

## Chapter 7: Disaster Recovery Frontier

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### Introduction

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### Summary

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### Introduction - Aiming for “the ideal state of Japan in the mid-21st century”

The Basic Act on Reconstruction in Response to the Great East Japan Earthquake, which was promulgated and enacted on June 24, 2011, three months after the Great East Japan Earthquake and the accompanying Fukushima Daiichi Nuclear Power Plant accident, declares its basic principles (Article 2) in the General Rules (Chapter 1) as follows.

Reconstruction from 3.11 is “not just a revival, but a reconstruction aiming for the ideal state of Japan in the mid-21st century”, and in addition to “addressing cutting-edge measures to contribute to the resolution of issues common to all humankind” such as responses to falling birth rates and demographic aging, population decline, progress in socioeconomic activities across borders, the food question, restrictions on the use of electricity and other energy, environmental load, and global warming and so on”, our aim is to “create a safe community where people can live in peace of mind” and “to revitalize a sustainable and vibrant socio-economy.”

In other words, there are urgent issues on the one hand that exist in the affected areas, and structural issues on the other hand in Japan's economy and society such as the declining birth rate and demographic aging that predate the disaster. Through a twin strategy of overcoming them, it intends to achieve reconstruction underpinned by a “will for universal reversal”. A firm intent can be felt here that Fukushima's reconstruction in the face of a triple compound disaster of earthquake, tsunami, and nuclear accident should not only naturally deal with individual issues, but also universal issues that go beyond. The backdrop created by such a context no doubt included a desire to make this national crisis that occurred at the very bottom of Japan's “lost twenty years” into a catalyst for revitalization and rebirth. The phrase “the ideal state of Japan in the mid-21st century” is nothing if not a statement of intent.

This intent to revive may well be the same as the words of Governor Andrew Cuomo of New York, which was in the grip of the coronavirus crisis in the spring of 2020: “I don't want to simply restart. Let your imagination work again, be smart, and let's use this crisis to grow,” in the sense that it is a declaration on projects for the future, not only for reopening, which is revitalizing, but also for reimagining, which is rebuilding.

This intent arose during the parliamentary debate between the ruling and opposition parties seeking ideas on reconstruction. On May 13, 2011, the then Democratic Party of Japan Administration

submitted a Bill on Basic Policy and Organization for the Great East Japan Earthquake Recovery (177th Ordinary Diet, Law No. 70). On the other hand, the opposition party and the LDP submitted a counter-proposal, Bill on Basic Policy and Organization for the Great East Japan Earthquake Recovery (177th Ordinary Diet, Law No. 70). At the plenary session of the House of Representatives on the 19th when the two parties met, the Democratic Party's government proposal was subjected to criticism.

“I am forced to say that the content is extremely inadequate for a bill submitted more than two months after the Great East Japan Earthquake. Many headquarters have been set up haphazardly and a mass of Cabinet advisors have been appointed and yet, there is still ongoing confusion in the command system, and now when a bill is finally presented, it is almost just a reprinted version of the system put in place at the time of the Great Hanshin-Awaji Earthquake [1995].”

So speaking, Shigeru Ishiba, then Chairman of the LDP, remarked, it is “essential that we try to revitalize the region, and eventually Japan, by anticipating what Japan should be in the future,” asserting that “reconstruction and revival after the Great East Japan Earthquake must be carried out with the purport of aiming for an ideal state for the mid-21st century, not just restoration to the original state.”

Prime Minister Naoto Kan proposed an amendment on May 31 in the form of incorporating the LDP opposition party's proposal. The next day, the bill was enacted under the agreement of the three parties: Democratic, Liberal, and Komei.

How did the subsequent reconstruction project in Fukushima proceed?

The total reconstruction budget for the intensive reconstruction period from 2011 to 2015 and the reconstruction/reconstitution period from 2016 to 2020 amounted to 32 trillion yen. This 32 trillion yen included reconstruction in other disaster areas such as Iwate and Miyagi. Apart from this, the costs (assumed) involved in cleaning up after a nuclear disaster, decommissioning, compensation, decontamination/intermediate storage have reached 21.5 trillion yen. A huge amount of unprecedented costs has been poured into this region, people working to shift it, and vast amounts of knowledge having been accumulated.

But how has this been connected to the realization of the “will for universal reversal”?

Certainly, at least as a matter of form, the “will for universal reversal” can be said to be currently reflected to some extent in various initiatives aimed at ensuring food safety and improving brand value in the primary industry, new town development aimed at compact towns in disaster-affected municipalities, and the Fukushima International Research and Industrial City (Innovation Coast) Plan put forward as a national policy and which will be later looked at in detail. However, on the other hand, many projects are not making adequate progress due to constraining factors that must be called the negative legacy of radioactive material from the disaster, prolonged evacuation, difficulty in lifting evacuation orders, and deep-seated, persistent reputational damage.

In fact, it is not easy to sweepingly say that the current state of reconstruction is “like such and such”. In terms of the extent of the widespread damage that occurred at the time, there are substantial variations depending on the region, location, and attributes. In addition, there are discrepancies between psychological reconstruction at the individual level and social ones at the group/organizational level.

There is a tendency for those on the outside to facilely repeat the pressing set phrase “the recovery is lagging”. However, it is also important to reconsider the fact that reconstruction should be promoted from a longer-term perspective, that is, “that adverse effects have come about due to rushing reconstruction”.

In this way, it can be said that the concept of “reconstruction” itself, especially the concept of “rebuilding Fukushima”, has remained unclarified for the past 10 years. Furthermore, the state is far from one where everyone shares the feeling of finding the “will for universal reversal”.

Again, we must recapture the meaning of reconstruction. To that end, I would like to look back at what kind of trajectory the reconstruction of Fukushima has taken during this period.

## **1. Fixed and isolated by the disaster**

After 3.11, more than 160,000 people in Fukushima were forced to evacuate at the peak. Ten years on, the number of evacuees still outside the prefecture is some 30,000. On the other hand, many residents have returned to their original home bases, and even if they are not in their original homes, they have moved, relocated, and settled down in Fukushima Prefecture. Immediately after the disaster, there was a flow of evacuation a long way from existing home bases as well as a return to home bases within the prefecture from evacuation destinations. However, that coming-and-going has long been lost. In other words, the number of people who continue to live far away from Fukushima - now less than 2% of the total population of Fukushima- has fallen and is becoming fixed as “evacuees who will not return to Fukushima in the long run”. This does not indicate the end of the evacuation problem. Rather, the amount of support, whether it be public or community, for evacuees scattered all over the country is decreasing. Of the people involved in wide-area evacuation, who lost their jobs and social networks to avoid radiation from the nuclear accident, there are those who are confused about what their ten years were like and who feel a sense of isolation every time they look askance at most of their former friends and acquaintances continuing to live in Fukushima where they once lived, eating local food, raising children and living a healthy life.

In that respect, the issue of disaster-related death is also serious. Earthquake-related deaths (2,306 as of April 2020), which refer to cases of physical and mental illness and death due to prolonged evacuation, show a unique situation in Fukushima. It now greatly exceeds the number of people who died directly from the earthquake and tsunami (1,605 ditto)<sup>1</sup> and is still climbing. The fact that immediately after the disaster, the government was forced to carry out large-scale evacuation, and the necessary medical care for patients who were hospitalized or had chronic diseases was not available, and since the evacuation became prolonged, evacuees continued to have greater mental, physical, and social burdens than initially anticipated form the backdrop to these numbers.

At the bottom of this lies the background of a declining birth rate and aging population. The fact that this disaster occurred in 2011 when Japan’s birth rate was low and its population was aging, and in an area where these trends were relatively widespread, has amplified the issue of earthquake-related death. The disaster has also accelerated the drop in the birth rate and demographic aging.

Had the falling birth rate and demographic aging not been so strong, human resilience would have undoubtedly been more effective in supporting reconstruction. Even if you suddenly lose your daily life or job, you will need to rebuild your home and human relationships, relearn what you need, find a new job, and jump into it. For example, young people tend to possess higher abilities for this than

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<sup>1</sup> Fukushima prefectual government, 2020b.

older people. The same applies to the ability to recover from temporary damage to one's health. Initiatives to overcome various disasters by harnessing the powers of the individual are difficult to achieve in an aging society. It is very hard for the elderly to return to their original state once they have lost their home bases. Here, too, we see a structure in which people in a disaster-affected situation lose the opportunity to overcome, become fixed/isolated, and the burden is concentrated there. For example, in an ongoing Awareness Survey on Residents in Nuclear-Affected Municipalities conducted by the Reconstruction Agency, Fukushima Prefecture and each municipality since 2012, and when comparing the present time with the earthquake, the number of households with two or less people has consistently risen and households with five or more people has consistently dropped. The dismantlement of the family, which is one of the foundations of work and life for the elderly, can be seen. The biggest difference between the Great Hanshin Awaji Earthquake in 1995 and the Great East Japan Earthquake in 2011 is the aging of Japan's population during this period. That is behind the extraordinary increase in earthquake-related deaths.

The disaster also confronted this region with the issue of declining birth rates and an aging population in a condensed form. Fukushima Prefecture is one of the prefectures with the most advanced demographic aging in a greying Japan. Most symbolic is the trend of insurance premiums in the long-term care insurance system. Nursing-care insurance premiums for residents over the age of 65 are reviewed once every three years, depending on whether there is a high or low demand for nursing-care services by each municipality or regional association. Fukushima's Katsurao Village had the highest long-term care insurance premium for residents aged 65 and over among nationwide municipalities for JFY 2018-2020. The village was the most depopulated and aging population of the local governments instructed to evacuate their residents during the Fukushima nuclear accident. Furthermore, Futaba, Okuma, Namie, Iitate and Kawauchi are in the Japanese top ten for long-term care insurance premiums for residents over the age of 65, and were also municipalities that received evacuation orders after the accident. Along with the evacuation process and the loss of employment, these local governments saw a rapid loss of connections between families and local communities with residents moving to work and life bases in urban areas proceeding apace. This move has led to the collapse of the mutual aid safety net that existed in these areas up until now, and has forced people, including the elderly and the socially vulnerable, to depend on public medical, welfare and nursing care services. The result has been an unprecedented surge in long-term care insurance premiums.

The triple set of problems of a declining birth rate and aging population, a falling population, and a decline in industry that has supported the region can be seen not only in Fukushima but throughout Japan. However, in Fukushima, which experienced the disaster, it has struck the area in a shorter period of time, more seriously, and more directly, and still continues to do so.

In short, the damage is becoming more fixed and isolated. It is progressing not only at the level of individual residents in wide-area evacuation and earthquake-related deaths, but also at the regional level. Initially, evacuation orders were issued to residents of 12 municipalities around the Fukushima Daiichi Nuclear Power Station. Futaba Town, the last municipality still subject to evacuation orders, started lifting them in March 2020.



Nevertheless, from 2017, some of the difficult-to-return zones with low doses and highly convenient areas with transportation infrastructure have been designated as “special reconstruction and regeneration zones”, and intensive land preparations have begun with decontamination and house demolition. However, the future of most other difficult-to-return zones remains unclear. There are fixed and isolated disasters here as well. Some of the disaster difficulties are concentrated at both the inhabitant and regional level, which deepens fixing of the status quo and isolation.

#### Persistent economic loss

Economic losses from 3.11 continue to occur.

Among the economic losses, some were caused by the earthquake and tsunami, which made it impossible to physically use farmland, factories, stores, etc., thereby making it difficult to continue business. In addition, people in charge of businesses were forced to evacuate. As a result, the living environment has changed and future prospects are uncertain, so there is a loss in terms of human resources, such as the inability of a business owner to restart his or her business and prospective successors leaving the job. Additionally, even if a business can be resumed, there are losses in the form of an inability to cover the costs required for maintaining the business resulting in the reduction or withdrawal of the business amongst various changes in the environment.

Of these economic losses, it is reputational damage that afflicts residents the most. Reputational damage is mainly concentrated in primary industry and tourism. The resulting economic losses, although improving, still cause serious problems in the local economy. Refer to Chapter 3 for details of reputational damage.

Economic losses are ongoing with the interaction of a falling birth rate and aging population, the decline of the industrial base, and persistent reputational damage. While the causes and places affected by these losses vary widely, taking for example the amount of compensation for corporations and sole proprietors suffering damage due to the TEPCO disaster, some 5,802.9 billion yen has been incurred as of April 2020 in approximately 438,000 payments, indicating an enormous scale.

Of course, the economic loss from the Great East Japan Earthquake was enormous even in affected areas other than Fukushima, but Fukushima, which still has areas suffering reputational damage or under evacuation orders, is one of the most left behind areas for reconstruction.

Following the disaster, extremely strict inspections have been carried out on agricultural products produced in Fukushima Prefecture. It is still ongoing, but no outliers above the legal standard have been detected.

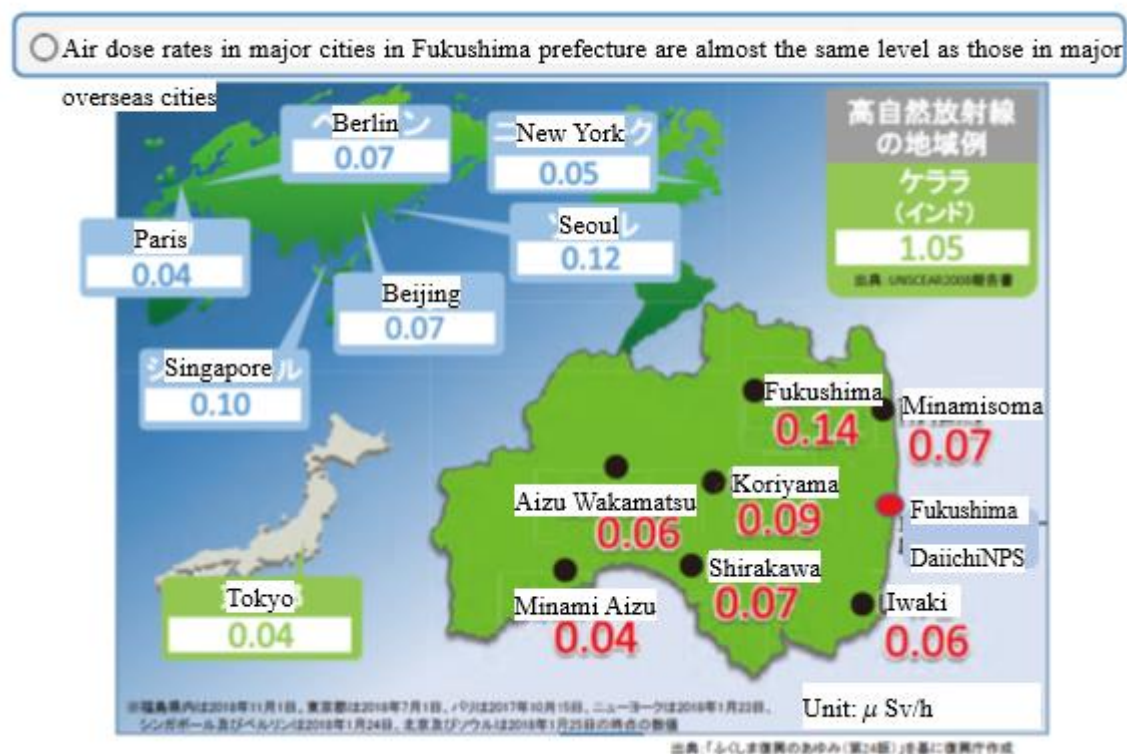
Regarding the risk of radiation exposure in the environment, environmental air doses in various areas in Fukushima Prefecture, including areas where evacuation orders have been lifted, are consistently measured and disclosed, and their values are dropping.

For example, the average air dose rate at a height of one meter from the ground surface within 80 km of TEPCO's Fukushima Daiichi Nuclear Power Plant fell by about 77% compared to November 2011, and the air dose rates for major cities in the prefecture are shown in the figure. As you can see, it is almost at the same level as major overseas cities.<sup>3</sup>

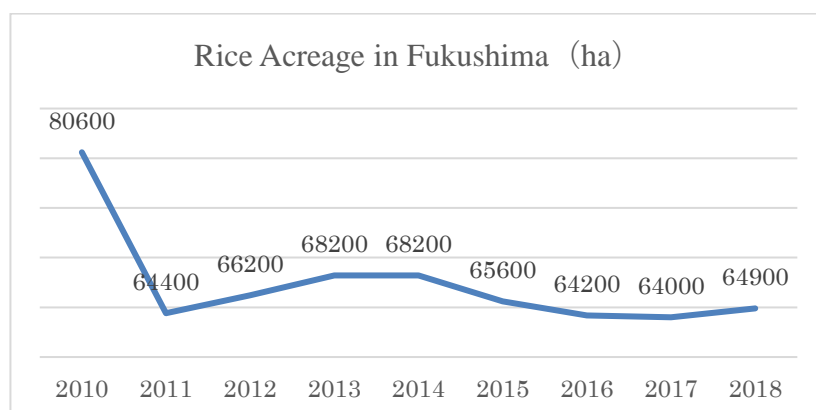
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<sup>3</sup> The Reconstruction Agency, 2019.

### Current Air Dose Rates in Fukushima Prefecture

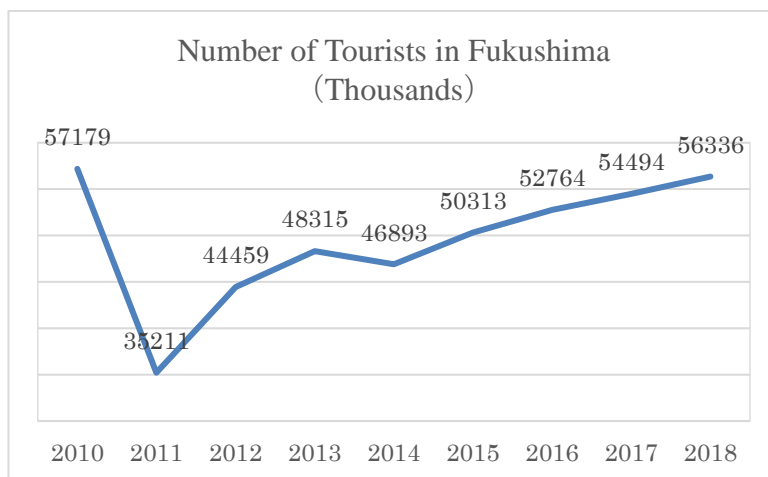


However, this situation is still not well known in Japan and abroad, as evidenced by persistent reputational damage for primary products and tourism.<sup>4</sup> Awareness of Fukushima's actual status is constantly being updated inside Fukushima, but that is not the case outside Fukushima. Some people still see Fukushima as it was in March 2011. Speaking only of Fukushima, time has passed in the absence of any updates about the current situation. Radiation monitoring is the most important data that forms the basis for understanding the current situation.



<sup>4</sup> For example, the rice acreage and number of tourists have shown some recovery but have not recovered to 2010 levels.





## 2. Radiation monitoring

After the Fukushima nuclear accident, the four investigation reports later released had set the accident itself and the circumstances leading up to it as the central theme of the investigation, and there were not so many proposals related to “the reconstruction of Fukushima”. At the time, we were still trying to find out how the area should be restored and rebuilt, and in a process of trial and error for the reactor decommissioning that was to follow. However, even in that situation, a number of recommendations regarding radiation monitoring and decontamination were made.

The Independent Accident Investigation<sup>5</sup> states that the effects of radiation exposure on residents should be managed over the medium- to long-term, and recommends the need for a more accurate, faster, and longer-term specialized survey by the government in addition to the “prefectural health management survey”.

The Parliamentary Accident Investigation<sup>6</sup> proposed the need for proceeding with inspections of external and internal radiation exposure and disclosing information, and monitoring forests and rivers, stating the government should take responsibility for managing the effects of radiation exposure in residents in the medium- to long-term.

Furthermore, the Atomic Energy Society of Japan<sup>7</sup> has proposed the establishment of a system for centralized data collection and storage from the early stages of an emergency, and the development of a new method for ongoing and long-term individual dose monitoring for residents.

It is commendable that these recommendations for radiation monitoring have subsequently largely been achieved.

The target of radiation monitoring is broadly divided into three categories: environment, food, and the human body.

For radiation monitoring of the environment, the Nuclear Regulation Authority has a system in place to measure the dose in Fukushima Prefecture in detail and disclose it to the public.<sup>8</sup> This radiation

<sup>5</sup> Independent Investigation Commission on the Fukushima Daiichi Nuclear Accident, 2012, p. 67.

<sup>6</sup> The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission, 2012, p.2.

<sup>7</sup> Atomic Energy Society of Japan, 2014, p. 370.

<sup>8</sup> Nuclear Regulation Authority. *Hōshasen monitoringu jōhō* [Monitoring information of environmental radioactivity level]. Retrieved from <https://radioactivity.nsr.go.jp/ja/> (In Japanese.)



monitoring information has been regularly conveyed by newspapers, television and radio in Fukushima Prefecture along with weather forecasts.

On the other hand, radiation monitoring of food has been mainly promoted by the Fukushima Association for Securing Safety of Agricultural Products consisting of producer groups, distributors, retailers, consumer groups and Fukushima Prefecture. Extensive inspections have been conducted on the amount of radioactive substances contained in primary products, including an inspection of all bags of rice produced in Fukushima, and results can be checked through the continuous disclosure of the latest information on the web.<sup>9</sup>

Furthermore, regarding the status of radioactive substances inside individual human bodies, Fukushima Prefecture has established a system where people can voluntarily undergo “internal exposure inspection by a whole body counter” in Fukushima Prefecture. At the same time as notifying the individual person himself/herself of the test results, overall results are also disclosed.<sup>10</sup> The government/administration have not only conducted these large-scale, comprehensive, and continuous surveys, but have also tried to highlight various dose information with individual surveys on the soil, sandy beaches, and waters in the sea off Fukushima Prefecture, as well as the status of radioactive materials in and around the Fukushima Daiichi Nuclear Power Plant premises.

Along with this, investigations by governments and NGOs are being conducted. For example, the Survey on Radioactive Substances Intake from Meals at Home<sup>11</sup> conducted by the Japan Consumers' Co-operative Federation since 2011 covers meals actually provided to ordinary households using the duplicate method and is an effort to collect nationwide the amount of radioactive substances, accumulate and disclose the data. Alternatively, the Super Science Club, which is a club activity at Fukushima High School, has shown that external exposure in the living space of high school students in Fukushima Prefecture does not show a unique value compared to that of high school students outside Fukushima Prefecture and overseas. A part of these results was put together in a paper, which was published in the peer-reviewed *Journal of Radiological Protection*,<sup>12</sup> and featured in many media.

These independent activities by civil society are not limited to simply investigating the actual state of radiation in more detail, but have great significance in acting as a kind of second opinion to the effect that “the conclusion is the same even if measured by a third party or using different methods”. As a result, it has acted to mitigate distrust of the government/administration, experts and media. In that respect, it can be commended that actions beyond the recommendations for radiation monitoring in each accident investigation are taking place in the field.

However, radiation monitoring is now at a turning point. Despite being safe, an answer is still to be found for the question of how long should the monitoring continue.

Why can it not be stopped? It is because the acknowledgement that safety has already been achieved is insufficient, especially outside Fukushima Prefecture and overseas.

For example, regarding rice, which is the main crop of Fukushima and had the fourth largest

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<sup>9</sup> Fukushima Association for Securing Safety of Agricultural Products. *Kore made no hōshaseibushitsu kensa jōhō* [Information about radioactive substance inspections to date]. Retrieved from <https://fukumegu.org/ok/contentsV2/index.html> (In Japanese.)

<sup>10</sup> Fukushima Prefectural Government, 2020d.

<sup>11</sup> Japanese Consumers' Co-operative Union. Retrieved from <https://jccu.coop/products/safety/radiation/method.html> (in Japanese.)

<sup>12</sup> Adachi et al., 2015.

nationwide production in 2010, an annual budget of 5 billion yen has been spent conducting an all-bag inspection of an annual production reaching 10 million bags. No bag exceeding the legal standard value has been found in inspections since 2015. However, inspections are maintained under the premise that the fact that rice from Fukushima Prefecture is “safe” has not been sufficiently shared at home and abroad. There is no problem with Fukushima's rice itself, but there is a problem with the perception outside Fukushima, but it is not easy to change external perceptions. At the production and inspection sites, the ritual verification of safety is still carried out “even though it is known that the inspections will continually confirm the safety and yet time and effort is spent to prove it.”

However, the fact that radiation monitoring has been excessively promoted in each of the three fields of environment, food, and the human body has provided important assessment material in formulating a regional reconstruction vision.

The special reconstruction and regeneration zones, which are designated only in those relatively high-dose difficult-to-return zones whose dose is low, were precisely possible because of the trust of the residents engendered by the accumulation of this kind of honest-to-a-fault radiation monitoring.

Difficult-to-return zones have a more difficult outlook for future recovery than any other area. In the first place, the very name “difficult-to-return zone” carries political overtones. In the 2017 Diet session, Goshi Hosono, a member of the House of Representatives, said:

“At the time, there was a huge debate among the ministers about using the strict name of ‘difficult-to-return zone’. I am sorry for those forced out of their hometowns, but by intentionally using such a strict expression, we wanted people to choose a new life. By making it clear that returning home was difficult, TEPCO had to pay compensation to the more than 20,000 evacuees living in the area on the assumption that they couldn’t return.”<sup>13</sup>

As once was the case with some overseas regions that underwent nuclear tests and nuclear accidents, it could have been possible to have a policy of semi-permanently designating areas with high doses as uninhabitable zones. However, it became clear while carefully measuring radiation doses that there were places where the dose dropped more than expected even if decontamination was not actually carried out. This has led to the creation of “special reconstruction and regeneration zones,” and provided the prospect for revitalizing difficult-to-return zones.

In the towns of Okuma and Futaba, where the Fukushima Daiichi Nuclear Power Plant is located, there happened to be an area with a low dose that was suitable for redevelopment as a highly convenient town, so it was first decontaminated as a “special reconstruction and regeneration zone”, and the decision taken to relocate the functions of the government office there. Redevelopment of “special reconstruction and regeneration zones” has begun even in neighboring local governments that have difficult-to-return zones. Various trials and errors will be pursued over the next five to ten years to see whether residents and industries can be rebuilt.

### **3. “1mSv/Year Golden Line”: Decontamination and intermediate storage facilities**

Along with radiation monitoring, decontamination is a large-scale project offsite from the Fukushima Daiichi Nuclear Power Plant.

After the disaster, the national government uniformly targeted decontamination for areas where the

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<sup>13</sup> House of Representatives, 2017.

additional exposure dose was 1 mSv/year or more.

The need for decontamination to reduce the adverse effects of radioactive substances on the human body and environment was recognized immediately after the disaster. However, widespread decontamination of radioactive materials in a residential area was unprecedented worldwide, there being little technical knowledge, and existing laws were unable to even determine the responsible ministries in terms of administrative procedures. They literally had to start from scratch.

Meanwhile, the Ministry of the Environment raised its hand. The then Administrative Vice-Minister of the Environment Secretary, Hideki Minamikawa decided, “Seeing the turmoil in Fukushima Prefecture caused by this accident and the local bewilderment, let’s raise our hands here even if it’s excruciating.” He was “almost overwhelmingly opposed within the Ministry of the Environment”, but he pushed it through.<sup>14</sup>

In August 2011, the Act on Special Measures Countering Radioactive Material Pollution (a special measure act on the pollution of the environment by radioactive materials released by the nuclear power plant accident following the Tohoku-Pacific Ocean Earthquake on March 11, 2011) was stipulated and concrete work began.

Regarding decontamination, the Atomic Energy Society of Japan<sup>15</sup> made specific proposals regarding the following three points: setting decontamination targets/areas; decontamination and implementation system; and safekeeping/storage of decontamination waste.

1) Setting decontamination targets/areas: “While positioning 1mSv/year as a long-term target and based on the optimization principle of ICPR, given the decontamination effect, time and cost required, as well as individual annual effective residual dose, realistic decontamination targets and decontamination areas should be set. In decontaminating, the “average individual” should not be used for exposure control, but should be reviewed based on the exposure dose measurement results for each individual.”

It must be concluded that this has not been achieved even after ten years.

Initially, the radiation dose of people living in each region had to rely on estimates from the air dose, which acted as the premise for decontamination. There were some areas where the effects of decontamination (benefits) could not be expected, and the balance between them and the costs and risks was unclear. When decontamination actually started, it was found that speculation did not always match the “actual individual dose of exposure”. Actual doses were lower than conservatively calculated estimates, and doses were completely different, for example, for people working outdoors in difficult-to-return zones and for indoor deskwork in other areas. It has become clear that there are individual differences.

Although this recommendation was made based on this reality, the decontamination project has almost reached completion with no improvements being made here to date. The standard of 1 mSv/year was recognized by residents as something that should be immediately achieved irrespective of cost, and local governments and other local communities made decisions based on this assumption and went ahead with decontamination.

2) Decontamination and implementation system: “In decontamination performed by municipalities,

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<sup>14</sup> Ministry of the Environment, 2018, p.15.

<sup>15</sup> Atomic Energy Society of Japan, 2014, pp. 370–371.

steps should be taken to make prompt decision-making near the site possible so that decontamination can be carried out flexibly according to the local situation. In carrying out decontamination, all parties should make every effort to ensure the cooperation and participation of local residents. Decontamination technology needs to be selected and individually assessed on the basis of the attributes of the location and target.”

Regarding this recommendation, the importance of the part “all parties should make every effort to ensure the cooperation and participation of local residents”, which does not necessarily seem to be given special weight in this context, has emerged in the course of practical work, and is assessed as having been achieved to a certain degree.

Initially, the main issue for decontamination was to overcome technical and engineering problems such as choosing the decontamination technology, but as the actual decontamination went forward, the need for a perspective on how to communicate closely with residents and promote consensus building was recognized as a major issue.

For example, before implementing decontamination, the Ministry of the Environment had a conflict with target sites over the question of the wide-area treatment of disaster waste. Some people lay in front of the trucks carrying waste in trying to block their way, which spread via net-based media, the same thing happening elsewhere. There were almost no examples of consistent and accurate information sharing from the mass media and the Ministry of the Environment.

In these circumstances, everyone started talking about the importance of “risk communication”, but it was shown to be just an armchair theory even when it did materialize, and ineffective as a means of securing interaction with residents. Even all the various methods amassed by advertising agencies that are launched every time there is a scandal to be dealt with proved to be not very useful.

Even so, through repeated trial and error, communication and cooperation between the government and residents has made headway.

For example, the decontamination promotion team from the Ministry of the Environment, which was created in the first year and consists of 31 people from Fukushima, frequently goes around each municipality deepening dialogue with local residents and the heads and other officers from government offices.<sup>16</sup> In the process, temporary storage areas have gradually been opened with the agreement of local government and residents, and decontaminated soil in flexible container bags has been brought into the temporary storage areas.

In January 2013, when the Asahi Shimbun reported suspected improper dumping of decontaminated soil into rivers near the decontamination work site<sup>17</sup>, Shinji Inoue, then Vice-Minister for the Environment, other politicians and top officers from the Ministry of the Environment frequently visited the local area to try and restore trust.

The decontamination work methods and progress are constantly available on information bases and homepages that are always open to residents, such as Fukushima City’s Environmental Regeneration Plaza (Decontamination Information Plaza until 2017).<sup>18</sup> They created a system for answering questions from the general public, and according to the need, have started holding workshop-type and

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<sup>16</sup> Ministry of the Environment, 2018b.

<sup>17</sup> Aoki and Kihara, 2013.

<sup>18</sup> Ministry of the Environment. Kankyō-saisei-plaza. [Environmental Regeneration plaza]. Retrieved from <http://josen.env.go.jp/plaza/> (In Japanese.)

tour-type events that involve sending experts to residents' groups and schools as well as workshops and the involvement of local residents.

**Perhaps there was no detailed image involved in the recommendations from the Academic Accident Investigation for “decontamination and the implementation system”, but they can be said to have been realized to a certain extent.**

**Of course, not everything was smooth sailing. There were problems such as the improper dumping mentioned earlier, the lengthy time it took to form a consensus delaying plans, and although in hindsight it looks like it proceeded smoothly, matters moved forward always in the midst of conflict with local governments and residents.** However, the root of the problem was the same kind of difficulty as with “setting decontamination targets/areas”. In other words, no matter how long, communication and agreement with residents to optimize the balance between decontamination effects (benefit), costs and risk could never be achieved. The nub of the problem was that various untenable aspects emerged such as the initial standard of 1 mSv/year being taken as gospel, and ignoring actual exposure dose and the existence of individual differences, the premise that it should be achieved regardless of cost as well as the reality that it ended up being shared as if it was a new “safety myth”, all this was allowed to go unchallenged as matters moved ahead.

3) Safekeeping/storage of decontamination waste: “Since the provision of a temporary storage site will immediately affect the progress of decontamination, the parties concerned need to actively engage in dialogue with residents and secure the participation of residents in selecting sites. This involves management from temporary storage sites to intermediate storage facilities, and further to final disposal sites. Minimizing the amount of material to be moved in this flow greatly contributes to rapid transferral. To this end, reducing volumes and recycling waste pollutants is essential. The parties concerned should take the necessary steps to ensure that measures are taken promptly.”

As is pointed out here, decontamination cannot proceed unless a temporary storage site is set up. Of course, everyone wants to decontaminate and remove contaminants, but allowing a temporary storage site means contaminants will be gathered and stuck close at hand, even if only temporarily. A dilemma exists between promoting decontamination and setting up temporary storage sites. Therefore, the need for dialogue with and the participation of local residents is emphasized more when setting up temporary storage areas than for decontamination. However, if you try to proceed with building such a consensus, this means placing importance on the residents’ feeling that the 1 mSv/year standard is gospel and should be achieved regardless of cost. As decontamination progresses, further temporary storage areas will need to be installed, and when intermediate storage facilities come into view, parties are forced to be even more sensitive to such feelings.

In that respect, it is commendable that the first half of this third recommendation was realized to some extent. On the other hand, it is the latter section that has stalled, “reducing volumes and recycling waste pollutants”. In 2020, although it is possible to a certain extent both technically and in terms of equipment to reduce the amount of waste transported to intermediate storage facilities, in short **operations to reduce the amount of highly radioactive contaminated soil through incineration, technology known as sorting that classifies based on soil and sand particle sizes, and heat treatment technology**, prospects for recycling decontaminated soil of 8,000 Bq/kg or less stipulated by the **Act on Special Measures Against Radioactive Material Pollution** are non-existent. Recycling before transportation to an intermediate storage facility has started to be practiced in farmland in the Nagadoro area of Iitate village, but plans have foundered in the cities of Minamisoma and Nihonmatsu, where a relationship of trust with residents broke down in the midst of a consensus-building exchange. The difficulty of building a consensus with residents will continue to have a major

impact on the future of decontamination projects.

Goshi Hosono, who was in charge of responding to the disaster during the accident at the Fukushima Nuclear Power Plant, was appointed Minister of Environment in the Yoshihiko Noda Cabinet in September 2011. At the time, the problem was how much decontamination should be done. If the decontamination standard was strictly set to “1 mSv/year”, nobody would be able to return in the atmosphere of the debate at the time when it was assumed that decontamination would be completed for the return of evacuees. Former Special Advisor Hosono recalls those days.

“On the Fukushima Prefecture side, there was a strong demand for things to be returned to how they were, and it turned out that unless we said that goal exactly down to the millimetre, the decontamination project itself wouldn’t start.

I then decided to decide it like this while doing a lot of behind-the-scenes talking for about two months, I think.”

It was decided that “1 mSv/year” was a standard for safety but not a standard for evacuee return, but in view of TEPCO's responsibility, that should be the target when decontaminating.

“But in reality, it was kind of taken as a safety standard, and dragged along for a long time,” says Hosono.

The decontamination gospel of “1mSv/year” has become a new form of “safety myth” that still remains. Both politicians and administrative officials hesitate to challenge it head-on, and residents set it aside, avoiding revisiting the issue. Discussions never reach the stage of pursuing a “global optimal solution” with a balance between benefits, costs and risks.

Nevertheless, decontamination and intermediate storage have achieved certain results and have a good future outlook. Currently, the main issue is shifting to “reducing and recycling waste pollutants”.

Radioactive material released from the Fukushima Daiichi Nuclear Power Plant has extensively contaminated land and soil in Fukushima Prefecture. The amount of decontaminated soil is equivalent to 11 million Tokyo Domes = 14 million cubic meters. Where is it to be amassed? In October 2011, the government formulated and published its basic concept (road map) for intermediate storage facilities, explaining it to mayors in the Prefecture. This showed that final disposal would be completed outside Fukushima Prefecture within 30 years from the commencement of intermediate storage. Until then, it would be stored in intermediate storage facilities to be constructed in Futaba and Okuma, the most polluted areas from the Fukushima Daiichi Nuclear Power Plant.

This final disposal policy continues to be the most burdensome political and psychological theme for Fukushima citizens even after the passage of ten years.

The deep involvement of local people is essential for this discussion. However, whether the locals have a venue for such discussion, what is their will, and whether they are interested in the first place, the reality today is that these considerations remain vague.

Behind this is a situation where “local residents” are not monolithic, or where they have no other choice but to do so.

The local residents mentioned here are the residents of Futaba and Okuma towns, as well as future residents, residents who have decided to build roads, embankments, and farmland reusing

decontaminated soil, residents in the area who accept final disposal, and those involved in the process of determining all this. Almost no detailed explanations or discussions have started yet for each of these local resident groups. In the first place, although it has been decided to remove waste from the intermediate storage facilities to outside the prefecture within thirty years, it does not look like there will be any decision soon on who will actually accept it. The promise of ten years ago may not be fulfilled after all. That is what is generally thought to be the current situation.

However, according to the Ministry of the Environment, about 80% of this decontaminated soil is below the reference value of 8,000 Bq/kg specified by the Act on Special Measures Against Radioactive Pollution. 8,000 Bq/kg is a value that keeps the annual additional exposure dose within “1 mSv” even if a person works a year along side it. Moreover, a group of experts<sup>19</sup> has pointed out that waiting for natural decay over time to reduce volume further will lower the volume of highly radioactive decontaminated soil, ultimately making about 99.2% of the total decontaminated soil 8,000 Bq/kg or less.

Reusing decontaminated soil of 8,000 Bq/kg or less will lead to a significant reduction in the amount transported to the final disposal sites to be set up outside Fukushima Prefecture. Therefore, promoting volume reduction and recycling would increase the feasibility of final disposal outside the prefecture within thirty years, and even if it was delayed, it would reduce the amount of highly radioactive decontaminated soil that carries the risk of radiation exposure stored in intermediate storage facilities and lessen the physical and mental burden on residents living in the towns of Futaba and Okuma.

There are places in Futaba and Okuma where there has been a lot of traffic with the start of evacuation orders being lifted even on land adjacent to intermediate storage facilities. In the future, it will be necessary to proceed with discussions on how to use the land in the intermediate storage facilities. In this way, the process of moving intermediate storage facilities to final disposal sites is no simplistic thing as imagined by many people, witness statements like “if only someone would decide to accept a final disposal site, it could be shifted out of the intermediate storage facilities. But that’s totally impossible, so it’s a dead end, and that place is bound to end up as a final disposal site.”

The transfer of decontaminated soil to intermediate storage facilities that started in 2015 is planned to end by 2021.

Looking back over the past 10 years, although the decontamination/interim storage project did not go as planned in the middle stages, it can be said that the Ministry of the Environment has made good progress by flexibly changing its stance on building relations with residents/municipalities, as recommended by the Academic Accident Investigation, and cooperation with the Ministry of Land, Infrastructure, Transport and Tourism in the practice of securing land.

However, the greatest issue for these decontamination/intermediate storage facilities is final disposal outside the prefecture within thirty years. No doubt, it will continue to be so in the future. How can taking decontaminated soil, etc. out of the prefecture and finally disposing of it within thirty years from starting to place it in intermediate storage facilities, a policy set out under the Democratic Party Administration, be achieved? There is no specific solution or prospect at this time for this quintessential NIMBY issue. While the countdown to the final deadline = 2045 has already begun, there will be limits to how long this issue can be shelved. The discussion needs to shift from decontamination/intermediate storage facilities to the realization of final disposal, and to be promoted throughout Japan.

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<sup>19</sup> Ministry of the Environment, 2018a, p. 7.



#### 4. Over-diagnosis

On February 19, 2020, in an Upper House study group on resources and energy, Member Otokita (Japan Restoration Party) called the government to task on the thyroid cancer screening that was underway in Fukushima Prefecture.

The content was roughly as follows.

- 1) Have multiple occurrences of thyroid cancer from the nuclear accident been noted in Fukushima Prefecture, or if not, is thyroid cancer that would normally have gone undetected throughout a lifetime being discovered and an over-diagnosis of treatment targets happening?
- 2) Although with the quasi-compulsory tests conducted at schools, it is extremely rare for thyroid cancer detected in a minute stage to lead to death, what should we think about the risk of detecting at any cost?

Member Otokita persisted as follows.

“If, for example, you’re a teenager and you have cancer, you are more likely to be treated with discrimination at every stage of your life, such as going on to higher education, getting a job, getting married, or having a baby. As one example, there’s a chance that you may not be able to get major life insurance, you may not be able to get a loan, or you may not be able to buy a house. In addition, there are cases where patients continue to be ill due to surgery and have to take medication.”

Katsushi Tahara, Director-General of the Environmental Health & Safety Division at the Ministry of the Environment, stood to reply.

“The over-diagnosis that you have just pointed out, in other words, the high likelihood of a cancer being diagnosed that the patient already had, but that did not cause life-threatening symptoms has been pointed out in scientific knowledge to date.”

“In response to this kind of over-diagnosis, we follow the guidelines of the Japan Association of Breast and Thyroid Sonology and take measures to prevent the diagnosis of lesions which do not require treatment as much as possible. Additionally, in Fukushima, from April this year, we are sending a guide on thyroid examination that explains the advantages and disadvantages of examination more carefully to the examinees, and we are aware that measures will be taken so that applicants can receive a medical examination.”

These tests were initially started to seek the benefit of eliminating the anxiety of prefectural residents, but as it has progressed, the risk of over-diagnosis and the most likely unnecessary costs that examinees will incur have been exposed. However, for the time being, this discussion is based on an inner circle of “the administration plus alpha (experts etc.)”, including Fukushima Prefecture, which is in charge of administering the tests, Fukushima Medical University, and experts from the Prefectural Health Survey Exploratory Committee/Subcommittee, the issue not being widely known amongst the public, and discussions based on a dialogue with residents have not been developed. Victims of exposure are purportedly informed of the risks and costs of the test in writing, but it remains unclear how this is to be conveyed to the public or how politicians are to be involved in the matter.

What was the situation immediately after the disaster? Lower House Member Hosono, who was

involved as Special Advisor to the Prime Minister in launching the prefectural health survey including thyroid tests, explains the circumstances at the time as follows.

“The government tried at the time to conduct a health survey for the residents of Fukushima Prefecture, but because Fukushima Prefecture wanted to do it on its own, it was decided to do a prefectural health survey. One of the main items was the thyroid test. It started tracking children from zero age up to the age of 18.”

“I thought it'd be better not to test everyone but only those who wanted it, so I told them they should introduce a system that didn't have to be taken by people who didn't want to... Responses right after an accident tend to be excessive, but after that, the thyroid test is a typical example of how do you phase it out? At the time, the question was whether to take iodine or not, to drink or not to drink, so the thyroid test was the most requested. So all we could do was to run them to prove it was safe.”

Despite changes in the situation from the start of 3.11, the countermeasures there remain in place, and the issues and adverse effects we have learnt more about during that period have been shelved. The benefits, costs, and risks for not only “the administration plus alpha” but residents and politics as well need to be scrutinized, and discussions started in order to pursue overall optimal solutions.

## **5. The ambiguous concept of reputation: Countermeasures against reputational damage**

When considering rebuilding Fukushima after the nuclear disaster, the cruellest discrimination and severest trial for residents would have to be so-called reputational damage. As mentioned earlier, **even if safety can be scientifically proved, the tendency for a question mark to hover over Fukushima Prefecture and to avoid Fukushima products and Fukushima as a tourist destination persists.**

The government has made various efforts to dispel reputational damage. In Fukushima Prefecture, prefectural government departments in charge of primary industry, tourism, the Paralympics, education, etc. are all trying to dispel reputational damage in their respective areas. Additionally, central government ministries like the Reconstruction Agency, the Ministry of Economy, Trade and Industry, and the Ministry of Agriculture produce and distribute pamphlets and videos, and hold events outside Fukushima Prefecture to invite Fukushima farmers and others to introduce Fukushima produce and products. In 2017, the government announced its Reputational Damage and Risk Communication Strengthening Strategy, and started disseminating information across ministries. In addition, there are many efforts to dispel reputational damage at the private level. For example, grassroots efforts include a major company in Tokyo creating an opportunity for employees to buy and support Fukushima products directly, and university students in urban areas working voluntarily to have rice and vegetables from Fukushima at university cafeterias and school festivals.

In this way, countermeasures for reputational damages have spread to a certain degree through the offices of various bodies, but conversely speaking, it has remained from start to finish a passive structure in which no one is responsible for the problem and no one takes responsibility for the results.

Looking back on these ten years, what is missing from the countermeasures for reputational damage is an objective analysis of how successful they have been and how sustainable they are.

At the root of the problem lies the ambiguous nature of the concept of “reputation”.

Roughly speaking, what manner of things comprise “reputational damage countermeasures”? What

do people think of when they hear the word?

PR for agricultural products and tourist spots in Fukushima carried out by the pop group, TOKIO, has been going on in various forms, including TV commercials. Produce exhibitions dealing with Fukushima products have also been held in various places.

However, how effective are they as measures against reputational damage? For example, even areas unaffected by the disaster promote agricultural products and tourist spots, run TV commercials and hold produce exhibitions in remote locations. If it is not possible to clearly distinguish Fukushima's promotional activities from those of other places, it cannot be deemed a countermeasure for reputational damage even though it is sales promotion. Measures, therefore, need to be separately evaluated to see how effective they are in eliminating reputational damage.

This does not mean that the various measures implemented as countermeasures for reputational damage have been meaningless. There is no doubt that it is important to do what you can in order to first recover consumption that has dropped due to reputational damage.

However, when advancing conventional countermeasures for reputational damage, it is tempting to come up with countermeasures by advocating some vague concept of reputation. There may be a shared problem here associated with the equivocality of the concept of risk communication.

A person from the Ministry of the Environment, who has been involved in the reconstruction of Fukushima for ten years, points out that the concept of so-called "risk communication" has changed after a lapse of time from that immediately after the disaster.<sup>20</sup>

Initially, the concept was for policymakers and TEPCO to "close" the distance with residents through transparency and information disclosure. That was the ideal that risk communication experts spoke of. However, from some time or another, the aim became to "persuade". This is because the risk communication ideal theoretically envisioned before 3.11, and the experts who promulgated it, were shown to be ineffective and powerless before the overwhelming reality of 3.11. With risk communication required within the budget range of the administration, advertising agencies commissioned to do the work had to produce "results". They leant towards a narrative-oriented risk communication that aimed to "persuade". However, even if this has a certain effect in knowledge transfer, it does not spread beyond a certain level. After all, the purpose itself is to hold an event and create a pamphlet, WEB, video, etc. on the assumption that the budget will be exhausted. The structure is one in which the key question of how well the original purpose of risk communication was achieved is not asked.

There is survey data that suggests that the effectiveness of the reputational damage prevention measures has so far been limited.

With the Tokyo Paralympics 2020 advocated as the Reconstruction Olympics in mind, the Mitsubishi Research Institute conducted two polls in 2017 and 2019 on the awareness, interest and understanding of Tokyo residents regarding the reconstruction situation in Fukushima Prefecture and the health effects of radiation.<sup>21</sup>

The two surveys revealed that:

- About half of the people in Tokyo think that people in Fukushima will later have health problems

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<sup>20</sup> Interview with Ministry of Environment official, February 16, 2020.

<sup>21</sup> Mitsubishi Research Institute, 2019.

such as cancer, contrary to scientific knowledge, and about 40% said that “I am concerned that children and grandchildren born will have health effects.”

- About 30% of people answered that they would hesitate because of radiation to ask their families, children, friends, and acquaintances to eat foods from Fukushima Prefecture or to travel to Fukushima.

Although these reactions have improved slightly over the past ten years, they do not seem to have improved significantly. Discrimination and prejudice against Fukushima is still widespread.

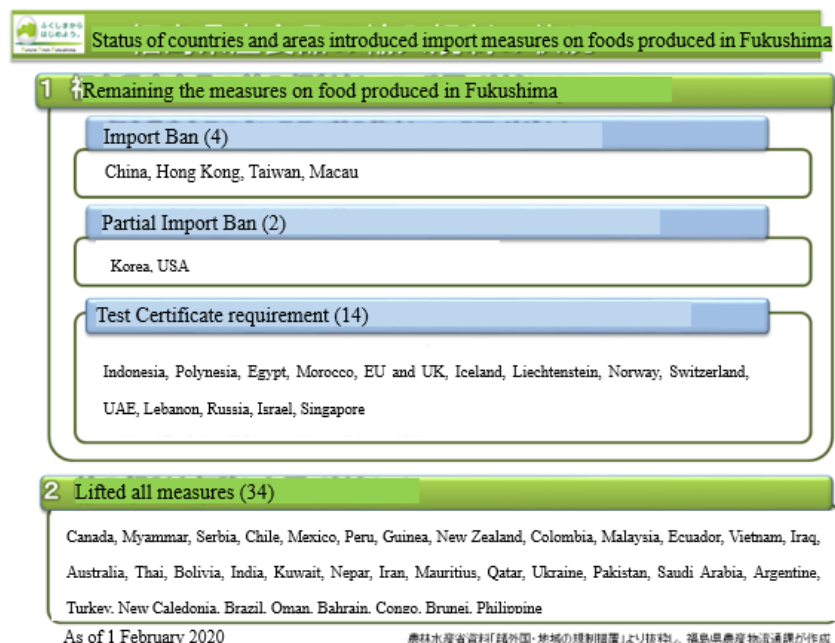
In response to this situation, the administrative authorities have consistently taken the position of “continuing to convey accurate information”. Although it seems to be a decent attitude to respond calmly and patiently, in reality, it can be said to be risk avoidance that fears coming face-to-face with reputational damage and confronting radical people who discriminate and are prejudiced. It is nothing less than a “head-in-the-sand” policy that wants to avoid arousing criticism of politics and the bureaucracy from people with radical views.

Preventing reputational damage does not just amount to a sales promotion event, nor can it be entrusted to risk communication experts. It is a major strategic theme related to the essence of Fukushima's rebuilding, which is a multidisciplinary issue spanning decommissioning, decontamination, health surveys, return of evacuees, economic revitalization, town development, and the rehabilitation of nuclear disaster areas. It is a theme related to the Fukushima identity and the establishment of the brand itself, a “will for universal reversal”.

Nevertheless, measures on reputational damage to date are only a patchwork of individual and decentralized measures by each manager. There has been no thorough verification of the results, and no strategy for a fundamental solution to the problem. As a result, reputational damage continues today not only in Japan but also overseas. There are many countries that continue to regulate the import of Fukushima products even after ten years.<sup>22</sup> For example, in Taiwan, a referendum held in November 2018 proposing opposing the lifting of the import ban on Fukushima and other foods produced by five prefectures of Japan passed. Also, with South Korea, Japan has sued as unjustified the ongoing South Korea prohibition of the import of marine products from eight prefectures including Fukushima at the World Trade Organization (WTO), a final decision that the action was justified being handed down in April, 2019. The price is being paid for shelving the idea of taking the initiative to formulate a consistent strategy that pays attention to domestic and international public opinion and situations. An entity and command tower that comprehensively responds to reputational damage needs to be established.

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<sup>22</sup> Fukushima Prefectural Government, 2020a.



## 6. Hamadori and the Innovation Coast

The experience of disaster and rebuilding is to be a world experience. Fukushima Prefecture is attempting projects carried out with such a concept and aspiration. One of them is the Fukushima/International Research and Industrial City (Innovation Coast) Framework.

As the name suggests, this concept takes an international perspective in turning the Pacific coastline of Fukushima Prefecture into a seedbed for innovation in fields such as robots, energy, decommissioning, agriculture, and the space industry. It aims to be an area of intensive research and industry.

The concept was originally compiled in June 2014 by the then Vice-Minister of Economy, Trade and Industry, but in May 2017 with the enactment of the Revised Act on Special Measures for Fukushima Reconstruction and Regeneration, it was upgraded to a national project.

Research facilities related to decommissioning by JAEA (the Japan Atomic Energy Agency) have already been established in the towns of Naraha, Tomioka and Okuma. In July 2017, the Fukushima Innovation Coast Framework Promotion Organization opened the Fukushima Robot Test Field in Minamisoma City as a core legal body promoting the framework. In Futaba Town, the Great East Japan Earthquake/Nuclear Disaster Museum has been established as a base for disseminating information.

However, looking back from the start of the framework to the present, no results have been achieved. The Innovation Coast concept is still relatively unknown, and the only visible results are the creation of buildings.

For example, according to the Fiscal 2019 Report on Prefectural Government Opinion Poll Results<sup>23</sup> regarding the status of recognition for the Fukushima Innovation Coast Framework, 83.3% said they did not know of it: “I don’t know the name or anything about it” (46.3%), “I’ve heard the name, but I don’t know very well what it is about” (37.1%). On the other hand, only 15.7% said “I have heard

<sup>23</sup> Fukushima Prefectural Government, 2019.

the name and know something about it” (13.1%) and “I have heard the name and know a lot about it” (2.6%).

What is the issue here? Former Special Advisor Hosono commented, “There is still a huge gap between the Innovation Coast concept and how much local residents are involved in it.”<sup>24</sup> He was pointing out that the framework mainly focuses on companies coming in from outside, and that it would not function unless the gap in terms of local human resources, technology, management, and capital was filled.

Of course, there are some efforts with a strong presence. For example, the Fukushima Soso Reconstruction Team (commonly known as the “Joint Public-Private Team”)<sup>25</sup> is a public-private support platform for disaster-affected businesses in the Soso district of Fukushima. This organization was established in August 2015, and supports rebuilding Fukushima in terms of industry by bringing together “public” human resources from the Ministry of Economy, Trade and Industry, Fukushima Prefecture, and the Ministry of Agriculture and Fisheries, and “private” human resources from TEPCO, local banks, and consulting companies. Specifically, they have conducted door-to-door visits to businesses in the prefecture providing expert consulting if there is a need. They have been supporting business restarts, increasing sales, and human resources.

By March 2020, they had conducted individual visits to 5,400 businesses based in 12 disaster-affected cities, towns and villages. Since April 2017, they started visits to individual farmers, visiting some 1,800 farmers in an effort to support restarting farming and improving profitability and competitiveness.

Many people may not really understand what 5,400 door-to-door visits mean. If it was achieved in Tokyo, it would probably not be a big deal because the number of businesses is huge. However, more than 9,000 disaster-affected businesses are scattered around Fukushima Prefecture. They include some organizations where managers, including elderly owners are missing. Before a visit can take place, preparatory work to grasp the current situation has to be conducted via mail or telephone. At first, there were many businesses that regarded them with distrust. However, a steady approach has been successful and produced results. General Secretary of the Fukushima Headquarters for Fukushima Reconstruction and Revitalization Directorate, Masakatsu Okamoto said, “Now, when you ask the local municipalities, the most trusted among organizations working on recovery is the Joint Public-Private Team. They’ve seen all the ledgers of small and medium-sized enterprises and helped people who don’t know how to do bookkeeping. Some of them have even intervened in fights between parent and child...”<sup>26</sup> and laughed.

There is even some infrastructure for restarting, maintaining or expanding business activities that appears to be more robust than prior to 3.11

For example, after the disaster, the Joban Expressway, which connects Tokyo to Sendai and runs through the Futaba district, was fully opened. Roads connecting the Joban Expressway and the regional main roads were also constructed partly in order to transport decontaminated soil to intermediate storage facilities. The JR Joban Line was also reopened in March 2020, directly connecting them to Tokyo and Sendai. A number of industrial parks in the area that can serve as production bases for companies have also been readied.

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<sup>24</sup> Interview with Goshi Hosono, December 19, 2019.

<sup>25</sup> Fukushima Reconstruction Promotion Group homepage: <https://www.fsrt.jp/>

<sup>26</sup> Interview with Masakatsu Okamoto, January 17, 2020.

In the process of lifting evacuation orders in 12 municipalities over the past 10 years, there was initial pessimism that “no one will return and no businesses will be viable in a place with such high radiation”. However, when the dose fell more than expected and the number of people coming and going increased due to the resumption of housing and business, customers gathered at convenience stores and hotels. In order to then attract employees, there was for a time an exceptional jump in wages to an hourly rate of 1,500 yen, when the minimum wage in Fukushima was in the 700-yen range. Although this temporary “reconstruction bubble” has settled down to some extent now, economic activity seems to be strong due to the flow of funds for compensation, decontamination, and decommissioning.

However, compared to residents, it is much more difficult for a business operator who has evacuated at the time of the disaster and rebuilt production and sales bases elsewhere to return. Many businesses have also gone out of business due to aging and a lack of successors.

Former Special Advisor Hosono put it in this way.

“Fukushima’s reconstruction, I think they’ve done a great job coming this far in nine years, more than I expected. Okuma Town is a symbol. It was 2012 when Okuma’s Mayor Toshitsuna Watanabe told me he wanted to make Okuma a base for reconstruction, and to tell you the truth, that gave me a bit of a headache. But the mayor was adamant. I think it’s ground breaking that the Okawara district in Okuma has now become just such a base.”

Fukushima's industrial recovery has yet to show any outstanding results. Nonetheless, the state, prefecture, and Hamadori municipality hope that the Innovation Coast framework and actions by the Joint Public-Private Team will serve as the basis for various future reconstruction efforts. It is strongly desired that the special reconstruction and regeneration zones mentioned above will also become a base for rebuilding industry and daily life in cooperation with these movements.

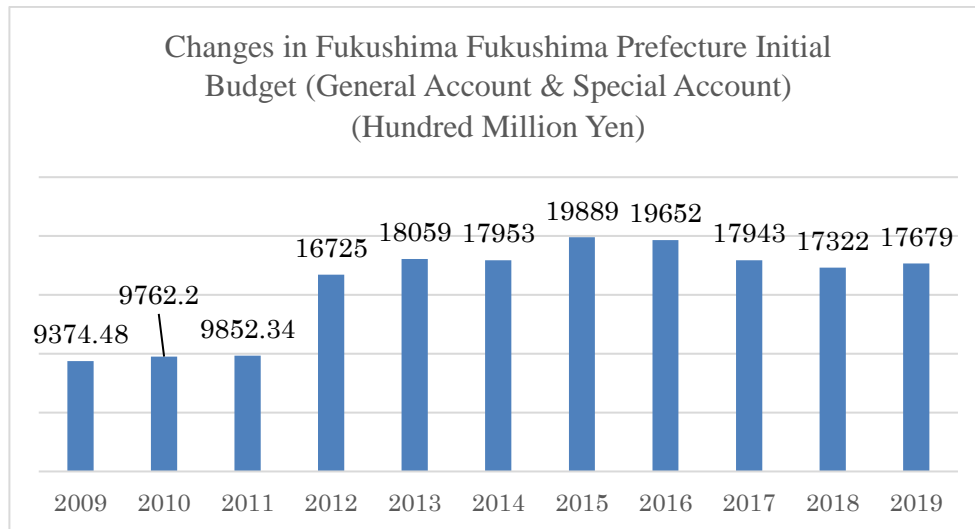
However, beyond that, there may be some areas where the problems of regional reconstruction and those of decommissioning and decontamination/interim storage, which have run on different rails up to this point, overlap. A concrete image remains unclear, however, in the present tenth year.

Even so, in areas where social issues are concentrated and multiply layered, an attractive and sustainable life base for both original residents and newly incoming residents must be built by re-understanding the issues and their potential, by turning decommissioning, that will take decades, into a local industry, and by establishing new industry in the region as promoted by the Innovation Coast framework. This is to be enhanced to a level where it can act as a regional model for a future Japan. Once seemingly dead, it must rise from such a crisis, reverse its fortunes, universalize the knowledge and lessons experienced there, and open up the future. This is the vision of reconstruction for Fukushima that should not be allowed to go out.

## **7. Zombies and the End State**

As reconstruction-related projects proceed, the government's reconstruction budget has blown out. For example, in terms of the budget scale for Fukushima Prefecture, it has expanded during these ten years to approximately 1.7 to 2 times that of 2010, the year that predates 3.11.





As many of the reconstruction-related projects reach completion in the tenth year, it is evident that the peak occurred around 2015-16 and that it continues to shrink thereafter. Completing the intensive reconstruction period and the reconstruction and revitalization period, it is assumed that a post-reconstruction bubble period will be experienced in various aspects and that a fraying of the economic structure supported by reconstruction projects and their ripple effects will become apparent. There is a strong possibility that business sentiment, already deteriorating little by little due to the new coronavirus crisis, will suddenly worsen.

Adverse effects will not only affect the industrial side but also the living side. For example, the total fertility rate in Fukushima Prefecture fell immediately after 3.11, but then recovered in a V shape, reaching the highest level in eastern Japan at one point. The economic boom may have contributed to support this phenomenon. What will happen to it in the future will be another important theme in reconstruction.

#### Full-scale reconstruction of evacuation areas

While Fukushima as a whole has entered the post-reconstruction bubble period, the reconstruction of areas under evacuation orders has been forgotten. These areas have been described in the stereotyped image of “ghost towns with no human figures and where time has stopped”. This is not the case, however. From the beginning, there have at times been tens of thousands of people involved in decommissioning and decontamination projects coming and going.

On-site at the Fukushima Daiichi Nuclear Power Plant, there were more than 7,000 people working every day at its peak, and more than 3,000 people today. Even off-site, when the initially planned decontamination work was completed, work on intermediate storage facilities and the demolition of houses started, and people continued to come and go. As evacuation orders were lifted, the number of residents returning, albeit slow, gradually increased. Behind this was the fortuitous miscalculation of the dose falling much faster than initially expected.

However, there are disparities in regional development, within the region depending on the timing of when evacuation orders were rescinded. It is in the number of inhabitants who actually live in the municipality that the difference becomes apparent. Namie Town, where the evacuation order was finally lifted in spring 2017, six years after the nuclear accident, has a population of 17,114 (as of the end of February 2020), but the number of residents actually living in the town is 1,332 (as of the end of March of the same year). Similarly, in Tomioka Town, where the evacuation order started to be

lifted in the spring of 2017, only 1,205 residents out of a population of 12,673 live there (all as of February 2020). In other words, only about 10% of the total population actually lives in the town. On the other hand, Naraha Town, where the evacuation order was lifted in September 2015, has 3,937 inhabitants out of a population of 6,784, that is, 60% of the population. Elsewhere, in Hirono Town, where the evacuation order was lifted at the end of March 2012, from a population of 4,755 people 7,268 currently live in the town, the actual number of residents being larger than its population. In the case of Hirono, the fact that residence could be taken up from an early stage and it became a living base for decontamination and decommissioning workers, and that a new school, Futaba Mirai Gakuen, was established there to provide integrated education from elementary and junior high school with a school dormitory saw many new residents starting to live there. Even now, because residents who newly come to the area for decommissioning work and other reconstruction-related work and live in hotels and employee dormitories are not registered as official residents, the number of people actually living there is higher than the number of registered residents. In this way, there is a substantial difference between areas where efforts to rehabilitate were started as a base for early reconstruction and decommissioning and where they were not.

If there was a competition, the advantages and disadvantages would be blatant. Discrepancies would also emerge. This fact itself is the result of economic activity in a market economy, and must be accepted as a by-product. The issue is the sustainability of these economies. To put it somewhat cruelly, doubts exist as to whether the various “Fukushima's revival” phenomena we have seen so far are ventilators, artificial hearts, nutritional supplements, but not blood transfusions, and just how sustainable are they?

In the long run, the budget devoted to the reconstruction of Fukushima will shrink. Areas that have experienced evacuation orders are no exception, and demand and employment will gradually decline. After reconstruction projects are over, the facilities built during them will not create added value and may turn into “useless boxes” with high maintenance costs. At such a time, the state of reconstruction up to that juncture will once again be questioned. The cost performance of past reconstruction, which has been accepted because they're disaster victims, they're disaster victims, will come into question.

If venturing a comment, reconstruction projects in Fukushima seem to be resting on the laurels of an “unfounded sense of safety”. This also connects to a structure in which areas where nuclear power plants were located coexisted with the “safety myth”, which was examined in the Independent Accident Investigation. In the past, in the midst of forging an economic and social coexistence with nuclear power, nuclear power plant sites in Fukushima were incorporated into a governance that avoided facing the risks and economic sustainability of nuclear power. They supported the “safety myth” about nuclear power. The “unfounded sense of safety” that seems to be occurring in “Fukushima's revival” may now become a “new safety myth” that replaces the former safety myth.

For example, the financial sustainability of compensation, decommissioning, and decontamination/interim storage-related businesses that will continue in the future depends on TEPCO's management performance. How much do residents, local governments, people outside Fukushima and the government realize that TEPCO is in a situation of severe competition with the deregulation of electricity while fulfilling its responsibility for the accident?

A former Minister of Economy, Trade and Industry executive, who took the lead in reforming TEPCO reform, says:

“The balance between responsibility and competition was set out in the 2014 New Comprehensive Special Business Plan, but how long can this last, the motivation of the people onsite, which I

mentioned earlier, they've been inspired in bringing them along so far... I'm personally worried that just dragging this all the way will turn both responsibility and competition into a zombie.”<sup>27</sup>

Shimada is afraid that TEPCO will not be able to maintain both responsibility for Fukushima as a disaster-inflicting company and competition in the market as a private company without continuing to motivate its onsite workers.

Another person, Masakatsu Okamoto, who has been in charge of the post-earthquake, post-tsunami, and post-disaster reconstruction of the Tohoku region during this time, testifies as follows.

“I think it can be said that the tsunami has ended to some extent, but when will Fukushima end... I think it will probably not be finished until the debris is taken out and the decommissioning is over.”<sup>28</sup>

Decommissioning, intermediate storage facilities, and other reconstruction in Fukushima is endless. That is why discussions with an end in sight have been shelved to date. In the meantime, many appear to be trapped in a “new safety myth”. No real recovery will come from that.

What is needed now for decommissioning, decontamination/intermediate storage, and regeneration of industries and livelihoods in the 12 municipalities is nothing but an extensive discussion of the end state.

The end state is a concept originally used in engineering discussions on decommissioning, and refers to the final circumstances.

What should the end state for the Fukushima Daiichi Nuclear Power Plant be? For example, how can we accept that it takes a long time and a huge amount of money to dispose of the waste generated even if we completely remove waste and pollution and return it to a greenfield site? Is it alright, for example, to accept that this time and cost should be spent on other things, and that rather than bringing it back to a greenfield state, couldn't we stop at dismantling the buildings and so on and reducing the risk to a state that does not affect the lives of the residents in the surrounding area, a state where it can be safely managed? Or, will we create a power generation facility for thermal power and renewable energy in the vacant place on the site to make use of the existing power transmission facilities and make it into a new industry in the region? The Fukushima Daini Nuclear Power Plants situated in Tomioka and Naraha towns will also enter a 40-year long decommissioning process. Is it possible to add value by treating them both in an integrated manner?

The debate about various possible end states for decommissioning the Fukushima Daiichi reactors has still not begun even after ten years. Are they running a 100-meter sprint or a marathon? It is equivalent to running without knowing the answer. You will run out of breath on the way.

There is almost no open discussion about the end-state theory for intermediate storage facilities. The work of loading, sorting and storing decontaminated soil at the intermediate storage facilities will be completed in about 5 years. After that, the actual area used to store soil will be less than half the total area of the intermediate storage facilities. However, what needs to be considered is the fact that the area covered by intermediate storage facilities is about 1600 ha, which is almost the same size as Haneda Airport (1522 ha). And 70% of the landowners who provided the land for the intermediate storage facilities have responded to the purchase of land by the state (not by setting land lease rights). In other words, in the future, a vast stretch of government-owned land will lay idle there, and by

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<sup>27</sup> Interview with former Ministry of Economy, Trade and Industry executive, February 27, 2020.

<sup>28</sup> Interview with Masakatsu Okamoto, January 17, 2020.

rights, discussions on what to do with this should be considered in tandem with the issue of securing a final disposal site outside the prefecture and transporting waste there. Such discussions have hardly begun, however.

What should be the end state for issues such as radiation monitoring, thyroid cancer inspection, and recompense/restitution? What will the 12 municipalities look like in the end, and what kind of treatment of the difficult-to-return zones would please old and new residents alike?

The difficulty of defining an end state for Fukushima's revival lies in the twin difficulties of “what to define as the end” and “who can argue this”.

Initially, it was clear what to overcome and where to aim for “reconstruction”, but even as time progresses and certain conditions improve it has paradoxically become more ambiguous.

The various remaining reconstruction challenges that have been left untouched in the last ten years are not simply a question of getting the budget, or perfecting the technology, or involving residents in discussions. All of them can only be resolved by taking the time to make efforts based on these complex issues. Shelving will only continue without clarifying who is to aim for what as “certain situations improve”, and what resources are to be used to solve difficult problems and rebuild.

Thorny problems that remain unsolved even after ten years include ensuring safety and security through detailed radiation monitoring, confronting reputational damage, starting up decontamination and intermediate storage facilities, lifting evacuation orders and rebuilding local life and industry.

Reconstruction after a nuclear disaster: this contains many questions where the answers cannot easily be found even if you think of it as an applied problem of “learning” from the reconstruction carried out after the many wars and disasters that humankind has experienced to date.

## **Summary**

In the history of Japan's recoveries, has there ever been one where the end point beyond the restart is so hard to determine?

The shape of Tokyo laid out in the Teito Reconstruction Plan after the Great Kanto Earthquake in 1923, the main functions of the state, the industry and education formed by World War II and the subsequent rebuilding, the nature of democracy, or the changes that have been wrought since the Great Hanshin-Awaji Earthquake in presence of civil society, police, fire departments, and the Self-Defense Forces. These things created during this reconstruction assuredly exist at our feet. Will something similar to this be created after the disaster recovery?

If there is to be, it must be found beyond the tackling of globally shared issues such as declining birth rates and aging populations, the decline of established industries, the relationship between huge science and technology, political interests and the formation of democratic consensus, that is, universal issues through reconstruction.

Ten years since the nuclear accident. The disaster recovery is at a turning point. Memories of 3.11 are fading, but domestic and overseas reputational damage has become even more persistent, frustrating Fukushima residents. Neither politics nor the administration have been able to take any effective measures during this period. And, after the post-revival bubble, a great depression from the new

coronavirus is on the attack. In a structure of entrusting decision-making to the “administration plus alpha”, the disaster is becoming more fixed and isolated, political and administrative voices relying on scientific and accurate information are weak, and a “new safety myth” is unconsciously being constructed. And the shelving of issues continues. As it stands, Fukushima's problems will be preserved as issues peculiar to Fukushima.

Once again, we should return to that horizon keeping in mind the “will for universal reversal” that does not stop at restoration but aims at resurgence, and imagine an end state for recovery. And then, should we not look ahead to “the ideal shape of Japan in the mid-21st century”?

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