt to deal simultaneously with bureaucratic inefficiencies and a lack of public participation, which are the veritable plagues of a democratic system.

Three main innovations are presented by NEPA: a declaration of a national policy for environmental protection, the creation of an "action-forcing" mechanism in the form of the environmental impact statement (EIS), and the inclusion of the public in decisions that affect the environment (Dreher, 2005). We offer a fourth: the ability to challenge the iron triangle of relationships between elected officials, the bureaucracy, and interest groups.

EIS-related legislation has been shown to increase the potential for citizen involvement (O'Faircheallaigh, 2010), particularly for the Chinese case (Mol, 2009). This applies pressure to the iron triangle structure by increasing the public's voice as well as increasing the total number of ENGOs. The cycle repeats itself as ENGOs become more active, increasing environmental policy outcomes that are more responsive to this larger, more diluted group of ENGOs.

In terms of NEPA and environmental impact assessments, the actors involved in environmental policy-making in the 1970s in the United States are well documented in Liroff (1976) and Taylor (1984). The latter stresses the importance of institutions that both facilitate the EIS-making process and move in some degree of harmony with political forces, but things have changed considerably since Taylor's work was originally published. A variety and increasing number of interest groups, shown in Figure 1 for the Northeast Asian cases of interest here, introduces a diverse set of concerns and priorities. At the same time, the public is now much better informed about environmental issues, given its proximity to environmental problems, the economic costs incurred, and media attention to such problems. This translates into contentious politics of EISs, given coalitions that arise between stakeholders and intellectuals and the ability of the public to hinder large-scale development projects (Devlin & Yap, 2008).

Despite the potential for favorable policy outcomes, public involvement in the EIS process does not guarantee that its voice will be heard or acknowledged. This inconsistency lies at the crux of the environmental policy dilemma: the policy-making and the policy-ratifying processes remain largely a function of the iron triangle. When invitations for public participation are offered, the EIS process becomes a strategic or negotiating tool for the bureaucracy or elected officials to use, as politicians use the EIS to generate political capital through promises of action or opposition to inaction, while bureaucrats block the process from forward movement with claims of insufficient evidence or procedural malfeasance (Caldwell, 1988; Taylor, 1984).

This is largely the case in China and Taiwan, where the public is not consulted but still attempts to contribute to the EIS process (Du, Yang, Xu, Harashina, & Li, 2010; Tang, Tang, & Lo, 2005; Zhan & Tang, 2010). Some have found that government support at the local level is much more important than social forces such as ENGOs and the public (Lo, Fryxell, & Wong, 2006; Van Rooij & Lo, 2010). Particularly in Guangdong province in mainland China, EIS procedures were not consistently enforced, likely due to weak public support for protection and rent-seeking behavior by the bureaucracy (Lo, Tang, & Chan, 1997; Wang, Morgan, &

Cashmore, 2003). Recent research on China has shown, however, that environmental enforcement officials are increasingly relying on the rule of law (Lo, Fryxell, & Van Rooij, 2009).

This is not unlike the evolution of environmental groups in Japan, where successful policy outcomes were the result of coalitions established between environmental groups and state agencies (Stearns & Almeida, 2004). Public environmentalism in Japan is distinct in that it has been politically marginalized and underfunded (Mason, 1999), particularly before the 1994 Lower House electoral reform when political institutions represented favored business interests and limits were placed on environmental pollution regulation (Rosenbluth & Thies, 2002). There has been, however, a resurgence in the wake of environmental disasters such as the 1995 Kobe earthquake, oil spills near Yokohama and Toyama in 1997, and nuclear fuel reprocessing accidents at Tokai in 1997 and 1999 (Dobson, 2002).[2]

In Korea, we also observe coalition building between environmental groups and state agencies, but the process is beset with obstacles. First, citizen participation is impeded, which some attribute to the country's authoritarian past and a lack of institutions (Lim & Tang, 2002), although a similar case could be made for the other three countries of interest here. Second, goal congruence among members of a coalition is difficult to achieve. In their study of Korean land-use movement, for example, Ju and Tang (2010) identified goal congruence in Daeji and goal divergence in Won-Dong. Success in Daeji was due to shared goals and a clear delineation of tasks and duties among environmental groups. What Ju and Tang (2010) overlook, though, is the potential for increasing numbers of ENGOs in Korea (see Figure 1) to present diverging opinions and, thus, increase the likelihood of disagreement.

Hypotheses

For Japan, Korea, Taiwan, and China, the literature does not present a consensus as to how ENGOs impact environmental policies. Elsewhere, there is evidence of the government affecting ENGOs (Nikolic & Koontz, 2008) as well as ENGOs (and NGOs) impacting environmental (and broader) policy-making (Desai, 2002; Furlong & Kerwin, 2005; Golden, 1998; Newig & Fritsch, 2009; Yackee, 2006). In light of our literature review outlining the role of public environmentalism and ENGOs, the time is ripe for a broader test in Northeast Asia. As shown in Figure 2, we hypothesize that the increase in the number of ENGOs in each of these four countries has led to a larger number of environmental policies. We have selected the increase in the number of ENGOs as our independent variable for one primary reason: ENGOs are particularly effective in their formative years. Using the total number of ENGOs as our independent variable would overestimate the effect of interest groups that have become ineffective over time, and qualitatively measuring ENGO effectiveness is beyond the scope of this article.

A second hypothesis focuses on the involvement of the public. Efficacy of the EIS process, to address the previous section, is contingent on the degree to which the public is involved or, more specifically, allowed to be involved (Fine & Owen, 2005; Popovic, 1993).[3] This is not only related to the influence the public has on

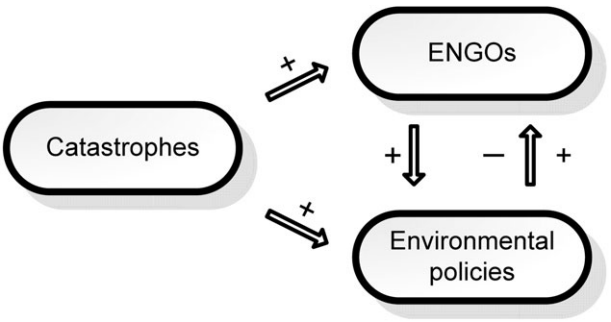

Figure 2. Theoretical structure and expectations

ENGOs but also the ENGOs' ability to effect change at both the administrative law and political levels (Melnick, 1983).[4] In other words, the influence of the public extends beyond EIS-related policies to other, non-EIS process-related environmental policies such as air pollution policies, broad environmental policies, and market-related environmental policies.

There are several strata along which we can examine effective participation by the public, including environmental education, information access, voice in decision-making, transparency in the decision-making process, evaluation, enforcement, and the appeals process (Popovic, 1993).[5] In this article, we look exclusively at environmental education and voice in decision-making, as it is a measurable and varied quality across ENGOs. We hypothesize that education-oriented ENGOs are likely to create an additional, positive effect on the growth of environmental policies. Voice is already captured and measured by growth in environmental policies; that is, the enactment of an individual policy reflects some exercise of voice in decision-making.

We acknowledge that there may be endogeneity in ENGO growth. Environmental policies, especially weak ones, can increase ENGO activity and the perceived need for larger numbers of environmental groups. Environmentalists also mobilize when policies (like the EIS) invite participation by the public. At the same time, effective policies might diminish the need and, thus, the number of ENGOs. This positive/negative causal relationship from policies to ENGOs is presented in Figure 2, but the effects are not entirely clear. To address this potential problem, we assume that ENGO growth occurs primarily when there is a policy deficiency, effectively eliminating the policy-to-ENGO relationship.

An additional innovation of this article is the incorporation of catastrophes and environmental disasters. Catastrophes are a potential determinant of both policies and ENGOs (Elsarji, 2008), are strictly exogenous, and provide an added level of understanding about how ENGOs and the public have interacted. Post–catastrophic event, the public may support existing ENGOs or create new ENGOs to shore up deficiencies in the government response, ex ante preventative measures, or funding allocations in rebuilding efforts. More importantly, catastrophes allow us to establish nonspuriousness in the ENGO-policy relationship. Shown in

Figure 2, it is expected that the growth in both ENGOs and environmental policies is a positive function of catastrophes. Rejection of this hypothesis establishes nonspuriousness.

The Data, Empirical Model, and Results

Data

Environmental policy data were collected from the Japanese Ministry of Environment, Laws section (http://www.env.go.jp/en/laws/), the Korean Ministry of Environment, Major Policies section (http://eng.me.go.kr/main.do), the Taiwanese Environmental Protection Administration, Laws and Regulations section (http://law.epa.gov.tw/en/), and the Chinese Ministry of Environmental Protection, Policies, and Regulations section (http://english.mep.gov.cn/Policies_Regulations/). Each country's environmental ministry or administrative apparatus has already established categories of environmental policies. For example, in Japan, policies are categorized as follows: global environment; waste and recycling; air and transportation; waste, soil, and ground environment; health and chemicals; and nature and parks. The following categories are used in Korea: green growth; environment, economy, and society; water quality and water ecosystem; water supply, sewerage, soil, and groundwater; air and climate change; wastes and recycling; health and chemicals; nature and parks; and international cooperation. In Taiwan, the policies are divided into the following categories: basic and organic, soil and groundwater pollution, water and marine, waste, atmospheric pollution, EIS, toxics management; environmental disputes, and other laws and regulations. Finally, in China, policies were divided as follows: framework provisions, prevention and control of water pollution, prevention and control of air pollution, solid wastes management, noise and vibration management, hazardous chemicals management, EIS, and pollution discharge and levying.

We use the aforementioned categorization schemes as the basis for a consolidated set of categories across all four countries. For certain categories, this is a relatively simple process: Japan's "waste and recycling" policies, Korea's "wastes and recycling" policies, Taiwan's "waste" policies, and China's "solid wastes management" policies can be initially grouped together. Other groupings across all four countries are also possible, such as Japan's "air and transportation" policies, Korea's "air and climate change" policies, Taiwan's "atmospheric pollution" policies, and China's "prevention and control of air pollution" policies. However, for other categories, close matches are possible initially for only a couple of countries: Japan's "global environment" policies with Korea's "international cooperation," for example, or Taiwan's "EIS" policies with China's "EIS" policies. There are also a number of categories that are unique to particular countries, such as Japan's "health and chemicals" policies, Korea's "green growth" policies, Taiwan's "environmental disputes" policies, and China's "noise and vibration management" policies.

Despite these apparent overlaps across countries, or the lack thereof, our extensive analysis of the content of these environmental policies resulted in the following eight categories: air pollution, broad frameworks, EIS related, market

oriented, manure/methane related, recycling related, internationally focused, and export/import related. Environmental policies were categorized as air pollution based on whether they targeted emissions of pollutants or polluting factories or plants. These policies often were identifiable by their use of standards for emissions and air quality. Policies were categorized as broad when they sought to address multiple issues. Their breadth is based on efforts to address not a single goal but to serve as a basis for future laws and policies. As such, they are typically the first of all environmental policies. EIS-related policies were identified by their connection to a NEPA variant, discussing the EIS process in terms of development projects, public input, and/or the certification and qualification of those individuals who would be conducting assessments. Policies were coded as market related if they satisfied one of the following two standards: whether the policy directly targeted or created standards for any products that would have an impact on the market, such as "green" rated household products, and whether a policy would have some sort of market-related effect, such as standards affecting automobile, coal-fired power plants, or construction.

For a number of reasons, we have omitted the remaining four categories of environmental policies from the ensuing analysis. Manure-/methane-related policies were isolated to the Korean case. Initially, we had expected that they could be incorporated into the air pollution category, as methane is a significant contributor to global warming, but these two laws (Act on the Disposal of Sewage, Excreta, and Livestock Wastewater [3/8/1991]; Act on the Management and Use of Livestock Manure [9/27/2006]) addressed a unique environmental concern. The recycling-related, internationally focused, and export-/import-related categories were omitted to provide focus for the statistical analysis. They are at times closely related to the four selected categories: recycling-related policies can be viewed as a variant of market-related policies in that they can impact business practices and consumer demand. In other cases, such as the internationally focused and export-/import-related policies, the domestic and regional/international policy-making spheres are bridged, hindering cross-country analysis.

Within the four categories of environmental policies given focus in this article—air pollution, broad frameworks, EIS related, market oriented—the list of policies was further restricted in order to eliminate those policies that were strictly administrative in nature. These ranged from policies establishing fines and punishments (e.g., China's "Interim Measures on the Collection of Pollution Discharge Fee" [2/5/1982]), to those explaining the procedures for implementing a previously established policy (e.g., China's "Measures on the Administration of Pollution Sources Monitoring [11/1/1999]; Korea's "Environmental Dispute Adjustment Act" [8/1/1990]; Japan's "Law Concerning the Promotion of Business Activities With Environmental Consideration by Specified Corporations, etc., by Facilitating Access to Environmental Information, and Other Measures" [2004]), to those elaborating upon previous legislation (e.g., Taiwan's "Air Pollution Control Act Enforcement Rules [7/23/2003]), to those acting merely as circulars or updates (e.g., China's "Circular on Relevant Issues Concerning Monitoring for Inspection and Acceptance of Completed Environmental Protection Facilities of Construction Projects [2/22/2000]). These policies, in our view,

offered a very limited contribution to the existing set of policies, as they were enacted strictly to deal with technical and administrative deficiencies in existing policies.

Data on catastrophes were collected from the U.S. Geological Survey (USGS) and other online sources.[6] To our knowledge, there are no collective lists of both man-made and natural disasters besides these sources. To confirm that these sources are accurate, we cross-referenced USGS and online sources. Such opportunities for cross-referencing increased with more recent events. Data on the number of environmental groups were gathered through online searches and formal documents such as KENGO and NNEOK (2007).[7,8]

To determine education focus, we assessed each ENGO's engagement in educational programs or activities beyond basic awareness-raising efforts. Education focus by an ENGO is exemplified by in-class projects for students, traveling lectures, day and summer camps, and tours of established wildlife facilities.[9] These programs and goals aim to raise awareness, directly engage citizens (particularly students), and teach these citizens about certain actions that can be taken, such as gardening techniques, fighting against desertification, and reducing electricity usage.

Empirical Model

Equations (1) and (2) present the two parts of the spuriousness test. To test the hypothesis that the number of ENGOs created is a positive function of the number, type, and degree of catastrophes, we predict the following Poisson model:

$$ENGO = \alpha + \beta(CATASTROPHE) + \varepsilon \quad (1)$$

for each nation-state from year t^0 to 2010, where t^0 represents the year preceding the first environmental policy in a nation-state. ε captures all other unobserved variation. This model is appropriate as the number of ENGOs is assumed to follow a Poisson distribution, and it remedies violations of normality presented with count data (Cameron & Trivedi, 1998; Hausman, Hall, & Griliches, 1984), which is the case for those collected for this article (above and below). We also predict that

$$POLICY = \alpha + \beta(CATASTROPHE) + \varepsilon \quad (2)$$

POLICY represents one of the following four environmental policy types: air pollution, general environmental policies, EIS-related policies, and market-related policies.

Finally, to test the hypothesis that the growth of environmental policies in Japan, Korea, China, and Taiwan has resulted from the increase in ENGOs, we predict the following Poisson model:

$$POLICY = \alpha + \beta_1(ENGO) + \beta_2(EDUCATION) + \varepsilon \quad (3)$$

for each nation-state from year t_0 to 2010, where t_0 represents the year preceding the first environmental policy in a nation-state. *EDUCATION* is a dummy variable coded 1 if at least one of the generated ENGOs in a particular year has an education focus. ε captures all other unobserved variation.

Our empirical model of ENGOs determining environmental policies is not without acknowledged deficiencies. The Poisson model predicts the number of environmental policies in a given year given the number of ENGOs created in a year, but policy quantity may not capture measures of quality. Outcome measures for each policy are unavailable, so we are assuming that greater, more impacting policy outcomes correlate with the policy generation. This is not an extreme assumption, though, as each policy generated is rooted in substantive discussion among policy makers, ENGOs, and even scientists. In other words, policies generated are de facto evidence of a policy-making process that involves interest groups such as ENGOs. The degree to which ENGOs are involved, however, remains unknown in our model. The case studies below fill in the knowledge gaps about how ENGOs have limited environmental degradation.

Statistical Results

The Poisson model is based on a unique time period for each country, which ends in 2010 and begins in the year prior to the first environmental policy (t_0), regardless of category. If there were any lagged effects of ENGO creation on environmental policy, it is assumed that the previous year of data would capture them.[10] The time period begins in 1967 for Japan, 1962 for Korea, 1974 for Taiwan, and 1980 for China. We realize that we could have set the time period for each type of environmental policy according to the first policy of each type, but this would not have accounted for the propensity for the policy types to grow together.

Descriptive statistics are presented in Table 1. When considering these summary statistics, it should be kept in mind that Japan and Korea have approximately 50% percent more time periods than China, based on t_0; thus, when data are concentrated in the smaller period, as they are for China, the results are (positively or negatively) weighted.

A number of observations can be made about the descriptive statistics. First, across nation-states but within each nation-state's environmental policy-making time frame, air pollution policies tend to be well represented. The exception is Korea, where general policies dominate. Second, EIS-related policies are relatively less represented in all four nation-states, as the mean for EIS-related policies is ranked fourth (out of the four types of environmental policies) across each nation-state's policy-making time frame. In other words, calls for public involvement seem to be relatively less important than other methods of overseeing and regulating environmental concerns. Third, China has a very high mean score for market-related policies. We attribute this to the need for careful monitoring of industry in the wake of exceptionally high growth.

Turning now to part 1 of our spuriousness test, presented in Table 2, the relationship between catastrophes and ENGO creation is statistically significant only in Japan and China: each additional catastrophe decreases ENGO creation by 12.01% in Japan and increases ENGO creation by 9.86% in China. These contrasting results are challenging to interpret, but the lack of consistency across all four nation-states does not present strong evidence of a catastrophe-ENGO connection. To confirm this, a Poisson fixed-effects model is used to estimate the effects of catastrophes on ENGO creation, to aggregate the data and deal with

Table 1. Summary Statistics by Country

Panel A: Japan, $t = 44$ (1967–2010)				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Air pollution	2.88	2.15	0	6
General	0.65	0.86	0	2
EIS related	0.31	0.47	0	1
Market related	0.43	0.78	0	2
ENGO (no.)	1.36	1.77	0	7
Education dummy	0.36	0.48	0	1
Catastrophe (no.)	1.70	2.85	0	10
Panel B: Korea, $t = 49$ (1962–2010)				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Air pollution	0.42	0.50	0	1
General	2.18	1.01	0	4
EIS related	0.24	0.43	0	1
Market related	0.48	0.73	0	2
ENGO (no.)	6.95	8.23	0	36
Education dummy	0.38	0.49	0	1
Catastrophe (no.)	0.24	0.56	0	2
Panel C: Taiwan, $t = 37$ (1974–2010)				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Air pollution	4.00	2.67	0	8
General	0.24	0.43	0	1
EIS related	1.83	2.19	0	5
Market related	1.18	1.68	0	4
ENGO (no.)	0.27	0.50	0	2
Education dummy	0.16	0.37	0	1
Catastrophe (no.)	0.91	1.40	0	5
Panel D: China, $t = 31$ (1980–2010)				
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**
Air pollution	3.61	3.61	0	8
General	3.06	2.03	0	6
EIS related	2.67	1.35	0	4
Market related	6.06	5.27	0	12
ENGO (no.)	4.77	5.18	0	16
Education dummy	0.90	0.30	0	1
Catastrophe (no.)	2.22	2.81	0	11

expected country and temporal effects in the empirical specification not captured by catastrophes. With t_0 set conservatively to 1965 for the entire fixed-effects model, the coefficients are positive but not statistically significant (0.086; $\chi^2 = 2.21$, Prob > $\chi^2 = 0.1369$).

Table 2. The Relationship Between Catastrophes and ENGO Creation

	ENGOs created	ENGOs created	ENGOs created	ENGOs created
	Japan	**Korea**	**Taiwan**	**China**
Number of disasters	**–0.128****	0.168	–0.304	**0.094***
	(0.055)	(0.214)	(0.224)	(0.055)
Incidence rate (percentage)	**–12.01**	18.29	–26.21	**9.86**
Obs.	44	49	37	31
Log-likelihood	–77.957	–276.415	–23.214	–115.575
Wald chi^2	5.32	0.62	1.84	2.91
Prob > chi^2	0.0210	0.4325	0.1751	0.0878

Notes: * and ** represent statistical significance at the 0.10 and 0.05 levels, respectively. White's robust standard errors are presented in parentheses. Coefficients for the constant are omitted. For identification purposes, bold font represents statistically significant coefficients, $p < 0.10$.

Part 2 of our spuriousness test provides a much clearer picture of the relationship between catastrophes and environmental policy generation. Tables 3 and 4 present the statistical results, where coefficients from the Poisson model are presented in Table 3 (along with log-likelihood and χ^2 values) and the incidence rate ratios are presented in Table 4. The number of catastrophes is positively and significantly related to environmental policy generation across all four countries. This is particularly true for the Korean case, where each additional disaster increased the percentage of environmental policy generation from 40.64 to 194.47%. The effect was also quite high in Taiwan. In Japan and China, the effects were still statistically significant, ranging from 14.22 to 38.82% in Japan and from 10.19 to 75.24% in China. In terms of how the ranking of these effects compares across countries, there are no clear patterns except for market-oriented policies, which have the greatest effect in Japan and China and the second-largest effect in Korea and Taiwan.

Test results for the hypothesis that environmental policies are a positive function of ENGOs are presented in Tables 5 and 6. In Korea and China, while controlling for the education efforts of ENGOs, ENGO creation leads to increases in all four types of environmental policies. In Korea, for every ENGO created, air pollution policies increase 6.93%, broad environmental policies increase 2.02%, EIS-related policies increase 14.57%, and market-oriented policies increase 9.64%. In China, for every ENGO created, air pollution policies increase 14.00%, broad environmental policies increase 8.22%, EIS-related policies increase 6.61%, and market-oriented policies increase 12.30%. In Japan, each additional ENGO led to an increase in air pollution policies and decreases in broad environmental policies, EIS-related policies, and market-oriented policies; however, these results were all statistically insignificant. In Taiwan, there are statistically significant decreases in broad environmental policies and market-oriented policies for each additional ENGO.

These results confirm that the growth of ENGOs is a positive function of all four types of environmental policies, but not across all four nation-states. This

Table 3. The Relationship Between Catastrophes and Policy Creation

	Japan	Korea	Taiwan	China
		Air pollution		
Number of disasters	**0.133*****	**0.707*****	**0.285*****	**0.187*****
	(0.018)	(0.145)	(0.038)	(0.042)
Obs.	44	49	37	31
Log-likelihood	–80.985	–36.082	–73.041	–77.297
Wald chi^2	49.92	23.76	54.65	19.56
Prob > chi^2	0.0000	0.0000	0.0000	0.0000
		Broad		
Number of disasters	**0.217*****	**0.341*****	**0.681*****	**0.144*****
	(0.034)	(0.066)	(0.111)	(0.028)
Obs.	44	49	37	31
Log-likelihood	–39.050	–73.105	–14.787	–53.926
Wald chi^2	38.92	26.45	37.11	25.74
Prob > chi^2	0.0000	0.0000	0.0000	0.0000
		EIS		
Number of disasters	**0.229*****	**1.080*****	**0.449*****	**0.097*****
	(0.041)	(0.202)	(0.075)	(0.024)
Obs.	44	49	37	31
Log-likelihood	–24.757	–24.505	–62.599	–51.117
Wald chi^2	30.15	28.58	35.43	16.37
Prob > chi^2	0.0000	0.0000	0.0000	0.0000
		Market oriented		
Number of disasters	**0.328*****	**0.969*****	**0.561*****	**0.561*****
	(0.048)	(0.185)	(0.080)	(0.080)
Obs.	44	49	37	31
Log-likelihood	–25.051	–39.277	–42.944	–42.944
Wald chi^2	45.49	27.44	48.29	48.29
Prob > chi^2	0.0000	0.0000	0.0000	0.0000

Notes. *** represents statistical significance at the 0.01 level. White's robust standard errors are presented in parentheses. Coefficients for the constant are omitted. For identification purposes, bold font represents statistically significant coefficients, $p < 0.10$.

phenomenon occurs only in Korea and China, whereas coefficients for Japan and Taiwan are inconsistent and, in the case of Taiwan, potentially biased due to a relatively small number of documented ENGOs. The results do not confirm our second hypothesis that education-oriented ENGOs have an additional, positive effect on the growth of environmental policies. Indeed, the impact appears to be negative, which may indicate a misallocation of ENGO resources and offers a direct challenge to Popovic (1993).

Conclusions and Policy Prescriptions

This article explains variance in environmental policies as a function of ENGO generation, streamlining the data into a simple model of effective public partici-

Table 4. Incidence Rate Ratios for the Catastrophe-Policy Creation Relationship

	Japan	Korea	Taiwan	China
		Air pollution		
Number of disasters	**14.22**	**102.79**	**32.98**	**20.56**
		Broad		
Number of disasters	**24.23**	**40.64**	**97.59**	**15.49**
		EIS		
Number of disasters	**25.73**	**194.47**	**56.67**	**10.19**
		Market oriented		
Number of disasters	**38.82**	**163.53**	**75.24**	**75.24**

Note. For identification purposes, bold font represents statistically significant coefficients, $p < 0.10$.

pation. This was framed initially within the construct of NEPA variants in Japan, Korea, Taiwan, and China, as the EIS process mandates public environmentalism and subsequent ENGO involvement. It was expanded to account for other key environmental policy types and provide an unprecedented look at the effects of ENGOs in these four countries. Our results from Poisson modeling show that policies increase as ENGOs are created, albeit not always at a statistically significant level across all countries.

These results counter our expectations. Our review of the case-specific literature and the tendency for the state to limit public environmentalism in these four countries led us to expect that the iron triangle structure would limit the effects of ENGOs on environmental policies; however, the iron triangle strength-test showed different results across countries. Given ENGO generation across each country's respective time frame, not a single category of environmental policies in Japan and Taiwan experienced a positive, statistically significant change. In Korea and China, the opposite was true. This offers evidence that ENGOs in Korea and China are actively involved in the policy-making structure, representing multiple interests and perhaps even limiting the iron triangle from dictating environmental policy-related outcomes. We attribute this to a sufficient balancing of the interests of the public and the government in these two countries, which should be confirmed through qualitative analysis of ENGO efficacy. This is the next logical step in research for studies of Northeast Asian environmentalism.

We suggest two additional foci for future research. First, we must develop and understand how the education focus of each nation-state's ENGO base affects the public's role in environmental policy outcomes, particularly the EIS process. In this article, we hypothesized that education, in addition to ENGO growth, would impact environmental policy-making. Our results were counterintuitive. Exploratory research would do much to detail how and to what end an education focus enlarges the public's knowledge of environmental problems.

Second, future research efforts must account for landmark environmental events that have the potential to stimulate public environmentalism and, thus, challenge the integrity of the iron triangle with regard to environmental policy-

Table 5. The Relationship Between ENGO Creation and Policy Creation

	Japan	Korea	Taiwan	China
		Air pollution		
ENGOs created	0.008	**0.067*****	–0.062	**0.131*****
	(0.065)	(0.020)	(0.258)	(0.021)
Education	0.170	–0.162	–0.036	**–1.359****
	(0.302)	(0.430)	(0.356)	(0.550)
Obs.	44	49	37	31
Log-likelihood	–93.801	–34.319	–89.449	–71.497
Wald chi^2	0.84	18.99	0.23	36.98
Prob > chi^2	0.6243	0.0001	0.8929	0.0000
		Broad		
ENGOs created	–0.050	**0.020*****	**–16.250*****	**0.079*****
	(0.157)	(0.005)	(0.592)	(0.012)
Education	0.044	0.646	**15.894*****	**–0.877****
	(0.599)	(0.108)	(1.194)	(0.382)
Obs.	44	49	37	31
Log-likelihood	–48.638	–73.135	–20.631	–55.747
Wald chi^2	0.18	16.37	770.64	42.16
Prob > chi^2	0.9129	0.0003	0.0000	0.0000
		EIS		
ENGOs created	–0.276	**0.136*****	0.107	**0.064*****
	(0.226)	(0.030)	(0.537)	(0.011)
Education	0.600	**–2.879****	–0.230	**–0.621*****
	(0.709)	(0.952)	(0.777)	(0.231)
Obs.	44	49	37	31
Log-likelihood	–29.409	–24.084	–83.886	–49.991
Wald chi^2	1.54	22.96	0.09	30.48
Prob > chi^2	0.4619	0.0000	0.9566	0.0000
		Market oriented		
ENGOs created	–0.399	**0.092*****	**–0.919***	**0.116*****
	(0.345)	(0.022)	(0.545)	(0.018)
Education	–0.250	**–1.584*****	0.761	**–1.135****
	(1.158)	(0.489)	(0.851)	(0.472)
Obs.	44	49	37	31
Log-likelihood	–37.485	–41.208	–64.486	–93.008
Wald chi^2	5.64	17.33	2.99	38.44
Prob > chi^2	0.0595	0.0002	0.2245	0.0000

Notes. *, **, and *** represent statistical significance at the 0.10, 0.05, and 0.01 levels, respectively. Intercept represents the average value of the country-specific fixed effects. White's robust standard errors are presented in parentheses. Coefficients for the constant are omitted. For identification purposes, bold font represents statistically significant coefficients, $p < 0.10$.

Table 6. Incidence Rate Ratios for the ENGO-Policy Creation Relationship

	Japan	Korea	Taiwan	China
		Air pollution		
ENGOs created	0.80	**6.93**	–6.01	**14.00**
		Broad		
ENGOs created	–4.88	**2.02**	**–100.00**	**8.22**
		EIS		
ENGOs created	–24.12	**14.57**	11.29	**6.61**
		Market oriented		
ENGOs created	–32.90	**9.64**	**–60.11**	**12.30**

Note. For identification purposes, bold font represents statistically significant coefficients, $p < 0.10$.

making. We have seen this most recently in China with regard to the previously undisclosed social and economic costs of the Three Gorges Dam. As well, the March 2011 tsunami's impact on the Fukushima Daiichi nuclear reactors in Japan will undoubtedly impact the assessment process—in Japan and abroad—and fuel growth in environmental policies to further address nuclear risks and hazards. Our spuriousness test for Japan also confirms that the number of ENGOs does not grow in the wake of catastrophes. Given the impact of the damaged nuclear reactors on human health and the local (and potentially regional) ecosystems, we would be surprised to see this pattern continue.

Notes

[1]See Jones, Baumgartner, and Talbert (1993) for details about iron triangles, also known as "policy communities" and "policy monopolies."

[2]It is important to note that NGOs in Japan, such as those mentioned above, do not always have a strict environmental focus. Johnson, Saito, and Nishikido (2009), for example, examine NGOs that include the environment as part of a larger agenda. Others, such as Knight (2010), look longitudinally at ENGO influence based on social and political factors.

[3]It should be noted that formal participation in the EIS process cannot always be equated with effective participation (Simon, 1999).

[4]With regard to the EIS process, this is particularly important when private entities fund and prepare EISs and exacerbate problems of information asymmetries (Ashford & Caldart, 2008).

[5]Education has been identified as a mobilizing factor in China (O'Brien, 2008).

[6]See, for example, http://earthquake.usgs.gov/earthquakes/world/, http://en.wikipedia.org/wiki/List_of_natural_disasters, http://en.wikipedia.org/wiki/List_of_earthquakes_in_China, http://www.asianews.it/news-en/Worst-drought-in-a-century-wipes-out-harvests-in-south western-China-17947.html, and http://en.wikipedia.org/wiki/List_of_earthquakes_in_Japan. Note that for every event listed, we accessed all references (journal articles and news reports) to collect information on damages (in monetary terms), number of casualties, and event strength.

[7]See, for example, http://www.jeef.or.jp/, http://www4.ncsu.edu/~leung/ioasia.html#tw, and http://en.wikipedia.org/wiki/List_of_environmental_organizations.

[8]The complete list of ENGOs (including number of members, contact information, and operating budget) is available upon request to the corresponding author.

[9]Additional examples include distance learning programs, zoo programs, degree programs, issue-related training, school workshops, camping trips, teacher training programs, service-learning programs, touring mobile education vehicles, television programs, public classes, publishing lesson plans and classroom materials, eco-trips, and observation trips.

[10]We examine the possibility of lagged effects (i.e., ENGOs impacting policy-making one or two years later) with no difference from the results presented here.

References

Ashford, N. A., & Caldart, C. C. (2008). *Environmental law, policy, and economics: Reclaiming the environmental agenda*. Cambridge, MA: MIT Press.

Caldwell, L. K. (1988). Environmental impact analysis (EIA): Origins, evolution, and future directions. *Review of Policy Research*, *8*(1), 75–83.

Cameron, A. C., & Trivedi, P. K. (1998). *Regression analysis of count data*. Cambridge: Cambridge University Press.

Desai, U. (2002). Institutional profiles and policy performance: Summary and conclusion. In U. Desai (Ed.), *Environmental politics and policy in industrialized countries* (pp. 1–28). Cambridge, MA: MIT Press.

Devlin, J. F., & Yap, N. T. (2008). Contentious politics in environmental assessment: Blocked projects and winning coalitions. *Impact Assessment and Project Appraisal*, *26*(1), 17–27.

Diamond, L. (1999). *Developing democracy: Toward consolidation*. Baltimore: Johns Hopkins University Press.

Dobson, H. (2002). Social movements, civil society and democracy in Japan. In C. Kinnvall & K. Jonsson (Eds.), *Globalization and democratization in Asia: The construction of identity* (pp. 131–148). London: Routledge.

Dreher, R. G. (2005). *NEPA under siege: The political assault on the National Environmental Policy Act*. Washington, DC: Georgetown Environmental Law and Policy Institute.

Du, J., Yang, F., Xu, L., Harashina, S., & Li, B. (2010). Characteristics of public participation in EA: The potential to improve sustainable environmental management in China. *Journal of Sustainable Development*, *3*, 187–193.

Elsarji, M. (2008, May). *How a local NGO succeeded in cleaning up the Lebanon oil spill, 2006*. Paper presented at the International Oil Spill Conference, Savannah, GA.

Fine, J. D., & Owen, D. (2005). Technocracy and democracy: Conflicts between models and participation in environmental law and planning. *Hastings Law Journal*, *56*, 901–982.

Furlong, S. R., & Kerwin, C. M. (2005). Interest group participation in rule making: A decade of change. *Journal of Public Administration Research and Theory*, *15*, 353–370.

Golden, M. M. (1998). Interest groups in the rule-making process: Who participates? Whose voices get heard? *Journal of Public Administration Research and Theory*, *8*, 245–270.

Hausman, J., Hall, B. H., & Griliches, Z. (1984). Econometric models for count data with an application to the patents-R&D relationship. *Econometrica*, *52*, 909–938.

Johnson, E. W., Saito, Y., & Nishikido, M. (2009). The organizational demography of Japanese environmentalism. *Sociological Inquiry*, *79*, 481–504.

Jones, B. D., Baumgartner, F. R., & Talbert, J. C. (1993). The destruction of issue monopolies in Congress. *American Political Science Review*, *87*, 657–671.

Ju, C. B., & Tang, S.-Y. (2010). External legitimacy, goal congruence and collective resistance: Environmental NGOs and land use politics in South Korea. *Urban Studies*, *48*, 811–825.

Knight, C. (2010). The nature conservation movement in post-war Japan. *Environment and History*, *16*, 349–370.

Korea NGO Promotion (KENGO) and National Network of Environmental Organization of Korea (NNEOK). (2007). *Encyclopedia of Korean environmental associations*. Seoul: Author.

Lempriere, T. C., Stanbury, W. T., & Vertinsky, I. B. (1996). Environmental NGOs, new information technologies and the demand for environmental improvement in the developing and industrializing nations of the Asia Pacific region. *Journal of the Asia Pacific Economy*, *1*, 139–169.

Lim, J. H., & Tang, S. Y. (2002). Democratization and environmental policy-making in Korea. *Governance*, *15*, 561–582.

Liroff, R. (1976). *A national policy for the environment: NEPA and its aftermath*. Bloomington: Indiana University Press.

Lo, C., Fryxell, G., & Wong, W. (2006). Effective regulations with little effect? The antecedents of the perceptions of environmental officials on enforcement effectiveness in China. *Environmental Management*, *38*, 388–410.

Lo, C. W.-H., Fryxell, G. E., & Van Rooij, B. (2009). Changes in enforcement styles among environmental enforcement officials in China. *Environment and Planning A*, *41*(11), 2706–2723.

Lo, C. W.-H., Tang, S.-Y., & Chan, S.-K. (1997). The political economy of EIA in Guangzhou. *Environmental Impact Assessment Review*, *17*, 371–382.

Mason, R. J. (1999). Whither Japan's environmental movement? An assessment of problems and prospects at the national level. *Pacific Affairs*, *72*, 187–207.

Melnick, R. S. (1983). *Regulation and the courts: The case of the Clean Air Act*. Washington, DC: Brookings Institution.

Mol, A. P. J. (2009). Urban environmental governance innovations in China. *Current Opinion in Environmental Sustainability*, *1*, 96–100.

Newig, J., & Fritsch, O. (2009). Environmental governance: Participatory, multi-level—and effective? *Environmental Policy and Governance*, *19*, 197–214.

Nikolic, S. J. S., & Koontz, T. M. (2008). Nonprofit organizations in environmental management: A comparative analysis of government impacts. *Journal of Public Administration Research and Theory*, *18*, 441–463.

O'Brien, K. J. (Ed.). (2008). *Popular protest in China*. Cambridge, MA: Harvard University Press.

O'Faircheallaigh, C. (2010). Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making. *Environmental Impact Assessment Review*, *30*, 19–27.

Popovic, N. A. F. (1993). The right to participate in decisions that affect the environment. *Pace Environmental Law Review*, *10*, 683–709.

Rosenbluth, F. M., & Thies, M. F. (2002). The political economy of Japanese pollution regulation. *American Asian Review*, *20*(1), 1–32.

Shapiro, M. A. (2009). Korea's environmental sustainability leadership in East Asia and beyond. *Korea Observer*, *40*, 735–762.

Shapiro, M. A. (in press). Northeast Asian environmental regimes: Regional and technological considerations. In Z. Zhu (Ed.), *New dynamics in East Asian politics*. New York: Continuum.

Simon, A. E. (1999). Valuing public participation. *Ecology Law Quarterly*, *25*, 757–763.

Stearns, L. B., & Almeida, P. D. (2004). This formation of state actor-social movement coalitions and favorable policy outcomes. *Social Problems*, *51*(4), 478–504.

Tang, S.-Y., Tang, C.-P., & Lo, C. W.-H. (2005). Public participation and environmental impact assessment in mainland China and Taiwan: Political foundations of environmental management. *Journal of Development Studies*, *41*, 1–32.

Taylor, S. (1984). *Making bureaucracies think: The environmental impact statement strategy of administrative reform*. Stanford, CA: Stanford University Press.

Van Rooij, B., & Lo, C. W.-H. (2010). Fragile convergence: Understanding variation in the enforcement of China's Industrial Pollution Law. *Law & Policy*, *32*(1), 14–37.

Wang, Y., Morgan, R. K., & Cashmore, M. (2003). Environmental impact assessment of projects in the People's Republic of China: New law, old problems. *Environmental Impact Assessment Review*, *23*, 543–579.

Yackee, S. W. (2006). Sweet-talking the fourth branch: The influence of interest group comments on federal agency rulemaking. *Journal of Public Administration Research and Theory*, *16*, 103–124.

Zhan, X., & Tang, S.-Y. (2010, February). *Political opportunities, resource constraints, and policy advocacy: A longitudinal study of environmental NGOs in China*. Paper presented at the Symposium on Reform and Transition in Public Administration Theory and Practice in Greater China, University of Hong Kong.

Zywicki, T. J. (2002). Baptists: The political economy of environmental interest groups. *Case Western Reserve Law Review*, *53*, 315–351.