Re-building Japan: Still-photographic Documentary Project on the Resilience of Rice Cultivation

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Introduction

It has been a year and a half (at the time of this report's completion) since the 2011 tsunami incident, which took place and destroyed much of the northwest regions of Japan. Apart from the twenty thousand lives lost, the damaged area devoted to rice cultivation is still under rehabilitation. From the field research, it was found out that there are many problems arising from damage to land and properties which, over time, have become social issues, among them salt and radioactive contamination of farmlands, migration, insufficient incomes. The Japanese government has planned for the rehabilitation of agricultural areas from the tsunami to take place between three and five years, while the leaked radioactive materials from Reactor 1 of the Fukushima Daiichi Nuclear Power Plant has not been contained to a safe level. The associated health effects on the nearby population, especially on children, and the loss of land and properties inherited from many generations ago brought about the need for evacuation from the contaminated area, which move could last for 30 years. The government's inspection of food materials for radioactivity has proven inadequate and has thus brought about a loss of confidence in the safety of agricultural products within the area. The fear generated has expanded into the trust of the entire nation's population in electricity generated from nuclear power plants. This safety issue had never been in question ever since the first nuclear power plant was established in the 1960s. The mistrust and fear of the Japanese population of late was manifested via the demonstration by tens of thousands of people in front of the Japanese Parliament in Tokyo. This report aims to summarize the damage inflicted upon rice cultivation by the tsunami and the subsequent leaking of radioactive materials from the nuclear power plant. Also included are the issues that arose from the incident, and the rehabilitation program which has just begun. The other result of the project, the photographic essay, will be presented at the 11th API Regional Workshop.

At 2:46 pm of March 11, 2011, some 130 km off Ojika Peninsula in Miyagi Prefecture, an earthquake of magnitude 8.9 on the Richter scale took place. One hour later, a tsunami with a recorded height of 40.5 meters struck and traveled 10 km inland, causing massive damage to lives and properties. In Minamisanriku, over a thousand deaths were reported. Large parts of Kuji and the southern section of Ofunato, including the port area, were almost entirely destroyed, rendering 23,600 hectares of cultivation areas useless. Of these, about 20,000 hectares were rice cultivation areas. The Prefectures most impacted were Aomori (76ha, 0.1%), Iwate (1,172ha, 1.2%), Miyagi (12685ha, 11.0%), Fukushima (5,588ha, 4.0%), Ibaraki (525ha, 0.3%), Chiba (105ha, 0.2%). The Miyagi Prefecture was the prefecture with the most damaged area, with two-thirds of the total land impacted. In Shichigahama and Watari, damaged agricultural lands were in the vicinity of 93% and 79%, respectively. However, despite such extensive damage, it is estimated that only 1% of total rice production, or about 100,000 tons, were affected. The damage can be classified according to the type and magnitude of the destruction as follows:

1. The agricultural area that was heavily damaged by the earthquake and the tsunami. The area is full of debris. It is unlikely to recover.
2. The agricultural area that was mildly damaged from the earthquake and the tsunami. It is likely to recover.
3. The agricultural area that was not damaged directly by the earthquake and the tsunami, but radioactive contaminated. The agriculture produce in the area could not be sold or distributed.
4. The agricultural area that was not damaged and not considered as contaminated, except

that the market lacked confidence in the safety of the products

This report aims to present the second, third and fourth findings just mentioned, since the operations were commencing during the project's duration (2011-2012), while the rehabilitation of the damaged cultivation area (item 1 in the list) had yet to take place (Begin?) during that period.

When the water receded, it left huge volumes of debris from buildings and construction. Salt and chemicals from seawater, various debris, and rubbish covered up the entire area. At the end of July, or four months after the incident, I had a chance to investigate the area for the first time at Minamisanriku, a town in Miyagi Prefecture. I saw that most of the land was still covered in medium-sized debris, and only the road was functional, almost at the normal level. Big pieces of debris, such as boats and cars, were segregated and removed by the workers. A local person whom I interviewed was very much impressed by the hard work done by the government officers. She said that right after the incident, things were a lot worse than what I saw. The area where there used to be a city was rendered into heaps of materials many meters high, covered in snow. The Self-Defense Forces began the recuperation process by first reclaiming the roads, so that other agencies could access the area.

When compared to the Boxing Day Tsunami of 2004 in Thailand, the tsunami that struck Japan in 2011 brought about greater devastation. In my opinion, it will take at least three years to rehabilitate the area for resettlement (if the population is willing to return, given that there still are safety issues to be concerned about). When the community can reestablish itself, the agriculture activities can also resume.

The problems with the agricultural area can be classified as follows:

1. Debris: The destruction caused by the tsunami created a huge amount of debris covering most of the land. The central government is trying to clean up the debris systematically by separating them according to types. Apart from the large debris that can be removed by heavy machinery, smaller debris requiring manpower still represents an obstacle for the agricultural area, especially for rice cultivation.

2. Soil salinity: The salinity level depends on the duration seawater remains on land. In the short-term, after a tsunami or seawater inundation, soil salinity is the main limiting factor for agriculture. The effects of salinity and sediments on soil chemistry and the availability of nutrients in the longer term will require attention.

3. Land subsidence: The 9.0 magnitude earthquake that struck Japan caused land subsidence in large parts of Tohoku. In most areas, the ground dropped only a few centimeters, so the change was hardly noticeable. However, according to a report filed by Asahi newspaper and TV from Japan National Geographical Survey Institute, some coastal areas have sunk to below sea level, leaving the area permanently flooded. Some of these areas were agricultural lands.

4. Pests: Apart from salinity, seawater also carried with it soil and pests from other areas. Insects and weeds have become an obstacle for rice cultivation. Because of them, farmers in a town in the city of Rikuzentakata, Iwate Prefecture, were not able to farm rice and had to allow the cultivation area to be covered with weeds, something that had never happened before.

5. Water quality and assessment: In some areas, delays in reconstructing irrigation/drainage channels meant they remained waterlogged or were unable to access irrigation water. This waterlogged condition was due to earthquake-caused subsidence. Some sites needed pumps to remove saline water and bring fresh river water to the dams, and some dams needed cleaning and deepening. In some areas, saltwater entered freshwater aquifers, so freshwater was not available.

6. Drainage: After the earthquake and tsunami, coastal drainage patterns changed. Some land rose and other areas subsided. In areas with poor drainage, improving the irrigation and drainage systems

was a key first step for successful agricultural production, thereby making drainage improvement an important priority for local government and NGOs.

7. Tidal inundation: The earthquake and subsequent tsunami changed the coastline dramatically. Areas that were once freshwater catchments became affected by high tides and saline groundwater, making them permanently unsuitable for agriculture.

Apart from the aforementioned damage, the loss of lives and property—machines and agricultural tools—also presented obstacles to the rehabilitation of agricultural activities. Farmers experienced severe losses and were forced to move into temporary housing or government-provided housing. They were additionally pressured by the losses and the readjustments they had to make. Some aged family members in the new environment faced uncertain futures since they might not be able to resume agricultural activities again. Younger generations were choosing, instead, to live and work in cities. All this, coupled with the lack of supporting capital, is severely compromising the chances of agricultural activities to resume once again.

From the aforementioned situations, it can be seen that there are many levels of damage, and this damage covers a very large area.

In addition to government officers, volunteers from all around Japan have also been an important factor contributing to the recovery process. This, I see, as a very inspiring thing to have emerged from the losses.

On another note, there is a systematic study of the rehabilitation process of damaged agricultural areas resulting from the tsunami in Aceh province in Indonesia. This can be applied to the situation in Japan as follows:

Immediate activities

A number of actions can immediately be taken toward recovery:

- Clean up: Remove debris and sediments that cannot be incorporated into the soil. The debris left by the tsunami on agricultural land was substantial, but the debris overall also included building materials from destroyed houses, trees, vegetation, and dead animals. For the rice cultivation area, small debris left in the soil should be removed by manpower using simple tools such as a mattock and a shovel. I had a chance to join a volunteer group for this activity and found that one person can clean up the area of about 30 meter squares in eight hours.

- Manage salinity: Seawater inundation introduced salinity into areas where it had never before been a problem. The longer the soil was inundated, the greater the chances that there were salts infiltrating the soil. The highest salinity levels occurred in areas where seawater stayed on the soil for weeks after the tsunami, allowing salts to penetrate the soil and attach to clay particles. Land inundated for more than three days was usually too saline for most crops to yield well in the first year or so. Flushing fields with irrigation water and natural rainfall is possible, once drainage and irrigation channels are cleared of sediment and a through flow of water is available. Where farmers had access to irrigation water, surface salt was easily flushed away and rice crops appeared unaffected by the tsunami seven months later, even where tsunami deposits were still present.

Figures 1: The coastal areain Miyagi prefecture, four months after it was hit by a tsunami

- Survey land levels: When there is an earthquake before a tsunami, land levels may be altered, so surveys will be needed to establish levels and direct rehabilitation of drainage lines and irrigation channels. Some coastal areas may no longer be suitable for agriculture due to subsidence and the high frequency of tidal inundation.

- Repair infrastructure: Assessment and the repair of irrigation and drainage infrastructure are priorities for successful agriculture recovery.

- Train agricultural staff and farmers: Provide them with the right knowledge and skills to combat the issues. From being in the area and conducting interviews with farmers who faced the problem of salinity in a rice cultivation area, I heard one farmer say in October 2011 that he tried to remedy the problem by following a fellow farmer's advice to grow plants such as sunflowers to remove salt from soil. The sunflowers grew well but, from research, it has not been found that sunflower can rid the soil of salt at all.

Short-term activities

- Coordinate with the farming community: Conduct participatory surveys with the rural community to understand the immediate and long-term needs of farmers and their families. This will help avoid misdirected and wasted aid efforts.

- Establish income-generating opportunities for the farming community: In the short term it may not be possible to generate income from farming activities. Therefore, temporary jobs or the growing of salt-tolerant plants may be recommended. These activities will provide income and help return the farmer's lands to production (their productive) state. They will also promote independence among the farmers from food aid. Microfinance to help groups of farmers may be appropriate.

- Provide high quality planting materials and agricultural tools: Supplies of seeds, planting materials, small machines and tools may be scarce. It is vital that only government certified quality seeds are supplied to farmers to ensure that the first post-tsunami crops do not fail. Japanese farmers employ small machines to save energy and improve efficiency, and these may have gotten lost in the tsunami?) (was this what you meant?). Providing funds or lending out expensive equipment is as important as the provision of implements for farming.

- Avoid farming saline land: Most crops struggle to be productive in saline soils. Successful crops are an important part of the recovery process after a tsunami. Salinity surveys will identify areas unsuitable for farming. Periodic monitoring ensures that farmers do not commence cropping before salinity levels have dropped to acceptable levels.

- Grow salt tolerant crops where possible: Varieties of rice and other crops that can be grown in saline soils need to be identified and recommended to farmers while there is still a possibility of salt in the soil. The recommended crop is cotton (there is a program to introduce cotton to be farmed instead of rice in Arahama and Natori in Miyagi Prefecture. See: www.tohokucottonproject.com). Salt disrupts crops by hindering their ability to absorb water and other nutrients such as potassium but cotton has more than double the saline tolerance of rice. This recommendation means to provide farmers with income during the time when rice cultivation is still not possible.

Long-term activities

- Transfer technology and knowledge to the farming community: As information on farming on tsunami-affected soils becomes available, it needs to be passed on to the farming community as quickly as possible, to ensure they receive up to date information. Farm demonstrations and field days show farmers what methods work best.

- Continue to build the capacity of farmers, extension staff, and NGOs to manage soils. Networks need to maintain contact between farmers, agronomists and NGOs. Demonstration sites are important for bringing groups together for updates on farming practices, rehabilitation efforts, and possible collaboration.

The damage to agricultural production is generally the same in all affected areas in that the cultivation zones can no longer function, or can function but with reduced productivity for the aforementioned reasons. However, these are problems that are visible and categorizable, with defined and static affected zones. Rehabilitation can begin once the condition is favorable.

The explosion and the subsequent leaking of radioactive materials from Reactor 1 of the Fukushima Daiichi Nuclear Power Plant present a different issue from salinity and widespread destruction. Radioactive materials that leaked out along with hydrogen, iodine, plutonium, strontium, and cesium have been detected to contaminate air in areas hundreds of kilometers away. Contamination has been detected as far away as the Kanagawa Prefecture, which is situated 300 kilometers south of Fukishima.

After the incident, the surrounding areas became an exclusion zone. The population of around 100,000 that mostly worked in agriculture such as rice cultivation, vegetable and mushroom farms, or dairy farms had to emigrate. Even though the emigration is not permanent, that the half-life time of cesium is 30 years means it will take 30 years for the former settlement to be safe for habitation again. Most farmers have decided to move permanently to Central Japan to begin anew. They learned that to farm in a new environment, where the soil and the weather are different, is difficult. The situation differs from their previous settlement where soil quality had been refined and developed over many generations.

While the government pays monthly compensation to those forced to move due to radiation up till the time they can return to their previous houses, agricultural compensation is paid by the Tokyo Electric Power Company. The farmers have to request compensation themselves and this involves complicated documentation. Sometimes, the smaller farming operations cease to apply for compensation altogether.

One week after the explosion, it was reported that the public water reservoir in Tokyo (238.34 kilometers away from Fukushima), which is the main reservoir of consumable water of the city, had been contaminated. Afterward, they detected contamination of dairy products, causing panic and concern among the entire country's population. Part of the reason why this was so was that this new problem represented an invisible threat. It was also a threat which manifested itself only over a period of no less than ten years, with repeated exposure, especially for children whose bodies were still growing and developing.

> We didn't know what was dangerous, what was safe to eat. The government has relaxed radiation targets for food, nuclear workers, school playgrounds, and discharges into the sea. What was considered dangerous a year ago is now deemed safe and legal.
>
> *- A Tokyo citizen expressing his concern over the radioactive leakages from the nuclear power plant.*

In a country long famous for safety, hygiene, and raw food, millions of people are now being asked to accept a small but persistently higher health risk. Individuals are being forced to make decisions about what is safe to eat and where it is safe to live. They have not received data to prove that 10 becquerels is safe, or 100 becquerels is safe. There is no clear evidence.

In the case of rice, when hydrogen explosions tore through reactors at the Fukushima plant and released radioactive materials following the March 11 earthquake, rice planting had not yet started. In the 17 prefectures of Aomori, Iwate, Miyagi, Akita, Fukushima, Ibaraki, Tochigi, Gunma, Chiba, Kanagawa, Saitama, Tokyo, Yamagata, Niigata, Nagano, Yamanashi, and Shizuoka, 2,500 rice paddies have been inspected at the behest of the central government in the aftermath of the disaster at the Fukushima No. 1 nuclear power plant. The test was started in early August 2011. Ninety-six percent of all rice paddies or 2,429 fields under cultivation were found to be cesium-free. Even among the remaining 98 rice paddies where varying radiation levels were found, the highest measurement was only 136 becquerels of radioactive cesium per kilogram. This was in Fukushima City. Three other rice paddies—in Fukushima and Miyagi prefectures—had levels

exceeding 100 becquerels. However, the figure is well below the government's safety standard of 500 becquerels per kilogram. On October 2011, the Fukushima prefectural government declared that all newly harvested rice [harvested in year 2011] in the prefecture passed inspection tests for radioactive substances, thereby giving the go-ahead for the rice to be sold nationwide.

Figures 2: A machine used for measuring radioactive conatamination in food, Tono Town, Fukushima

How did the prefecture test the rice?

According to the farm ministry, 17 prefectures required to inspect rice screened their produce in two stages using pre-harvest tests and postharvest tests. Pre-harvest tests on unmilled rice were carried out in areas where soil had been found to contain 1,000 becquerels of cesium per kilogram, which means that it radiates more than 0.15 microsievert per hour. The soil inspections in April to determine if rice paddies were not heavily polluted were only conducted in one location in each municipality. Checks on harvested rice were more expansive, but were generally conducted only in two locations per municipality. If rice containing more than 200 becquerels per kilogram was found, the crop had to undergo a postharvest test for every 15 hectares harvested. "It is impossible to achieve 100 percent detection since what we do is sampling", a municipal officer mentioned. It would take officials 57 years to check every single bag at the current pace of 4,000 bags a week, a prefectural official said.

The government's standard sets a limit of 200 becquerels of cesium per 1 kilogram of milk and dairy products, and 500 becquerels per 1 kg of vegetables, grains, meat and eggs. The provisional rules, modeled on international criteria, generally deem a food unsafe if consuming it daily for one year would be likely to cause health problems (*New York Times* 2011).

Radiation above standards found in rice from five farms

Fukushima prefecture, the fourth-largest rice producer in Japan in year 2010, accounted for about 5 percent of the harvest. After the municipal government's declaration of safety, contaminated rice was discovered when a farmer who lived in Fukushima farm brought his harvest for testing, since he thought that the government's testing was not thorough enough. He found a trace of radiation of more than the safety level of 630 becquerels per kilogram. In this case, the contaminated rice had not yet reached the consumer; but in a similar case in the town of Date, contaminated rice of 700 becquerels per kilogram was found after 10.5 kilograms of the said rice had been sold to the consumers. Afterward, rice exceeding the government's cesium threshold of 500 becquerels per kilogram was found in five districts in the cities of Fukushima, Nihonmatsu, and Date, which had been known as "hot spots". An area was considered a "hot spot" if its annual exposure exceeded the 20-millisievert limit. No rice over that limit has been found in other prefectures so far. The highest contamination of cesium-134 level so far is 1,240 becquerels per kilogram of unpolished rice grown in Date.

Experts say that cesium levels will decline quickly as the rice is polished. About 70 percent of the cesium ends up in the straw, with another 10 percent ending up in the bran and 7 percent in the chaff and the rice itself.

Most consumers rejected rice from the 2011 harvest season of Fukushima. The selling price fell by 40%, whereas the overall nationwide price increased by 10% to 20% when compared to the price in 2010. Fukushima is a very good cultivating area for the light and sticky Koshihikari strain of rice preferred by many Japanese.

The concern over the safety of rice, the main food staple, led many families to stock up on rice cultivated before 2011, and only choose to consume rice cultivated in 2011 from Western Japan. For most consumers, especially for families with small children, a contamination of one becquerel is enough reason to avoid consumption altogether. Even the scientific information provided to the public is divided into two camps, one of which says it is safe and the other which says it is unsafe to consume contaminated foods for a prolonged period of time, causing much confusion and lack of confidence among the general public.

The following factors contribute to the contamination level of rice, especially by cesium, one of the leaked radioactive materials, which is light, transportable by wind and water, and has a half-life of more than 30 years (The half-life of iodine-131 is about eight days. Cesium-134 has a half-life of about two years, cesium-137 a longer half-life of about 30 years).

1. Distance from the Fukushima Nuclear Power Plant. The 20km radius around the plant has been declared an exclusion zone.

2. Wind. The wind direction directly after the explosion blew was northwest, causing the area around Iitate, which is about 39 kilometers (24 miles) northwest of Fukushima I Nuclear Power Plant, to become a highly contaminated area that is prohibited from habitation. The wind also relocates radioactive contamination from around the incident zone to elsewhere. For instance, contamination can emanate from pine trees up in the mountain, downhill to the agricultural zone.

3. Water can also carry radioactive materials and spread them along irrigation networks and natural waterways. Radioactive materials trapped on hills, in trees on soil, can also be washed downhill by rainwater to the reservoir and the cultivation zones, respectively.

4. Geography. A valley or mountain range directly in the way of wind blowing from the incident zone stands a higher chance of receiving contamination. This has caused some area to become a contamination hotspot, while an area directly adjacent to it could receive very little contamination in comparison. The Fukushima Prefecture's geography is composed mainly of complex mountainous regions; as such, the random rice test procedure of every 15 hectares is not effective in such a region.

Situation after the detection of contamination (after November 2011)

> I feel a sense of crisis over food safety and I cannot trust the government. I have to set my own standards and make my own choices. My priorities have changed. My child comes first now. When it comes to radiation problems, our only option is self-protection.
>
> *- Tokyo citizen (Interviewed by me)*

The ineffectiveness of the government's rice testing made the population's concern over food safety even stronger. People chose to purchase food produced as far away from Fukushima as possible. As for rice, they would choose to purchase that produced in 2010, instead of the regular practice of buying the newest rice produced within the year. This concern caused products from Fukushima to become unsellable, even if these products had gone through safety testing procedures. Big, a super-store type of department store such as Aeon, adopted thorough testing procedures and clearly stated the contamination level on each product's label, whereas a food franchise giant with a nationwide network, Ootoya, which received much of its rice from Fukushima, has had its sales greatly affected from the incident.

The Fukushima municipal government has confiscated the municipalitie's rice stock with high risk of contamination, for further testing. The rice now on sale in the market should, therefore, be safe for consumption but is still being rejected by the consumers.

Farmers left in Fukushima are all affected by the lower sales and even the farmers from adjacent Ibaraki Prefecture are also affected by a similar

situation. Farmers who grow their rice using the organic method without relying on any chemical means are especially affected. They sell their products directly to customers and are very much concerned about the safety of their rice (hence the organic method); but they still have to answer to the question of contamination. The contamination level detected ranges from none at all to 20 becquerels per kilogram only, but their products are still being rejected by the customers.

Figures 3: Officers are working on radioactive contaminated land in Iitate, Fukushima, one of the most severely contaminated areas.

Figures 4 Agricultural machines were kept in the storehouse while rice plantation was banned in Iitate, Fukushima

In March 2012, Seiyu, a supermarket chain with the most stores in Central Japan, started importing rice from Jilin Province in China. The 5 kilogram bag was priced at 1,299 yen, or 30 percent cheaper than the lowest-priced domestic rice. The importation of foreign rice to sell in supermarkets is an unconventional act for Japan, a country that imposes high duties on imports to protect domestic rice production. The last time there was an import of rice was in 1993, when rice production countrywide was down. The importation of rice this time clearly demonstrates the lack of confidence in the safety of domestic rice in a very profound way.

Problems to be solved for the preparation of the 2012 growing seasons (the second growing season since the incident)

In March 2012, the Farm Ministry and the municipal government announced the ban on rice cultivation on 10,500 hectares of paddies in Fukushima Prefecture, or on about one for every eight of the total land cultivated. This banned zone included the no-entry zone within the 20 kilometer-radius around the power plant and in the cities of Fukushima, Date, Nihonmatsu, and Soma. Apart from this, the cultivation area of 4,000 hectares covering 30 districts in Fukushima, Sate, Nihinmatsu, and Motomiya, as well as four districts in Kori and Kunimi towns, may only begin growing rice under the conditions that the soil pass the contamination management plan, the farmers allow inspections at every point of the cultivation process, and the final products be submitted for contamination detection before sale.

Figures 5: Zeolite, a rock-shaped mineral, is used to trap cesium in natural waterways in Nihonmatsu, Fukushima.

In 2012, based on orders from the government, rice farmers sprinkled zeolite, a mineralthat traps cesium, in natural waterways that flow into paddies, and added fertilizer with high potassium levels, in efforts to prevent seedlings from absorbing cesium through their roots as they grow. Farmers have had time to prepare and understand the situation more; there is greater exchange of information and facts from government officials and academics nationwide. Farmers are finding ways to resolve the issues in the most effective manner. A research

from the University of Fukushima states that the cesium absorption level of rice is unstable. Rice absorbs less cesium in soil with high organic content, than does rice in soil with low organic content (in effect, paddy with artificial fertilizer). Farmers who face the problem of contamination believe that improving the organic content of the soil, adding potassium, and ploughing the land deeper than before to reduce the concentration of cesium in the upper surface of the soil, will solve the problem. But a bigger problem than paddy management is the lack of confidence among buyers in products from Fukushima and parts of Ibaraki. The problem lies in the restoration of confidence in the product from the area previously contaminated with radioactive materials. Some farmers in Fukushima have adopted a more direct-sale approach of meeting the buyer face to face, thereby creating more trust in the safety of the produce. In addition, another group of scientists is experimenting with different rice strains from around the world to find one that is suitable for growing on cesium-contaminated soil. They look for rice that has a low level of cesium absorption, or none at all. A news agency reports that the experiment is going well, but the taste of the rice is still not accepted by the Japanese people.

Conclusion

The problem involving rice in the aftermath of the tsunami and the subsequent leakage of radioactive materials is a big one that has caused the Japanese people to lose confidence in their own nation for the first time since World War II. Factors that will bring Japan out of this crisis are the ones that have accumulated in a time of peace: research, civil society networks, economic power. The chaos resulting from contaminated food in the first year has now been largely reduced by the knowledge passed down from the scientific community. The communication between the rice producers and the consumers is expected to create trust and confidence. Those heavily affected by the incidents will receive support from the state and the strong civil society networks. Japan might be an unlucky nation that has faced the most number of nuclear-related problems in the world, but the Japanese will once again show the whole world that they will always find a way to bring their country out of the crisis.

One Japanese told me, as a man from a country that has not yet relied on nuclear-generated electricity, "Let your country take a lesson from the problems that we are facing. Do not make the same mistakes that we made. Let us be the last country to face nuclear-related problems".

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