

# POLICY BRIEF

No. 5, 2016

## Nuclear Disasters and Risk Communication: Learning from Fukushima

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### Highlights

Risk communication efforts after the Fukushima nuclear disaster face a range of challenges: disparities in access to information and perceptions of risk among the affected people, uncertainties in radiation science and its technical nature, persistent public distrust, and the complexity of the disaster recovery process. This underscores that risk communication in the context of nuclear disasters should be continuous, timely, inclusive and context-sensitive. This policy brief recommends that:

- Risk communication is continuous, preparing for potential crises and using stakeholder discussions and joint monitoring and evaluation of risks related to the nuclear industry.
- Emergency communication mechanisms are established and utilised to ensure timely provision of situation-specific risk information.
- The limits of scientific knowledge and variations in expert views are openly discussed, with public risk perception and concerns in mind.
- Post-disaster radiation risk communication and dialogues on other recovery challenges are integrated in policymaking and implementation.

### Introduction

The meltdown of nuclear reactors at the Fukushima Daiichi nuclear power plant in March 2011 following the Great East Japan Earthquake and tsunami led to a large-scale release of radioactive materials, which will require a long process of environmental and societal recovery. Radiological remediation is expected to take longer than the repairing of structural damage caused by the earthquake and tsunami due to the long lifespan of some radioactive substances.

Communicating risks to concerned actors is a crucial element of disaster management governance. Yet post-Fukushima risk communication has been faced with multiple challenges. The majority of the public has found information about radiation to be unfamiliar and highly technical, and difficult to apply to decision-making in their daily lives. Discussing potential health risks also tends to be complicated and contentious. Consequently, describing radiation and radiation risks in an understandable, practical and credible manner is difficult — despite its importance for disaster management, including the protection and recovery of people and their livelihoods.

This underscores the need for risk communication policies and strategies appropriate for the management of nuclear disasters. This policy brief discusses five major

challenges to communicating risks in the aftermath of the Fukushima nuclear disaster. It provides recommendations for policymakers, industries and other risk communication practitioners in Japan and other countries with nuclear industries, and promotes discussion of risks, enabling individuals and communities to make informed choices.

## Risk Communication

Risk communication involves “the exchange of information among interested parties about the nature, magnitude, significance, or control of a risk” (Covello 1992, 359). It serves as a tool and a process to (i) enable the audience to understand and internalise risk messages, (ii) promote attitudes and actions to avert or mitigate a specific risk and/or its source, and (iii) facilitate consensus building and collaborative problem-solving. Risk communication plays a vital role in disaster management, from policy to individual behaviour, and from the pre- to post-crisis phases.

## The Aftermath of the Nuclear Disaster

Five years after the Fukushima nuclear disaster, several areas that were previously restricted have now been reopened following decontamination efforts and repairs to infrastructure. The Government of Japan aims to terminate all evacuation orders by March 2017, aside from those in areas where radiation levels are expected to remain above 20 millisieverts (mSv) per year (Nuclear Emergency Response Headquarters 2015). Nevertheless, the disaster is far from over, and people continue to have grave concerns about radiation (Fukushima Prefectural Government 2015).

In addition to concerns about long-term exposure to low-dose radiation from the accident, there are ongoing issues related to the management of contaminated materials and the decommissioning of the damaged reactor. In September 2015, torrential rains washed away bags with contaminated waste from some temporary storage sites in affected prefectures. Although no serious contamination was detected (Ministry of the Environment, Japan 2015), this provoked public anxiety. To monitor safety, there is a need for information relevant to everyday life, such as radiation levels in residential areas, schools and their surroundings, water sources and temporary storage sites for contaminated waste, and along routes used to transfer such waste.

## Communication Efforts and Challenges

Since the disaster, a large quantity of information has been made available to non-experts. The government,

for example, has developed brochures and websites on radiation, radiation levels and the status of disaster recovery, and established the “Decontamination Information Plaza” — a centre for disseminating information about decontamination activities. Public forums have been organised with invited experts. Tablet computers are provided to residents to share locally specific information, such as municipal government announcements, as well as to facilitate communication with and between residents. A support centre was established in Iwaki city in Fukushima prefecture to provide technical assistance for radiation risk communication to social workers and others engaged in community-based recovery efforts. Additionally, experts organise workshops independently; some work with local people to promote citizen science related to radiation — efforts by members of the public to monitor, evaluate and protect themselves and communities from potential hazards — through capacity-building workshops focused on individual measurement of radiation doses. Medical professionals provide individual assistance with reading data from personal dosimeters and medical examinations.

The coverage and success of these practices, however, is unknown — even though a structured evaluation of the improvement and/or expansion of effective practices is essential. In addition, the results of radiation monitoring are generally kept by the monitoring providers or the respective municipalities; unified information management is needed. Further challenges were raised during (i) focus group discussions and interviews conducted by the author with affected residents, as well as local government officials, social workers and civil society organisations in Fukushima, and (ii) a UNU-IAS research workshop on risk communication held in November 2015. These challenges can be grouped into the following five themes:

### 1. Limited Information for Some Population Groups

Although many different communication channels are used, the results of the focus group discussions and interviews suggest a worrying information disparity between (i) elderly-only households, the unemployed, and others with fewer social interactions; and (ii) those with extensive social interactions. Participants in the field research repeatedly noted that community support is vital for those with limited in-house family assistance to obtain, understand, evaluate, select and apply information that is useful for their daily lives. This is not only due to physical difficulties, but also a general tendency to seek information from family members, friends and trusted community members. There is a concern that the ongoing closing of temporary housing facilities for evacuees, where it tends to be easier to exchange

information, will disrupt the social flow of information and exacerbate information disparities.

## 2. Diverse Perceptions of Radiation Risks

The field research showed that the affected population has a range of different perceptions. Some people remain highly concerned about the health effects of radiation and wish to reduce radiation exposure to the lowest possible levels, while others accept or agree with official assurances that the risks are limited, and instead prioritise other issues. Others do not even want to think about radiation, due to the exhaustion caused by constant preoccupation and anxiety over a long period.

These differences in risk perception have led to tensions among and within communities — and even within households in some cases. Mothers, for instance, tend to be more concerned about radiation impacts on children than fathers, who pay greater attention to economic security. This is possibly due to the differences in their traditional household roles (e.g., housekeeping versus ensuring financial and social stability). According to a 2013 study, in areas recognised as localised radiation hotspots, over two-thirds of the surveyed mothers with small children stated that their level of concern over radiation had not changed since the disaster (Shimizu 2015). The author also found that women are often under-represented in policymaking and in surveys. In this context and under the present government's policies for accelerating disaster recovery, those with strong concerns about radiation can be vulnerable to social marginalisation.

## 3. Limits of Scientific Knowledge

People's concerns about radiation risks are not merely a result of lacking in-depth scientific knowledge. The field research and workshop revealed a key challenge to be the gap between people's expectations about certainty and the levels of certainty that are actually available. This is connected to continuing disagreements between experts reported in the media, about radiation threshold models and the possible effects of long-term exposure to low-dose radiation. People now have access to an overwhelming amount of information and advice representing different perspectives on these issues, of varying reliability. This can exacerbate their confusion and the polarisation in perceptions about "safe" or "unsafe" levels and health impacts from radiation exposure. Clear communication about people's concerns, the limits of the available scientific knowledge and points of disagreement is vital.

## 4. Persistent Public Distrust

The breakdown of public trust in the government, Tokyo Electric Power Company and the scientific community, as well as the loss of a sense of security were significant outcomes of the disaster and continue to impede post-disaster communication (Hobson 2015). The shortcomings of disaster-preparedness measures, information and stakeholder communication before, during and immediately after the crisis led to chaotic evacuations, serious confusion and avoidable radiation exposure. Participants in the field research stated that their everyday lives had suddenly been taken away by the nuclear power plant, which they had been told was safe, and believed to be so. Concerns about information transparency still persist among the affected people.

This scepticism and the need for individual-level, comprehensive, freely accessible radiation data, however, has provided opportunities for citizen science, in which non-experts acquire an independent means of monitoring radiation. Such programmes have increased in popularity. Government policy also supports personal radiation monitoring as a tool for decision-making. However, it is critical to make assistance available to ensure accurate radiation measurements that produce credible data, and are competently interpreted for individual decision-making.

## 5. Divergent Information Needs for Disaster Recovery

Post-disaster radiation risk communication for a sustainable recovery needs to take into consideration the diverse concerns of the affected individuals, and facilitate genuine dialogue and comprehensive information sharing. The diverse challenges that the affected people face in the process of rebuilding their lives include unemployment with declining occupational options; adjusting to unfamiliar environments and changing lifestyles; disruption of family ties, social networks and community life; and uncertainties about the future (Mosneaga 2015). Addressing radiation issues is certainly a core issue in the disaster recovery agenda, but others are equally important. The current suffering of the affected people is closely tied to the long-term social impacts of the nuclear disaster.

## Communication for Sustainable Recovery and Reduction of Future Risk

The Fukushima case shows how a nuclear disaster creates environmental and health concerns, which are associated with scientific uncertainty as well as social issues. While many countries continue to operate and build nuclear power plants, the experiences of Fukushima underscore

that risk-communication policies and strategies in such contexts should consider the following issues:

- **Radiation risk communication must take place at all stages of the disaster management cycle, starting from the pre-disaster period.** Citizens must be provided with a clear explanation of risks related to the nuclear industry, including their social dimensions. Emergency plans should be developed in cooperation with local citizens, followed by similarly inclusive processes for risk monitoring and evaluation. Individual radiation monitoring should be promoted and financial and technical assistance provided as a part of joint monitoring throughout the disaster management cycle.
- **It is vital to establish a communication mechanism for provision of timely risk messages in emergency situations.** Governments must provide early warnings and situation-specific guidance to minimise actual damage. An emergency communication mechanism should be agreed upon by the concerned actors during a non-crisis period, and consistently used during crises. Building international information partnerships is particularly important in the case of nuclear disasters.
- **Points of scientific disagreement should be explicitly discussed.** A credible platform for dialogue should be developed to clearly discuss the limits of available scientific knowledge, as well as contested opinions or different interpretations of available evidence. Risks involving scientific uncertainty need to be discussed by stakeholders, including citizens, and defined in a collective manner. Transparency should be ensured in policymaking processes.
- **Post-disaster radiation risk communication should be part of disaster-recovery dialogue between concerned actors as a core element of post-disaster management.** It is important to develop platforms

that enable broad stakeholder engagement in other recovery processes, to collaboratively address people's concerns. Such stakeholder dialogue should be an integral part of policymaking and implementation. These platforms should be used to foster a social support mechanism that identifies population groups with limited information opportunities and provides them with continuous support.

#### Note

This analysis is based on focus group discussions and interviews carried out by the author in June–September 2015 with displaced residents, returnees, residents in areas neighbouring evacuation zones, local government officials, civil society organisation representatives and social workers in Fukushima. Support was provided by the Fukushima Cooperative Reconstruction Center and other local partners. Lessons were also drawn from the UNU-IAS workshop "Understanding and Communicating Risks Post-Fukushima", held in November 2015.

#### References

Covello, V. T. 1992. Risk communication: An emerging area of health communication research. In: Deetz, S. A. ed. *Communication yearbook 15*. Newbury Park, CA, USA: Sage, pp. 359-373.

Fukushima Prefectural Government. 2015. Heisei-26-nendo Fukushima-ken-hinanshya-ikō-chyōsa (Ōkyu-kasetu-jyūtaku-nyūkyo-jittai-chyōsa): Zentai-hōkoku-shyo.

Hobson, C. 2015. Rebuilding trust after Fukushima. FGC Working Paper Series No. 4, UNU-IAS.

Ministry of the Environment, Japan. 2015. Heisei-27-nen-9-gatsu Kantō-Tōhoku-gōu ni tomonau jyokyo-dojō-tō-ryūsyutsu-jian ni taisuru taiō ni tsuite.

Mosneaga, A. 2015. Tackling prolonged displacement: Lessons on durable solutions from Fukushima. Policy brief No. 1, UNU-IAS.

Nuclear Emergency Response Headquarters, Prime Minister of Japan and His Cabinet. 2015. "Genshiryoku-saigai kara no Fukushima-fukkō no kasoku ni mukete" Kaitei. Adopted by Cabinet Decision, 12 June 2015.

Shimizu, N. 2015. Ishikettei to gender-fubyōdō: Fukushima-genpatsujiko-go no "saiken"-katei ni okeru kadai. FGC Working Paper Series No. 9, UNU-IAS.

Nuclear Disasters and Risk Communication: Learning from Fukushima  
UNU-IAS Policy Brief — No. 5, 2016

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ISSN: 2409-3017

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#### Publisher

United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)  
Tokyo, Japan

This policy brief is a result of research conducted for the UNU-IAS Fukushima Global Communication Programme, which examines impacts of the Great East Japan Earthquake, tsunami and nuclear accident of 11 March, 2011 on people and society.

