Exploring people's relationship to food in the aftermath of the Fukushima Daiichi Nuclear Power Plant disaster

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ABSTRACT

The ongoing Fukushima Daiichi Nuclear Power Plant (FD1-NPP) disaster is releasing large amounts of anthropogenic radionuclides into the environment. This study uses food as a focus to explore the disaster's possible impact on bio-cultural diversity as it is a basic, universally utilized element which links biology and culture. Drawing on insights from the fields of agroecology and risk communication, a survey of 40 concerned citizens in the Kansai region of Japan—approximately 600 kilometers south-west of the FD1-NPP—was designed to explore how the disaster has affected people's beliefs about and relationship to food. Survey results revealed heightened concerns about the safety of foods from prefectures in north-eastern and central Japan, as well as a decrease in the consumption of some culturally significant foods. Concerns were also found to be complex and multidimensional (associated with health, future generations, the environment, society, culture, the economy, politics, self image and personal responsibility). Additionally respondents showed a general lack of trust in the government, mass communication and the food industry as sources of information on radiation and food safety.

INTRODUCTION

The continuous release of anthropogenic radionuclides from the ongoing Fukushima Daiichi Nuclear Power Plant (FD1-NPP) disaster poses a risk to environmental and human health.

- Of the estimated initial releases of Cs-137 (between March 12th and 20th of 2011), 1.9% fell outside of Japan, 80% into the ocean, and 18% over Japan itself, concentrating mostly in the north-east of the country (Stohl et al., 2012).
- Secondary releases occur daily as anthropogenic radionuclides are intentionally (NHK, 2014) and unintentionally (Yoshida, 2013) released into the Pacific Ocean.
- The hazardous lives of anthropogenic radionuclides in the environment vary from minutes to thousands of years (ex. I-131 80-160 days, Cs-134 20-40 years, Cs-137 300-600 years, and Pu-239 244,000-488,000 years) (CDC, 2004).
- According to the National Academy of Science's linear no-threshold risk model, there is no safe dose of radiation exposure (NRS, 2006).
- Exposure to radiation can cause early and late onset cancer and non-cancer diseases (Ozaka et al., 2012).
- Women and children are more at risk from radiation exposure (NRC, 2006).

Foods grown or raised in areas, or using inputs, contaminated with anthropogenic radionuclides are at risk of being transported through national and international food systems. Many of the foods found with contamination are cultural staples of Japan.

Table 1. Example of radiation monitoring results for selected Japanese foods

Category	Sample date	Food item	Region	Prefecture	Cs-134+137 (Bq/kg)	Government safety levels of Cs-134+137 on sample date (Bq/kg)
Mushroom	2012.5	Dried shiitake (log-grown)	Tohoku	Iwate	1,200[b]	100
Mushroom	2012.8	Tawny milk cap mushroom	Kanto	Tochigi	31,000[d]	100
Rice	2011.11	Brown rice	Tohoku	Fukushima	630[a]	500
Rice	2011.11	Milled rice	Tohoku	Fukushima	300[a]	500
River fish	2011.5	Ayu Sweetfish	Tohoku	Fukushima	2,900[a]	500
Seafood	2011.5	Hijiki seaweed	Tohoku	Fukushima	1,100[a]	500
Seafood	2013.2	Greenling	Tohoku	Fukushima	740,000[c]	100
Soybean	2011.11	Soybean	Tohoku	Miyagi	240[a]	500
Tea	2011.5	Dried green tea	Kanto	Kanagawa	3,000[a]	500
Wheat	2012.2	Wheat (soba) noodles	Kyushu	Okinawa	258[a]	500

a-MHLW, 2012b; b-MHLW, 2012c; c-Tepco, 2013; d-Tochigi Prefecture, 2012

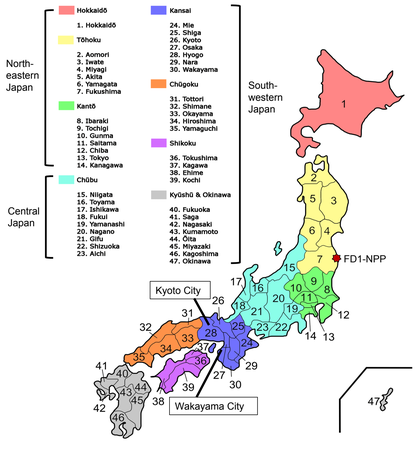

Figure 1. Map of the regions of Japan, the FD1-NPP, and study area locations (Original map: Regions and prefectures of Japan, s.a.)

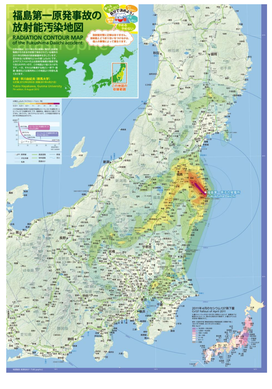

Figure 2. Radiation contour map of the FD1-NPP disasters (Hayakawa, 2012)

The Japanese government is involved in both regulating food safety and promoting the consumption of foods from disaster-stricken areas suffering from *fuhyouhigai* ('financial damage due to harmful rumors or misinformation') (MAFF, 2012).

Following the disaster, citizens in areas beyond the fallout zones became active in voicing concerns about radiation and food safety.

Research questions:

1. What are concerned citizens' food safety concerns? 2. What actions are they taking on the issue?

Photos by Yuki Wada

Participants in an anti-nuclear parade in Osaka City, Japan. The woman's sign reads: "I want to eat food that makes me feel at ease."

METHODS

The respondent sample (n=40) is composed of concerned individuals who attended one of two meetings on the topic of radiation and food safety in Wakayama City (May, 2012) or Kyoto City (June, 2012). Both cities are located in the Kansai region of south-western Japan, approximately 600 kilometers south-west of the FD1-NPP.

Respondents were offered a self-administered questionnaire survey based on insights collected from interviews, activist meetings, and a review of newspaper articles, blogs and activist fliers.

RESULTS

The results of the survey reveal shared concerns and actions taken by respondents regarding the possible contamination of foods with radionuclides. Results were analyzed based on major agreements (90%+) and general agreements (75%+) with items on the questionnaire.

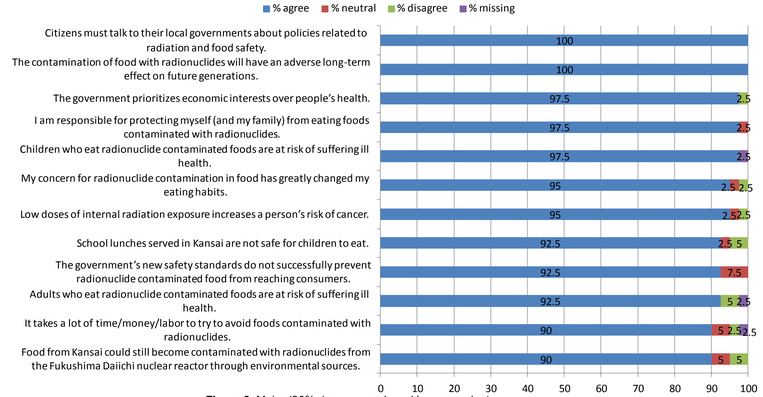

Figure 3. Major (90%+) concerns shared by respondents

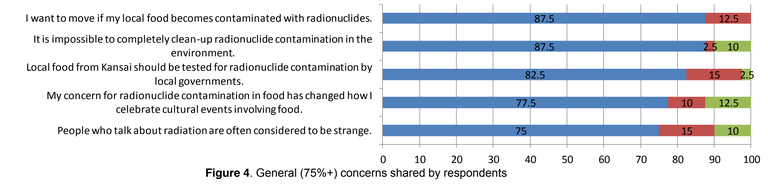

Figure 4. General (75%+) concerns shared by respondents

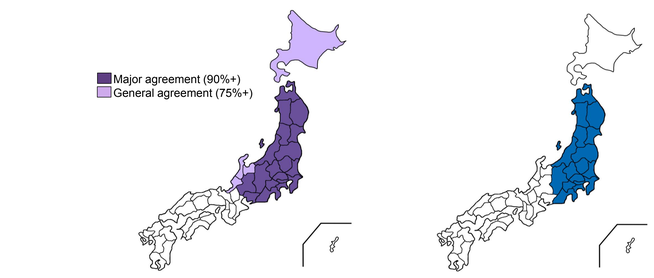

Figure 5. 23 prefectures respondents agree produce foods that are not safe/safety unknown

Figure 6. 17 prefectures required to monitor foods for radionuclides due to cases of previous food contamination (MHLW, 2012a)

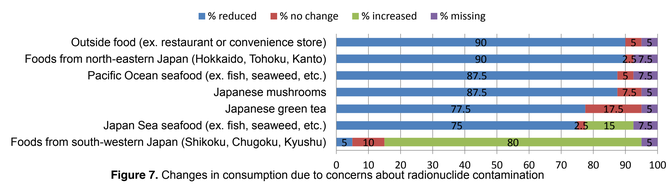

Figure 7. Changes in consumption due to concerns about radionuclide contamination

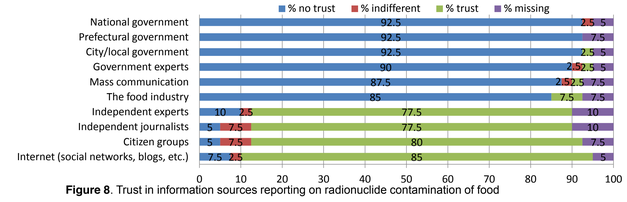

Figure 8. Trust in information sources reporting on radionuclide contamination of food

CONCLUSION

Concerns associated with the risk of radionuclide contaminated food among members of the concerned citizen sample are complex and multidimensional, associated with the topics of health, future generations, the environment, society, culture, the economy, politics, self image and personal responsibility.

Results reveal a general uncertainty in the safety of foods coming from prefectures in the Hokkaido, Tohoku, Kanto and Chubu regions, many of the prefectures where the government is testing food due to previous cases of contamination.

There was a general decrease in respondents' consumption of culturally significant Japanese foods as well as foods prepared outside the home where individuals have little control over ingredients. The foods of most concern (such as seafood, green tea and mushrooms) have shown levels of contamination in government radiation safety tests .

Respondents tend to lack trust in the government and their experts, mass communication and the food industry as sources of information on radiation and food safety, looking more toward independent experts, independent journalists, citizen groups and the internet for reliable information.

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