Topics: Lessons learned on public health from the Fukushima Daiichi Nuclear Power Plant accident

＜ Review ＞

History and lessons of science communication: implications from and for the 3.11 triple disasters

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Abstract

The 3.11 disaster brought not only direct damages, but also huge ramifications to Japanese society. To consider confusion and structural issues of communication regarding the 3.11, we overviewed history of science communication and current studies on media analysis concerning the 3.11.

In the 3.11 disaster context, we should not overlook that fact that the Nuclear Power Plant accident deprived media attention from topics concerning the earthquake and tsunami, particularly in national and social media. There were also gaps in the media framing between national/social media and local newspapers in the Tohoku area.

In addition, current studies on science communication taught us that we should not solely examine the scientific contents, but also the social contexts of science and technology. They indicated that the public tends to be aware of and regard risks, responsibility and liability, and other post-disaster schemes as important factors rather. To secure "trust," mutual understanding, and proper communication concerning post-disaster schemes, including responsibility and liability, is essential. The opening of stakes will support this process.

keywords: science communication, risk communication, framing, media, 3.11

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I. Introduction

On March 11, 2011, a massive earthquake and tsunami and the severe accident of the Fukushima Daiichi Nuclear Power Plant (the NPP accident) struck Japan. This triple disaster (hereafter referred to as "3.11") brought extreme damage to people, buildings, communities, and societies. There were over 20,000 recorded deaths and missing persons. Approximately 79,000 people evacuated from their homes in Japan [1,2]. The tsunami wiped out several hundred kilometers of coastline in Japanese towns. Concerning the causes of death, drowning was responsible for over 90 percent of lost victims, with about 65 percent of victims being over the age of 60 [3].

The 3.11 disaster brought not only direct damages, but also huge ramifications to Japanese society. For example, previous studies showed changes of media attentions in national and social media from topics on "earthquake and tsunami" to "the NPP accident." In other words, it can be said that the NPP accident deprived the media attention from topics concerning earthquakes and tsunamis [1,4]. In addition, it has been pointed out that there are gaps in the media framing between national/social media and local newspapers in the Tohoku area [1,5-6]. At the same time, issues concerning different media framing have been discussed repeatedly in the context of science, risk, and crisis communication. Tanaka (2013) pointed out that the adoption of an appropriate scheme and style

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of communication according to situations of emergency is necessary [7], but that it was not achieved in the 3.11 context. In our opinion, these communication issues are rooted in the history and structural issues of Japanese science and technology policy (STP), as well as in Japanese communication practices.

To consider these issues, we would like to provide an historical overview of the domestic and international context on science communication, as well as the implications of the media framing concerning the 3.11 context. Then, we would like to discuss common issues in Japanese science communication within the concept of a “structural disaster” [8,9].

II. Rough outline of the history of science communication in Japanese science and technology policy

In this section, we will overview the history of science communication in the context of Japanese STP. Since the Meiji era, the cultivation of public scientific capabilities has been a prominent political theme in Japan. Particularly after the 1960s, various enlightened activities have been conducted. Namely, those include the “science and technology week” program, the establishment of the Japan Science and Technology Agency, and others. Watanabe (2008) pointed out that these efforts were relatively early cases in a worldwide context [10].

After activities on the “public understanding of science (PUS)” began in the 1980s in the UK, Japanese STP began to focus on the keyword “science communication” in the 1990s. The National Institution for Science and Technology Policy (NISTEP) published several reports concerning science communication, and emphasized the gaps that could not be filled with knowledge, as well as the importance of two-way communication. Although these NISTEP discussions were pioneering, the majority of discussions concerning PUS in the 1990s (for example, discussions on communication regarding genetically modified organism:GMO) were based on the deficit model [11].

This situation changed around the year 2000. In 2001, The 2nd Science and Technology Basic Plan pointed out the importance of scientists’ outreach activities [12]. Additionally, The 2nd Science and Technology Basic Plan of 2006 discussed mutual communication between scientists and the public, and anticipated the active participation of scientific communities [13]. Simultaneously, working papers analyzing science communication in the EU and other countries were published [14-16]. Simultaneously, number of café scientific increased and consensus conferences were tried [17-21]. In 2005, three educational programs for science communication were established at the University of Tokyo, Waseda University, and Hokkaido University [21]. The trend of emphasizing two-way communication continued in The 4th and 5th Science and Technology Basic Plan [22,23]. Generally speaking, the current Japanese STP on science communication is directed to exceed one-way communication policies, and will focus on the ethical, legal, and social implications (ELSI) of science and technology. However, Ishihara-Shineha (2017) pointed out the ineradicable nature of one-way communication and the deficit model, which will be discussed later [24].

III. History of science communication: a global context

Here, we discuss science communication in a global context. We would like to start with an introduction of the UK context in the 1980s. In 1985, the Royal Society published a landmark report entitled The Public Understanding of Science (also known as the Bodmer report). This report was written with to prevent the public from losing interest in science, and emphasized the importance of the idea of the public understanding of science (PUS), as well as the importance of scientists who develop public communication activities [10]. As a result, several governmental offices and institutions were established in the 1990s concerning PUS activities.

The turning point for science communication occurred around the year 2000. In the late 1990s, BSE affairs damaged the trust of the government and related experts. Extracting lessons from these experiences, the limitations of the PUS model involving one-way communication were realized, and methods of gaining the public trust and acceptance by informing them of scientific knowledge were developed. This was the beginning of the so-called “deficit model.” Although the details of discussions concerning the “deficit model” will be illustrated in the next chapter, the idea has been discussed and criticized repeatedly. Regardless, a direction of the concept that went beyond deficit model was shown in a landmark report published in Science and Society by the House of Lords in 2000 [25]. This report discussed the mutual dialogue between science and society rather than one-way communication based on the deficit model. In this report, the expressions “science and society” or “science in/for society” were seen as noteworthy features, and discussions beyond the deficit model were conducted. We can interpret this history as having moved from PUS to PE. In the PE context, knowledge is regarded as “knowledge in context” and related to value [26]. This idea heavily impacted the discussions and STP concerning science communication

[25,27]. This change also meant that the importance of communications on broader social impacts was recognized.

This two-way communication trend was shown in other governmental reports, such as in OPEN CHANNELS Public dialogue in science and technology [28]. As well, in the USA and in international discussion, the same trend is evident. Unlocking Our Future: Toward a New National Science Policy [29] and WORLD Conference on Science: Science for the Twenty-First Century, A New Commitment [30], pointed out the importance of sharing of knowledge, equal accessibility, and encouraging public engagement (PE) concerning science and scientific knowledge. In addition, the EU commission (2002) also took up public engagement as an important theme in their famous policy agenda entitled Science and Society Action Plan (so-called as the Lisbon Agenda) [31]. This trend can be seen in Taking European Knowledge Society Seriously [32] and Horizon 2020, which is the current EU basic framework for STP. At the same time, the attitudes of scientist and hurdles to communication activities have been examined repeatedly according to the progress of science communication by STP [33-38].

Now, we would like to introduce a prominent large-scale dialogue experiment in the UK that focuses on the GMO controversy. From 2002 to 2003, the UK government and The Agriculture and Environment Biotechnology Committee (AEBC) conducted “GM Nation? The Public Debate,” which consisted of multi-level open meetings, citizen workshop participation, focus group interviews, stakeholder conferences, and consensus conferences. An articulation of public interests and the extraction of key messages in the GMO controversy surfaced through these PE trials. Through GM Nation, several key points were discovered. That is, there were various types of unease regarding scientific, political, and social risk, a complicated understanding of risk-benefit (an increase of the interest in long-term risk), value judgement against rapid commercialization, suspicion of the government and multi-national companies (particularly for their alibi-making communication), a request for more and various types of information closure and scientific testing, interests in developing countries, and a welcome recognition the of value of participation in discussion and communication [39-44].

In summary, GM Nation worked as system for knowledge and information sharing through PE [44]. However, the most important lesson from GM Nation is that “GM Nation was too late.” Thus, AEBC developed a mission to recover “the public trust.” However, the suspicion that GM Nation was merely concerned with creating alibis could not be removed. In addition, several issues were pointed out through following studies [40-44], as follows:

- ○ Control participant bias. How to involve citizens with low-interest in this theme.
- ○ Ambiguity of GM Nation’s aim and transparency. The position in the policy-making context and the way to reflect the results of policies.
- ○ Quality of information materials and discussion tools.
- ○ Evaluation system of PE
- ○ Recovery of trust of science and the government

In a more current context, the discussion regarding communication between scientists and society has been progressing through the concept of “Responsible Research and Innovation (RRI),” particular in the EU community since 2011 [45-47]. Now, RRI has become the central concept of the “Science with/for society” program of Horizon 2020, which is the basic framework of EU science policy [48]. As well, “Anticipation,” “Reflexivity,” “Inclusion,” and “Responsiveness” have been regarded as basic ideas [49,50]. Thus, RRI was expressed as “Responsible innovation means taking care of the future through collective stewardship of science and innovation in the present” (p.1570) [50]. With this idea, Horizon 2020 claimed that RRI policy will perform the following [47]:

- ○ Engage society more broadly in its research and innovation activities,
- ○ Increase access to scientific results,
- ○ Ensure gender equality, in both the research process and research content,
- ○ Take into account the ethical dimension, and
- ○ Promote formal and informal science education.

This concept recommends greater communication, engagement, and the inclusion of various stakeholders in science and technology innovation. The societal impact of scientific research, especially research related to SCR and RM, and the ways in which visions for the future may be shared with society are the focus of such policies.

IV. Discussions on the “Deficit Model”

In the early 1990s, the model for science communication policy was generally based on the idea that the public is lacking in scientific knowledge and literacy. Because of that, the public irrationally declined advanced science and technology. Therefore, it was thought that the teaching and informing of scientific contents was the solution. In other words, the more public knowledge there was about science, the more acceptable new science and technology would become. However, this idea has been called the "deficit model," and has been repeatedly criticized. Particularly since 2000, there have been repeated efforts to overcome PUS based on the deficit model.

For example, social psychological studies have discovered that knowledge level does not simply affect public acceptance. Several studies using a large-scale investigation in the EU (i.e., Eurobarometer) found that public "informedness" on science and technology does not simply encourage optimistic attitudes toward science and technology, but also aids in the development of negative attitudes toward concepts such as GMO [51,52]. The increased level of knowledge develops both critical attitudes toward new technology and the overrating of risk. Regardless, it can be said that the effect of knowledge is more complicated than the expectations involved in the deficit model. Risks were understood as being multidimensional, as outlined in the epistemology of diversity and the perception of risk [53-55], the local and contextualized understanding of knowledge [26,56], and knowledge about political context [57]. In Japan, Nagata and Hibino (2008) pointed out that the perception of biotechnology was influenced by moral recognition rather than risk-benefit perspectives through an investigation of university students [58].

Another landmark example of these discussion was provided by Brian Wynne, a sociologist of science in the UK. Wynne emphasized "knowledge in context" [26,56] . He focused on the case of sheep farmers in the Sellafield of the Lake district of Cumbria in the UK. Farmers in this area faced the risk of dispersed radioactive material from the Chernobyl accident. Wynne (1996) examined the contradictive ideas on the protection and handling of radioactive risk, and the uncertainty of scientific knowledge between governmental experts and local farmers [56]. In this context, governmental experts lost "trust" in their judgement on false assumptions and ad-hoc handling, including the "deficit model" style of communication. Wynne also pointed out three key points for wider understanding as follows (p.21) [56]:

○ The fundamental interaction between scientific expertise and lay-publics is cultural, in that scientific knowledge embodies social and cultural prescriptions in its very structure;
○ The problem of public uptake of science therefore lies in the institutional forms of science and of its incorporation into policy and administration;
○ 'Local' case studies of this sort should be seen as an expression of deeper problems of modernity as embodied in dominant institutional cultures. They are not just a defence of 'traditional communities' against an anonymous modernizing 'centre', but a more fundamental challenge to the very idea of a universalizing 'centre' in the first place

One-way communication based on the offering of knowledge is not an effective way to generate a positive public perception of new science and technology. However, it is necessary to point out the confusion of critics of the deficit model, which is common. Critics of the deficit model are at times criticized for refusing knowledge circulation. This idea is incorrect. As already detailed in the discussion above, the nature of criticism of the deficit model involves the simple idea that offering knowledge will develop a perception of new science and technology. In short, critics of the deficit model do not deny the importance of sharing knowledge, but regard it as the basis of discussion and decision making. In other words, the deficit model was criticized as a top-down scheme of information management and knowledge offering; critics of this model aimed to place the sharing of knowledge as a basis for mutual communication with broader meaning, including knowledge on social contexts [59].

V. Lessons from communication and media attention after the 3.11 disaster

The 3.11 disaster brought not only direct damages, but also huge ramifications to Japanese society. Considering the impact of miscommunications after the 3.11 disaster, media has become an important factor. This is because media played various roles in agenda-building and bringing attention to issues through framing [60-63]. Therefore, the effect of media discourses on the agenda-building process in the context of the 3.11 disaster should not be overlooked. Entman (1993) explained that "Framing essentially involves selection and salience. To frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (p.52) [62]. Thus, it is necessary to examine the changes of framing and its effects on society.

Previous studies showed that media attention to the 3.11 disaster decreased over time, and that the decrease was more significant in social media. Although news on the earthquake and tsunami decreased, news concerning the NPP accident increased. In other words, the NPP accident shifted attention away from the earthquake and tsunami [4-6] and played a strong part in setting the agenda. On the other hand, local newspapers showed different realities according to local contexts. For example, in Kahoku-shimpo, a key local newspaper in the Miyagi prefecture, news on the tsunami continued to appear in equal proportion to news on the NPP [1,5].

Takano, Yoshimi, & Miura (2012) pointed out that there is no correlation between the number of times which TV news program mentioned and the scale of damage of damaged autonomies [64]. For example, Yamamoto-town of the Miyagi prefecture was seriously damaged, but this was not as widely broadcast as other famous cities or the NPP accidents. This phenomenon has been called a "depopulated area of information (Joho-Kasochi)"[65].

Surely, this lack of media attention and so-called "depopulated area of information (Joho-Kasochi)" have exacerbated some of the issue's problems. Considering previous discussions on media studies, it is clear that gaps of attention between national or social media and local media will influence the distribution of capital and social interest during the reconstruction process, largely as a result of their agenda and frame-building process [60-63]. This is also true in the 3.11 disaster context, in which the gap of media attention resulted in gaps of capital in the society, including those of assistance grant funding, the number of volunteers, and public interest [64].

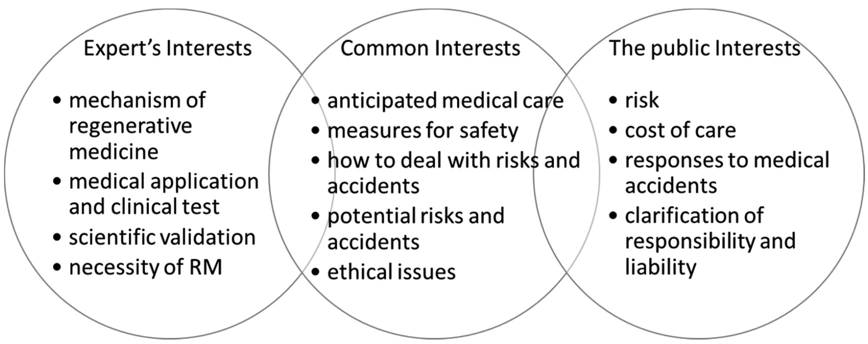
However, the disaster continues. The disaster struck local sites, but the reconstruction process is influenced by an agenda set at the national level. Previous studies showed changes in media attention in national and social media ranging from topics on the "earthquake and tsunami" to "the NPP accident." In other words, it can be said that the NPP accident, and perhaps other kinds of severe accidents, attracted media attention away from topics concerning the earthquake and tsunami [1,4]. Thus, this process is also influenced by gaps of power and interest between metropolitan areas and devastated rural areas that are mediated by gaps of attention between national or social media and local media. In other words, it seems that the locals were made "peripheralized" and the agenda was developed in the "center" without enough care for local contexts and the diversity of "realities."

VI. Beyond "risk communication"

What is the problem with communication activities concerning science and risk moving forward? To consider these important issues, we would like to introduce several current studies. Particularly, we would like to look at the case of the Japanese Society for Regenerative Medicine (JSRM). The activities conducted by JSRM were some of the newest and most insightful trials in the Japanese context. JSRM conducted risk communication activities and investigations that were funded by the MEXT Program for Developing Models of Risk Communication in Science and Technology. During this program, JSRM conducted a large-scale questionnaire for the purpose of providing a comparative analysis of attitudes and interests toward communication on stem cell science (SCR) and regenerative medicine (RM) between experts and the public. They collected the responses of 1,115 experts who were JSRM members, and 2,160 from the public [37,66].

Their results indicated that the public was more interested in the post-realization aspects of RM, such as the cost of care, countermeasures for risks and accidents, and the clarification of responsibility and liability, than they were in the scientific aspects. The scientific aspects were of greater interest only to JSRM members. In summary, communication trials concerning RM should be conducted that consider the pragmatic interests of the public. While scientific facts should form the basis of dialogues between the public and JSRM members, there is a need for increasing awareness on the wider aspects of RM, such as that of developing an understanding of the factors that may arise after the implementation of RM, including the responsibility and liability for accidental cases. At the same time, the public "trust" of RM healthcare providers/developers should be considered while developing

Figure Summary of interests between the public and experts in the case of regenerative medicine (Shineha et al. *Stem Cell Translational Medicine*. 2018;7(2):251-258)



strategies to bridge these gaps [66]. An interesting point is that the above results are similar to those from previous studies involving the nuclear energy case [67,68].

In other words, these results indicated that it is not sufficient to cultivate "trust" by simply offering scientific contents. Rather, a clear scheme of the countermeasures and a clear post-accidental scheme, including responsibility and liability, is necessary to cultivate "trust." To establish a responsible dialogue and cultivate "trust," the points discussed by Matsumoto of sociologist of science will be useful and insightful. Matsumoto (2002) pointed out that experts were required to open their stakes and make their interests clear. In other words, if experts, communicators, and interpreters try to conduct communication without making or explaining their responsibilities, stakes, and interests clear, their communication activities are not exempt from blame to be delusive [69].

In summary, although the sharing scientific contents for discussion is an important process, the viewpoints discussed above should not be overlooked. Then, to consider the future direction of discussion, we would like to introduce Matsumoto's "structural disaster" concept as an auxiliary line [8,9]. Matsumoto (2012, 2013) discussed the 3.11 events as having the character of a "structural disaster." He then examined the Japanese context of science communication through the same concept. According to Matsumoto, there are five elements that constitute a "structural disaster," as follows [8,9]:

1. Following wrong precedents carries over problems and reproduces them.
2. Complexity of a system under consideration and the interdependence of its units aggravate problems.
3. Invisible norms of informal groups virtually hollow out formal norms.
4. Patching over problems at hand invites another patching over for temporary countermeasures.
5. Secrecy develops across different sectors and blurs the locus of agents responsible for the problems in question.

It seems that several factors of the "structural disaster" can be seen in past Japanese science/risk communications (particularly factors 1 and 4). Considering the implications mentioned above, such as in the cases of SCR/RM and nuclear power, past Japanese science communication focusing on scientific contents has been conducted repeatedly without sufficient examination of the political and social aspects, such as the post-handling phase of severe or accidental cases, including the responsibility and liability scheme. Therefore, the Japanese STP on communication should be discussed to avoid these structural disaster factors in the future.

VII. Delusion of neutrality

Additionally, the structural disaster concept is supported by the delusion of its stakeholders. That is, they are obstinate to espousing the neutrality of science and its knowledge. Even before and after the discussion of the deficit model, scientific experts are continually defining themselves as the guardians of scientific knowledge, and tend to think that if society is pervious to their ideas, every argument related to scientific issues might be solved [70]. Namely, the belief is based on the assumption that knowledge is neutral, and that most societal disorders related to science are caused by the misunderstanding of knowledge or the malignant failure of media communication. However, such a standpoint is overlooking the fact that an act of science is essentially argumentative, and also runs against the presumption of democracy and pluralism of opinion. Ignoring these principles result in harm, and do no good for communicating a sound scientific statement.

The cardinal concepts of democracy, such as neutrality, fairness, and impartiality, have long been argued on the frontlines of our societal arena. These are also some of the current main issues in media and journalism. However, through the experience of continuous discussion, those concepts have been removed from the codified norms. That is, "it became clear that a number of familiar and even useful ideas associated with news were too vague to rise to the level of essential principles of journalism" (p.10) [71]. Those essential concepts are endearing and important, but we can never achieve perfect fairness [72]. Those ideals must be pursued with perpetual efforts to keep the society intact.

Nevertheless, most experts believe that the knowledge of science and technology is essentially neutral. However, mere numbers cannot escape societal and political contexts during the constructive process or through application [73]. We are keenly aware of this fact through disputes that occurred during the process of defining the criterion of a contaminated area or security for evacuation in our society after the 3.11 disaster. Every number and discourse contained in our societal narrative is arranged in a political context whether or not we wish it to be; pure scientific neutrality can barely be realized.

VIII. Preparing message toward public

On facing the necessity to send a public message toward scientific controversy to allow for their accountability, scientific experts or public information officers have two choices for contextualizing the message. Namely, they can choose internal or external pluralism. Choosing an internal pluralism strategy involves the challenge of integrating balance or fairness into the opinions of a message. This strategy is effective when targeting a type of audience possessing enough will to understand the situation, and that is seeking for a choice. However, the quest for such an internally pluralistic message may not directly offer neutrality. Creating such a message will reflexively ask you about the meaning of fairness. An internal pluralism strategy can easily develop into a ritual of "including both arguments," even for experienced journalists. Alternatively, if you are a scientist, imagine the difficulty of drafting a perfect review paper in a field in which no peer would criticize your efforts. Furthermore, whenever the message is scientifically well-balanced and impartial, the majority of the targeted audience may not hear or read it. Most audiences favor a simple message, and the only audiences who receive your message might be the people who were interested in and understood the issue beforehand.

One of the best practices in 3.11 disaster case was performed by Toshio Katsukawa, a fishery scholar. In his August 2011 book about fishery, Katsukawa added a small chapter directed at consumers who were anxious about radioactive-contaminated foods [74]. After describing scientific evidence about radioactive food contamination, Katsukawa offered three concrete choices to readers on buying seafoods. These choices were directed at consumers depending on their perceptions about the world. Namely, those are the people who deeply trust governments, who are a little anxious about the situation, or who are deeply concerned about a beloved person, such as a little baby. Note that this advice focuses on free will rather a debate about scientific choice.

On the other hand, choosing an external pluralism strategy indicates that the message will advocate a single point of view and expect others to provide other perspectives. When thinking about risk, however, this strategy is not favorable in the age of social media. When facing such a message, people tend to obey their chosen partisanship beforehand. That is, people will accept the message if it fits their ideology. If the message is contradictive toward that ideology, they will simply deny it or share it among their community by adding sarcastic comments. Our society has not found an effective measure to break through this so-called "filter bubble" [75]. Every practitioner of communication has experience facing such a nuisance, and has sought out countermeasures. However, we should instead send a message toward the silent majority that is willing to think about the issue and then choose. This is not a statement to ignore the people who are yelling scientifically irrational requests. Every message must include the expectation of senders to reach all audiences. A supremely important point is that we should maintain awareness of the power of our own stake, and continually trying to understand the rationality of others as indicated in the deficit model argument. To be too humble is not a problem. Namely, this involves more haste and less speed. That is, one should open their stake to secure the external plurality, and, moreover, emphasize internal plurality as much as the message.

Additionally, in the age of social media, the sender of a message also has the duty to monitor flattering supporters. Supporters may side with the message, but can sometimes abuse it to defeat their "opponents." This may offer a short-term triumph, but will detract from the long-term goal of reaching the democratic choice of scientific risk of society.

In this paper, we have chosen not to introduce a more concrete methodology because of limited space. The field of risk communication already offers decades of history and scientifically tested knowledge and wisdom. However, even people who call themselves "risk communicators" are overlooking or ignoring the fruits of those studies. If you have a chance, or become an accidental stakeholder of science communication, this wisdom should aid your engagement [76,77]. The accumulation of the efforts of each stake could lead to the reform of our society after the damage caused by the disaster.

IX. Conclusion

The 3.11 disaster brought not only direct damages, but also huge ramifications to Japanese society, including serious instances of miscommunication. We would like to mention two points concerning miscommunication from the current studies.

In the 3.11 disaster context, we should not overlook that fact that the NPP accident deprived media attention from topics concerning the earthquake and tsunami, particularly in national and social media. At the same time, local media outlets continued to observe the realities of each area. There were also gaps in the media framing between national/social media and local newspapers in the Tohoku area.

The current investigation of communication between science and society, particularly in the SCR and RM cases, taught us that we should not solely examine the scientific contents, but also the social contexts of science and technology. This case indicated that the public tends to be aware of and regard risks, responsibility and liability, and other post-disaster schemes after the implementation of RM as important factors rather than scientific contents, as experts expected. To secure "trust," mutual understanding, and proper communication concerning post-disaster schemes, including responsibility and liability, is essential. The opening of stakes will support this process.

Sharing an imagination of the future and of responsibility are regarded as important points in the current state of STP in Europe. However, from overviewing the history of Japanese STP concerning science communication, it seems that the discussion mentioned above has not been sufficient for progress. Finding ways to overcome this lack of discussion for a shared imagination of the future and of a responsible scheme to avoid structural disaster should be discussed more often.

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Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this article.

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科学コミュニケーションを巡る歴史と教訓

―東日本大震災からの示唆―

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抄録

東日本大震災は直接的な人的被害のみならず，大きな社会的被害と混乱をもたらした．この東日本大震災を巡る社会的課題の一端について考察するために，本稿では日本の科学コミュニケーションが持つ構造的問題とその歴史的経緯について検討を行う.（特に再生医療分野のリスクコミュニケーションに関する）最近の研究において，科学的コンテンツは重要であるものの，それ以上に潜在的なリスク，事故の際の対応スキーム，責任の所在などへの関心事がより一般の人々の中で優先的であることが見出されている．このことは「信頼」の醸成において，責任体制も含めた事故後の対応スキームの共有が重要であることを含意している．また，コミュニケーションの実践においても利害関係や責任の所在の明示が重要であることを指摘する．

同時に，東日本大震災を巡るメディア動向とその含意についても，最近までの研究成果を踏まえながら考察を加える．東日本大震災において，とりわけ全国メディアとソーシャルメディアにおいて福島第一原子力発電所事故がメディア上の関心の中心事となり，東北地方の被災地における地震・津波に関する話題が相対的に背景化したこと，一方で被災現地のメディアでは異なるメディア関心が見出されてきたことを指摘する．

キーワード：科学コミュニケーション，リスクコミュニケーション，フレーミング，メディア，東日本大震災