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From Risk Communication to Participatory Radiation Risk Assessment

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This working paper series shares research produced as part of the Fukushima Global Communication (FGC) Programme, a research initiative of the United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS). The FGC Programme applies a human security approach to examine impacts of the Great East Japan Earthquake, tsunami and nuclear accident of 11 March, 2011 on people and society, and the challenges of the recovery process in Fukushima. It also focuses on issues of risk and information provision, aiming to improve understanding of how the threat of radiation is perceived, and the specific challenges of risk communication related to nuclear energy.

This working paper is an output of the FGC research workshop "Understanding and Communicating Risks Post Fukushima", held in Tokyo on 12–13 November 2015. The workshop brought together international experts to explore the specific challenges of understanding and discussing risks related to nuclear accidents, and identify appropriate and effective forms of risk communication.

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ABSTRACT

In the aftermath of the Fukushima nuclear accident, many of the post-disaster responses undertaken by the Japanese government sparked vivid debates and criticisms from the civil society. These concern emergency responses such as the revision of public exposure dose limit, designation of evacuation zones, distribution of iodine tablets, and risk communication as well as mid and long-term policies including radiation dose monitoring, decontamination, waste management, return of evacuees, and health and food monitoring. Convinced that such public agitation derived from their lack of scientific knowledge, the authorities undertook a strategy to enhance their communication on radiological risk and its health effects. In this paper, we attempt to challenge the traditional notion of "risk communication" which considers that the concerned risks have been clearly defined by the scientific community and that the problem simply remains in communicating them "rightly" to the population. We argue, in contrary, that risks cannot be properly defined without understanding the "real" concern of the population – what they consider as risks - nor taking into account existing scientific controversies and uncertainties. In such a context, what we need is not so much of risk communication but rather participatory risk assessment where risks are debated by multiple stakeholders and actors including counter- or independent experts and third parties such as NPOs, and are defined collectively rather than decided single-handedly by policymakers – the authorities and their affiliated experts.

The paper is drawn from the preliminary results of the SHINRAI ('trust' in Japanese) project led by the French Institute for Radiological Protection and Nuclear Safety (IRSN), in collaboration with Sciences Po Paris and Tokyo Institute of Technology (Tokyo Tech). This research examines the relation between science, expertise, trust and decisions in the aftermath of the Fukushima nuclear accident by conducting an extensive field interviews in the affected areas of the Fukushima prefecture.

抄録

福島第一原子力発電所の事故後、日本政府の対応について多くの激しい議論が行われ、また市民社会から批判が巻き起こった。公衆の被ばく線量上限の修正、避難地帯の指定、ヨウ素剤の配布、リスクコミュニケーション、そして放射線量モニタリング、除染、廃棄物管理、避難者の帰還、健康・食品モニタリングといった中長期の政策的対応などがその主題である。このような市民の「動揺」は科学的知識の欠如によると信じて、政府は、放射線のリスクと健康影響に関する情報発信を強化する戦略をとった。

本論文では、人々が懸念するリスクは科学によって明確に定義することができ、単にそのリスクを国民に「正しく」伝えることだけが課題であるとする昔ながらの「リスクコミュニケーション」の考え方に批判を試みる。このような考え方とは逆に、人々が「実際」に懸念すること（市民が何をリスクとして捉えるのか）を理解することなく、また、科学的論争と不確実性の存在を考慮することなくしては適切にリスクを定義することはできないと著者らは考える。このような文脈において、人々は「リスクコミュニケーション」を専ら必要としているわけではなく、政策決定者（規制当局およびそれに委託された専門家）の独断によるのではない、様々な利害関係者、および多様な専門家を含むアクターやNPOなどの第三者が集ってリスクを議論し、それが定められる参加型リスク評価が求められる。

本論文は、フランス放射線防護原子力安全研究所（IRSN）、パリ政治学院、東京工業大学の共同研究である信頼（SHINRAI）プロジェクトの中間成果に基づく。同プロジェクトでは、福島県内の被災地の広範囲で現地インタビューを行い、福島原発事故後の混乱における科学、専門知識、信頼、意思決定の関係を検証することなどを進めている。

Introduction

Our paper questions the very idea of "risk communication" in order to argue for an alternative approach, the concept of "participatory risk assessment". We will first analyse the notion of risk and its limits in the context of nuclear accidents[1]. The strategy of communication undertaken by the Japanese authorities will also be analysed as a "rhetorical marginalisation of science and democracy" (Hirakawa and Shirabe, 2015). Then, the paper develops the concept of participatory risk assessment. Participation has become, according the famous formula of Loïc Blondiaux and Yves Sintomer (2011), an "imperative" nowadays. The term "participation", however, is widely used to describe a variety of activities. Topçu (2013) has shown, using the Foucauldian concept of "government of criticism", how a series of instruments (including some forms of participation) was used in France as a mean of taming anti-nuclear critics. For this reason, we attempt to clearly define what "participatory" means in our paper from the outset. By "participatory", we do not mean that communication is made simply in the presence of the population where information is transferred from the provider (one side) to the receiver (the other), nor "consulting" citizens in the last minutes for pre-determined decisions that would concern their immediate future. More precisely, we call for a joint assessment where risk is framed as a threat (and not reduced to quantification and numbers) and the vulnerability of various individual circumstances is taken into consideration. This participatory approach also means that risks are debated openly and democratically with the participation of multiple stakeholders and actors, including counter- or independent experts and NPOs, and

are defined collectively, not framed as "individual decisions" or "individual acceptation of risk" where "incalculable risks to personal health and reproduction are therefore privatised and experienced as random personal tragedies, rather than being recognized as systemic externalities" (Nadesan, 2013).

The Notion of Risk: its limits

The traditional notion of risk communication is based on an idea that the risk has already been well established by scientists and experts and that it simply has to be clearly explained to the population. The problem identified by this model of risk communication is a "bad" communication: for example, people may fear radiation "too much" because the information on risks has been poorly conveyed. Following this logic, the message has to be clear, pedagogical, and adapted to the knowledge level of information "receivers". In this case, information often becomes repetitive with almost no change in the content of the message.

The limit of "risk paradigm" and quantification of risks

In the first place, we will discuss the paradigm of risk itself to approach the consequences of a nuclear accident. The concept of "risk analysis paradigm" is taken for granted in the field of risk communication. Our main argument is that this risk paradigm is far from adequate to account for and manage the aftermath of a nuclear accident. The notion of "risk" is indeed very much linked to being able to frame, visualise, and to quantify the consequences. The case of radiological risks after Fukushima demonstrated well indeed the difficulty of this quantification. As also summarised by Yannick Barthes during an interview: 'when we speak of "risks" today in the environmental or health domain, we mean most often "threats", uncertain dangers in fact. We are not so much confronted to risks than to situations that are uncertain, dangers that cannot be quantified. From this point of view, a notion such as "risk society" proposed by Ulrich Beck is slightly misleading because we did not enter into the risk society, in contrary, we have moved out of it[2]'. (Barthes, 2007)

The limit of risk assessment

This is particularly true when risks are the source of controversies. In this case, epistemic and political divisions may result in different evaluations of risks. These different views may come from divisions among scientific groups or between groups in opposition. In some cases, these divisions derive not only from different scientific opinions but also from a long-standing divide between pro- and anti-nuclear groups. The controversy regarding "low-dose effect" is "as much scientific and technical as social and political as long as it raises the question of choice for nuclear energy" (Boudia, 2013b).

Risk communication on radiological risk after Fukushima

Following the Fukushima nuclear accident, Japanese authorities seem to have adopted a risk communication strategy of a very "traditional" nature. They have chosen and nominated their experts to be in charge of assessing radiological risks and then of communicating such risks to the population. Most important post-accidental policies such as raising the public radiation exposure dose reference were decided thus following the advice of these chosen experts. Japanese uses a specific term 'goyo-gakusha' to call experts who appear to be 'patronized' by the government or attached to the power structure, on the contrary to 'independent' experts who would speak freely on the basis of their knowledge and convictions (Onai and Hondou, 2011). Goyo-gakushas are thus regarded as those taking into account the values and political agenda of the government. Many institutional experts and official advisors were considered as such after the Fukushima disaster regardless of their actual stances. In this context of lost trust[3], independent experts or academics seemingly not under the influence of Japanese politics or nuclear industries were quickly perceived, blindly in some cases, by the population as independent and their views unbiased.

During these communications, the officially chosen experts often framed radiological risks as a problem of "communication". This approach is very close to what was described by B. Wynne (1991) as a "deficit model": according to this model, the problem in communication lies with the knowledge deficit of the information receivers: the population. The role of experts, in this case, is to reduce this deficit by providing information and "enlighten" the public so to speak. There is no place for taking into account the knowledge already possessed by citizens themselves. They are seen either as unknowledgeable or, in some cases, naïve, possessed by false ideas and inadequate and exaggerated information, victims of pure rumours. For example, some of post-Fukushima public communication uses an expression such as "to fear radiations correctly". This term leads us to suppose that the "correct" fear is the one established by the authorities and the others are necessarily "wrong". Another pattern of public discourse on radiation risk involves the use of two distinct Japanese words: "anzen" and "anshin", which mean "safety" and "feeling of safety" respectively. By this, the authorities imply that they are providing the information on "anzen", a tangible scientific fact, while the civil society is reacting in an emotional and less rational manner, seeking "anshin", the subjective notion of safety. The official communication often presented the risk analysis conducted by the government experts as a sole "objective" interpretation of risk which was based on correct and scientific views, while qualifying others as "subjective" notions of risk, based on an ideologically distorted or emotional views, which were held by citizen associations and the population, mothers in particular.

These characteristics of post-Fukushima risk communication have been analysed in detail by Hirakawa and Shirabe (2015) as a rhetorical marginalisation of what have been at stake in public anxiety and controversies over the risk of low-dose radiation and radioactive contamination of foods, water, soil, and tsunami debris. The two patterns of marginalisation that they analysed are directly linked to the shortcomings of what we have called here the "classical approach of risk communication". The first one "scienceplanation"[4] is the reduction of wider dimensions of the issues, making social problems to a scientific dimension or as a matter of public misunderstanding of science. For example, the Science Council of Japan (SCJ) held an emergency lecture meeting after the accident with an objective as follows: 'After the earthquake disaster, a lot of information about radiation has been released, and many people in this country are vaguely anxious about the effects of radiation on health. This emergency lecture meeting is intended to present correct information as it stands, to dispel anxiety about radiation, and to improve radiation literacy through lectures and panel discussions by leading researchers." (Translated by Shirabe). The second form of marginalization is the mobilization of shaky or imbalanced scientific arguments in conducting risk communication for the public. This encompasses, for example, the claim that cumulative additional radiation doses below 100 mSv are safe, or employment of the theory of radiation hormesis. Indeed at the same lecture meeting, the SCJ invited four speakers, one of which gave a talk about radiation hormesis theory. At the end of the presentation, the speaker suggested that hormesis effects on human health were about to be scientifically proved. Who could imagine that the title of this lecture meeting was 'to fear radiation "correctly"'?

The issue concerning the risk of low-dose ionizing radiation is a long-standing controversy, linked to the development of the nuclear industry together with the concept of radiological protection (Boudia, 2008). There has been no scientific consensus even today on the borderline between what is considered "safe" and "unsafe" of low-dose effects. Scientific controversies may oscillate between "confinement" (to a circle of scientists and experts specialised on the question) and "de-confinement" (the detail account of the controversy emerges for public debates). Boudia (2013a) shows in her history of radioprotection how the controversy on low doses is "reconfined" to a circle of scientists in the 70s. "For some (institutions) it was important to try to contain the controversy within closed institutional arenas where negotiations were easier than in public". The Fukushima disaster indeed transformed the debate on low-dose radiation effect from a confined to a de-confined controversy in a matter of several weeks in Japan. During the first months after the accident, the risk communication made by the Japanese government was globally of a reassuring nature: there is little risk below 100mSv and the public exposure dose limit at 20mSv/year, which had been raised from the 1mSv/year one week following the accident, is an acceptable threshold for all populations including children, following the recommendation made by International Commission on Radiological Protection.

Participatory approaches: what definition? (Policy Recommendations)

The term "participatory" indeed encompasses a large spectrum of activities, so large as to include an initiative aiming to help people live with radiological contamination. In such initiative, the risk assessment is often entirely and exclusively assigned to public and institutional experts and the paradigm of risk models is still considered relevant and valuable. This implies that "risks" are considered as tangible and calculable: the only question is how to protect oneself and his/her family, but a certain amount of risk is implicitly considered as acceptable. According to this vision, there is no room for the public recognition of controversies, whereby controversies are deconfined from the simple disagreements within the scientific world and open to public debates. Moreover, experts are meant to "teach" people how to protect themselves from radiation and ultimately how to "live with" radiation, by developing proper behaviours and constant monitoring in order to make a link between their actions (taking a walk in the forest, the consumption of wild food…etc.) and the "results" in terms of contamination (revealed by Whole Body Counter and/or dosimeters). In her critics of the ETHOS project led in Belarus, Topçu (2013) argues that, paradoxically, "the promotion of empowerment in the context of long-term radioactive contamination may imply a new form of abandonment of individuals by the state and the international bodies". Although she does not deny the need to assist these individuals, she insists on the fact that living on contaminated territories should not be considered as "normal" and referred to by means of a euphemism and concludes: "There are no real solutions –only partial rearrangements- for the management of contaminated territories".

The participatory approach for which we argue here encompasses a much larger variety of actors and is thus quite distinct from the example shown above. Participatory does not mean only a "dialogue" between official experts and citizens, which can lead, in fact, to a situation where there is no other ways of defining risks than the ones already framed and elaborated by the authorities. In order for the genuine participatory approach to work, we propose the following policy recommendations with some concrete examples:

1. Risk assessment exercise should involve counter-experts and scientists who may disagree with the official views on radiation risk as well as third parties such as NGOs and legal observers (or ombudsman). This allows risks to be framed more in terms of threats rather

than by percentages and probabilities, which necessarily calls for taking into account other elements such as justice and precautionary principles, in addition to science, in assessing risks (Boudia and Jas, 2014). These exercises would then help the affected persons to globally assess the situation and come up with their own decisions as to whether or not to return, resettle, stay and leave from their homes and start a new life.

2. In risk communication and assessment, scientific controversies should be recognised as a major issue of consideration and thus be debated publically. The uncertainty is not a side-effect of science nor "one of the characteristics of the radiological risk", but rather the central gravity which has many political implications. Taking into account such controversies may mean formulating policies based on precautionary principles accommodating worst case scenarios, and providing realistic options for the affected, for example, either to evacuate from or stay or return to the place of origin with radiological protection measures, treating both on equal terms with adequate financial assistance.

3. Participatory approach could also be a joint initiative in measuring radiological contamination levels. Currently, there are many citizen associations and NPOs measuring radiation on the soil, water, food and in the air. These activities should be promoted, financially supported and even jointly implemented by the local or central authorities. For example, Naraha town has been measuring radiation levels around the Interim Storage Site (Kariokiba) together with resident volunteers. This could also help restore trust that was lost between the population and authorities following the accident.

4. Finally, migratory decisions after the nuclear accident in the post-emergency phase should be made in a truly participatory manner. Currently, many important decisions concerning the future of the affected population such as the timing of their return, are often predetermined by the government and are only communicated to nuclear evacuees at the last minute, leaving them often with no choice but to accept such decisions (Hasegawa, 2015). Moreover, the last-minute consultations are usually organized behind closed doors without any presence of media, NGOs, legal or independent experts, producing often no record of what has been exactly discussed and thus leaving evacuees with little recourse. As such, evacuation orders have already been lifted in three towns, Tamura city, Kawauchi village and Naraha town, despite strong opposition from the evacuees. The decision-making process for reconstruction thus needs to be more inclusive and transparent, assisting a variety of options for the affected, and not emphasizing only the option of return and how to live with radiological contamination.

The role of counter-expertise

In the immediate aftermath of Fukushima, the lack of reliable information related to the radiological contamination played a crucial role in the citizens' loss of trust toward the authorities. Many felt that such information was released very slowly and with little explanation. Others believed that the government deliberately withheld critical information in order to minimize public alarm (Aldrich, 2013). This black-out of information was also caused by the lack of measuring devices in the country. Under the circumstance, a number of citizen initiatives and associations sprang in an attempt to obtain such information and make it available to the public by procuring themselves such devices or calling out for help to the experts and associations abroad. These so-called citizen scientists were motivated to develop their own knowledge and assessment of risks, instead of waiting to be "communicated" by the authorities, in order to set up their own base judgment on radiological risks. A number of them focused on measuring radiological contamination in the air, soil, human body and food items. These citizen initiatives include the Citizen Radiation Measuring Stations (CRMS), SAFECAST, Fukuro-no-kai, Radiation Watch and many others. Morita et al. (2013) qualified these civic radiation measurement initiatives as having become a collective response to the limitations of the governmental and institutional post accidental management, filling the information void created by the authorities and public institutions and performing an ad hoc role of public delegation. The same authors resumed, "public engagement with technoscience is called for most strongly at exactly those moments when established political and institutional frameworks fail to address collective concerns"(93).

Some of these organisations or individuals have positioned themselves as counter-experts vis-à-vis governmental or institutional experts, and others didn't. But these public engagements have made significant impacts on the post-Fukushima Japanese society. One of them was that they offered an alternative view on risk, namely, informing the public on the existence of scientific controversies on low-dose effect, apart from the traditional risk communication conveyed by the authorities. By doing so, they played an important role of paving the way for a new kind of participatory approaches in assessing risks, putting in question the existing paradigm of risk, shedding a light on essential life-related issues which had been treated as periphery to purely scientific matters and calculations, and broadening the frame of decisions to be made after a nuclear accident.

Conclusion

Participatory risk assessment after a nuclear accident thus entails a truly democratic process of involving multiple stakeholders and actors including counter-experts, citizen experts, legal experts, resident associations and NPOs,

which goes beyond the mere involvement of citizens in "managing" radiological risks or improvement of communication on risks. It also encompasses, in our view, examining different views on risks by taking into account the existence of scientific controversies on the subject. This requires a process where counter-expertise or other forms of alternative expertise on radiological risks are to be recognised as legitimate partners in policy-makings as well as risks are to be debated by experts of different opinions in front of stakeholders who then would be able to form their own risk analysis and make decisions with regard to their life choices: return, evacuate or stay in the place of origin. These different choices should be then treated and assisted on equal terms by the authorities in order to mitigate disparities and tension within communities. Moreover, the participatory process should also allow the possibility to make alternative collective decisions at the level of a community or a village, to be relocated or resettled in another city for example, different from those pre-chosen by the government. Nuclear accidents shake the foundation of so-called democratic societies and call into questions the legitimacy of establishment and institutions. In this context, what we described as genuine participatory processes above could be a key to addressing some of protracted and complex issues that are facing the affected communities following nuclear accidents.

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Notes

[1] This is true that in emergency situations and for short-term decisions, there is little room for taking into account various controversies, uncertainties, and participation of citizens (e.g., a decision to evacuate hospitals and nursing homes following the nuclear accident). Our focus here is on the risk communication where decisions do not have to be made in an urgent manner, as in the case of migratory decisions after nuclear accidents: whether or not to return home in the former evacuation zones.

[2] Translated from French by the authors.

[3] Concerning the post-Fukushima loss of trust, the Japanese government also acknowledges it in its official document. The Ministry of Economy, Trade and Industry (METI) produced a supporting document in November 2014, entitled "Regaining Trust toward the Nuclear Policy" (http://www.enecho.meti.go.jp/committee/council/basic_policy_subcommittee/011/pdf/011_003.pdf), in which it says that "under the context where trust is lost toward the government and nuclear operator, risk analysis of experts would not be listened to (by the population)" (p.4).

[4] Scienceplanation is a term coined by Shirabe, based on the concept of mansplanation which means the way (of a man) of commenting on or explaining something to a woman in a condescending, overconfident, and often inaccurate or oversimplified manner. Similarly, scienceplanation is defined as the way (of a scientist or an authority) of commenting on or explaining to lay persons in a condescending overconfident, and often inaccurate or oversimplified manner. (http://dictionary/reference.com/browse/mansplanation).

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