

HAS JAPAN OVERCOME THE IMPACT OF FUKUSHIMA? : INTERACTION BETWEEN THE GOVERNMENT AND THE CIVIL SOCIETY OVER NUCLEAR SAFETY ISSUES

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The accident of Fukushima nuclear power plant occurred in 2011 revealed deficits of governance over nuclear safety in Japan. As the society has faced challenges to improve and enhance the nuclear power safety and disaster prevention systems, this study focuses on reforms undertaken after the accident. Results of questionnaire surveys conducted showed that the civil society has not considered the new regulatory body as trustworthy. In like manner, the questionnaire surveys shows many look upon evacuation plans formulated in the system as not sufficiently “concrete and reasonable.” This study sees determinants of trust and procedural fairness as significant to interact successfully with the civil society, and to reconstruct risk governance.

1. Introduction

1.1 Impact of “Fukushima”

On Friday 11 March 2011, a magnitude 9 earthquake and subsequent tsunami struck the Pacific coast of northern Japan, Tohoku region, and triggered severe damage at the Fukushima Daiichi Nuclear Power Station. The accident was measured Level 7 on the International Nuclear and Radiological Event Scale (INES), and significantly affected the environment and society. As large amounts of radioactive materials were released, the populations of the areas around the nuclear power plant were forced to abandon their home and workplaces. Within almost 6 years, the government lifted evacuation orders on some areas where decontamination operations have been finished, 40,245 residents remain displaced from Fukushima prefecture at 2016 (except for evacuees inside the prefecture).

1.2 Deficits of governance exposed by the accident

The Japanese society has faced many serious issues since 2011, and found some of them have existed since before 2011. Because numbers of people got affected seriously by the accident, lack of public engagement in decision making has been held in question. Prior to “Fukushima,” civil society including local governments and residents, NGOs, has not officially involved in decision making processes concerning nuclear safety issues. Values and public opinions were not considered to be essential to make nuclear policy decisions. Residents of Fukushima Prefecture also had no voice, no role, no access to information, and even no

question, until just before they were forced to evacuate. Today, many consider insufficient public engagement, which also means insufficient monitoring by civil society, as one of reasons why the Fukushima accident could not be prevented.

Without sufficient public engagement, regulatory activities were carried out centralized and even exclusively, between regulators and licensees. Many have pointed out already the system prior to “Fukushima” had the problem of regulatory capture. The former regulatory body, Nuclear and Industrial Safety Agency (NISA), was established in 2001 as a special organization of the Ministry of Economy, Trade and Industry (METI). Because of the institutional design, the organization had roles of promoting nuclear power generation and safety regulations at the same time. NISA failed to fulfill sufficiently its oversight, supervisory and enforcement functions as it was expected, and failed to prevent the Fukushima accident. Needless to say, the public trust was severely damaged.

It is possible to say that Fukushima accident actually revealed those deficits of governance over nuclear safety, and necessity of reconstruction of nuclear risk governance in Japan.

Japan has dealt with the issues within 6 years from the accident. This study focuses on 2 significant reforms of the nuclear power safety and disaster prevention systems undertaken after the accident: setting of a new regulatory body and development of evacuation plans for wide areas within enlargement of emergency planning zones.

In order to find out those reforms can be seen as effective, and if they have affected the social acceptance of nuclear policy decision after the accident, this paper brings the analysis and insight based on the data from the questionnaire survey conducted in the study.

2. Challenges to reconstruct the system to govern the risk

2.1 Setting of a new regulatory body

As mentioned earlier, in the former system before the accident, NISA (and METI) plays the central role for the nuclear safety regulations. The Japan Nuclear Energy Safety Organization (JNES) had the role to provide technical support for NISA. Nuclear Safety Commission (NSC) was also supposed to perform the important role, as an independent organization of the Cabinet Office, to conduct “double-checking,” by reviewing safety inspections. The accident made clear that NSC functioned in only limited ways, similar to NISA.

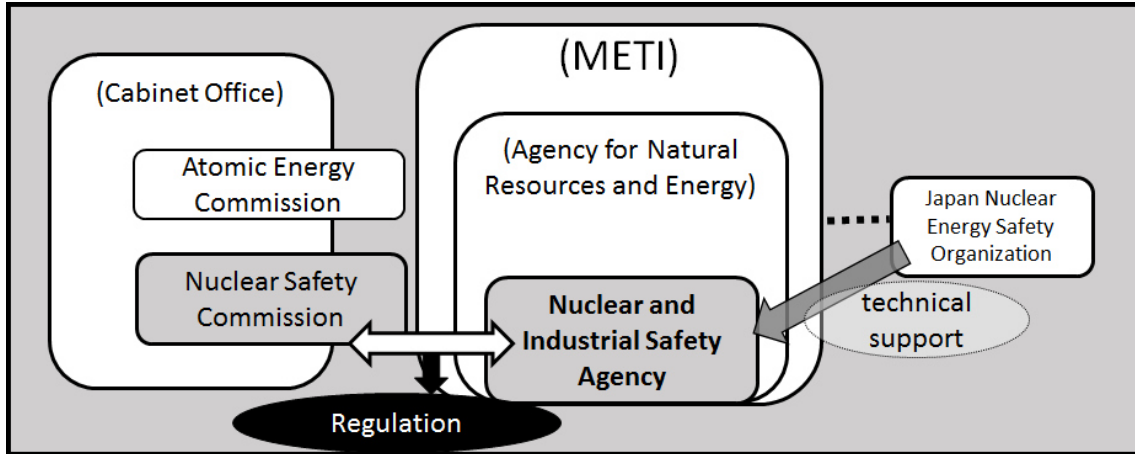


Fig 1. Nuclear Safety Regulation System before “Fukushima”

The Nuclear Regulation Authority (NRA) was established as the new regulatory body taking the places of NISA and Nuclear Safety Commission (NSC) in the Cabinet Office, on September 19, 2012. As an external organ of the Ministry of the Environment, NRA separated regulation from utilization and ensures organizational independence.

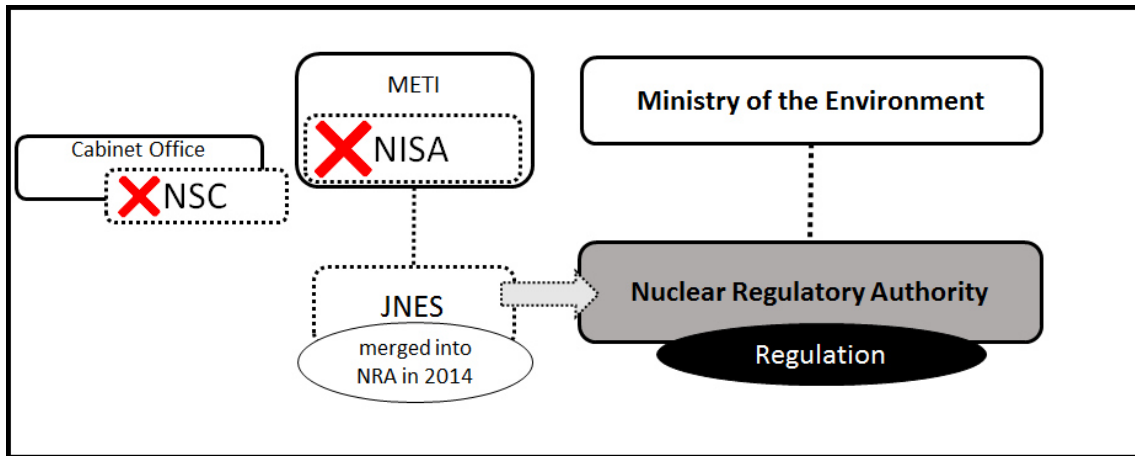


Fig 2. Nuclear Safety Regulation System after “Fukushima”

NRA also aims to rebuild the public trust which was badly damaged by the accident, by ensuring transparency. Policy on Ensuring Operational Transparency of the NRA” was determined on the same day the organization was established. It stipulates the basic policies for information disclosure without formal request, adhering to disclosing discussions, and the principle of decision-making based on written documents. In accordance with the Policy, NRA makes the contents of meetings available to the public, such as the agenda, the minutes and distributed materials. Press conferences are held regularly by the NRA Chairman and the spokesman of the NRA Secretariat. Unscheduled press conferences were also held when necessary. According to the NRA Annual Report FY2013, a total of 141 press conferences

were held in the year. In the same way as meetings, press conferences are reported, recorded and released on the website.

According to NRA Chairman Shunichi Tanaka at the regular press conference on September 2014, prior to triennial review scheduled in the following year, the effort of NRA have generated certain results to restore the public trust so far.

2.2 Enlargement of emergency planning zones

Regarding to the evacuation zone in the time of nuclear emergency, approximately 8-10 km evacuation zone was regarded as sufficiently safe as the range of the emergency preparedness zone (EPZ) in Japan before 2011. It was stated in the Nuclear Emergency Response Guideline by NSC in 1982. Although NSC tried to revise the range in 2006, it wasn't fulfilled because NISA made an objection. After experiencing an enormous impacts not only on municipalities in siting areas, but also on surrounding areas within the radius of 30 kilometers from the plant, Precautionary Action Zone, or PAZ, and Urgent Protective Action Planning Zones, or UPZ were introduced instead of the former EPZ, as the Nuclear Emergency Response Guidelines was revised by NRA on January 2014. PAZ means approximately 5 km away from the plant as the zone where residents take swift actions based on the emergency action level (EAL) before the potential release of radioactive material into the environment due to a nuclear accident. UPZ means approximately 30 km away from the plant, as the zone where residents take actions.

Municipalities located within 30 km from the nuclear power plant became obligated to formulate evacuation plans. It aims to improve and enhance the disaster prevention system, by developing strong and detailed evacuation plans for wide areas. As the zone was expanded literally from 8-10 to 30 km, the number of municipalities involved increased up to 136 (21 prefectures) from 45. Because many of local governments have no experience and no expertise to develop the strong and detailed plans, the government, mainly the Cabinet Office has functions to support for local governments in the disaster prevention system. On September 2013, working teams (renamed the Regional Nuclear Emergency Preparedness Council with strengthened functions on March 2015) were established for each of 13 areas within 30 km from the nuclear power plants (Tomari, Higashidori, Onagawa, Fukushima, Tokai, Kashiwazaki-Kariwa, Shika, Fukui, Hamaoka, Shimane, Ikata, Genkai, and Sendai). Evacuation plans are reported by working teams (the later Regional Nuclear Emergency Preparedness Council) at the meetings of the Nuclear Emergency Preparedness Council held by Prime Minister, and are approved as "concrete and reasonable". As of December 2016, evacuation plans of 5 areas have been approved so far. Evacuation plans formulated and approved are supposed to be examined and provided support continuously to improve and strengthen measures, based on the outcomes of evacuation drills and other information.

3. Perceptions of the civil society toward the attempts found in results of

questionnaire surveys

However, the results of questionnaire surveys conducted in this study made clear that many of civil society consider the regulatory body as not trustworthy, and formulated evacuation plans as not sufficiently “concrete and reasonable” in reality.

The first questionnaire survey was conducted in the following 3 regions: Fukushima prefecture, Aomori prefecture where a spent nuclear fuel reprocessing facility is located, and Tokyo as a maximum power-consuming area. The aim of the questionnaire survey was to clarify public perceptions toward the regulatory body established after the accident. The time period for tallying the results of the survey was from September 17 to 24, 2014, which was one year prior to triennial review of NRA.

There were 1,500 valid respondents, including 750 males (50%) and 750 females (50%), in terms of sex. In terms of age groups, it includes 300 respondents aged in twenties comprising 20% of the total, 300 respondents aged in thirties (20%), 300 respondents aged in forties (20%), 300 respondents aged in fifties (20%), 232 respondents aged in sixties (15.5%), and 68 respondents aged older than sixties (4.5%). The distribution of respondents by region is as follow; 500 citizens from Aomori (33.3%), 500 citizens from Fukushima (33.3%), and 500 citizens from Tokyo (33.3%). For each question items in the survey, the likert scales are used for scaling responses. The four-point scale is used, from "(1) Disagree" to "(4) Agree," without the middle option of "Neither agree nor disagree."

As a result of the question asking “Do you agree that you can leave the decision-making concerning nuclear safety issues to any specific administrative body?,” 43.5 % of respondents answered "disagree," and 41.1% answered "moderately disagree," and only 3.0% answered "agree." 84.6% of the total have negative attitudes toward decision-making made by the new regulatory body. It showed that many of the civil society have not considered the responsibilities and functions of the NRA as worthy of praise. Obviously, loss of trust has not been sufficiently resolved even five years after the accident, and remained serious challenges for nuclear policy-making.

"Do you agree that you can leave the decision-making concerning nuclear safety issues to any specific administrative body?"

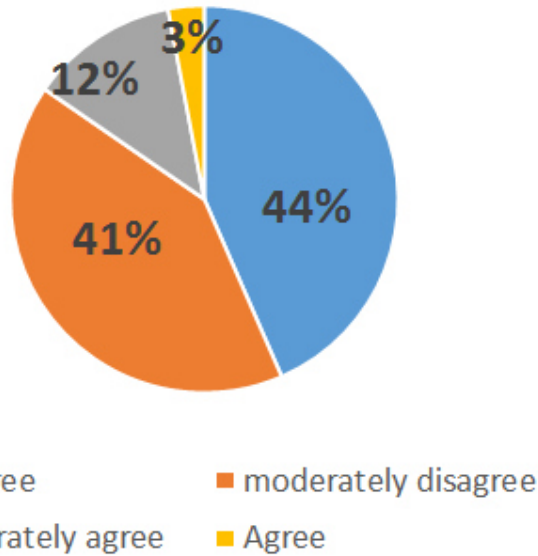


Fig 3. The Response Result of the Question about the Public Trust

	n	%
A total	1500	100.0
Disagree	652	43.5
Moderately disagree	617	41.1
Moderately agree	186	12.4
Agree	45	3.0

Tab 1. The Response Result of the Question about the Public Trust

Even though NRA, replacing NISA which caused loss of trust, has put more emphasis on ensuring transparency of the decision-making processes in various ways, it is difficult to say the efforts have produced fine results within 6 years.

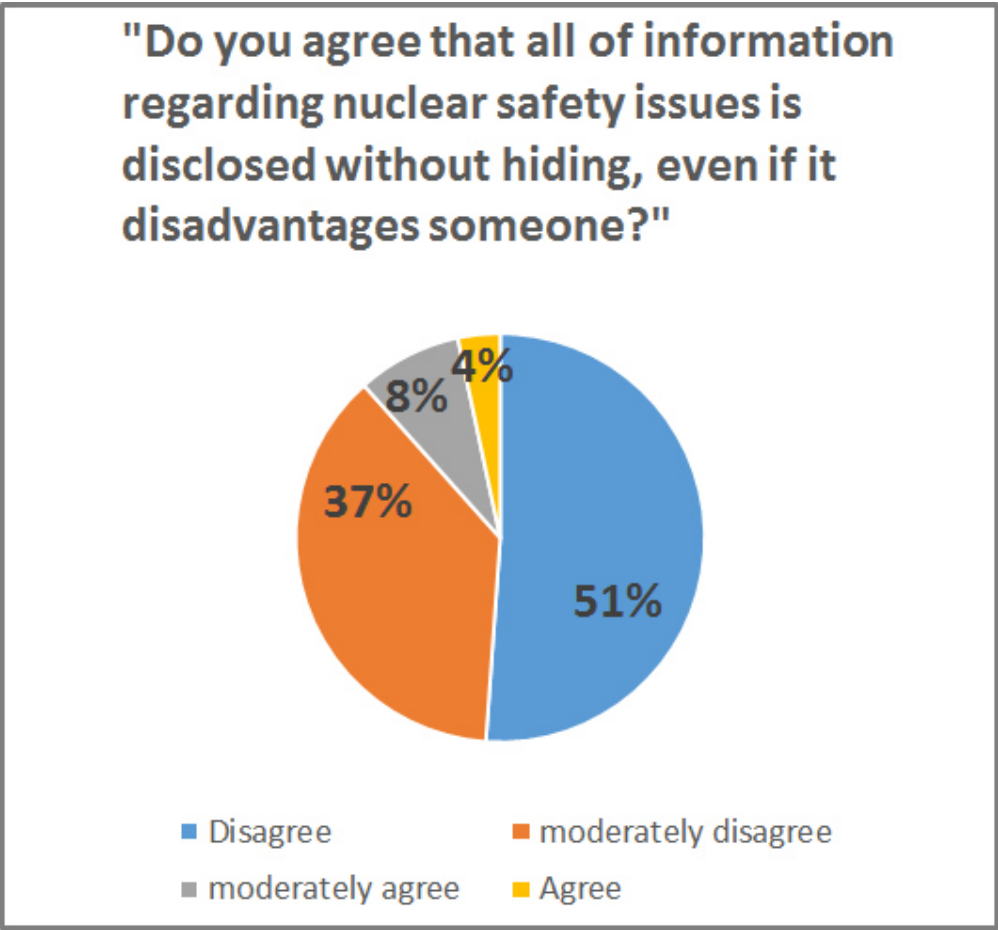


Fig 4. The Response Result of the Question about Transparency

As a result of the question asking transparency, more than 50% of respondents answered "disagree," and 37.3% answered "moderately disagree."

	n	%
A total	1500	100.0
Disagree	767	51.1
Moderately disagree	559	37.3
Moderately agree	124	8.3
Agree	50	3.3

Tab 2. The Response Result of the Question about Transparency

The similar results can be found from the second questionnaire survey conducted on February 2015, to clarify public perceptions toward evacuation plans approved as sufficiently "concrete and reasonable" in the new system after the accident.

The questionnaire survey was conducted in the following 4 areas: the Sendai area (mainly

Kagoshima prefecture), the Ikata area (mainly Ehime prefecture), the Takahama area (Kansai region including mainly Fukui, Kyoto, Hyogo prefectures) which have been involved to formulate evacuation plans, and the Tokai area which was scheduling to formulate the plan. There were 1,400 valid respondents, including 856 males (61.1%) and 544 females (38.9%), in terms of sex. In terms of age groups, it includes 280 respondents aged in twenties comprising 20% of the total, 280 respondents aged in thirties (20%), 280 respondents aged in forties (20%), 280 respondents aged in fifties (20%), and 280 respondents aged in sixties (15.5%). The distribution of respondents by region is 25% for each.

Firstly, the question was asked to find out how much resident of the areas know about the formulated evacuation plans. As a result, 357 of 1,400 respondents (25.5%) answered they do know about the plans. The following question “Do you agree that the evacuation plan of the region you live is realistic enough to accept, and provides sufficient satisfaction?” target the respondents. As a result,

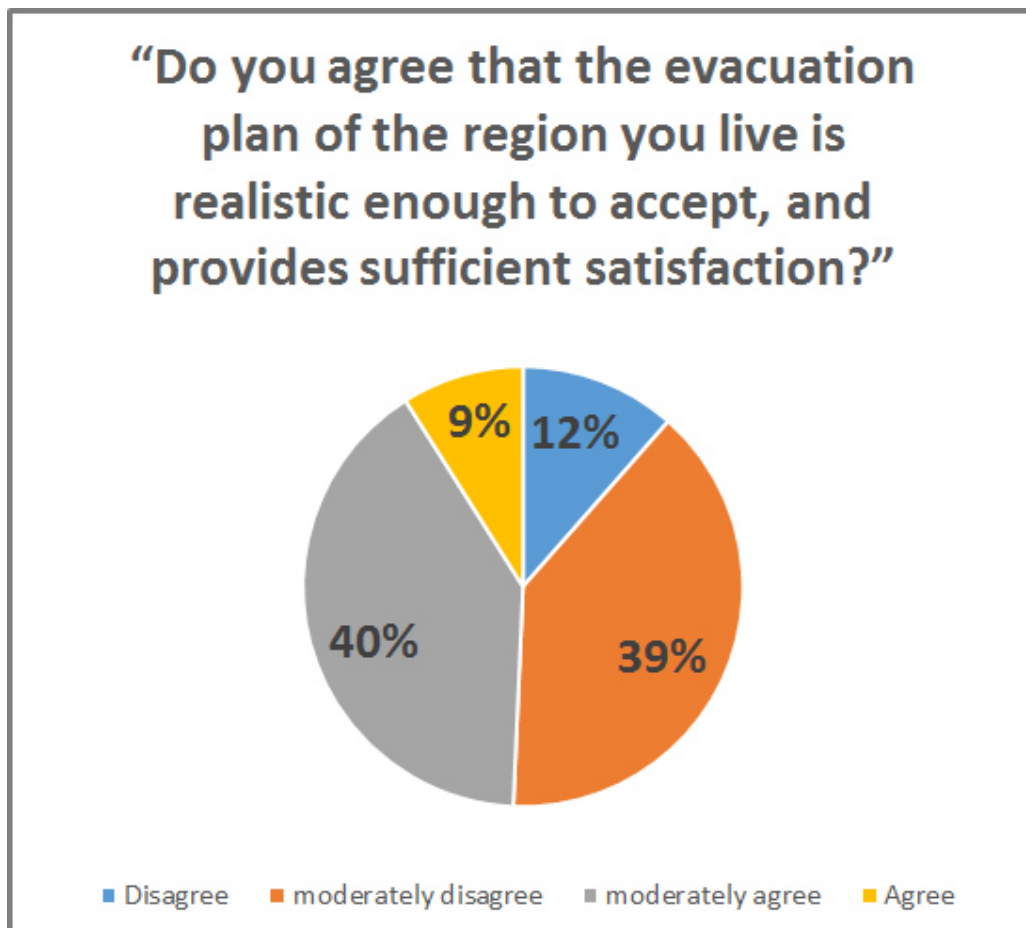


Fig 5. The Response Result of the Question about Acceptance of Evacuation Plans

	n	%
A total	357	100.0
Disagree	41	11.5
Moderately disagree	140	39.2
Moderately agree	144	40.3
Agree	32	9.0

Tab 3. The Response Result of the Question about Acceptance of Evacuation Plans

Even though numbers of relevant municipalities, relevant prefectures, and local residents were mobilized in the process to formulate the plans, they are not regarded as “concrete and reasonable.”

In order to identify lessons that can be learned from Fukushima, it is strongly necessary to find out factors that the government needs to pay more attention to restore the public trust.

4. Consideration

4.1 Utilization of findings from the previous studies of trust

In the field of risk study, many researchers agree that trust is an important factor. A number of studies showed that trust is related to perceived risks and benefit, social acceptance of technologies. In the previous researches by the Yale Communication and Attitude Change Program started in the 1950s, there are two major factors determining the level of trust: perceived competence, such as experience, expertise, specialized knowledge, qualification, and perceived motivation, such as fairness, honesty, and impartiality.

Earle and Cvetkovich (1995) added perceived salient value similarity as another important factor. Salient values means an individual's representations of the goals and values, understanding of what is the problem, what measures are available in responding to a problem. If the other person has the salient values which are similar to one's own values, that person would be estimated as trustworthy.

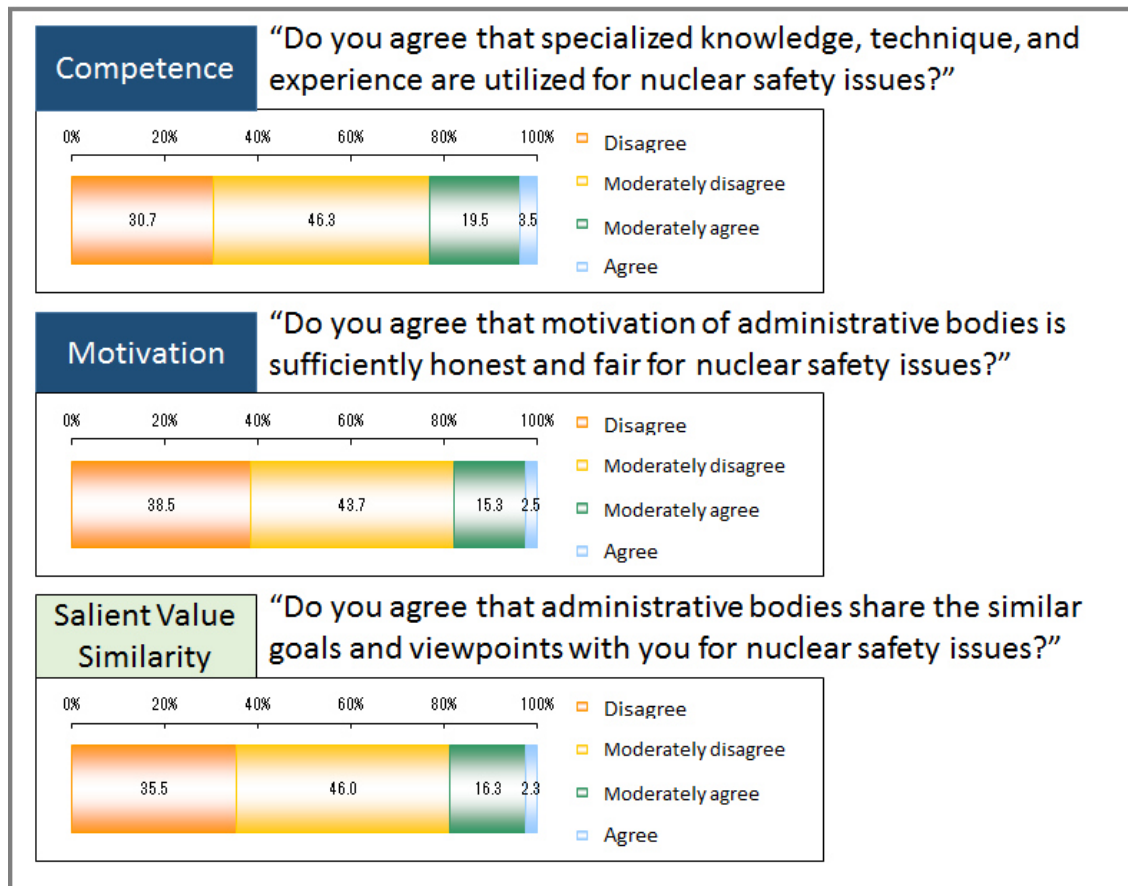


Fig 6. The Response Result of Questions concerning determinants of trust

4.2 Utilization of findings from the previous studies of procedural fairness

The result of the questionnaire survey concerning evacuation plans developed in the recently reformed disaster prevention system shows that experience of the accident has actually decreased the public acceptance of the decision that are evacuation plans approved by the government. Even though the government has tried to improve public engagement by mobilizing more local governments into the process of decision-making, it seems to be as ineffective.

According to Visschers, fairness can be defined as the extent to which a person feels that he/she is correctly treated or that an issue is acceptably dealt with. (Visschers, 2012)

A number of studies pointed out that procedural fairness has a strong influence on the acceptance of the decision outcome. People seemed to accept decisions, even those with negative outcomes, as long as the decision-making procedure was fair.

Similar to the difficulty to answer the basic, fundamental question "How safe is safe enough?", it is substantially impossible to ensure the outcome as "the evacuation plan with guarantee of absolutely safe." That is, it is significant to ensure procedural fairness, regarding formulation of evacuation plans.

Osawa overviewed the previous studies, and organized 4 conditions of procedural fairness:

accessibility to information, sufficiency of opportunity for discussion and expression of opinions, representativeness of participants, and legitimacy of decision-making (2014). In order to clarify how much procedure fairness was ensured regarding the formulation of the evacuation plans, the 4 conditions were adopted in the questionnaire survey. The response results of each question related to conditions showed that procedure fairness was not ensured sufficiently.

Accessibility to information	“Do you agree the evacuation plan of the region you live has been developed in transparent ways as you can check?”	<table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>18.9</td> </tr> <tr> <td>Moderately disagree</td> <td>48.7</td> </tr> <tr> <td>Moderately agree</td> <td>25.1</td> </tr> <tr> <td>Agree</td> <td>7.4</td> </tr> </tbody> </table>	Response	Percentage	Disagree	18.9	Moderately disagree	48.7	Moderately agree	25.1	Agree	7.4
Response	Percentage											
Disagree	18.9											
Moderately disagree	48.7											
Moderately agree	25.1											
Agree	7.4											
Sufficiency of opportunity for discussion/expression of opinions	“Do you agree that local residents have had sufficient opportunities for discussion and expression of their opinions in the process of developing the evacuation plan?”	<table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>28.5</td> </tr> <tr> <td>Moderately disagree</td> <td>51.4</td> </tr> <tr> <td>Moderately agree</td> <td>17.0</td> </tr> <tr> <td>Agree</td> <td>3.1</td> </tr> </tbody> </table>	Response	Percentage	Disagree	28.5	Moderately disagree	51.4	Moderately agree	17.0	Agree	3.1
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Agree	3.1											
Representativeness of participants	“Do you agree that local residents need to participate more actively in the process of developing the evacuation plan?”	<table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>5.0</td> </tr> <tr> <td>Moderately disagree</td> <td>14.0</td> </tr> <tr> <td>Moderately agree</td> <td>49.9</td> </tr> <tr> <td>Agree</td> <td>31.1</td> </tr> </tbody> </table>	Response	Percentage	Disagree	5.0	Moderately disagree	14.0	Moderately agree	49.9	Agree	31.1
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Legitimacy of decision-making	“Do you agree that the government has fulfilled its role adequately to develop the evacuation plan?”	<table border="1"> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Disagree</td> <td>34.2</td> </tr> <tr> <td>Moderately disagree</td> <td>45.6</td> </tr> <tr> <td>Moderately agree</td> <td>17.3</td> </tr> <tr> <td>Agree</td> <td>2.9</td> </tr> </tbody> </table>	Response	Percentage	Disagree	34.2	Moderately disagree	45.6	Moderately agree	17.3	Agree	2.9
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Tab 4. The Response Results of the Question about procedural fairness

5. Conclusion

Despite the risk of nuclear accidents which got obvious by the lessons from Fukushima, or risks of other threats such as natural disasters and terrorist attacks, a number of countries still want to adopt nuclear power generation. Reactors under construction or in the planning stages are about 170, and many of them are in developing countries. Especially in Asia, the number of nuclear power plants is expected to nearly triple by the year 2035. Nuclear power generation is highly complicated technology, and also a big challenge for the whole society. The expected role of Japan by the international society is considered dissemination of information, lessons learned from Fukushima, especially to countries that are going to introduce the nuclear power generation in the future.