1. Here are two knowledgeable doctors in radiation medicine of Nagasaki University, Dr. Shunich Yamashita and Dr. Noboru Takamura. Right after the FDNPP accident, they were appointed “Advisor on Radiation Health Risk Control” by the Fukushima Prefecture Government, “to provide the Fukushima people with the correct information on radiation exposure and health” 

Mayor Tomihisa Taue of Nagasaki-City recognized that: Experience of Nagasaki’s atomic bomb radiation motivated Nagasaki citizens to support Nagasaki University’s assistance to victims of Fukushima nuclear radiation disaster as they are reminiscent of deep-rooted prejudice and discrimination in the Japanese society which Hibakusha had suffered. The same motivation had directed Nagasaki University to provide Chernobyl in 1986 with health care and accumulated considerable knowledge and experience in radiation medicine.

2. Nagasaki University assisted the affected communities such as Kawauchi-Village (March 2011 about 3,000 population) and Tomioka Town (About 9,300) in Fukushima in applying intensive science-policy interface to promote a multi-hazard risk management.

Kawauchi-Village has achieved return of evacuees to its homeland following the displacement of entire municipality. This is the first case in the world where the affected local community has achieved return of its population and its reconstruction following a nuclear disaster.
3. On 11 March 2011, the Great East Japan Earthquake and Tsunami (called Tohoku disaster) severely damaged the Fukushima Daiichi Nuclear Power Plant (FDNPP). Large radioactivity released, induced multi-hazard disasters on human livelihood and ecosystem in the Fukushima Prefecture. Radiation fear and anxiety precipitated displacement of some 165,000 persons in the absence of sound risk information and communication during the initial stage of the crisis.

As of 9 April 2019, some 39,000 residents of Fukushima are yet to return to their hometowns.

This represents 8.3% of the total displaced persons (nearly half a million) by the Tohoku disaster and accounts for 81.3% of the current total of 48,000 displaced persons who are still in temporary locations. Among whom more than 40% are under the age of 18.

The population in the Fukushima prefecture decreased from 2,024,401 in 1 March 2011 to 1,861,839 in November 2018.

4. The delay in return of the population and reconstruction of the affected local communities in Fukushima has certainly something common with other disasters which occurred in Japan and elsewhere in the world. Current disasters tend to be on a large scale and the recovery process gets longer due to urbanization and concentration of highly sophisticated infrastructure and life-lines vulnerable to hazards.

5. In addition, nuclear and radiation hazard has both acute and chronic, and direct and indirect
impacts throughout multi-disciplinary dimensions. They are due to uncertainty of long-term radiation impacts on human health; psychosocial and mental stresses; and loss of community infrastructure and livelihood impacting on employment opportunities. Persistence of such impact tends to delay recovery of the communities and alienate them from the rest of the country leaving them in deep rooted inequality and underdevelopment.
6. Those diverse reasons germane to the characteristics of nuclear hazard, reflected on the intent of residents to return to their homelands. The delay in return of the population and reconstruction of the affected local communities in Fukushima is part of universal problems deriving from socio-economic complexity of reconstruction process.

7. Eleven municipalities of Fukushima (originally inhabited by 81,000 residents in March 2011) affected by the FDNPS accidents, made surveys (published on 6 March 2018) on the intention of their evacuated residents on the return to their home communities in the zones where evacuation designation was lifted. According to the results, only in four municipalities, the number of residents who have expressed will to return or have already returned exceeded the half of the respective total evacuees. And the shares of the returnees in the evacuated residents ranged from 11.1 % to 37.3 %.

8. The accident at the Fukushima Daiichi Nuclear Power Plant caused extensive human suffering and revealed the need for more effective means of communicating health risks to the public.

<table>
<thead>
<tr>
<th>II. Survey on residents’ intent to return</th>
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<tr>
<td>Okumama Town (Jan. 2018)</td>
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<tr>
<td>Futaba Town (Oct. 2017)</td>
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<tr>
<td>Tomioka Town (Aug. 2017)</td>
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<td>Namie Town (Dec. 2017)</td>
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<td>Kawamata Town (Jan. 2018)</td>
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<td>Etake Village (Jan. 2017)</td>
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<td>Katsurao Village (Oct. 2017)</td>
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<td>Naraha Town (Oct. 2017)</td>
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<td>Minamisouma City (Nov. 2016)</td>
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<td>Kawasuch Village (Jan. 2016)</td>
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<td>Tamura City (Jun. 2015)</td>
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Dates in brackets are those when surveys were made.
9. There is lopsided difference in radionuclides released by the accidents at Chernobyl and Fukushima: The amount in Fukushima was one 7th of that in Chernobyl.

10. Radiation doses in Kawauchi Village were abated to 2 mSv/y, and only 10% of edible plants collected in the Village exceeded 100Bq/kg lower than 200 Bq/Kg allowed by health regulations.

NB: Fukushima-ken: 0.14~0.04 MSv/h
11. There were practically no cases where children in Fukushima local communities experienced thyroid equivalent doses more than 20mSv/y which is far below 100mSv a level which caused cancer in Chernobyl.

12. In Kawauchi Village, among those factors that had prevented return of the evacuees were: one third was related to fear for radiation and medical facility access problem and another one third was related to environmental and social issues such as livelihood, employment, and education (See factors affecting return to hometown (in percentages of 1,039 persons surveyed in Kawauchi Village, February 2012)).
13. These are complex situations that cannot be managed with radiation protection considerations alone; we must address all relevant human suffering in various dimensions: health, environmental, economic, social, psychological, cultural, ethical, political, etc.

✓ Individuals are not willing to leave the affected areas. Therefore, a long-term goal should be to rehabilitate areas to allow people to return to their normal habits, through inclusive risk communication.

✓ Risk communication has taken place through various events: to address inhabitants’ concerns: e.g.
   (i) Public village lectures on the radiation situation of the village; (ii) Briefing meetings for village leaders, staff and experts specialized in municipal public management (such as health care, life support for elderly displaced people in temporary housing, long-term care prevention, farming recovery, food safety, etc.); etc.

IV. Accelerating reconstruction through inclusive risk communication

✓ Reconstruction of the Affected communities cannot be managed by radiation protection considerations alone; we must address all relevant human suffering in various dimensions: health, environmental, economic, social, psychological, cultural, ethical, political, etc.

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14. In Kawauchi Village, such risk management entailed a paradigm shift from focusing on safety principle based on radioactive doses to addressing social, environmental and psychological impacts not only of the nuclear accident but also countermeasures such as evacuation, relocation, decontamination and constraints on freedom of residence and movement as well as limited use of ecosystem for livelihood.

15. The University helped its whole community recovery involving residents, specialists and local authorities through the provision of risk evaluation and interactive communication, often face to face with the affected residents on the health impact of radiation doses experienced by them.

Need for better risk communication
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15. The University helped its whole community recovery involving residents, specialists and local authorities through the provision of risk evaluation and interactive communication, often face to face with the affected residents on the health impact of radiation doses experienced by them.
Risk communication has taken place through various events organized by the Village and the University members:

16. The events are targeted towards those villagers who have returned from temporary locations seeking advice on the prospect of village’s livelihood recovery including health environment.

(i) Public village lectures on the radiation situation of the village;
(ii) Briefing meetings for village leaders, staff and experts specialized in municipal public management (such as health care, life support for elderly displaced people in temporary housing, long-term care prevention, farming recovery, food safety, etc.);
(iii) Elderly people salons such as fall prevention classroom, lecture meetings for the elderly on physical strength and awareness improvement; and
(iv) Child rehabilitation classes at least five times a year in elementary schools working with the village board of education and elementary schools so that children can learn, in an active learning format, what is necessary for recovery, such as knowledge on radiation and health effects as well as Village's efforts towards recovery.
Conclusion

- Our engagement in Fukushima is a village-academia collaboration conducive to better managing and preventing new multi-hazard disaster stemming from technological hazards as envisaged in the Sendai Framework for DRR. It enabled inclusive genuine risk communication with the inhabitants and opened up the safety myth or culture in Japanese nuclear power generation.

- Such inclusive risk communication and dialogue are essential for carrying out each stage of countermeasures to minimize the damage of nuclear disasters. Our experience would provide a model of a multidisciplinary approach to the formulation and implementation of inclusive community-based recovery after a nuclear accident drawing on.

- Need for IRP to address nuclear and radiological hazard and prepare for future unexpected nuclear disasters elsewhere in Japan and the world.

Thank you.

Need for IRP for nuclear and audiological hazard based on inclusive risk communication

17. Our engagement in Fukushima is a village-academia collaboration conducive to better managing and preventing new multi-hazard disaster stemming from technological hazards as envisaged in the Sendai Framework for DRR. It enabled inclusive genuine risk communication with the inhabitants and opened up the safety myth or culture in the nuclear industry so as to accommodate the concerns of the surrounding communities.

18. Such inclusive risk communication and dialogue are essential for carrying out each stage of countermeasures to minimize the damage of nuclear disasters. Accumulated experiences and practices of the sort if carefully evaluated and recorded would not only accelerate the recovery of other local communities in Fukushima as and when evacuation orders are lifted therefrom, but also prepare for future unexpected nuclear disasters elsewhere in Japan and the world.

19. Our experience would provide UNDRR and IRP with a model of a multidisciplinary approach to the formulation and implementation of inclusive community-based recovery after a nuclear accident.

Thank you.
Qs & As

- **Question 1:** How are the residents mobilized in the village-academia collaboration model?
  - > **Answer:**
  - 1) Mayer ENDO's leadership in Kawauchi Village, trust in effectiveness academia-municipal partnership built on his firm belief in academic impartiality enabled whole-village mobilization of the residents.
  - 2) Stationing a permanent public health nurse on a permanent basis in the village has been instrumental for face to face and inclusive risk communication with inhabitants;
  - Regular & Ad Hoc meetings organized by the Joint Reconstruction Promotion Base achieved inclusive education and communication;
  - These factors have effectively developed practice of inclusive risk communication and education on nuclear DRR within the affected communities, thus demystifying and secretive nuclear safety culture hitherto cherished by the Government and the nuclear industry in Japan.
Qs & As

• **Question 2:** What are the challenges in including the villagers in designing and implementing the countermeasures (e.g., evacuation and decontamination) under this model? How were these addressed?

• **Answer:**

• 1) We built up sense of mutual trust between academia and affected residents: Risk communication is in both directions: For example, in making mushroom maps, the University learned a lot from inhabitants’ traditional knowledge on local ecological conditions and growing environment of plants. Their knowledge was quite useful in effective radiation dosimeters’ surveys.

• 2) Individualized care and risk communication are essential for planning, organizing and implementing every step of decontamination while evacuation was ordered and enforced by the central Government in cooperation with local governments.

END