

The Fukushima Nuclear Accident and Environmental Risk: A Survey of Fukushima Residents

Takeshi Miyawaki¹

Nihon University

Shinya Sasaoka

Hiroshima Shudo University

Abstract

The Fukushima nuclear accident caused by an earthquake and a subsequent tsunami on March 11, 2011 has seriously impacted the environment surrounding the Fukushima Daiichi nuclear power plant. While all the residents near the plant were evacuated from the area deemed uninhabitable after the accident, residents of the neighboring area outside of the evacuation zone still seem to live in fear of invisible radiation. To understand Fukushima residents' thinking about the environmental risks that accompany a nuclear disaster, we utilize a poll of the residents of Fukushima conducted in 2013. Based on the survey data, we reveal factors that seem to strongly affect their knowledge and concerns about nuclear power plants. The results of the multivariate analysis show the importance of the following two factors: (1) confidence in mass media, and (2) trust in institutions in charge of administering the accident, especially the central government, the Nuclear and Industrial Safety Agency, and Tokyo Electric Power Company. We conclude that the more people trust mass media and particular institutions, the more likely it is that they have an elevated sense of anxiety and fear of the presence of nuclear plants.

Key Words: Fukushima nuclear disaster, public opinion, mass media, risk perception

¹ All correspondence concerning this article should be addressed to Takeshi Miyawaki at the College of Risk Management, Nihon University 3-34-1 Shimouma Setagaya-ku, Tokyo 154-0002 or by email at miyawaki.takeshi@nihon-u.ac.jp

Introduction

This paper attempts to clarify Fukushima residents' views concerning nuclear energy after the Fukushima nuclear power plant accident on March 11, 2011. There has been research into the risks of nuclear energy based on public opinion polls regarding the Chernobyl nuclear plant accident (Eiser, Spears, & Webley, 1989; Lindell & Perry, 1990). Some of these investigations reveal that the devastating event changed the public's acceptance of nuclear power. However, other studies show that public attitudes toward nuclear energy have been slowly rebounding recently (Visschers & Wallquist, 2013). Further, polls in many countries consistently found growing support for nuclear energy through the 1990s and 2000s (Newport, 2012; Stoutenborough, Sturgesb, & Vedlitz, 2013). On the other hand, scholars point out that often the general public tends to overestimate the risks of the nuclear power (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978; Slovic, 1987). Thus, there exists an abundance of research on public understanding and acceptance concerning the risks involved with nuclear energy since the Chernobyl accident.

In Japan, the nuclear power plants lost public trust after a critical accident at JCO Co. of Tokai Village on September 30, 1999.² However, sometime after the nuclear power plant accident, nuclear power started to regain public trust (Kitada, 2006). Reacting to the positive public opinion, the government promoted building nuclear power plants as an energy policy in Japan³, about which, according to the public poll, people were positive⁴.

These results of the public polls on nuclear power plants raise questions: how did the Fukushima nuclear accident affect the perception of the environmental risks of nuclear energy among the residents who lived near the plant? Further, what do the Fukushima

² *Mainichi Shimbun* on October 4, 1999.

³ In the energy basis plan (June 2010), the ratio of the zero emission power supplies (nuclear power and renewable energy origin) is assumed to be about 70% (roughly 50% or more in 2020) of the government. <http://www.meti.go.jp/committee/summary/0004657/energy.pdf>

⁴ See, outline of "Special public opinion poll concerning nuclear power" (2009 November) Cabinet Office, Government of Japan <http://survey.gov-online.go.jp/tokubetu/h21/h21-genshi.pdf>

residents understand about the environmental risks caused by the nuclear disaster, such as the fear of invisible radiation, after the accident? However, there is little research in terms of the risk of the nuclear power plant and the residents in Fukushima. Imai (2011a, 2011b, 2012) investigated the extent to which residents supported the nuclear power plant after the accident. However, his research neither assesses the fear of nuclear power plant nor addresses the question concerning the understanding of risks associated with the nuclear power plant. Meanwhile, Takagi (2015) clarified the influence that the radiation should have among citizens of Iwaki, the city near the nuclear power plants; his research showed that health-related anxieties concerning radiation influenced interpersonal relationships and that the risk the locals feel about nuclear power plant has not been clarified.⁵

Based on the research so far, we asked how fearful those citizens are about nuclear power plants in Japan. Table 1 shows that 66.19% of respondents of this study were very fearful of nuclear plants. As will be revealed in the present research, the clear majority of the Fukushima residents live with some degree of fear concerning nuclear power. According to Beck (1986), individual risk perception is directly related to the level of uneasiness and fear experienced by the individual. In this paper, we analyze the factors of fear and risk of the nuclear power plant.

Hypothesis

What, then, are the factors that influence the fear of nuclear power of the residents of Fukushima? In this section, two hypotheses about the possible factors are introduced. First, trust in mass media can be an important factor. Onishi (1998, 48) found that public attitude towards nuclear power plants is significantly affected by information provided by media in Japan. This means that those who have more confidence in mass media may feel more fearful of nuclear plants. In the case of Fukushima, after the nuclear accident, many residents were forced to evacuate. Therefore, mass media such as televisions and

⁵ The research of Iwai and Shishido (2015) serves as a reference. However, the research does not clarify the consideration of the residents of the location.

newspapers is their only source for receiving information about the nuclear power plant accident. These media, in fact, turned out to increase their fears of the risks (Shimbun Tsushin Chosakai, 2012). Fukuda (2010) demonstrated that when the media reported on nuclear accidents, the degree of interest increased. Therefore, many studies reveal that risk anxiety and cognition are related.

Other research also suggests that the general public feels uneasy about radiation, and points to media coverage of the nuclear accident as a cause (Iida, Yamamoto, & Shimada, 1997). Thus, it has been pointed out that the mass media and the uneasiness about the nuclear power plant are related. Therefore, trust in the mass media as the source of information can be important.

Hypothesis 1: Those who have more confidence in mass media feel more fearful of nuclear plants.

Second, it is thought that trust in the institution is related to fear. Some research shows that public attitude towards nuclear power plants changes depending on the amount of information that rouses uneasiness (Tanigaki, Tsuchida, Tsujikawa, & Nagaoka, 2009). The research results reveal that the trust in information is related to the attitude toward the institution, that is, the government and the nuclear power plant. Those who have less confidence in the institution feel afraid of the nuclear plants, as they do not trust the information released by them. The residents, however, can do nothing but learn about the nuclear accident through information released from institutions, such as the government, Nuclear and Industrial safety agency (NISA), and Tokyo Electric Power Company (TEPCO). Public trust in such institutions has an effect on their willingness to accept nuclear power plants (Kimura, Furuta, & Suzuki, 2003).

Hypothesis 2: Those who have less confidence in information from institutions in charge of nuclear accidents feel more afraid of nuclear plants.

In the following sections, these factors will be examined using regression analysis

Methodology

In order to test our hypotheses, we use the data from a survey conducted at several safe shelters in Fukushima in February 2012. The survey was developed and conducted by Fukuda and Miyawaki, both of Nihon University. Two-hundred-ten respondents living in temporary housing complexes were interviewed; 105 respondents lived within a 20 km radius of the plant (Futaba Machi, Okuma Machi, Tomioka Machi, Namie Machi, & Naraha Machi) and 105 respondents lived within between a 20 and 30 km radius of the plant (Iwaki City). Fukuda and Miyawaki selected these residents to represent both those that lived in the area surrounding the Fukushima Daiichi plant and those that lived farther from it. Their sampling method is a purposive sampling that is usually used to choose areas and sample.⁶ They collected data by conducting in-person interviews and employing leaving method, which means respondents completed questionnaires handed to them by a researcher, and then the researcher picks them up. The number of questionnaires collected by the interview process is 217, of which 210 were valid. The questionnaire consists of 22 questions.

Analysis

Factor Analysis

We used factor analysis to find correlations among the observed variables and generate a new set of variables prior to testing the hypotheses. The question Q16, "On a scale of 1-4, how much trust do you have in information that originates from the mass media?" was used (N=210). Q16 is 4-point ordinal scale with decreasing values representing trust (1 = trusts it very much, 2 = trusts it a little, 3 = does not trust it much, 4 = does not trust at all). We factor-analyzed nine sub-items of Q16 to create new variables

⁶ The residents who lived in the region located in the Fukushima Daiichi were taking shelter, and as such it was difficult to extract the sample from the basic resident register. Therefore, the author executed the questionnaire and the interview investigation in the temporary shelter to which the residents took shelter by the group in each region.

showing which factors the respondents have confidence in (Table 2). We recognize that Q16 has two factors. The first factor is called “Confidence in Media” because items regarding newspapers, TV, and radio load highly on it.⁷ This variable represents whether mass media could win over public confidence. If a value of the variable is high, it means that mass media has high credibility. Next, we labeled the second factor “Confidence in Institutions⁸” because entities including government, NISA, and TEPCO load highly on it. This variable shows whether some public and private institutions on nuclear energy stimulate public confidence.⁹ If a value of the variable is high, it means that the institutions could earn a high level of trust.

Ordered Logit Regression Analysis

As already mentioned, the dependent variable of this analysis is *Fear About Nuclear Plants* (Q21), which has a 4-point Likert scale, with decreasing values representing greater fear (4 = not fearful at all). Therefore, ordered logit regression analysis was used here for analyzing the variance in the degree of fear, because it is often employed to estimate relationships between an ordinal dependent variable and some independent variables.

Each of the newly crafted “Confidence in Media” and “Confidence in Institutions” factors was used to test Hypothesis 1-2 as the independent variables. As described above, “Confidence in Media” and “Confidence in Institutions” were extracted by the factor analysis of Q16. These values are represented by the factor scores. These independent variables were expected to have a negative correlation with *Fear about Nuclear Plants*.

Additionally, three demographic variables that were incorporated into our model are Gender (male = 0, female = 1), Age (20-89) and Education (Elementary school = 1, Junior High School = 2, University = 3) (see Table 1). As for gender, other research supports the finding that women feel more fearful of nuclear energy compared to men (Onishi, 1998;

⁷ Cronbach's coefficient alpha of the first factor was 0.889.

⁸ In the present study, the word “institution” refers to the government, NISA, and TEPCO only.

⁹ Cronbach's coefficient alpha of the second factor was 0.852.

Kono & Masaki, 2014). This research, however, indicates that both men and women felt a surge in uneasiness during nuclear accidents.¹⁰ The research also indicates that women feel more uneasiness than men about a potential nuclear accident. Moreover, age and educational background are related to knowledge about nuclear power plant accidents.

Furthermore, another four variables that are likely to influence the analysis were included as control variables. The first was *Support of Ruling Party*, which showed whether the respondents supported the ruling party at the time of the survey that is the Democratic Party of Japan (DPJ), and was coded 1 if they supported DPJ and 0 otherwise. The second was *No Connection to Nuclear Industry*, which indicated that the respondents were not employed in nuclear industries nor had close relatives or friends who worked there. It was coded 1 if they, their friends, and their relatives did not have any connections with nuclear industries and 0 otherwise. The third was *Frequency of Seeing Mass Media*. Mass media trust and time spent consuming it may be related. Therefore, we treat it as a variable (see Table 1). Finally, the fourth was *Necessity of Nuclear Plants*.¹¹ Kitada and Hayashi (2000) pointed out that the number of those who reported a rise in negative perceptions of the nuclear power plant on their questionnaire and those who feel insecure increased after the accident.

The results of the analysis clearly indicate that those who have more confidence in mass media have less confidence in institutions, and feel at higher risk of nuclear plants than those who do not trust mass media as much. First, the coefficient for “Confidence in Media” is positive and statistically significant, though at the 10% level, as predicted. This

¹⁰ Some research found that neither the male nor the female differ in their uneasiness of nuclear power (Tsuji & Kanda, 2008, 38).

¹¹ To create this variable, we conducted factor analysis on six sub-items of Q18 (N=210). (“How often do you think about each of these issues concerning the nuclear power plant?”) Q18 is 4-point ordinal scale with decreasing values representing trust (1 = thinks about it very much, 2 = thinks about it a little, 3 = does not think too much about it, 4 = does not think about it at all). As the result, we introduced two factors, “Necessity of Nuclear Plants” and “Risk of Nuclear Plants.” Ominousness to Nuclear Radiation, Unpredictability of Effects of Radioactive Contamination, and Impossibility of Protecting Oneself from Risk of Nuclear Wastes are loaded higher on the second factor. This “Risk of Nuclear Plants” is a variable that represents nuclear plants to be unsafe because of the massive risks associated with them (Cronbach's coefficient alpha of the second factor was 0.705). If a value of the variable is high, it suggests that people felt more exposed to the risk.

can be because those who have more confidence in mass media had more opportunities to be exposed to footage or articles of disastrous events involving nuclear plants. One example of this was found in an article in *Asahi Shimbun*. When a unit at the Fukushima Daiichi nuclear plant exploded on March 12, a woman moving from Tomioka to Kawauchi heard of the event on radio at a safe shelter. She first felt fear, and thought to herself, "We are finished." She then shed tears while watching her children's faces, reported the newspaper.¹²

Next, the coefficient for "Confidence in Institutions" is negative and statistically significant at the 1% level and helps prove the hypothesis. Those who have less confidence in information provided by the institutions in charge of nuclear accidents are also likely to doubt whether existing nuclear plants are safe. In fact, those staffing the local government and the inhabitants expressed their dissatisfaction with the shortage of information coming from the national government. Therefore, it seems the results of the study are valid.

In general, the hypotheses were largely verified. As mentioned before, trust in mass media leads to more fear of nuclear power plants, as does mistrust in institutions. Although the sample size was not large, the findings provide some insights into the relationship between fear of nuclear plants and trust in mass media as well as in institutions.

Conclusion

In this article, we examined the factors that influence fear of nuclear power plants and identified who are more likely to be fearful of nuclear plants: those who have more confidence in mass media; and those who have less confidence in information from the institutions dealing with nuclear accidents. We identified two key results from our analysis of residents who once lived near the Fukushima nuclear plant. First, the less confidence people have in mass media, the more they fear nuclear plants. Second, people who do not

¹² *Asahi Shimbun* on March 29, 2011. This article was published only in Kochi.

trust institutions within nuclear energy industry and government agencies are likely to have a greater fear of it.

We can state the following two implications about distrust of the government. First the relationship between risk and public confidence in government should be noted. Since the Japanese government has lost public credibility for some time, it seems that these low levels of public trust in the Japanese government foster the fear of nuclear energy even more. Second, this type of public mistrust might be mediated by media. The Fukushima residents had limited access to precise information about the nuclear disaster. Because they could only get important information about the nuclear accident through the mass media, they had no choice but place considerable trust in those media among them. A lot of information that was conveyed from those media caused a great deal of fear. On the other hand, they thought that the Japanese government had not been playing a significant role in providing information on the ongoing situation, so they might come to lose confidence in those institutions affiliated with the government.

References

- Beck, U. (1986). *Riskogesellschaft* [Risk society: towards a new modernity]. Frankfurt, Germany: Suhrkamp Verlag.
- Chungn, W., & Yeung, I. M. H. (2013). Attitudes of Hong Kong residents toward the Daya Bay nuclear power plant. *Energy Policy*. 62, 1172–1186.
- Eiser, J.R., Spears, R., & Webley, P. (1989). Nuclear attitudes before and after Chernobyl: Change and judgment. *Journal of Applied Social Psychology*. 19, 689–700.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough: A psychometric study of attitudes toward technological risks and benefits. *Policy Sciences*. 9(2), 127–152.
- Fukuda, M. (2010). *Risuku Komyunikeshon to Media: Shakai Chousaronteki Apurouchi* [*Risk communication to Media*]. Tokyo, Japan: Hokuju Shupan.
- Iida, H., Yamamoto, T., & Shimada, Y. (1997). *Iryou niokeru Houshasen Bougo no Ishiki Chousa: Dai1pou Houshasen Bougo no Kiso Chishiki to Houshasen eno Fuan nitsuie* [Understanding of

- radiation protection in medicine: Part1: Knowledge about radiation exposure and anxiety about radiation injury]. *Japanese Journal of Radiological Technology*. 53(10), 1551–1563.
- Imai, A. (2011a). Genpatu saigai hinansha no jittutai chousa (1). [The primary survey of inhabitants who were evacuated from the nuclear power plant disaster]. *The Jichi-Soken Monthly Review of Local Government*. 393, 1–37.
- Imai, A. (2011b). Genpatu saigai hinansha no jittutai chousa (2). [The second primary survey of inhabitants who were evacuated from the nuclear power plant disaster.] *The Jichi-Soken Monthly Review of Local Government*. 398, 17–41.
- Imai, A. (2012). Genpatu saigai hinansha no jittutai chousa (3). [The third primary survey of inhabitants who were evacuated from the nuclear power plant disaster.] *The Jichi-Soken Monthly Review of Local Government*. 402, 24–56.
- Iwai, N. & Shishido, K. (2015). The Impact of the Great East Japan Earthquake and Fukushima Daiichi nuclear accident on people's perception of disaster risks and attitudes toward nuclear energy policy. *Asian Journal for Public Opinion Research*, 2(3), 172-195.
<http://dx.doi.org/10.15206/ajpor.2015.2.3.172>
- Keller, C., Visschers, V., & Siegrist, M. (2012). Affective imagery and acceptance of replacing nuclear power plant. *Risk Analysis*, 32, 464-477.
- Kimura, H., Furuta, K., & Suzuki, A. (2003). Genshiryoku no shakaitekijyuyousei wo handan suru youin :chishikiryou ni yoru hikaku bunseki. [Psychological factors affecting public acceptance of nuclear energy: Comparative analysis focusing on regional characteristics and degree of knowledge.] *Transactions of the Atomic Energy Society of Japan*, 2(4), 379-388.
- Kitada, A., & Hayashi, C. (2000). Tokai -mura rinkaijiko ga kousyu no genshiryoku hatuden ni taisuru taido ni oyoboshita eikyuu. [Effects of the criticality accident at Tokai - mura on the public's attitude to nuclear power.] *Journal of the Institute of Nuclear Safety System*, 7, 25-44.
- Kitada, A. (2006). Genshiryoku hatuden ni kansuru ishiki no keizoku chousa mihamaki jiko 1nenngo no kekka. [Longitudinal survey of public opinion toward nuclear power generation: The result of a survey conducted one year after the Mihama Unit 3 accident.] *Journal of the Institute of Nuclear Safety System*, 13, 303-310.
- Kitada, A. (2013). Keizokuchousa de miru genshiryoku hatudensho ni taisuru Yyoron kako 30nenn to Fukushima Daiichi Genshiryoku hatudensho jikogo no henka. [Public opinion on nuclear power generation measured in continuous polls changes after Fukushima Daiichi nuclear power plant accident over the past 30 years.] *Transactions of the Atomic Energy Society of Japan*, 12(3), 177-196.
- Kono, K., & Masaki, M. (2014). Shinsai 3 nen "bousai to Enerugii" Chousa: kokumin to hisaisha no ishiki wo saguru [Public opinion survey on "Disaster Prevention and Energy" conducted three years after the Great East Japan Earthquake: Exploring the attitudes of the people across Japan and of the residents in afflicted areas]. *The NHK Monthly Report on Broadcast Research*. 64(4), 2–29.

- Lindell, M.K., & Perry, R.W. (1990). Effects of the Chernobyl accidents on public perceptions of nuclear plant accident risks. *Risk Analysis*, 10(3), 393–399.
- Newport, F. (2012). Americans still favor nuclear power a year after Fukushima. Retrieved from <http://www.gallup.com/poll/153452/americans-favor-nuclear-power-year-fukushima.aspx>.
- Onishi, T. (1998). Variation of public opinion regarding nuclear energy with the change of nuclear information by the media. *Atomic Energy Society of Japan*. 40(7), 563–571.
- Shimbun Tsushin Chosakai. (2012). *Dai 4kai Media ni kansuru zenkoku yoron chousa 2011*[The 4th nationwide survey on media in Japan, 2011.] Retrieved from <http://www.chosakai.gr.jp/notification/pdf/report4.pdf>
- Siegrist, M., & Visschers, V. H. M. (2013). Acceptance of nuclear power: The Fukushima effect. *Energy Policy*, 59, 112–119.
- Siegrist, M., Sütterlin, B., & Keller, C. (2014). Why have people changed their attitudes toward nuclear power after the accident in Fukushima? *Energy Policy*, 69, 356–363.
- Slovic, P. (1987). Perception of risk. *Science*, 236(4799), 280–285.
- Stoutenborough, J.W., Sturgess, S.G., & Vedlitz, A. (2013). Knowledge, risk, and policy support: Public perceptions of nuclear power. *Energy Policy*, 62, 176–184.
- Takagi, T. (2015). Genpatsu jiko nitaisuru Iwaki shimin no ishiki kouzou (1): chousa kekka no gaiyou [Consciousness structure of Iwaki citizens for Nuclear Accidents (1) Summary of survey research for Iwaki citizen]. *The research bulletin of Iwaki Meisei University the College of Humanities. Humanities and social sciences*. 28, 65–80.
- Tanigaki, T., Tsuchida, S., Tsujikawa, N., & Nagaoka, Y. (2009). Gensiryoku hatsuden eno shoki taido niyotte enerugii busoku jouhou no okurite nitaisuru shinrai ni oyobosu eikyuu: risuku komyunikeshon no jikken kenkyu [The effects energy shortage information has on provider trust due to the primary attitude towards nuclear power: An experimental study on risk communication]. *Japanese Journal of Risk Analysis*, 19(2), 57–68.
- Tsuji, S., & Kanda, R. (2008). Nihonjin no gensiryoku houshasen kan nikansuru chousa kenkyu [The questionnaire survey regarding the image of “Radiation” among Japanese Public]. *Japanese Journal of Risk Analysis*, 18(2), 33–45.
- Visschers, V. H.M., & Wallquist, L. (2013). Nuclear power before and after Fukushima: The relations between acceptance, ambivalence and knowledge. *Journal of Environmental Psychology*, 36, 77–86.

Appendix

Table 1 The distributions of respondents to the questions

Q21. Fear of Nuclear Plants (N=210)

	Ratio
1. Very feaful	66.19%
2. Somewhat feaful	25.17%
3. Not so feaful	7.14%
4. Not feaful at all	0.95%

Gender (N=210)

	Ratio
1. Male	41.40%
0. Female	58.60%

Educational background (N=210)

	Ratio
1. Elementary school	23.40%
2. Junior High School * High School	56.50%
3. University	20.10%

Supported the ruling party (DJP) (N=210)

	Ratio
1. Supported the ruling party	15.20%
0. Not supported the ruling party	76.20%
No answer	8.60%

No Connection to Nuclear Industry (N=210)

	Ratio
1. No connection	45.60%
0. Otherwise	54.40%

Q13. Watch the news on nuclear power plant accident in the mass media.(N=210)

	Ratio
1. Not see the mass media news at all	2.40%
2. Not see much news on mass media	10.00%
3. Sometimes watched the mass media news	22.90%
4. Watched the mass media news very well	64.80%

Table 2 Trust in Information from the Institution (N = 210)

	Coefficient	S.E.	p-value
Confidence in Media	.341	.206	.099
Confidence in Institutions	-.497	.208	.017
Gender (F1) (Female = 1)	1.128	.377	.003
Age (F2)	-.031	.012	.008
Education (F3)	-.348	.305	.254
Support of Ruling Party (Q7) (Support = 1)	-.399	.482	.408
No Connection to Nuclear Industry (Q8.6) (No Connection = 1)	-.150	.378	.692
Frequency of Seeing Mass Media (Q13)	-.144	.231	.532
Risk of Nuclear Plant	.656	.199	.001
<i>Threshold</i>			
Cut 1	-2.099	1.332	
Cut 2	.454	1.331	
Cut 3	2.298	1.471	
Number of Observation		158	
Pseudo R-squared		.269	

Table 3 Ordered Logit Regression analysis on Fear About Nuclear Plants

	Coefficient	S.E.	p-value
Confidence in Media	.341	.206	.099
Confidence in Institutions	-.497	.208	.017
Gender (F1) (Female = 1)	1.128	.377	.003
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Cut 3	2.298	1.471	
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Biographical Notes

Takeshi Miyawaki is a lecturer at the College of Risk Management, Nihon University. Recent publications include “A Consideration of the Handling by the Government of Nuclear Power Plants and the Attitude of Residents of Municipalities Where Nuclear Power Plants are Located toward Nuclear Power Plants” (Studies in political science and economics, 2014).

He can be reached at the College of Risk Management, Nihon University 3-34-1 Shimouma Setagaya-ku, Tokyo 154-0002 or by email at miyawaki.takeshi@nihon-u.ac.jp

Shinya Sasaoka is part-time lecturer at Hiroshima Shudo University. His research interests include comparative politics. His main paper is “Environmental Consciousness of ASEAN Citizens” published in *Japanese Journal of Political Science*, 15(2), 2014.

He can be reached by email at: sasaoka@shudo-u.ac.jp

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