Pro-environmental Attitudes and Behaviors: An International Comparison

Midori Aoyagi-Usui
Social and Environmental Systems Division
National Institute Environmental Studies
16-2 Onogawa, Tsukuba, Ibaraki 305-0053
JAPAN[1]

Henk Vinken
Globus, Institute for Globalization and Sustainable Development
IRIC, Institute for Research on International Cooperation
Tilburg University
THE NETHERLANDS

Atsuko Kuribayashi
Insurance Research Group, NLI Research Institute
1-1-1 Yurakucho, Chiyoda-ku, Tokyo 100-0006
JAPAN

Abstract

Data from international comparison surveys was analyzed to explore differences in environmental values amongst Asian and Western countries. We found that the structure of environmental values in Asian countries differs from those in Western countries. While an environmental way of thinking conforms to traditional Asian values of honoring parents and family security, Western people believe that such thinking opposes their traditional values. These structural differences, which have been documented by White (1967) and by several Japanese researchers (e.g., Watanabe 1995), are confirmed and clarified by our surveys. Our study reveals the following conclusions: First, in the Netherlands and the United States, environmental values are linked with altruistic values that are perceived as being contrary to traditional values. In Japan, Bangkok, and Manila, environmental values are linked with both traditional and altruistic values. Second, environmental values are contrary to egoistic and progressive values in all surveyed countries. Third, factors encouraging environmental actions differ by country and by type of actions.

Keywords: *environmental values, general values, environmental behavior*

Introduction

The values of Japanese people and their attitudes toward nature have long been thought to be distinct from those of Western people. For example, Tetsuro Watsuji (1935-1979), one of the best-known prewar Japanese philosophers, contrasted the cultural climate of Asian countries (including Japan), in which he described people as living with nature, and that of European countries, in which he described people as fighting against nature. His essay significantly affected subsequent research on human attitudes and the environment in Japan. His influence was so strong that Japanese researchers tended to use his ideas *a priori* in their research, and seldom studied how Japanese environmental values differed from those of Westerners. Thus they established separate ideas of environmental values that were broadly accepted domestically, such as "life environmentalism ideology" (Torigoe and Kada 1984; Torigoe 1989). This ideology emphasizes concepts of living with nature. People holding this ideology usually do not use the term "environment." They have their own specific expressions for the nature around them and they know exactly how they should manage their land, rivers, meadows, and other regional resources. White (1967) insisted that the idea of human dominance over nature caused the destruction of nature in Christian countries, but

Watanabe (1995) insisted that Japanese people do not have the same concept of nature as Western people. *Shizen*, the word for nature that is currently used in Japan, is borrowed from Chinese and has a different meaning from the Western concept. Most Japanese do not draw a clear boundary between humans and nature, while Westerners discuss nature in the context of its relationship to humans. Watanabe further argued that most Japanese would not consider nature as a subject for scientific analysis or observation. In the same spirit, Ogawa (1998) pointed out that the Ministry of Culture and Education, in its "Guideline for Teaching" ("Shido Yoryo" in Japanese), suggests that science in the classroom should include "love for nature" elements. This means that *Rika* ("Science class" in Japanese) is not only for teaching natural science, but also for teaching a background philosophy of loving nature. Watanabe (1995) argued that the lack of a clear boundary between humans and nature in Japan causes destruction of nature. In his view, this aspect of the Japanese concept of nature meant that the Japanese could not discuss the value of the environment.

Researchers in western countries have been trying to analyze values in a common framework. Among them, Inglehart (1977, 1981, 1995, 1996), Inglehart and Carballo (1997), and Inglehart and Abramson (1999) found that his postmaterialist thesis was much related to the emerging environmentalism. Both postmaterialism and materialism are distinguished by a combination of items that refer to the condition of democracy. For postmaterialism, it is "giving people more say in important government decisions," and "protecting freedom of speech;" for materialism, it is "maintaining order" and "fighting rising prices." Researchers who chose other combinations of "giving people more say in important government decisions" and "maintaining order," or "protecting freedom of speech" and "fighting rising prices" are categorized as "mixed." Inglehart used other surveys to show that generational effect and also that the environmental values of a society are affected by its social and economic situation. This thesis is well known and fits well with data at the nation-state level in developed countries. However, there has been much criticism of this thesis. Brechin and Kempton (1994) maintain that this thesis is not appropriate for explaining globally emerging environmentalism, especially in developing countries. (See other criticisms, Brechin and Kempton 1997; Kidd and Lee 1997; Dunlap and Mertig 1997; Pierce 1997, and for Inglehart and others' responses, see Abramson, 1997; Inglehart and Abramson, 1999).

The history of Japanese environmental policy may add some contributions to this argument. McKean (1981) states that Japan's environmental movement has differed from that of the United States in that Japanese environmental issues are rooted in "the history of pollution." Since the beginning of industrialization in the nineteenth century, Japan has faced serious pollution problems. Typical nineteenth-century examples include toxic smoke hazards and river water pollution from Ashio copper mining and toxic smoke hazards from Niihama copper mining. In the twentieth century, residents in the area of the Shiranui Sea (midwest Kyushu Island) have been suffering from Minamata disease. As of 1993, the official number of victims was 2,255, with 2,376 others still seeking to be certified as victims (Environment Agency of Japan 1997). The number of persons denied this certification was 12,503.[2] Muramatsu (1998) states that there are two aspects in the Japanese environmental movement. One is the antipollution movement that started in the 1950s, in which pollution victims sued pollution companies and the national government. These cases often emerged in rural areas. Although they could get nation-wide attention, members of the movement were isolated in their local societies. Another aspect in Japanese environmentalism is the residents' movement, which often emerged in urban areas. Members of this movement called for participation in local government policy-making, and voted for their own candidates in local elections. This movement was very popular in the 1970s and early 1980s, and clearly corresponds to emerging postmaterialism in Japan. It would be a misunderstanding to think that the antipollution movement provided a pivotal position for emerging environmentalism based on postmaterialism. Those involved in the antipollution movement did not ask for democratic participation in policy formation. They just asked for basic human rights because people had had such severe and miserable experiences. They were not secure in any sense at all. The postmaterialist thesis is based on Rokeach's value theory (Rokeach 1973). Schwartz and Blisky also analyzed general value structures based on Rokeach's, using data from five countries and, later, twenty countries (Schwartz and Blisky 1987, 1990; Schwartz 1992); their five-country study included one Asian society, Hong Kong. They found that the value structure was slightly different in the Hong Kong sample from the samples of Western countries, but the values themselves were not different. Specifically, they found that "the meaning of the values and domains were not different for the Hong Kong sample. What differed was the perception of domains as compatible or in conflict. Value domains seen as incompatible in the West were seen as compatible in Hong Kong." Furthermore, they explain the differences "based on contrasts between Confucianist and Western thought" that can be clarified by "replications (of surveys) in Chinese cultures and studies in Islamic, Buddhist, and other cultures."

A number of researchers have explored values concerning the environment. Dunlap and Van Liere (1978) first proposed the New Environmental Paradigm (NEP), "composed of three distinct dimensions — balance of nature, limits to

growth, and anthropocentrism" (Dunlap and Jones 2002). The concepts of NEP contrast popularly accepted worldviews (the dominant social paradigm) that emphasize mass consumption and economic growth. Using a similar framework, Milbrath (1984) compared NEP and the dominant social paradigm in three Western countries: United States, Germany, and the United Kingdom. Karp (1996) tested the relationship between general values and environmental values. The George Mason University group (Stern, Dietz and Kalof 1993; Stern, Dietz 1994; Stern, Dietz and Guagnano, 1995; Stern, Dietz, Kalof and Guagnano 1995; Stern 1998; Stern, Dietz, Guagnano and Kalof 1999; Stern 2000; Dietz, Kalof and Stern 2002) has been investigating general and environmental values, including NEP. Using NEP and Schwartz's general value items, they derived four factors in the structure of general values. They called these factors biospheric-altruistic, egoistic, openness to change, and traditional (conservative). According to their results, biospheric-altruistic values, egoistic values, and traditional values are significantly correlated with items in the NEP. The components of each of these factors are shown in Table 1 with our own analysis (see the column for the George Mason University group's cluster in Table 1). Biospheric-altruistic values include unity with nature, respecting the earth, protecting the environment, and a world at peace, equality, and social justice. Egoistic values include authority, wealth, and influence. Traditional values include honoring parents and elders, family security, and self-discipline. Most research about environmental values has been done in the United States; few studies have been conducted in Asian contexts. One exception is the series of comparative studies by Pierce et al. (1987) in which they applied Inglehart's postmaterialist theory and Dunlap's NEP to both Japan and the United States. Japanese respondents showed a higher percentage of acceptance for NEP items, even among the materialist group, than did their counterparts in the United States. The authors reached a very interesting conclusion: "Unlike the United States, then, in Japan the New Environmental Paradigm is not really all that new."

The Survey Countries and Data Collection

Our survey was part of an international comparative study entitled GOES (Global Environmental Survey). The survey was carried out in September 1997 in Japan, December 1997 in Bangkok, Thailand, and January 1999 in metropolitan Manila, Philippines, by the National Institute for Environmental Studies of the Japan Environment Agency (now called the Ministry of the Environment). Another team from the Institute for Social Research at Tilburg University in the Netherlands conducted a survey in that country from December 1997 to February 1998. In Japan, respondents were aged sixteen years or older, sampled nationwide, and interviewed face to face. We surveyed 2,190 individuals; the response rate was 70.0%, yielding 1,533 respondents. In Thailand, respondents were twenty to forty-nine years old, sampled from residents of metropolitan Bangkok with annual incomes higher than the national average (20,000 bahts). In the Philippines, respondents were twenty to forty-nine years old, sampled from residents of metropolitan Manila whose annual household incomes exceeded the national average (25,000 pesos). The samples in Bangkok and Manila were drawn from populations with higher incomes to compare their way of life with people in Japan and other more developed countries. We received 300 completed surveys in each country due to limited funding and inability to get the list of residents. We could not employ exact proportional probability sampling based on individuals, as we did in Japan and the Netherlands. Instead, we employed area sampling. First we chose geographic areas, and then professional interviewers were sent to those areas, where they visited each house and chose interviewees in the house who were appropriate in age and income. They continued interviewing until the respondents numbered 300. The Netherlands' respondents were drawn from a nationwide random sample (N = 1,004) of the Dutch population aged 16 years and older by face to face interview. The response rate was somewhat puzzling, though: 37%. This response rate is clearly low, but alas, not exceptionally so. Consequently, a weighting procedure was used to correct for these differences. After this correction, the final research sample included exactly 1,000 respondents, which was quite sufficient for our research goals.

Japan and Thailand were compared because they are the only countries in Asia where the main religion is Buddhism, and because they have not been colonized by Western countries in the past (although Japan was occupied by the United States after World War II for six years). Thailand is categorized as a newly industrialized economic society. There is still a big economic gap between the two countries, which we tried to reconcile by using a sample from the so-called "new middle class" in Thailand.

The Philippines is the only country in Asia where the main religion is Catholicism (82% of respondents). Its history is complicated. It had no national king before being colonized, first by Spain, and then by the United States, briefly by Japan in Word War II, and again briefly by the United States before independence. The country is very much influenced by American culture. Because the schools teach in English, all of our interviews there were conducted in English.

Our questionnaire covered a variety of topics concerning the environment, including values, attitudes, and behavior. In

Table 1. Results of factor analysis of Schwartz's value items.

Japan Item	Loading	The Netherlands Item	Loading	The George Mason Group* Item	Loading	Bangkok Item	Loading	Manila Item	Loading
Factor 1: Biospheric-traditional		***Factor 1: Biospheric-altruistic***		***Factor 1: Biospheric-altruistic***		***Factor 1: Biospheric-altruistic***		***Factor 1: Tradition***	
A world at peace	0.787	Respecting the earth	0.723	Unity with nature	0.81	Unity with nature	0.804	Family security	0.846
Family security	0.765	Unity with nature	0.702	Respecting the earth	0.74	Self-discipline	0.717	Honoring parents and elders	0.762
Respecting the earth	0.648	Protecting the environment	0.629	Protecting the environment	0.81	Protecting the environment	0.628	Self discipline	0.707
Protecting the environment	0.610	Social justice	0.525	A world at peace	0.69	Equality	0.607	A world at peace	0.659
Honoring parents and elders	0.453	A world at peace	0.523	Equality	0.64	Protecting the environment	0.641		
		Equality	0.478	Social justice	0.59				
				Helpfulness	0.55				
				A world of beauty	0.53				
				Sense of belonging	0.43				
Eigenvalue	3.308	Eigenvalue	3.038			Eigenvalue	3.496	Eigenvalue	4.064
Factor 2: Altruistic		***Factor 2: Egoistic***		***Factor 2: Egoistic***		***Factor 2: Traditional***		***Factor 2:Biospheric-Altruistic***	
Influence	0.622	Authority	0.788	Authority	0.67	Family security	0.756	Social justice	0.680
Equality	0.581	Influence	0.763	Wealth	0.48	Respecting the earth	0.631	Unity with nature	0.678
Self-discipline	0.576	Self-discipline	0.300	Influence	0.44	Honoring parents and elders	0.629	Equality	0.624
Social justice	0.562			Social power	0.62	A world at peace	0.601	Respecting the earth	0.485
Unity with nature	0.520					Social justice	0.493		
Eigenvalue	1.342	Eigenvalue	1.452			Eigenvalue	1.617	Eigenvalue	1. 545
Factor 3: Egoistic		***Factor 3: Conservation*** (Traditional)		***Factor 4: Conservation*** (Traditional)		***Factor 3: Egoistic***		***Factor 3: Egoistic***	
Wealth	0.789	Family security	0.716	Honoring parents and elders	0.85	Authority	0.780	Wealth	0.734
Authority	0.780	Wealth	0.664	Family security	0.62	Influential	0.700	Authority	0.703
		Honoring parents and elders	0.522	Self discipline	0.56	Wealth	0.615	Influence	0.678
				Honesty	0.71				
				Obedience	0.54				
				Cleanliness	0.49				
				Politeness	0.46				
				Social order	0.46				
				Loyalty	0.40				
Eigenvalue	1.097	Eigenvalue	1.151			Eigenvalue	1.160	Eigenvalue	1.102
Total variance explained	48%	Total variance explained	47%			Total variance explained	52%	Total variance explained	56%

* "George Mason Group" defined in Stern, Dietz, and Guagnano (1995). Items that were not used in our analysis are not listed here.

this paper, we are focusing on the relationships between values and behavior. We used a modified version of Schwartz's general value items and economy-versus-environment items to clarify the value basis of environmental attitudes and proenvironmental behavior, and to compare these among the study populations. The modified Schwartz items were developed by the George Mason University group (Stern, Dietz and Kalof 1993; Stern, Dietz and Guagnano 1995) into a twelve-item system that is especially relevant to environmental attitudes and behavior.

As Schwartz noted, structural differences may exist between Western and Asian countries. According to Watsuji's idea, which is broadly accepted in Japanese academe, Asian people have the view that humans are united with nature — that nature is not against humans. Also, as Pierce et al. (1987) found, the NEP is not entirely new to Japanese people. We hypothesized that environmental values would be linked with traditional views already existing in Japanese society. We compared the value structures from our samples with the George Mason University group's U.S. results, focusing especially on the categorization of each value concerning the environment in Schwartz's general value system.

For economy-versus-environment items, we used a set of questionnaires from the International Social Survey Programme (ISSP) 1993 module on the environment. The content of this set of questionnaires is very similar to that used to derive NEP, and tries to draw a contrast between the dominant social paradigm and NEP. The six items that we used have two environmentally pessimistic expressions and four economic- and progress-oriented expressions. We used factor analysis to derive the tendencies of people's attitudes toward the environment, and compared the relationships with Schwartz's general value items in four countries and the George Mason group's U.S. results.

Finally, to the Japanese and Netherlands samples we applied regression and logistic analysis to derive predictors for proenvironmental behavior.

Results

Schwartz's Value Items

We asked respondents to evaluate each of twelve general value items with the following question: "Please tell me how important each of these is as a guiding principle in your life." We asked respondents to rate the importance on a five-point scale from "completely unimportant" to "extremely important," and included the voluntary options, "this item is against my (respondent's) principles" and "don't know." (The raw responses are available from the first author.)

We applied factor analysis to categorize the general value items in each country (Table 1), together with those of the U.S. samples by the George Mason University group (Stern, Dietz, and Guagnano 1995) for reference. By using factor analysis, for each country we derived three factors with eigenvalues larger than 1.

In Table 1, we compare Japan and the Netherlands, and also the George Mason University group results. For Japan's data, we labeled factor 1 as "biospheric-tradition" because it includes two items of tradition and two environmental items. Factor 2 was labeled "altruistic" because three altruistic items are included, although one was related to the environment (unity with nature). Factor 3 was labeled "egoistic," which includes wealth and authority. For the data from the Netherlands and the United States, three environment-related items (respecting the earth, unity with nature, and protecting the environment) were grouped with altruistic items such as social justice, a world at peace, and equality. But in Japan, they were grouped differently. We labeled factor 1 as biospheric-altruistic, factor 2 as egoistic, and factor 3 as tradition. Note that responses were labeled the same because the two countries had almost the same responses. They are both highly developed and predominantly Christian countries.

Table 1 also compares responses from the Asian countries. In all three countries, environment-related items were categorized differently. In Japan, two environment-related items were grouped with the traditional items, and another one with altruistic items. In Bangkok and Manila, two environment-related items were grouped with altruistic items, and another one with traditional items. In all three countries, the egoistic items were in a separate category.

The results suggest that the structure of values might be different in non-Western countries, as Schwartz found. Environmental values are not distinct from altruistic or traditional items. Thus, as Pierce et al. (1987) reported, the NEP concepts may not be new among Asian people. The environment is tightly connected with other value items. But the structure does not seem to be the same, even among Asian countries. The close relationship of traditional and environmental values was observed in Japan, but not in Bangkok or Manila.

Valuing the Environment

The results of our factor analysis of the data from Japan and the Netherlands seem to be almost the same (Table 2; the raw responses are available from the first author). The items belonging to factor 1 can be described as "preference for progress," and the items belonging to factor 2 as "preference for the environment." These two factors explain 55% of the total variance in Japan and 50% in the Netherlands. Table 2 shows that the value structure was the same in Manila as that of Japan and of the Netherlands, but was different in Bangkok. We were unable to explain the Bangkok structure, which requires further investigation.

Table 2. Belief in general consequences regarding the environment.

	Japan		Netherlands		Bangkok		Manila	
	Factor 1	**Factor 2**	**Factor 1**	**Factor 2**	**Factor 1**	**Factor 2**	**Factor 1**	**Factor 2**
a. Any change that humans cause in nature - no matter how scientific - is likely to make things worse.		0.818		0.749	0.542			0.812
b. Modern technology will solve environmental problems reasonably well.	0.644			-0.459	0.504		0.406	
c. We worry too much about the future of the environment and not enough about prices and jobs today.	0.790		0.784		0.747		0.747	
d. Almost everything we do in modern life harms the environment.		0.813		0.699		0.628		0.747
e. People worry too much about economic progress harming the environment.	0.719		0.733			0.807	0.430	
f. It is just too difficult for me as an individual to do much about the environment.	0.540		0.509		0.722		0.729	
Eigenvalue (total variance explained in parentheses)	2.161	1.132 (55%)	1.571	1.424 (50%)	1.631	1.230 (48%)	1.847	1.027 (48%)

Relationship between General Values and Environmental Values

To explore the relationship between the general value items and values on the environment, we applied ordinary least-squares regression (Table 3). We did not include the results for Bangkok because we could not find a progress-versus-environment structure in the Bangkok sample, as shown in Table 2. Our regression analysis did not reveal any statistically significant relationship in the Manila sample. There are interesting differences in our results from Japan and the Netherlands and the George Mason University group's U.S. results. The Netherlands results show interesting similarities to the George Mason University group's U.S. results. Traditional values were a negative predictor in the Netherlands sample, as was NEP. Although the items were similar to those in the Japanese "environment" value, the sign was positive in our Japanese sample. The other two variables were consistent with the George Mason University group's results. The "altruistic" factor was not statistically significant in the estimation of environmental values, but has a statistically significant negative indicator in the "progress" values in our data. We also observed negative effects of "egoistic" values in all countries.

These findings on "traditional" and "environmental" values are noteworthy, as are the features of Asian environmental values. As Pierce et al. (1987) noted, and our data suggest, "protecting the environment" is a traditional concept, especially in Japan.

We could not identify progress-versus-environment beliefs in Bangkok. Also, we could not identify clear and sig-

Table 3. Results of regressions for environmental values and Schwartz's values: Japan, the Netherlands, the United States and Manila.[a]

	Japan				The Netherlands				The George Mason Group's Result†	Manila			
Independent variable	Environment		Progress		Environment		Progress		NEP	Environment		Progress	
Traditional values	0.137	(0.025) ***	-0.167	(0.071) *	-0.111	(0.031)***	0.251	(0.030) ***	-0.197**	-0.017	(0.059)	-0.0397	(0.059)
Altruistic values	-0.017	(0.025)	-0.167	(0.024) ***	0.207	(0.032) ***	-0.168	(0.030) ***	0.459***	-0.080	(0.058)	0.0325	(0.059)
Egoistic values	-0.187	(0.025) ***	0.083	(0.024) ***	-0.0591	(0.032)*	0.024	(0.031)	-0.255**	-0.106	(0.59)	-0.0691	(0.059)
(Openness)									0.061				
Age	-0.0045	(0.014)	0.034	(0.024) **	0.0034	(0.002)	0.0181	(0.002)	0.000	0.0119	(0.007)	-0.0023	(0.007)
Gender (Female = 1)	0.144	(0.051) **	-0.117	(0.049) **	0.142	(0.063)**	-0.109	(0.061)*	0.407	-0.0693	(0.035)	-0.0272	(0.119)
Constant	-0.128	(0.074)	-0.164	(0.071) **	-0.202	(0.104)*	-0.714	(0.099) ***	-0.234	-0.375	(0.263)	0.0859	(0.266)
N	1322		1322		974		974		184	287		287	
R square (adj.)	0.069***		0.061***		0.069***		0.155***			0.367	0.011		0.008

† The George Mason group's result is derived from Table 5 in Stern, Dietz, and Guagnano (1995).

*p < 0.05, **p < 0.01, ***p < 0.001

[a]Figures in each column are coefficients and figures in parentheses are standard deviations.

nificant relationships between environment beliefs and general values in the Manila sample. One hypothesis is that in less developed parts of Asia, there might not yet be distinct environmental awareness or clear recognition of an association between progress and environmental destruction.

How Values Predict Behaviors

Table 4 shows the results of our estimation of significant variables for political, energy-saving, and "green-consumer" behaviors in the responses from Japan and the Netherlands, correlated by values, education, gender, and household income. We used three value systems: postmaterialist values, Schwartz's values, and environmental values.

Overall, the responses from Japan show very consistent tendencies in every variable, while the responses from the Netherlands show different directions for political behavior, energy-saving behaviors, and green-consumer behaviors. In Japan, postmaterialist values, the biospheric-tradition factor, altruistic values, household income, education, age, and gender had positive effects on these three types of behavior; only progressive values had a negative effect. In the responses from the Netherlands, postmaterialist values, biospheric-altruistic values, egoistic values, household income, and age had positive effects on political behavior. Tradition, progressive values, and gender had negative effects on political behavior. In the responses from the Netherlands, except for tradition values, almost all variables had a negative effect on energy-saving and green-consumer behaviors. In the Netherlands, women were less likely to be positive than men in political and energy-saving behaviors; Japanese women were more likely to be positive than Japanese men in energy-saving and green-consumer behaviors. Political behavior seems to have a totally different social context, and hence, personal context, in the Netherlands. Politically, the environmental movement seems to be counter-traditional in the Netherlands, while saving energy and being green consumers seem to be traditional ways of living. This is understandable since they are economic activities. But in Japan, even political behavior is associated with traditional ways of thinking, such as honoring parents and elders and family security. Moreover, environmental behavior in Japan is contrary to progressive values (preference for economic growth and technological solutions). Japanese people seem to think of energy-saving be-havior and green-consumer behavior as anti-economic growth actions. Also, environmental actions such as energy-saving behavior or green-consumer behavior are associated with altruistic values. This means that saving resources is not cost-saving, but is done for other people's sake.

Table 4. Summary of results of regression analysis of values and behaviors: Japan and the Netherlands.†

		Political[a]		Energy-saving[b]		Green-consumer[c]	
		Japan‡	Netherlands‡	Japan‡	Netherlands‡	Japan‡	Netherlands‡
Postmaterialist value		+	+	+	-		-
Schwartz value	Bios-tradition (J) Tradition (N)	+	-	+	+	+	+
	Altruistic (J) Bios-altruistic (N)	+	+	+	-	+	-
	Egoistic		+		-		-
Environmental value	Environment						
	Progress	-	-		-	+	
Household income	+	+			+	-	
Education	+		+				
Age	+	+	+		+		
Gender (Female=1)		-	+	-	+		

‡ + means positive significant (> 10%) relationship and - means negative significant (> 10%) relationship.

† Logistic regression was used to estimate consumer behavior; elsewhere, ordinary least-squares estimates were used.

[a] Political behavior includes signing a petition, joining demonstrations, contacting government officials, being a member of an environmental group.

[b] Energy-saving behavior includes using less energy for cooking, heating, and cooling in the household, using less water in the household, using public transport instead of a car, separating items for recycling.

[c] Green-consumer behavior includes looking at environmental labeling before purchasing, buying things made of recycled material, buying organically grown food, buying products that are environmentally packaged, buying cars that are more fuel-efficient, and taking one's own bags when shopping.

Conclusion

We found that the structure of environmental values in Asian countries differs from those in Western countries. In Asia, an environmental way of thinking blends with traditional concepts of honoring parents and family security, while Western people believe environmental concepts run counter to traditional values. These structural differences have been pointed out by White (1967) and several Japanese researchers (e.g., Watanabe 1995) and are here confirmed and shown clearly through surveys.

Here are the conclusions of our study: First, in the Netherlands and the United States, environmental values are linked with altruistic values that are perceived to be contrary to traditional values, while in Japan, Bangkok, and Manila, environmental values are linked with both traditional and altruistic values. Especially in Japan, environmental values are strongly connected with traditional values. Second, environmental values are contrary to egoistic and progressive values in all of the survey countries. But it seems this aspect is more pronounced in developed societies, based upon the different structure that we observed in the Bangkok sample. Because we conducted our survey in Manila in English, and thus our Manila respondents are educated in English, the results there might be affected by this fact. Third, the factors encouraging environmental behavior are different among countries, and vary according to the types of environmental behavior. In the Netherlands, political behavior seems to be in a totally different social context from energy-saving and green-consumer behaviors. Traditional values are negative predictors of political behavior, but positive predictors of energy-saving and green-consumer behaviors. In Japan, political, energy-saving, and green-consumer behaviors seem to be in the same social context, with signs of significant variables in the same direction (either positive or negative).

An interesting point is the relationship of postmaterialist values, traditional values, and pro-environmental behaviors. Postmaterialist values measure the degree of preference for socially liberal ideas. In the Netherlands' sample, postmaterialist values are positive indicators of political behavior, but negative indicators of energy-saving and green-consumer behaviors. In other words, the more the respondents have materialist preferences, the more they are likely to avoid political behavior, but to engage in energy-saving and green-consumer behaviors. Furthermore, traditional values are negative predictors of political behavior and positive predictors of energy-saving and green-consumer behaviors; this means that the Netherlands respondents who are more traditional tend not to engage in political behavior, but do engage in energy-saving and green-consumer behaviors. These results are consistent with the analysis shown in Table 2, where the environmental values have a negative relationship with traditional values.

In Japan, however, traditional ways of thinking seem to be consistent with environmental ideas. Consequently, signs for political behavior, energy-saving behavior, and green consumer behavior are the same. Based on these results, it seems that we can examine the social context of environmental policy-making in Japan. One of the recent, active arguments in Japan is to look back to the Edo period (the period when the Tokugawa Shogunate governed Japan, 1603-1868). Proponents of this argument maintain that people's everyday lives in the Edo period were characterized by resource-saving, nature-conserving, environmentally friendly behaviors, and community management of resources such as rivers, ponds, mountains, and trees. This argument is connected to the argument that we need to keep traditional values in order to maintain social order. People never talk about the environment in the context of issues of the new social order, such as human rights and democratic ways of political decision-making.

Endnotes

1. E-mail: aoyagi@nies.go.jp
2. The number of patients has been a controversial topic among stakeholders. For example, some physicians estimate that at least half of the 200,000 people who had lived along the coast of the Shiranui Sea in the late 1950s might be affected by some form of mercury poisoning (see for example, Harada 1985).

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