

How Assessment and Evaluation is Interlinked with Disaster Governance? A Case of the Tohoku Disaster

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Synopsis

The linkage of governance, disaster management and policy are not well established both in terms of conceptual basis and practices and require more in-depth analysis for better disaster management and governance (disaster governance). The weak linkage may prevent effective disaster management. The 2011 Tohoku Disaster posed many governance-related challenges, including processes or institutions of disaster management or decision-making. Especially, the analysis of the challenges turns out that many of core problems are interlinked with assessment and evaluation. The research problems the paper addresses are two-fold given the existing studies and practices: First, there is few conceptual foundation for linking disaster management and governance especially in light of assessment and evaluation. Second, while assessment or evaluation tends to be taken for granted at practices, few analytical research or discussions exist about how it is interlinked with disaster governance. This paper aims at filling in the above gap and attempts to elucidate analytically the linkage of assessment and evaluation with disaster governance through a case of the 2011 Tohoku Disaster in Japan for better disaster governance and actionable policies.

Keywords: disaster governance, adaptive governance, assessment, evaluation, Tohoku Disaster, actionable policies

1. Introduction

The linkage of governance, disaster management and policy are not well established both in terms of conceptual basis and practices and require more in-depth analysis for better disaster management and governance (disaster governance). The weak linkage may prevent effective disaster management. The 2011 Tohoku Disaster posed many governance-related challenges, including processes or institutions of disaster management or decision-making. Especially, the analysis of the challenges turns out that many of core problems are interlinked with assessment and evaluation.

More specifically, the research problems the paper addresses are two-fold given the existing studies and practices: First, there is few conceptual

foundation for linking disaster management and governance especially in light of assessment and evaluation. Second, while assessment or evaluation tends to be taken for granted at practices, few analytical research or discussions exist about how it is interlinked with disaster governance.

This paper aims at filling in the above gap and attempts to elucidate analytically the linkage of assessment and evaluation with disaster governance through a case of the 2011 Tohoku Disaster in Japan for better disaster governance and actionable policies. As a basis of understanding this paper, assessment refers to seeing what happened objectively, and evaluation can be differentiated from that. Evaluation is supposed to identify weakness of current approach or policies based on assessments and experiences to seek for what can

be done for better disaster management and how it can be done (More details are specified in the Section of Structure of Assessment and Evaluation for Disaster Governance).

Given the above, the paper explores three major research questions: (1) how assessment or evaluation has been addressed in existing research around governance or adaptive governance in association with disaster management; (2) what kinds of assessment or evaluation are practically used in disaster management and how they can be structured in terms of disaster governance; and (3) what kinds of lessons can be learned from cases of assessment and evaluation in the Tohoku Disaster, and how those lessons can be linked to the structured components of disaster governance articulated in (2).

Ultimately, the paper aims at a better understanding of the role of assessment or evaluation in disaster management and governance and how, at a practical disaster management levels, assessment or evaluation can be better linked to governance, institutions and processes and policy.

2. The Linkage of Assessment or Evaluation with Disaster Governance?

Addressing disaster risk reduction and governance together as a concept is not an established approach, but is a rather new academic exercise as seen from the effort in UNDP Global Report in 2004 which offers governance concept for disaster reduction (Lassa, 2010). Specifically, the relevant studies point out the following aspects are important in governance in light of disaster management (Ahrens and Rudolph, 2006).

- Participation
- Rule of Law
- Transparency
- Accountability
- Sharing decision making power between the stakeholders
- Institutions (both formal and informal)

Going a further step, the newer academic exercise of combining “adaptive governance” and disaster management has recently been introduced. “Adaptive governance” is a form of governance

that was originally developed as a management approach for ecological systems; adaptive governance aims at integrating science, policy and decision making in systems that manage for change, (Gunderson, et al., 1995) through formal institutions, informal groups/networks and individuals at multiple scales for purposes of collaborative environmental management. (Folke, et al., 2005) With this concept of adaptive governance, the recent studies suggest the following aspects drawn from adaptive governance are vital increasing resilience to natural hazards (Djalante, et al., 2011; Djalante, 2012):

- Multilayered institutions
- Collaboration and Cooperation
- Self-organization and networks
- Learning and Innovation

Given the above, specifically from assessment and evaluation points of views, the literature review suggests that assessment or evaluation is not necessarily focused, while it might be considered that transparency and accountability in governance or learning and innovation in adaptive governance implicitly include these aspects.

On the other hand, “adaptive management” in natural resources, a relevant concept of adaptive governance, puts the emphasis on monitoring and assessment. The relevant literatures stress importance of systematic monitoring of ongoing results and feedback loops so that monitoring and assessment can produce continuous and systematic (Center for Progressive Reform, 2011). The concept of adaptive management was developed from ecological theories of resilience to manage dynamic and unpredictable ecological systems, (Holling, 1978) and is a critical component of adaptive governance. (Folke, 2005) The concept has been used at the practical level since the mid-1990s at practical levels in natural resource management policies (Center for Progressive Reform, 2011).

In a summary, the linkage of assessment or evaluation with governance or adaptive governance of disaster management, has not explicitly been addressed in existing studies, although original ideas of adaptive governance or adaptive management, from ecology or social ecological perspectives, put emphasis on assessment especially

for vitalizing learning. Even in the latter case, there are few in-depth analysis of linkage of assessment and evaluation with governance.

3. Structure of Assessment and Evaluation for Disaster Governance

Whereas there is a lack of a conceptual and analytic basis for the assessment or evaluation in disaster governance as indicated in the Section 1, different kinds of relevant practices exist in disaster management, such as hazard assessment, risk assessment, vulnerability assessment, and post-event initial/damage assessment.

The above gap may imply that (1) the role of assessment or evaluation within disaster governance, or the role of governance within assessment or evaluation in disaster management has simply not been well understood well in governance/policy or disaster management communities; and (2) the results of assessment and evaluation conducted at practical levels have not been incorporated into governance or policy actions and therefore has not necessarily been linked to renewal or innovations of disaster management plans, programs and policies for better disaster management.

Especially from “adaptive governance” points of views, as indicated in the Section 1, since adaptive governance can play a role in integrating science, policy and decision making in systems that manage for change, it is critical to consider how the existing relevant practices can be related to adaptive governance, and in turn, how they can be structured along with disaster governance. This kind of analysis may help to incorporate assessment and evaluation into disaster governance and policy.

Based on the above basic conceptual frame, practices of major assessment or evaluation in disaster management can be categorized into three types along with key conceptual components in governance or adaptive governance (see Table 1). Before going into details, it is important to articulate the difference between assessment and evaluation since it is related to a critical part of governance, that is, “learning and innovation.” Generally speaking, as stated in the introduction, assessment is to see what happened objectively, and evaluation can be differentiated from that. A major

definition of evaluation can be drawn in the following:

Evaluation is a systematic and objective assessment of an on-going or completed project, programme or policy, its design, implementation and results, to determine the relevance and fulfillment of objectives, development efficiency, effectiveness, impact and sustainability and to enable the incorporation of lessons learned into the decision-making process. Evaluation also refers to the process of determining the worth or significance of an activity, policy or program (OECD, 2010).

In other words, evaluation is supposed to identify weakness of current approach or policies based on assessments and experiences to seek for what can be done for better disaster management and how it can be done.

Given the above, the Table 1 provides three categories for assessment or evaluation in disaster management along with components of governance, followed by a brief description on a type of assessment or evaluation and a note on how the category is related with governance for each category. The first category, (1) Hazard/Vulnerability/ Risk Assessment is mainly related to pre-disaster assessment. In terms of assessment, this category is primarily associated with “transparency” and “accountability” since the results of assessments provide a basis for governments or the public to address different kinds of hazards (e.g. hazards of natural origin and related environmental and technological hazards), vulnerabilities (e.g. characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard.) and risks (e.g. impacts of hazards and vulnerabilities) for risk reductions and preparedness. The assessment result will also be related to “sharing decision making power” between the stakeholders for managing risks, and will be a basis

Table 1 Categorization of Major Assessment or Evaluation Practices in Relations with Governance

	Brief Description	Brief Description
(1) Hazard/Vulnerability/ Risk Assessment	• Determining the nature and extent of risk by analyzing potential hazards and assessing existing conditions of vulnerability that together could potentially harm exposed people, property, services, livelihoods and the environment	• “Transparency” and “Accountability” for addressing hazard, vulnerability and risks. • “Sharing Decision Making power” between the stakeholders for managing risks • “Collaboration and Cooperation” and “Multilayered Institutions” for rapid and effective disaster management • “Multilayered Institutions” to capture critical indicators of risks and to integrate them into coherent assessment
(2)Rapid Needs/Initial (Damage)/Mid-Term Assessment	• Building on pre-disaster information to assess changes in the context caused by the disaster, identifying any new factors that create or increase vulnerability (e.g. “The Sphere Project”)	• “Collaboration and Cooperation” for rapid and effective disaster management • “Multilayered Institutions” to capture critical indicators of damage and to integrate them into coherent assessment
(3) Plan/Program /Policy Evaluation	• Identifying weakness of current approach or policies based on assessments and experiences through systematic and objective methodologies (see Box 1) • Seeking for what can be done for better disaster management and how it can be done	• “Transparency” and “Accountability” for justifying decision making or policy making. • “Multilayered Institutions” to capture critical issues, to integrate them into coherent evaluation, and to link to actionable policies • “Innovation” of Plans/Program/Policy and “Adaptation” for better disaster management

for mechanisms of “collaboration and cooperation” and “multilayered institutions” for driving rapid and effective disaster management. Moreover, “multilayered institutions” will be required to address hazards, vulnerabilities, and risks.

The second category, (2) Rapid Needs/Initial (Damage)/Mid-Term Assessment, is specifically for assessment needed to start implementing immediately after any disaster. There are many national or international guidelines for first responders or medical people at national and international levels, and one of major ones is Sphere Handbook by “Sphere Project” (composed of representatives of global networks of humanitarian agencies), which provides guidelines to “carry out an initial assessment immediately, building on pre-disaster information to assess changes in the context caused by the disaster, identifying any new factors that create or increase vulnerability”. This category of assessment will be related to “collaboration and cooperation” in terms of governance, since those assessment results will be a basis for “collaboration and cooperation” for rapid and effective disaster management to adapt to the changing situations and needs in devastated areas. On the other hand, “multilayered institutions” are required to capture critical indicators of damage and to integrate them into coherent assessment.

The third category, (3) Plan/Program /Policy Evaluation, is especially for post-disaster management to learn from disaster experiences or should be done built on a series of assessments such as hazard, vulnerability, and risk assessments, ultimately to incorporate lessons and results of assessments into plans, programs or policies for adaptations and renewal (see Fig. 1). The major role of this category is, as indicated in the above, to identify weakness of current approach or policies based on assessments and experiences through systematic and objective basis of evaluation (more specifically, see Box 1); and to seek for what can be done for better disaster management and how it can be done.

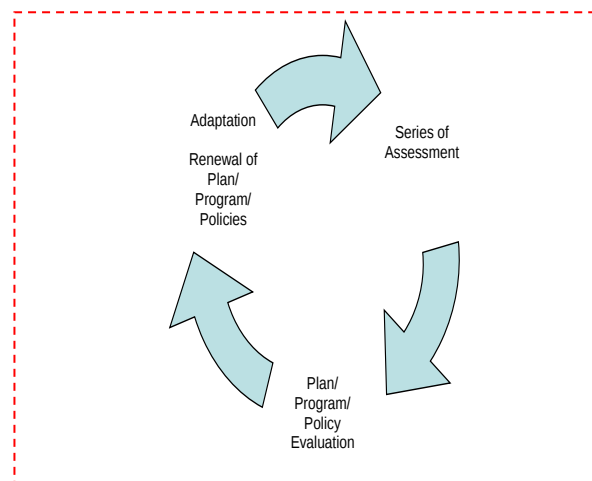
In terms of governance perspective, the third category can be applied to “transparency” and “accountability” for justifying decision making or policy making, “multilayered institutions” to capture critical issues, to integrate them into

coherent evaluation, and to link to actionable policies, and “innovation” of plans/program/policy and “adaptation” for better disaster management.

Box 1: Basis of Policy Evaluation

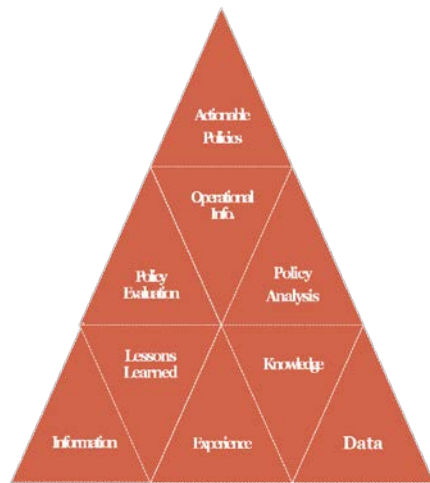
- Should be based on objective data and information and policy analysis
- Should include evaluation by a third party’s or independent evaluation
- Evaluation process and results should be open to the public and tracked by any expert or the public
- Should be linked with policy renewal process
- Should be continuous and not be one-time event.

Overall, policy evaluation (based on policy analysis) is a critical part in making most of different efforts in assessment and not wasting different experiences to link to actionable policies since every action through these processes are interlinked together as a knowledge production system as shown in the Fig. 2.



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Fig. 1: Linkage of Assessment /Evaluation, Disaster Management and Governance



(Shimizu, 2013)

Fig. 2: Knowledge Production System

4. Lessons from the Tohoku Disaster

Case 1: Case of Risk Assessment in SPEEDI

A specific lesson example with respect to risk assessment which is not based on sound governance relates to radiation from the Fukushima Daiichi nuclear plant. Japan developed and has had a radiation forecast computer system since the 1980s known as the System for Prediction of Environmental Emergency Dose Information (SPEEDI), with total investments of twelve billion yen in development and operations. Throughout the disaster, SPEEDI continually provided data on radioactive releases from the Fukushima Daiichi nuclear plant. However, the data had not been communicated appropriately within the central government (details are described below), and thus were not delivered to the local governments for their risk assessment in terms of judgment on where to evacuate during this most critical period. More tragically, it was later discovered that local people had evacuated, following the central government's judgment which are not based on sound risk assessment and direction, to evacuation centers which were located right on the course of the radioactive plume (Shimizu, 2013).

Issues Relevant to Governance in the Case

Failures of the risk assessment functions with respect to SPEEDI during critical timing is mainly

caused by a multilayer institution-related problem, which can be drawn from specific problems of disaggregated information-sharing and reporting system: There was a pre-disaster guideline called the Environmental Radiation Monitoring Guideline by the Nuclear Safety Commission (NSC; under the Prime Minister's Cabinet Office), which specified that, through the direction of the Ministry of Education, Culture, Sports, Science and Technology (MEXT), calculated results based on SPEEDI would be used as a basis in deciding measures for evacuations and actions. However, in reality, it seems the Prime Minister and his office largely did not know about SPEEDI before media reports (Japan Rebuilding Initiative, 2012). Specifically, a direct communication institution did not exist to link SPEEDI-based information and analysis to the Prime Minister, who served as the Director General of the nuclear emergency response headquarters. In fact, then-Prime Minister, Naoto Kan explained that he did not receive any report regarding SPEEDI from the head of the Nuclear and Industry Safety Agency although he sat in front of the Prime Minister when he made a decision on evacuation locations (Asahi News, November 1, 2011).

Also, it was found that while the office of the NSC had received the SPEEDI data hourly through MEXT since the first hours after the catastrophic earthquake and tsunami, the Commission's office thought the same data had been sent to the Prime Minister's office and simply had not taken any action on the information. However, there were no direct reporting lines for passing the data from MEXT to the Prime Minister's Office for SPEEDI (Asahi News, November 1, 2011). In fact, it was revealed that because the government officials believed that the data from SPEEDI was incomplete they did not report to the Prime Minister's office on it (Japan Rebuilding Initiative, 2012).

Lesson from Governance Perspective

While the rapid advance in network design for technical systems creates opportunity for computer scientists to developments of monitoring risk conditions, the design of such technical monitoring systems needs to be based on sound governance. That is, knowledge of the organizational practices

and personnel who operate them, as well as the social, physical, and engineered environment being monitored needs to be incorporated into assessment systems in order to capture the critical conditions of risk and integrate them in to a coherent assessment of risk conditions (Comfort, 2014). The SPEEDI in Tohoku Disaster is a typical case where governance, especially with respect to multilayered institutions, was not incorporated or insufficiently put in place into the assessment system. This was a core problem for the system failure when urgent risk assessment is needed to help people to evacuate in disaster.

Case 2: Case of Initial/ Mid-Term Assessment in Medical/ Public Health

Readers may tend to consider that assessment in medical/public health case in the Tohoku Disaster is a minor issue since there were no major public health disasters (e.g. infectious diseases) other than radioactive issues in Fukushima. However, the case here is not related to the technical assessment issue of medical or public health, but rather related to the overall challenge of assessment and disaster governance which can be drawn from the case:

Overall experts and practitioners agree that the medical assistance for mass casualties worked well during the acute phase (48 to 72 hours after its occurrence) based on the activities of the Disaster Medical Assistance Team (DMAT) which has been recently established based on experiences in Han-Shin Awaji Earthquake in 1995. 383 DMAT teams consisting of 1,852 members were dispatched immediately after the Disaster and engaged in rapid operations for mass casualties. On the other hand the experts and practitioners have revealed other operations after the acute phase or other aspects other than mass casualties posed daunting challenges especially in terms of systemic coordination for medical assistance. Assessment here is related to those aspects which can be explained by the two specific cases in the below:

Issues Relevant to Governance in the Case

Although search and rescue operations based on initial assessment is critical immediately after disasters, it was turned out that since fire fighters, polices and self-defense forces engage in their own

activities based on their individual plans, search for hospitals or medical institutions will be made on request basis (Uehara, 2012). For the request to be made, initial assessment by medical institutions is critical but this case was not made possible. As a matter of fact, in Shizugawa Hospital, in Miyagi, 150 patients and staff were isolated in the damaged building until they were rescued by the self-defense forces on March 12 and 13. For the time being, seven patients passed away before rescue; In the Ishinomaki City Hospital, 152 patients and 200 people had to wait for rescue until they were evacuated for over 3 days. As such, it was found out that search and rescue operation was not linked with medical health institutions and its initial assessment. For this, the 17th Conference of the Japanese Association of Disaster Medicine on February 2012 issued an urgent appeal statement to prepare for a large-scale disaster, which includes increasing a capacity for search and rescue for health/medical institutions as well as that for rapid assessment in emergencies. From governance perspectives, this is an issue for mechanism for collaboration/cooperation and the existing institution prevented from effective rescue and search operations based on effective initial assessment beyond institutions in cooperative ways.

Given the situations and needs in disaster areas constantly change over time after disasters, a consistent assessment institution is critical including initial and mid-term assessments. Regarding this, Professor Norio Uehara, who played a role as a medical coordinator and advisor for the Public Health Department of the Miyagi Prefectural Government, has pointed out: 1) governmental organization structures (national, prefecture and cities) after DMAT phase were not institutionalized for coordinating medical assistance, the structure remained to be stove-piped and vertical as they are in normal times, and medical teams needed different medical care requests and assistance offers for medical health to be linked to different (prefecture, cities and villages) disaster management headquarters; 2) emergency funding is not available for medical operations within governments and medical teams needed to look for different funds critical for medical assistance from different sources (Uehara, 2012). From the

perspective of assessment and governance, the lack of central coordinating institutions led to the absence of central functions for initial and mid-term assessments to integrate different information, data and reports for actions and to adapt to changing situations and needs. As a result, these barriers resulted in major delay in medical health activities or the initial response phase.

Lesson from Governance Perspective

Effective initial responses requires a sound governance mechanism by integrating search/rescue operations and initial assessments and by incorporating different stakeholders (e.g., fire fighters, polices self-defense forces, and medical teams) into the mechanism. Furthermore, given the situations and needs in disaster areas constantly change over time after disasters, a consistent assessment institution is critical which enables incorporating different-time scales (initial and mid-term assessments) and centralizing different information and stakeholders to adapt to the changing situation and needs.

Case 3: Case of Evaluation in National Disaster Recovery Budget-Making

The case of disaster recovery budget-making has simply demonstrated importance of incorporating

evaluation processes by multi-stakeholders in budget-making for disaster governance. As a matter of fact, the Board of Audit (hereinafter referred to as the Board) in Japan reported to Diet in October 25th 2011, that different national government ministries have requested disaster recovery budget for different projects which were never related to the Tohoku Disaster. The major ones are shown in the Table 2.

Issues Relevant to Governance in the Case

The above fact has illustrated that the budget-making did not include evaluation processes by multi-stakeholders, not only the government itself, but also the Diet and other independent stakeholders. If evaluation processes have been incorporated within disaster recovery budget-making process based on criteria specified in Box 1, requesting budget for items which are nothing related to the Tohoku Disaster for a few billion's yen would not have been possible. This is a critical accountability problem.

For readers' understandings, institutions around the Board in Japan should not be understood in the context of the United States: While the primary role of Governmental Accountability Office (GAO) in the United States is policy evaluation for governments and its responsibility is to publish

Table 2 Major Requests of Disaster Recovery Budget for Non-Disaster Related Projects by Ministries

Project Name	Ministry	Estimated Budget
Purchase of Rare Earth Mine	Ministry of Economy, Trade and Industry	8 Billion Yen
Low-Power Device Project for Low-Carbon Society	Ministry of Economy, Trade and Industry	7.8 Billion Yen
Youth Exchange with Asia Pacific and North American Regions	Ministry of Foreign Affairs	7.2 Billion Yen
Providing Disaster Management Equipment for Countries such as ASEAN Countries	Ministry of Foreign Affairs	4.2 Billion Yen
Support for Whaling Survey	Ministry of Agriculture, Forestry and Fisheries	2.3 Billion Yen
Relocation Cost of Nuclear Regulation Agency	Ministry of Environment	2.1 Billion Yen
Fixing Government Building	Ministry of Land, Infrastructure, Transport and Tourism	1.4 Billion Yen
Fixing Tax Offices	Ministry of Finance	1.2 Billion Yen

(The Board of Audit, Japan, October, 2011)

different policy evaluation reports monthly, the Board's primary role is in accounting, and is basically not intended to conduct policy evaluation within its institution. Having said that, after Reform in the Board of Audit Act in 1998, it was institutionalized the Board can report to Diet if Diet make any request to the Board. However, there are few cases for the Board to report to the Diet and as of 2012, the Board has made reports 9 cases to Diet, and for others the numbers are limited to less 5 cases every year.

For this time, as a result of the Board's report, media took this case sensationally and many criticisms were raised by the public, which led the Prime Minister, Noda to decide to suspend 16.8 Billion Yen for 35 projects in 11 Ministries. As such, the worst case happened to be suspended, but at the same time this case demonstrated that systemic evaluation based on objective data and information and policy analysis is not included in the budgeting process in Japan. As of today since evaluation process in budgeting-making is not institutionalized yet, it is unclear if this failure will not happen again for any future disaster.

Lesson from Governance Perspective

Incorporating evaluation process by multi-stakeholders based on policy evaluation criteria specified in Box 1 within not only budget-making but also overall disaster governance should be recognized well by policy makers. The lack of recognition and lack of institutionalization of evaluation processes resulted in the delay in decision making in disaster recovery budget, which directly or indirectly affected the delay in the recovery process in the devastated people and communities.

Case 4: Case of Policy Evaluation after the Tohoku Disaster

After the Tohoku Disaster, overall different kinds of evaluations on the Tohoku Disaster have been conducted by different stake-holders (see Box 2).

Box 2: Overview of Stakeholders Engaged in Evaluations on the Tohoku Disaster

- Government Agencies and government committees
- Central Disaster Management Council
- Reconstruction Design Council (Advisory Panel of intellectual figures which was set up by the Government of Japan on April, 2011)
- Local Governments
- Semi-Public Research Institutions/ Academic Groups
- Media
- Government Nuclear Power Accident Investigation Committee
- Japan Fukushima Nuclear Accident Independent Investigation Commission (NIIC, established by National Diet)
- Japan Rebuilding Initiative, "Fukushima Project"
- Tokyo Electric Power Company (TEPCO) Fukushima Nuclear Power Plant Accident Committee

It is to note that evaluations not only parties in interest such as different government agencies, but also third parties such as the Japan Fukushima Nuclear Accident Independent Commission (NIIC) established on December 8 2011 by the National Diet and Japan Rebuilding Initiative (private foundation, not founded by industries such as nuclear power companies) engaged in policy evaluations (mainly Fukushima nuclear power accidents). Especially NIIC was the first independent investigative body in Japan's constitutional history which was established by the National Diet. According to the stipulations in the Law for the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, the chairman and Commission members (nine) were appointed by Speakers of the House of Councilors and House of Representatives and were selected from the private sector. Other important points in the Act from governance perspectives were

- The commission conducts its investigation of government based on investigative powers that insulate it from the influence of political

parties and Diet members (Article 15).

- The Commission sets a goal of about six months from the date of appointment to submit to the Speakers of House of Councilors/House of Representatives a report listing the accident investigation results and proposals and to publish it (Article 16).

However, in reviewing overall evaluation processes and outputs by the above stakeholders from governance perspective, especially with respect to basis of policy evaluation in Box 1, the following three major issues can be pointed out:

Issues Relevance to Governance in the Case

First, overall, except for several examples pointed out in the above, most of policy evaluations are limited to the ones by governments or related committees or organizations. Furthermore, even policy evaluation cases conducted by third or independent parties are limited to the issue of Fukushima Nuclear Power Plant.

Second, while different governmental agencies including the related governmental committees conduct policy evaluation on issues such as tsunami, earthquake, energy and telecommunication, 1) most of those policy evaluations are conducted along with stove-piped and vertical organizational lines and do not incorporate multi-stakeholders into evaluation processes, and 2) most of policy evaluations are made one time or on ad-hoc basis and it is hard to find linkages between policy evaluations and policy renewal or innovation.

Third, other than government-related organizations, policy evaluations have been conducted by third parties and independent committees including media, but those evaluations tends to be conducted on one-time or on ad-hoc basis. It is to note that even NIIC highlighted in the above as the first independent investigative body in Japan's constitutional history to be established by the Diet has been resolved after publishing report and conducting open forums; the institution does not exist anymore. As such, overall policy evaluations tend to be ad-hoc, and it is hard to find linkages between policy evaluations and policy

renewal or innovation.

Lesson from Governance Perspective

Although different evaluations by different stakeholders tend to be conducted after disasters, it is critical to focus on processes and outcomes of evaluation from governance perspectives especially for policy renewal and innovation. The above case indicates there is lack of multilayered institutions in involving third or independent parties, conducting continuous engagement, and linking evaluation results with policy renewal or innovation.

These issues are related to the transparency and accountability issue for decision and policy making as well. Given the above, this case poses the daunting challenges in terms of overall structure of evaluation within disaster governance. As a first step to solve problems, it is vital to recognize importance of the evaluation structure within disaster governance and specifically the linkage between evaluation and policy renewal and innovation and constructing specific institutions for evaluation based on the recognition.

5. Conclusion and Policy Implications

The governance components drawn from the analysis of the linkage of assessment and evaluation with governance at the conceptual level were identified through the Case of Tohoku Disaster from the two perspectives: the role of governance within assessment and evaluation in disaster management, and the role of assessment and evaluation within disaster governance. More specifically the case of assessment technology, SPEEDI, and the case of overall policy evaluation tells us conducting assessment or evaluation without incorporating governance, such as multilayered institutions into to enable different stakeholders, into its process will result in not linking with actionable policies. The case of initial/mid-term assessment in medical/ public health, the case of evaluation in national disaster recovery budget-making, and the another aspect of the case of overall policy evaluation demonstrated the lack of incorporating sound assessment or evaluation structure linked with other critical operations within disaster governance structure will prevent effective

coordination of different functions by different stakeholders or policy renewal or innovation and adaptation for actionable policies.

Thus, the Tohoku Disaster Case has demonstrated that assessment and evaluation are critically interlinked in disaster governance at different levels which can be directly or indirectly linked to effective disaster management and policy innovation, adaptation or actionable policies. Given the above, the major policy implications are provided in the below:

First, although assessment or evaluation is considered mainly from technical perspectives, it is critical to recognize their functions and their linkages with disaster management from governance perspectives. Otherwise, the lack of recognition will directly or indirectly lead to the failures of effective disaster management and policies. Furthermore, these problems may lead to the overall governance issue including accountability. Although assessment and evaluation tends to be considered as secondary among policy communities, the Tohoku Disaster proved it is not.

Second, in terms how assessment or evaluation can be better linked to governance, institutions and processes and policy, 1) incorporating mechanisms of collaboration and cooperation or multilayered institutions into assessment and evaluation structure, and 2) incorporating assessment and evaluation structure through multilayered institutions into disaster governance are essential. Thus, the results of assessment and evaluation ultimately need to be incorporated into renewal or innovations of disaster management plans, programs and actionable policies.

Third, while different assessment such as hazard, vulnerability and risks assessment or policy evaluation tend to be considered separately, from governance and policy perspective, it is vital to formulate them into a consistent framework so that each role of assessment and evaluation can be clarified and governance-woven assessment and evaluation can be assured at different phase of disaster management. It is based on this that effective disaster management and disaster governance which can be linked with policy innovation, adaptation and actionable policies will be possible.

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