論　説

A Study of Risk Communication and Interactive Understanding :

Is it Possible to Enjoy Democratic Dialogue as a Citizen?

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Key words: Communication, Interactive relations, Citizenship, Democratic model of risk communication, Risk management cycle

1. Purpose and Objective

In this paper, under the theme of risk communication, the importance and significance of the understanding of the the impact of it and difficulties regarding information exchange. To do so, some experimental group discussions were conducted with the students at the Business Administration Faculty of Yokohama National University, quoting some past experiences in groups, how we should act as an information dispatcher to trigger an appropriate action from the people to avoid the risk facing natural disasters.

The configuration of the discussion is as follows. Firstly, we surveyed the main discussion points regarding risk communication mainly referring to Fischhoff(1995) and Kasperson (1991). These two scholars are well known for their clear benchmark and political implications of the potential problems of risk communication. Also Kasperson presented four inevitable duties which might cause problems if they are not fulfilled by the regulators. Ironically the phenomenon that these four duties missed out in the year of 2011, seemed to be happening when twenty years had passed since Kasperson pointed out potential problems which might be caused.

In fact, risk communication has attracted a lot of interest from various quarters these days. Of course it is natural that since 311(East Great Earthquake incident), people have noticed the vital importance of risk-avoiding activities and related information such as Tsunami or radiation contamination. In this first part, the analysis is based on the study group discussion which was held on the 8 January 2012 in Hamamatsu designed by Professor Koyama, Shizuoka University.

Secondly, based on the theoretical framework which was surveyed in the first part, the British bitter experience - the BSE[1] issue - from the mid 1980's to this day is studied from the scope of information

[1] Bovine Spongiform Encephalopathy, commonly known as mad-cow disease.

exchange and interaction between the originators and receivers. The materials for the discussion are from internet archive news which we can still read. In this part, the theoretical practice of the imperatives which were presented in the previous part are discussed.

Thirdly, the current topic is presented to the students regarding bird flu and meteorological influence which BBC news broadcast on the 16th January 2012. Actually this third session was held on the same day, so students could concentrate without being distracted by any other information or prejudice, because the news was literally fresh from the media. Students were meant to produce a hypothetical web message to the nation disseminating current situation and responding to the anxiety of the people, as students perform virtual spokesmen for a national health institution.

Through this activity in the last section, the process of the interaction of risk communication is modelled and the political implications are discussed. Based on this experimental procedure, the meaning of risk communication and the importance of interactive understanding is debated.

2. Risk Communication, What Is It?

First of all, based on the study group discussion held on the 8th January 2011, in Hamamatsu, several specialists' perspectives and re-definition of the risk communication is discussed from the scope of interactive information circulation.

Of course there are many perspectives regarding mutual understanding and important factors to protect ourselves in the event of sudden disasters, but in this essay, the author will try to concentrate on the importance and impact of information circulation and the gap of mutual understanding. From this sense, the risk communication which is discussed here could be named as "communication to fill the gap of the twisted understanding of both sides."

Kikkawa(2012) debates that risk communication is "the interactive process of exchange of information and opinions among individuals, groups and institutions" and emphasises the importance of mutual information flow and interaction quoting the definition by National Research Council (1989).

Also Fischhoff(1995), looking back over the twenty years of risk management trend, gives us a clear benchmark where we should stand. According to Fischoff, developmental stages of risk management, which he named "Ontogeny Recapitulates Phylogeny," can be described in the eight stages (table 1).

He debated that this concept was his original and quite a speculative one, but up to the time he wrote this thesis, the constructive and systematic analysis of risk communication had not been conducted. But ironically since he presented this historical trend, this notion can be adopted and experimented in the present Japanese situation.

Stage 1	*All we have to do is get the numbers right*
Stage 2	*All we have to do is tell them the numbers*
Stage 3	*All we have to do is explain what we mean by the numbers*
Stage 4	*All we have to do is show them that they've accepted similar risks in the past*
Stage 5	*All we have to do is show them that it's a good deal for them*
Stage 6	*All we have to do is treat them nice*
Stage 7	*All we have to do is make them partners*
Stage 8	*All of the above*

Table 1 Eight Stages of Risk Communication Evolution
(adapted from Fischoff (1995) p.138)

Also Kasperson (1991) argues that there are four imperatives regarding risk communication. He emphasises that any risk communication programme must strike a balance between four imperatives. More specifically, Stallen (1991) presents; a) practical reason, b) moral reason, c) psychological reason, d) institutional reason.

For instance, Fukamizu (2006) discusses the impact of the relations between experts and citizens. His indication has a deep connotation especially under the post-311 era. Many of the citizens are anxious about the safety of the food. Some of the mothers are getting together to research the contamination level of their children's school meal even though the government, central and local, insist that the food and milk in the market is definitely safe. The characteristics of the mothers' activities are collaborative sometimes with NPOs or other private organisations. This is quite a new wave because Japanese citizens have usually relied on the public sector's information without a drop of doubt.

Fukamizu debates "deliberation" or "discussion" between experts and non-experts when it comes to the daily life and health related issues, which we are now facing with huge questions. Since there is no mutual understanding and consensus between public and citizens, it seems to be bigger and deeper, the vague anxiety among citizens are expanding. But many of the risk communication studies have not considered the importance of the democratic procedure itself, whereas they seem to focus on achieving desirable outcomes only by using the democratic model. Perhaps new paradigm for the interaction for mutual understanding for citizens is now required.

When we discuss "democracy" we should be earnest and sincere. It is also useful to segment between the terms "citizen" and "consumer." To consider this proposition of the difference, an issue on citizenship cannot be missed out. That is, there is no reference to the "citizen" in the definitions of risk communication, whereas public participation (or citizen participation) is literally "the participation of citizens." Then do we have a common shared idea on "citizenship"? It is not clear who participates in risk communication. How about citizens, publics, individuals or consumers? Who are the main actors when we talk about risk communication? This haziness of participants is another problem for risk

communication studies. As Fukamizu presented with slight anxiety, it is because risk communication is sometimes considered only on the scope of risk-related policy, “politics” and “market.”

Then, Sagoff’s distinction between “citizen” and “consumer” is useful in this regard, since it can be thought that they represent the distinction between “politics” and “market.” According to him, “citizen” is concerned with the public interest, rather than his or her own interest; with the good of the community, rather than simply the well-being of him- or herself or family. Conversely, “consumer” concerns him- or herself with personal or self-regarding wants and interests. The statement “I pursue the goals I have as an individual.” is clearly describing an image of the tendency of “consumer.” (Sagoff 1988, p.8) This is not the objective here to critisise or analyse the difference between these two terminologies, but it might be useful to understand that “my preference as a citizen” is not consistent with “my preference as a consumer,” and that I, “as a citizen” should prioritise other-regarding preferences over self-regarding ones in the case of political decision. If this is so, then risk communication, which by definition does not require the participants as citizens, may allow them to express self-regarding preferences as consumers.

But is this right? The answer is no, However, because public policy that involves health and environmental risk and thus requires risk communication, as a understandable example, would have impact on not only his or her own interests only but also on other’s interests as well. Therefore, if the democratic model of risk communication is to be worthy of being called “democracy”, the participants of risk communication “as citizens” should take into account the common good or other-regarding preferences rather than just self-regarding ones.

Taking these points in mind, in the next section several controversial subjects will be discussed such as the difficulties of mutual understanding referring to the present hectic situation, presenting some facts which produce misunderstanding, increase the anxiety among the non-experts, laymen and citizens in risk-related policy incidents.

3. Japanese Hot Issues, Some Examples to be Discussed

First of all Picture 1 shows some strange labels of fruit and vegetables. We can see that the left one shows that on the white label it is said that these carrots were produced in Gumma (the Eastern part of Japan, Northern part of the Kanto region), but on the plastic bag, it is printed that they come from Chiba, which is also in the Kanto area but it is definitely different area. The one on the right shows that this orange is from Ehime, Shikoku island prefecture, which is well known as a huge orange producing area. But the golden seal implies that this is from Aichi, near Nagoya. Although both Ehime and Aichi use the same chinese character which means “Love” but this can not be the excuse for the mixed up. Here I am not saying that these four prefectures mentioned above are contaminated or something is wrong, but theoretically this kind of non-sincere procedure should not be overlooked. Hypothetically speaking, what would you feel if the place of the real origin is contaminated with Cesium but because of the trick of labeing, you bought it because of the labeled (fake) origin? What would you think if you had given contaminated fruit to your children without knowing the fact that the labeled place is contaminated from the nuclear incident?

Picture 1 Carrots and Orange Labels

Also NHK lunchtime news on the 12th March broadcast the producer's flurried comment, too abruptly stopping the news caster's reading the draft regarding the danger of "meltdowning" incident[2]. In the present ICT-based age, non-experts can access and evaluate the information and through social network services, their opinions and comments can be distributed to anybody instantly. This NHK incident does not seem to be given as much attention as it should have been, but this news were reviewed and forwarded by many twitters comments. Still now this accidental broadcast as a fact can be listened and anybody can access this generator so easily.

These examples should not been taken at face value, but at the same time this is a "massive jolt to the populations trust." The experiences of these solemn facts leave a deep impression on our memory. This kind of learning phase has a deep impact on a mothers maternal instincts especially ones with young children. From this, once again the importance of mutual understanding between experts and laymen should not be taken lightly. The implications of these actions have given us plenty of food for thought for this thesis.

With these facts, perhaps homemakers have increased their anxiety towards the safety of the food in Japan. Perhaps decreasing in the belief for the governmental regulatory framework also should be taken into account. It might be the trigger for the trust to the social system to be lost like a sand castle collapsing.

4. Learning Process - Through Three Sessions

Here are the records of several sessions which the author conducted in January 2012 at Yokohama

[2] Still now we can listen to the director's flurried comment on Youtube, which is surprisingly not yet deleted 11 months since it happened (http://www.youtube.com/watch?v=H8r4K-xOjGQ&feature=youtu.be Accessed on the 10th February 2012). The director cut in stopping the caster from repeating the draft "the bundles of the fuel rods are sticking out almost 90cm above cooling water level, which means the temperature inside the storage vessel might be over the limit of the safe threshold. The strained voice saying "this draft was not meant to be read!" we can hear.

National University and Showa Women's University, both in Japan.

Roughly speaking, there are three phases. The flow of the series of these can be summarised such as; a) lessons from the past (here the British BSE issue is quoted), then b) based on the current topic (the pandemic flu and academic research result is quoted), then c) virtual activities as a spokesman from a national organisation, and finally d) review and evaluation of the risk communication activities with each other. The students were asked to contribute to their group discussion positively and vigorously.

Beck (2006) discusses that "modern society has become a risk society in the sense that it is increasingly occupied with debating, preventing and managing risks that it itself has produced. Most of the risks we face today are luxury risks more than anything else." But facing the present situation after 311 in Japan, perhaps this kind of notion should be debated and reviewed carefully and urgently.

4.1 First Session - Lesson from the UK BSE Issue

In this session, the author used material from the BBC news on the 11th October 1990. In it, John Gummer[3] was seen with Cordelia munching burgers for the press, and this story is well known among most of the British people over a certain age. Because of this performance, Minister Gummer is called "beaf eater". In fact, Professor Kikkawa mentioned that making a great public show of food eating with an intention to emphasise the safety is common practice all over the world but usually these action cannot lead to success. The most controversial aspect of this public show was that his daughter was only four years old at that time and as a father of a young child, he forced her to eat it in the midst of the "mad cow" sensation. Of course the minister was confident in the safety of British beef with his public demonstration so he naturally ate the burger and emphasised the safety of the British beef market to do so. This public show was in Suffolk on the 6th May 1990.

Just six days before this, it had emerged an incident cat died of a BSE-like disease, also six months earlier the Government banned beef offal for human consumption considering these, he must have done this performance from his strong professional belief and sense of mission, as he himself insisted (http://news.bbc.co.uk/2/hi/uk_news/369625.stm (accessed on the 16th January 2012)).

Following Mr. Gummer's innocent effort, what was the reaction of consumers' understanding of the situation regarding British beef? Did they think that British beef was safe and did they go back to purchase British beef? The answer was "No." Students analysed this case and discussed the implications from this issue referring to the knowledge of risk communication studies.

This session analysing BSE issue was conducted on the 10th January 2012 at Yokohama National University and on the 12th January 2012 at Showa Women's University. (Picture 2-1, Picture 2-2)

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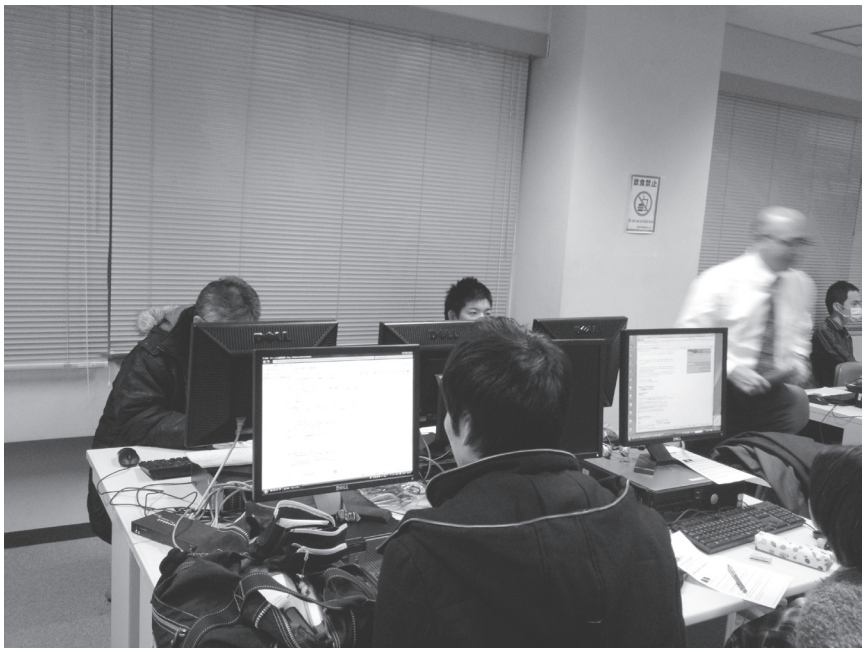
[3] At this time, Mr. Gummer was an Agricultural Minister for the Conservative Government.



Picture 2 -1 Gathering Information about "Beef Eater"
(Yokohama National University)

Picture 2-2 Discussing the Outcome of "Beef Eating Performance"
(Showa Women's University)

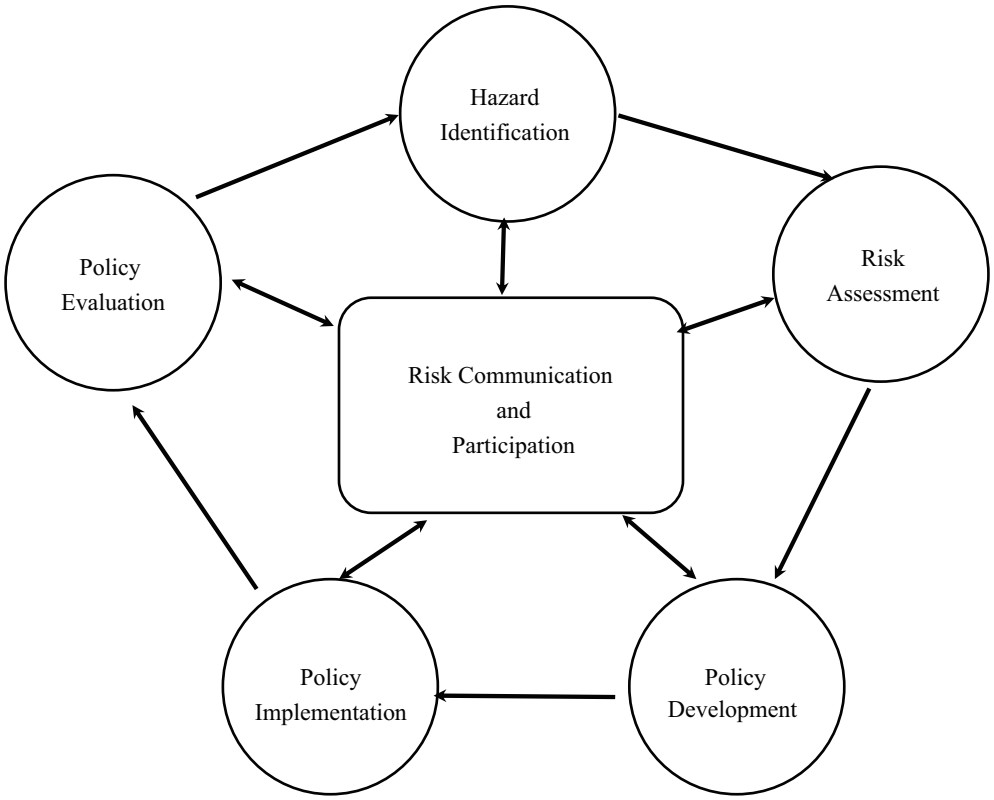


Figure 1 Risk Management Cycle (adapted from Chorus and Bartram 1999)

As risk communication is any purposeful exchange of information about risks between interested parties. More specifically in the context of this essay, risk communication is the act of conveying or transmitting information between parties relating with the matter. In this case, Mr. Minister's job had increasingly become high profile, which was called to account over health scares and, particularly, the beef crisis at that time. When it comes to food safety, the related parties are wide ranged, so to speak, all of the population. And when his act showing off the safety of beef was performed, examination was going on and no conclusion about the safety in agreement was gained among specialists yet.

This kind of "performance" to assure the safety is quite common also in Japan now. Moreover not only emphasising the safety, but also the campaign to support the region by eating the food originated in the sacrificed area is active since 311. For instance, Ministry of Agriculture, Forestry and Fisheries (MAFF) is now campaigning "Support by Eating" for the area suffered from Great East Japan Earthquake. But Kikkawa (2012) debates this kind of performance usually failed. Why is it? According to Chorus and Bartram (1999), risk communication is meaningful when it abides by risk management cycle. Figure 1 shows the image of this management cycle.

Perhaps BSE issue and food safety anxiety now Japan is facing have something in common. It is useful to analyse the situation based on Figure 1. If the hazard identification itself is not completed, the risk management cycle cannot work properly. Based on vague hazard analysis and identification, without any scientific facts backed up by data or clear explanation, risk assessment and policy development must be difficult. This is also matched with the evolutionary risk management image presented by Fischoff (1995), without stage one to three, it is crystal clear that we cannot proceed to stage four and onward. Ironically exceeding space and time, Cordelia Gummer's case indicates the core concept of risk communication.

4.2 Second Session - Bird Flu Pandemic and Meteorological Impact

The second session was conducted on the 17th January 2012, when material was selected from BBC news site (http://www.bbc.co.uk/news/science-environment-16577612, accessed on the 18th January, 2012). The title was "La Niña 'linked' to flu pandemics" and its authenticity is strengthened because the byline is attributed to the reporter Richard Black who is well known as a big name of environmental issues with BBC News.

Indeed, the essence of this article is "La Niña which may make flu pandemics more likely" and the fact that its source is a US national research institute increases the authenticity and impact dramatically. In Proceedings of the National Academy of Sciences (PNAS), they say that flu-carrying birds may change migratory patterns during La Nina conditions. What is "La Niña"? Perhaps we know something about "La Niño" but "La Niño" is quite new to us, isn't it? La Niña is the cold cousin of El Niño - the two collectively making up the El Niño Southern Oscillation (ENSO). In the seamless global warming and other meteorological changes, Dr. Jeffrey Shaman debates that "ENSO affects, precipitation and humidity around the world", but "the effects are very varied around the world. There's no coherent picture". This conversation is also evidence of the size of climatical influence and difficulties to anticipate.

The facts show that the last four pandemics - the Spanish Flu (1918), the Asian Flu (1957), the Hong Kong Flu (1958) and the swine flu (2009) - were all preceded by periods of La Niña conditions. Epidemiologically perhaps it might be difficult to prove this causal relation but socially this correlation is of great concern to society.

Monitoring of birds, pigs, people and the genetics of the influenza virus have all been stepped up in response to recent outbreaks of both swine flu and bird flu. But ironically this news was only in English, perhaps because of this, in Japan this news was not dealt with in any sensational way and so when we in Japan had our own Flu troubles we were ill informed and unprepared emotionally.

In this session, students were asked to perform as spokesmen at the virtual national scientific organisation to make a press release regarding this information. The Table 2 shows their task. Students were asked to proceed group work (Picture 3).

What to do
◎ You are the spokesmen for the National Institution in charge of health and hygiene issues ◎ Following the news overseas, some telephone calls were made to the institution recently, the Minister ordered that you should make a press release as soon as possible. ◎ Press release is to be made as a draft for the web page to the public.

Table 2 Task Image for the Web-page Making Session

Picture 3 Group Discussion Scene
(in the room #108 at Yokohama National University on 17th Jan. 2012)

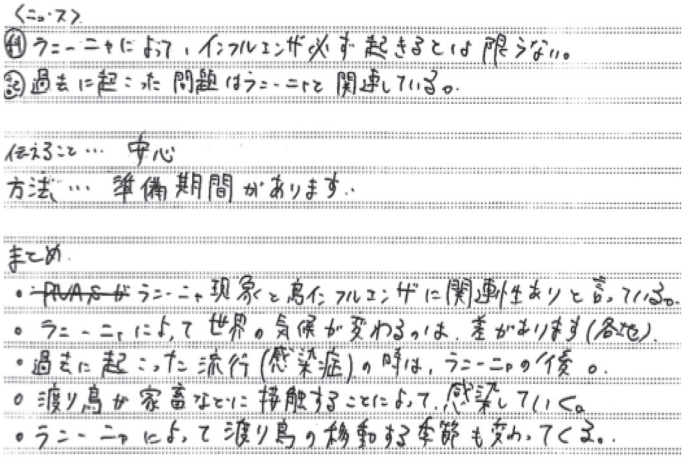


Figure 2 Brain Storming Output (G-1)

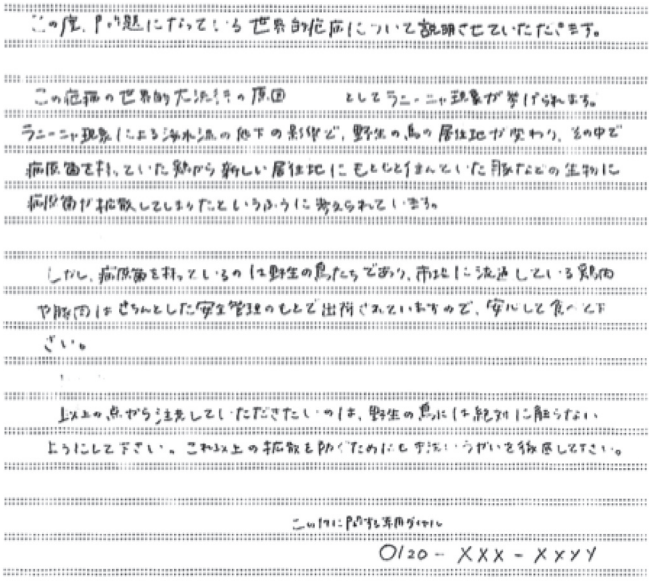


Figure 3　Brain Storming Output (G-2)

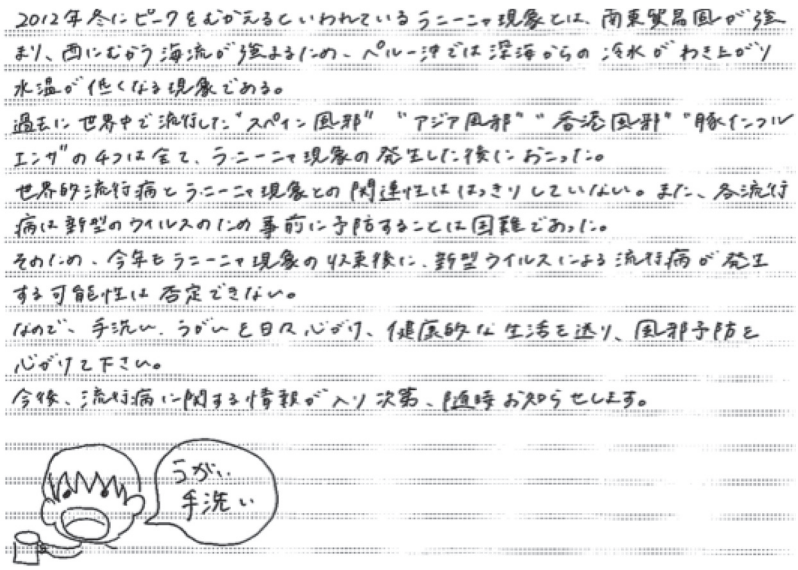


Figure 4　Brain Storming Output (G-3)

In Figure 2 to 4 you can see the output of the students' brain storming process. For instance, the draft of Group 1, based on their thinking process, can be summarised as a) Analysis of the news and extracted discussion points, dividing the facts and researcher's comments, b) which message they should convey, c) how and what future action should be taken.

Figure 2 and 3 are the flows of the brain storming to produce the draft. The upper half is expressing the gist of the news, followed by the sentence implying the safety of the food already on the shelf. This adding new information caused controversy among students later on, which reminded us of the harsh debate and soundbites by high ranked governmental officials last March, emphasising their strong intention to avoid unnecessary anxiety about the healthiness of nuclear plants after the big earthquake.

The output in Figure 4 is kindly mentioning the function and influence of "La Niña", but at the same time, they are innocently confessing that at the moment nothing is based on the scientific verification. They also suggest that we should at least wash hands and gargle properly to reduce the risk, adding that they are ready to give out more information promptly when they find it out.

This session was conducted as an informal trial lesson. These outputs might not be good enough to be published in reality. But referring to the messages of the specialists in this field, perhaps as learning material, this activity could give us some informative lessons. The core part of risk communication should follow the eight stages as Fischoff indicated, with some peculiar experiences about mis-information of food labeling and so on used as the benchmark for poor management decisions. Consumers and the population as a whole deserve honesty. We have to go back to the basic stages, emphasising the gist of the true facts in the first place, "All we have to do is to get the numbers right", then secondly "All we have to do is to tell them the numbers", then thirdly "All we have to do is to explain what we mean by the numbers". It is crystal clear that "telling the truth, in other words, facts" is the basic, most important and essential thing for risk communication to start.

4.3 The Third Session - Discussion, Reviewing and Some Experiences

Up to now we have surveyed the flow of the sessions with students. It has been confirmed that reality and facts should be clearly grasped and based on this, risk communication should start. Otherwise any of other the seven stages of risk communication evolvement cannot be achieved.

Then coming back to the pandemic and "la Niña" news, where can we go from there? Regarding the task which was given to the students, the information was limited only to the BBC news just one page of the web news. If the information is limited like in this case, what can the informant do to soothe the anxiety of the nation and react to their vague and unstable responses?

Regarding this point, uncertainty is a big issue. Amazingly natural disasters are influencing and bringing about various phenomena. Socially and economically we have to admit that Mother Nature is telling us that the meaning of the power of nature should be respected.

Students reacted to this when they produced their web draft based on the discussions they had. They pointed out that especially the public sector should be humble and concentrate to gather the facts with their greatest and ernest effort and without doing so, the successful communication cannot be realised. As we can see in Figure 3, the students tried to summarise what is known, what is found, then additionally

what they think and what they should propose.

Based on these two sessions, as a third and concluding session, a discussion and reviewing occasion was created. This session was held on the 24th January 2012, chaired by a voluntary student. At the beginning a gist of Fukamizu debate was presented so that all of the students could share the concept of two-way interactive communication for risk avoiding.

Fukamizu discusses the importance of risk communication studies and has emphasised the introduction of lay opinions and viewpoints into the policy process rather than technocratic policy making only as being very important. He named this process "two-way (interactive) communication" rather than "one-way" one, and mutual understanding or consensus rather than persuading the public to accept the experts' judgments. But communication itself was originally interactive, one way information flow cannot be called communication, then what is the gap? What can we contribute to this field based on the experimental sessions the author introduced in the previous sections?

This issue might include hard facts for us. Despite the emphasis on democratic interaction many of the risk communication studies have overlooked the importance of the democratic procedure itself, whereas they seem to focus on achieving desirable outcomes by using it in risk communication practice. If democratic risk communication deserves the name of "democracy", how democratic is risk communication?

Perhaps we have common sense that it did not exist in reality "democratic communication," public and private, government and ordinary population, experts and non-experts. But if quoting Fukamizu (1995) and Fischoff (1995), not only information dispatchers (in this context, public, government, and experts) but also information receivers (in this context, private, population, or non-experts) should set our antennas higher and more sensitive to maximise our information intake understanding.

Also to be able to make the most of "democratic risk communication", we (private, population, or non-experts) have to fulfill our duty to accept and evaluate the information which we receive. As Fukamizu confessed, his approach is speculative. Perhaps these sessions themselves are showing the difficulties of the study of the term "democracy" in risk communication study.

To enable to make two way communication, we face the big obstacle to do so, that is caused by information deviation, or an information divide. To make the situation more complicated, for both BSE and pandemic issues which we have surveyed, not analytical output or causal relation had not, or was not proved yet. While specialists debate have been continuing, what and how can we as laymen discuss these issues?

The subject is fatal, directly affects our health and life, but data to be analysed is not sufficient. Under these circumstances, specialists' "golden words" are "beyond our knowledge" or "not yet proved

epidemiologically". But it is quite a frustrating situation for the people. It is natural for the people to be scared about the potential fatal health issues. With a possibility or a pinch of the correlative sense, what action should the public sector in charge take? Which message should they deliver, and in which manner? This process has to be carried out carefully and deliberately.

For instance, very well known phrases the Japanese Governmental spokesman's repeatedly mentioning "...(the radiation reading after the explosion at Fukushima Daiichi does) not affect our health right away" and nuclear physicist's advising comment "be scared rightly[4]" might be the ones from their willful intention trying not to cause panic among ordinary people. But especially the former public announcements are now proved to be doubtful and criticised to be inappropriate, because the timing was too soon after the incident. In a way at that time the Government must have been concerned that their forecast on the map showing the expanding plume of radioactivity and the level of contamination of the mother land, which was brought about by the weather conditions after the explosion in March might bring huge anxiety. But even so, was that the right way to soothe the population facing the disaster which people had never experienced before? All the more reason, in the case of non-experienced disaster, shouldn't risk communication and the management cycle have been implemented sooner?

On the 8th January, during the risk communication workshop, many participants mentioned the fact that realtime radiation data collected via the System for Prediction of Environment Emergency Dose Information(SPEEDI) was not open to the public, literally not real time at all. When the output of SPEEDI was made known, two months had already elapsed. SPEEDI data could possibly have avoided unnecessary exposure to the radiation in the East Japan area in March.

Professor Hayakawa, Gumma University, Volcanologist, has created and presented his original contamination map, as a collaborative output with other voluntary data gathering by scholars, researchers and NPOs and he emphasises that his effort erupted from his belief that the very core and base of risk management starts from "knowing," so that people can judge the situation and decide what they should do. Decision making has to be on each person's responsibility or nobody else can give us the final decision. When it comes to the fatal issues, the responsibility on ourselves is extremely huge and especially to protect the younger generation, that of adults' and parents' should be recognised and fulfilled.

Actually this concluding session was meant to concentrate on the BSE and pandemic issues. But the post 311 situation in Japan is telling us the meaning of risk communication in a more timely manor, full of cases to be analysed and discussed. We have to admit that this almost one-year since March 2011 has made us consider the potential risk surrounding us from the risk communication and risk management perspectives. In other words social scientists including the author should not overlook and neglect what is happening in reality right now.

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[4] "Tadashiku Kowagare" in Japanese. Perhaps in English it does not make sense, but the author put it down this way as a direct translation.

At the end of the day, in the concept of risk communication and risk management, prejudiced intention trying to avoid panic among people, which seemed to be a strong characteristic for the post 311 situation in Japan should be discussed. In the third session, this issue became the biggest and hottest issue for the discussion; a) The first step -- try to know the facts and data, b) The second step -- should not hide or distort the facts and data, even though they are shocking and heartbreaking, c) The third step -- all the process of risk communication should be carried out with honesty, then d) The final step -- decision making should be conducted by each person on their own understanding and judgment, which makes it democratic, even though people have to take responsibility which sometimes is quite heavy.

As a conclusion of the series of the sessions, the tentative output was summarised as above. Additionally like the cases of BSE and pandemic, most of the social problems are quite complicated and problematic, the investigation to find out the reasons for the phenomena is usually resource consuming and difficult. But even so off the cuff expressions should not be used as an excuse to kill time or just telling the phrases easy on the ear, to avoid the panic not telling them the truth or potential disaster which might come next.

5. Conclusion

Once again, concluding what we have learned, another reviews might be useful. According to Fiorino (1989), the discussion should be divided into two types of risk communication; "technical model" and "democratic model", and many risk communication studies have been standing on the importance of the latter one. Fiorino (1989), who is thought to be the first scholar who introduced this distinction to risk communication studies, the technical model is one that emerged from natural sciences, statistics, engineering, economics and epidemiology, and it theorises that risk messages are scientifically and quantitatively expressed by the experts. Thus the lay public's concerns about risks are regarded as irrational. On the other hand, the democratic model is one that emerged from sociology, anthropology, political science, and philosophy as a criticism of the technical model, and it "accepts the legitimacy of lay judgments and the social and political values they reflect."(ibid., pp. 294)

According to Rowan, the technical model aims at "informing and persuading."(Rowan 1994, p.399) In short, "others should simply understand and accept experts' statistical characterisation of risks,"(ibid., p.393) because only technical risk data refers to true risk information for the proponents of this model. This idea seems to defend the purity of scientific rationality. But we have to admit that his model is too simplified to adopt to the analysis of the present situation in Japan. That is, not only eliminating any knowledge other than scientific fact provides efficiency in this model but also ignoring the fact today everything is complicated and interrelatedly influential with each other, antinomy such as "scientific or non-scientific" debate is non-sense. According to the idea of his, as a result, non-experts have no choice but to accept the experts' judgments literally one way, but is this true? Is this acceptable? The answer is "No". non-experts are entitled to protect ourselves, protect our precious children, families, and communities, and so on. This is because about twenty years ago Fischoff (1985) presented the path "risk communication" should follow the eight stages of the evolutional ladder, didn't he?

In contrast, proponents of the democratic model emphasise fair procedure in risk management. It is said that "all parties affected by a given risk should be committed to an extended, searching, and sincere dialogue on how to manage risk justly," and "since the goal of democratic risk communication is mutual understanding, persuasive efforts to gain agreement are out of place" (ibid .,p. 400). In this respect, it would appear that "fair participation in the risk-related decision making process" and "expression of free and unconstrained preferences" make this model democratic.

This discussion might be useful and meaningful as a conceptual model but before making it possible for all to participate in discussion and fair communication, there are some points which should not be overlooked; asymmetry of information, accessibility to the facts, empowerment of messaging, especially typical Japanese tendency, too reliable to the public sectors, experts, the fact that we are too inclined to normalisation bias and to react as if nothing has happened.

Risk communication of course needs to be regarded as one form of democratic public participation. As Fukamizu (2006) repeats, moreover, such risk communication will require the concept of "citizenship," because a public policy that involves health and environmental risk such as this essay deals with, and thus requires risk communication to have impact on not only our own interests but also other's interests as well. This includes the wide range of subjects and discussion points regarding risk communication. If this is so, "the task of citizenship is to rise above self-interest and take seriously the nature of the common good." (Fishkin and Ackerman 2003, 21). In other words studying risk communication cannot be satisfactorily conduced without paying attention to mutual interrelations itself. But in this sense, citizenship requires us to also fulfill our duty as a citizen.

At the end of the day, as Thompson argues, "greater participation not only gives more citizens the chance to enjoy the benefits of taking part in deliberation, it also can help develop the virtues of citizenship, encouraging citizens to consider political issues in a more public-spirited mode" (2004, p.30). Risk communication itself is democratic insofar as it promotes the function of citizenship. Perhaps we can learn citizenship through studying risk communication, and vice versa. As a Japanese social scientist in the academia who experienced 311 incident in 2011, it might be our duty and obligation, to think about the real risk communication once agein and try to develop practical methodology to avoid unforeseen risk which exactly we have experienced. This is why the author designed the sessions where students were invited and made an effort to extract some ideas of essential infrastructure for the mutual understanding and democratic communication. It is obvious that even though the facts are hurting and bitter, the real facts should be used as materials to start risk communication lesson.

<Bibliography>

BBC News (web version) "John Gummer: Beef eater" http://news.bbc.co.uk/2/hi/uk_news/ 369625.stm (accessed on 16 January 2012)

BBC News (web version) "La Niña 'linked' to flu pandemics" http://www.bbc.co.uk/news/science-environment-16577612 (accessed on 18 January, 2012)

Beck, Ulrich (2006) *Cosmopolitan Vision*, Cambridge: Polity Press

Chorus, I. and Bartram, J. (eds) (1999) *Toxic Cyanobacteria in Water. A Guide to Their Public Health Consequences,*

Monitoring and Management, E & FN Spon, London
Fiorino, D. J. (1989) "Technical and Democratic Values in Risk Analysis,"Risk Analysis 9(3), pp. 293–299
Fischhof, Baruch (1996) "Risk Perception and Communication Unplugged: Twenty Years of Process" Risk Analysis vol 15 No.2, pp.137–145
Fishkin, J. S. and Ackerman, B. (2003) "Deliberation Day,"in Fishkin, J. S. and Laslett, P. (eds.) *Debating Deliberative Democracy*, Malden, MA.: Blackwell, pp.7–30
Fujikawa Yoshimi (2006) "Duty and Obligation in Fair Society : On the Foundation of NOBLESSE OBLIGE" Chiba University of Commerce Ronsou 43(3/4), pp.23–39, 2006-03-31
Fukamizu, Mamoru (2006) "Risk Communication and Deliberative Democracy: How Democratic Is Risk Communication?" Journal of the Graduate School of Letters, 2: pp. 65–73
Gutmann, A. and Thompson, D. (2004) Why Deliberative Democracy?Princeton, NJ: Princeton University Press
Hayakawa, Yukio (2012)"The Fukushima Daiichi Accident (March 2011)from the Volcanologist 's Viewpoint (in Japanese)" (hand out for the study group on 8 Jan. 2012 in Hamamatsu)
Kikkawa, Toshiko (2012) "The Transition after the East Japan Great Earthquake from the Scope of Risk Communication(in Japanese)"(hand out for the study group on 8 Jan. 2012 in Hamamatsu)
NRC (1989) *Improving Risk Communication*, Washington, D.C.: National Academy Press
Rowan, K. E. (1994) "The Technical and Democratic Approaches to Risk Situations:Their Appeal,Limitations, and Rhetorical Approaches,"Argumentation 8 (4), pp. 391–409
Sagoff, M. (1988) *The Economy of the Earth: Philosophy, Law and the Environment*, Cambridge:Cambridge, University Press
Stallen, P. J.M.(1991) "Developing Communications about Risks of Major Industrial Accidents in Netherlands" in Kasperson, R. E. and Stallen, P.J.M.(eds)(1991) "Communicating Risks to the Public -Technology, Risk and Society", Kluwer Academic Publishers, pp.55–66

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