

Interview with Nobuo Fukuwa, Nagoya University Professor Emeritus and Chair of the Advisory Council for the Establishment of the Disaster Management Agency

Tackling Risks & Leading a Calamity-Prone Nation – Disaster Management Agency's Role

By Japan SPOTLIGHT

We spoke with Professor Emeritus Nobuo Fukuwa of Nagoya University, who served as Chair of the Advisory Panel for the Establishment of the Disaster Management Agency, about the agency's mission and role. A leading authority on earthquake engineering, Prof. Fukuwa began his career at Shimizu Corporation, where he conducted seismic research on nuclear power facilities, before entering academia at Nagoya University.

(Interviewed on July 7, 2026)

What Is Expected from the Disaster Management Agency

JS: Let me begin by asking what you expect from Japan's new Disaster Management Agency. The Diet approved the legislation, and the agency is scheduled to be established in November.

Fukuwa: Unfortunately, many people in Tokyo, having moved there from other parts of Japan, lack strong ties to their local community. As a result, few see disaster preparedness as a shared responsibility.

Another issue is that Japanese government agencies tend to focus on optimizing their own organizations, making it difficult to adopt a system that takes a comprehensive, bird's-eye view of the nation as a whole. Consequently, there is a tendency to turn a blind eye to inconvenient realities, and organizations often find it difficult to confront problems directly.

As a result, Japan remains insufficiently prepared for disasters that could threaten the very survival of the nation, such as a Nankai Trough megathrust earthquake or a major earthquake directly beneath the Tokyo metropolitan area.

What really brought this problem into focus was the revision of the Nankai Trough earthquake damage estimates in March 2025. When the estimates were updated, it became clear that the goals set a decade earlier – reducing fatalities by 80% and cutting housing damage by half – were nowhere near being achieved.

Many people assume that a major earthquake directly beneath central Tokyo is a rare event. However, if an earthquake strikes



Nobuo Fukuwa

directly beneath a populated area, there may be little or no time for an early warning. Tokyo has approximately 180,000 elevators. How many people would end up trapped in elevators if such an earthquake were to occur?

The Tokyo Fire Department only has about 20,000 personnel, and its first priority in the aftermath of a major earthquake would be firefighting. This raises the possibility of scenarios that are almost too disturbing to contemplate.

Moreover, damage assessments for super-high-rise buildings have not been adequately conducted. It seems to me that some high-rise buildings have been constructed with economic efficiency taking precedence, with costs being cut wherever possible. I am

particularly concerned about high-rise residential towers. How science and technology are used ultimately depends on society's values. Whether they are employed to enhance safety or primarily to reduce costs makes a tremendous difference to the level of safety that society can achieve.

Unless we take disaster preparedness seriously and implement robust safety measures, we risk suffering irreversible damage. We must first identify the problems that exist across the various government ministries and agencies and take corrective action. The Disaster Management Agency should have the authority to issue recommendations, and government ministries and agencies should be obligated to give due consideration to them. That is the first and most important step. We must create forums where ministries, government agencies, and local authorities can openly and honestly discuss the realities of disaster preparedness.

Once such discussions take place, it will become clear that the disaster-response capabilities currently available in our society are far from sufficient to cope with the scale of damage that a major catastrophe could cause. Therefore, we must make every possible effort to reduce potential damage. Yet over the past decade, the measures taken by both the public and private sectors have simply not been enough.

Take industrial water and energy, for example. Without a stable supply of industrial water, it is impossible to generate electricity, refine petroleum, or sustain manufacturing activities. Recent conflicts in the Middle East, including those involving Iran, have highlighted Japan's extremely low energy self-sufficiency rate. As an island nation, if its ports were to be severely damaged by a major disaster, energy imports could come to a halt.

The only way is for the Disaster Management Agency to use its authority to issue recommendations and drive efforts to reduce damage before disasters occur. According to current estimates, the worst-case Nankai Trough megathrust earthquake could completely destroy 2.35 million buildings. Yet Japan's construction industry can build only about 500,000 buildings per year.

If partially damaged buildings are included, the number of affected structures could amount to roughly ten times the annual construction capacity of Japan's building industry. In such a situation, it would be difficult for the nation to continue functioning. That is why we must make every possible effort to reduce potential damage in advance.

The most important task of the Disaster Management Agency is to fundamentally rethink Japan's disaster-management strategy. Once this is done, it will become clear that, under the current system, it would be impossible to cope adequately with a major disaster. Therefore, every available resource must be mobilized to implement thorough pre-disaster measures aimed at minimizing damage. This is the second mission of the Disaster Management Agency.

However, strengthening infrastructure and buildings through pre-disaster seismic retrofitting takes time, and those efforts may not be completed before a major earthquake strikes. So it is essential to secure the full commitment of both industry and the public and to establish a command center capable of mobilizing all available resources after a disaster occurs. At the same time, we must recognize that it is impossible to do everything. Regrettably, priorities will have to be set, and those priorities must be established with the understanding and agreement of the public.

To ensure that we leave this country in a sound condition for future generations, we must identify the measures that are indispensable, establish clear priorities, and work together to carry them out. We must take the threat of highly likely disasters, such as

a Nankai Trough earthquake, as an opportunity to pursue pre-disaster preparedness and strengthen our society.

As for disaster management studies, most disasters in the past were relatively limited in scale, so responses to them relied heavily on government support. Even the Great East Japan Earthquake affected only about 5 million people in the three hardest-hit prefectures of Tohoku – roughly 5% of Japan's population. This was comparable to the population of Hyogo Prefecture, which was affected by the Great Hanshin-Awaji Earthquake. The same applies in terms of GDP. The scale of the damage was very different from that of the Great Kanto Earthquake, which claimed more than 100,000 lives and caused economic losses equivalent to nearly four times the national budget.

Moreover, many past disasters struck rural areas. As a result, disaster research has not fully confronted the realities of a true catastrophe. At the same time, the focus on short-term results has reduced the number of researchers who take a comprehensive view of disaster management. With so much research confined to narrow specialties, the field of disaster management studies faces significant challenges.

Disaster management studies require a big-picture approach rather than focusing on individual areas. Unless knowledge from many different fields is brought together, it is difficult to produce results that truly benefit society. Society is the product of all academic disciplines combined, and a disaster is what happens when that society breaks down. That is why we need to connect natural sciences, engineering, and social sciences. Research alone is not enough; the findings from different fields must be brought together and understood by government officials. Only when officials across different ministries and agencies implement disaster-management policies with an understanding of the bigger picture can those research outcomes deliver real benefits.

In addition, we need to tell businesses that they must focus not on short-term profits but on business continuity. We must also encourage every citizen to take basic preparedness measures, such as storing emergency water supplies and securing furniture.

The Disaster Mitigation Research Center at Nagoya University

JS: Is the Disaster Mitigation Research Center at Nagoya University intended to promote the kind of interdisciplinary collaboration you have just described?

Fukuwa: In the past, academics often had broader areas of expertise.

However, with the abolition of the traditional course system at universities, that has largely disappeared. Under the old system, there was a professor, associate professors, research assistants, technical staff, and others, each with clearly defined roles. Professors were expected to maintain a broad, overarching perspective, while junior researchers concentrated on strengthening the foundations of their respective fields. Over time, they would develop and gain the ability to see the bigger picture. As a result, it was possible to “Think Globally, Act Locally”. Today, however, the system no longer functions that way. The loss of that capability was exactly why I decided to establish the Disaster Mitigation Research Center.

As concerns over a potential Nankai Trough earthquake grew, it became increasingly important to connect the findings of diverse academic disciplines and translate them into practical applications for industry and society. To achieve this, collaboration among all stakeholders, including government agencies, became essential. This was a challenge that a relatively small institution like Nagoya University could not tackle on its own. Therefore, with the support and participation of government and industry, the Center was established as a platform where all parties could work together to reduce disaster risks.

In addition, another organization, the Aichi-Nagoya Resilience Co-Creation Center, was established through joint funding from Aichi Prefecture and Nagoya City. This goes beyond collaboration to co-creation, making it a more proactive organization. The Aichi-Nagoya Resilience Co-Creation Center was jointly established by Aichi Prefecture, Nagoya City, and Nagoya University. Its objective extends beyond disaster management to the broader goal of enhancing societal resilience. I organized informal gatherings with long-time acquaintances from Chubu Electric Power, Toho Gas, and Toyota Motor Corporation, to have frank discussions about disaster preparedness.

After these gatherings had continued for some time, the Great East Japan Earthquake occurred. In response to concerns about the inadequacy of existing disaster-preparedness systems, we created an off-the-record forum where such issues could be discussed openly in daytime meetings. As a result, we were able to exchange honest views about vulnerabilities in society that are rarely discussed in public.

Having continued these activities for roughly 10 years, we gradually became able to communicate these ideas to government officials in charge of national resilience and disaster management. More recently, we have launched the Industrial Disaster Prevention Study Group to discuss disaster preparedness in industry, and the *Bōsai Furudanuki no Kai* (“Association of Veteran Disaster-

Management Experts”), where experienced practitioners can engage in more frank discussions.

The *Bōsai Furudanuki no Kai* brings together retired disaster-management professionals from government, industry, and the media and encourages them to speak frankly about the disaster-preparedness problems within their respective organizations. In fact, discussions of this kind have provided part of the foundation for the debates that are now leading to the establishment of a Disaster Management Agency.

About 100 companies participate in the Industrial Disaster Prevention Study Group. This would be quite difficult to organize in Tokyo. I believe it has been possible in Nagoya because it is a center of manufacturing and because the people there have a strong sense of local identity and pride.

JS: I think communication that spans organizations and sectors in this way is extremely important. To facilitate it, wouldn't it be desirable for it to become normal for people with industry experience, like yourself, to enter academia, and for academics to move into industry as well?

Fukuwa: Yes, I think that's very important. Personnel exchanges really matter. I worked at a major construction company's research institute, and I was involved in nuclear power as well. Because nuclear power is a comprehensive, multidisciplinary field, people from electric power companies, manufacturers, and government agencies all worked together. That kind of interaction is extremely important.

JS: That's one area where Japan hasn't made much progress yet.

Fukuwa: No, it hasn't. Another issue is the lack of a sense of crisis. Having enjoyed 80 years of peace, Japan has not become proficient at crisis management. I believe that is why the current Japan Growth Strategy Council has included investment in crisis management among its 17 growth-strategy initiatives – to improve this situation.

Disaster Risk Reduction Renaissance

JS: Could you tell us about the “Disaster Risk Reduction Renaissance”?

Fukuwa: My goal is to make Japan a better country and to realize a renaissance through disaster preparedness and risk reduction. They

can help create a safer, happier, and more prosperous society. By transforming Japan's current model of excessive centralization into one that is autonomous, decentralized, and cooperative, we can rethink how communities are built and how the nation is organized.

At the same time, if each region builds on its own traditions and develops new local industries, numerous opportunities for growth will emerge. By embracing regional diversity and encouraging people with different perspectives to create new ideas and initiatives, we can achieve regional revitalization. I see the Disaster Risk Reduction Renaissance as precisely this process: creating new industries, revitalizing local communities, and building a more resilient society through disaster risk reduction.

Disaster risk reduction is something that can be pursued because it is a matter that directly affects people's daily lives. Disaster preparedness and risk reduction are fundamentally local issues. They require an understanding of local conditions and a strong connection to the community. When we think about a vision for Japan's future, the essence of the National Land Development Strategy is to build a society that is autonomous, decentralized, and cooperative. Excessive concentration in Tokyo is not sustainable, so we need to make use of the strengths and resources of all parts of Japan.

To achieve effective disaster preparedness and risk reduction, education and public awareness are essential. Very few architects study thorough training in how buildings respond to earthquake motion. Architectural education is largely geared toward designing buildings that are attractive and well received, while safety-related education accounts for only about 20% of the training.

For instance, tall buildings constructed on soft ground are especially vulnerable to severe shaking. Yet designers often treat

building responses as if they were broadly similar. Consequently, buildings in major urban areas that are susceptible to strong ground motion can be at greater risk of damage. It is particularly worrying when value engineering is used to reduce costs by designing structures to meet only the minimum seismic requirements. Greater understanding of these issues is essential.

Learning from history is also important. In my view, the origins of the Pacific War can be traced in part to the Great Kantō Earthquake, the Spanish flu pandemic, the assassination of Prime Minister Takashi Hara, and the series of disasters that followed. Amid such upheaval, the democratic spirit of the Taishō Era gave way rapidly to militarism, eventually leading Japan into war. The transition from Taishō democracy to militarism did not occur in isolation; it was shaped by the succession of crises and disasters that Japan experienced during that period.

Toward the end of World War II, the Tōnankai Earthquake, one of the major earthquakes along the Nankai Trough, struck Japan. It devastated Nagoya's military production facilities, severely disrupting aircraft manufacturing. Similarly, one could view the collapse of the Edo period as the result of a succession of crises. In the span of only five years near the end of the Tokugawa Era, Japan experienced the Tōkai Earthquake, the Nankai Earthquake, an earthquake directly beneath Edo, a major storm that struck the city, and a cholera epidemic. These events may well have exhausted the shogunate and undermined its ability to govern.

The problem is that people receive almost no education about the connections among these historical events. Education remains compartmentalized. We need to rethink and improve the quality of education.

Disaster education should include experimental learning, such as using scale models to demonstrate which types of buildings are safer and which types of ground are more stable during an earthquake. For example, when teaching children, I often use a pudding experiment. If you shake a pudding while it is still in its container, it hardly moves. But once you remove it from the container and place it on a plate, it begins to wobble significantly.

Next, I ask the children to shake the pudding after eating parts of it away. As they do so, a valley forms. We then observe how a valley responds to shaking. Next, we carve a cliff on one side and look at how the top of the cliff shakes. Finally, we flatten the pudding until it becomes a thin, level surface. At that point, it hardly shakes at all. Through this exercise, they can see that the way something shakes depends on its shape alone.

Next, I place a piece of *takenoko no sato* (a bamboo-shoot-shaped biscuit topped with chocolate) on top of the pudding and stick a piece of *kinoko no yama* (a biscuit stem topped with a chocolate cap)

Photo: Japan SPOTLIGHT



into it. The *takenoko no sato* topples over almost immediately when the pudding is shaken because of its pointed shape. The *kinoko no yama*, however, has a stem that acts like a pile foundation, making it much more stable.

The lesson is that a structure needs a sound foundation.

This illustrates why hands-on learning can be so effective. Rather than relying solely on theoretical explanations, it is often better to help people understand through direct experience.

Creating good educational materials and distributing them widely could become a sustainable business, and even small changes in education can make a real difference in society.

That's why I created the Disaster Risk Reduction Center – a place to put those ideas into action. The Disaster Risk Reduction Center building is equipped with a seismic isolation system. The isolators are flexible, so we can pull the building slightly with a jack and then release it, causing the entire four-story structure to sway significantly. It's a real building that actually moves. A full-scale building that can be made to shake is an ideal experimental facility. It provides a unique environment for developing and testing new technologies, including various sensors and seismic retrofitting methods. The idea of a real building serving as a platform for that kind of innovation is incredibly exciting.

JS: It's important to improve disaster prevention awareness among the younger generation with the use of such tools.

What the World Expects from Japan

JS: Japan is recognized as a disaster-prone country, and there is great interest in how the country prepares for and mitigates disaster risks.

Fukuwa: Unfortunately, disaster losses have not declined compared with a decade ago. Despite national targets to cut damage by 50–80%, little progress has been made. Meanwhile, Japan promotes itself internationally as a science and disaster-preparedness leader. To live up to global expectations, Japan must now take disaster preparedness more seriously. That is the mission of the proposed Disaster Management Agency.

JS: Many Asian countries face similar disaster risks and look to Japan's Disaster Management Agency for guidance.

Fukuwa: What Asia needs is not expensive, cutting-edge technology,

but practical and affordable solutions that can be deployed on a large scale. Too often this point is misunderstood. By working with manufacturers, we can develop high-performance technologies that are also low-cost and widely accessible. The automotive industry demonstrates this well: mass production enables advanced technologies to be delivered at affordable prices. The technology is advanced, yet remarkably affordable. One example of something I helped develop is a single-sided hatchback damper.

A single-sided damper is extremely effective for preventing furniture from tipping over during earthquakes. Dampers would normally cost tens of thousands of yen per unit but can be manufactured for just a few hundred yen through mass production. Japan may be able to provide affordable, high-performance solutions by adapting automotive manufacturing technologies for disaster preparedness. Another example is a project we developed with a housing manufacturer: homes designed not only to keep pollen out through airtight construction, but also to provide protection against flooding through watertight construction.

Observations from past disasters show that airtight homes can remain largely dry even when flooded. Water typically enters through sewer pipes and foundation vents, so adding backflow prevention valves can turn an airtight home into a watertight, flood-resilient home. Such homes are now gaining widespread adoption.

This is a simple yet highly effective technology for protecting homes from flooding, developed by Ichijo Komuten. The company's manufacturing base is in the Philippines, where most of its housing materials are produced. Therefore, these factories would remain unaffected by a major earthquake in Japan, and materials could still be supplied from the Philippines. Based on this idea, we decided to have container homes manufactured there.

These container homes are equipped with solar panels, battery storage, and water purification systems, allowing them to function even when essential utilities are disrupted. If deployed quickly, they can provide immediate housing even in areas where lifeline services have been cut off. They could even be used in the desert. The way I think about disaster-prevention technology is to identify people's problems and solve them by combining the technologies that are already available. I feel that this is something the Japanese are particularly good at.

International contribution means understanding the challenges faced by different countries and addressing them by combining the technologies Japan already has. This is one of Japan's greatest strengths. While Japan may not always be known for original inventions, it excels at combining technologies into practical solutions.

I believe disaster preparedness is a comprehensive field that

combines existing technologies to deliver affordable solutions that benefit a wide range of people.

Disaster Risk Reduction in Tokyo

JS: Finally, one last question. Disaster preparedness is particularly important in Tokyo and other large cities. Yet many residents may not feel a strong connection to their local community. Could this be a disadvantage for disaster preparedness efforts?

Fukuwa: One possible solution is for Tokyo residents to maintain homes in two locations. At present, housing in Tokyo is so limited that people have virtually no room to accommodate others in times of need. A society with so little spare capacity is inherently weak in the face of disasters. After all, it is society's spare capacity that enables people to overcome disasters.

I often tell people, "Think about it. With working remotely now commonplace, there's no need to stay in such cramped conditions. Why not buy a house in the countryside and live there instead?" Vacant homes in rural areas can be earthquake-retrofitted and equipped with solar panels and battery storage. By working remotely most of the time and commuting to Tokyo only when necessary, families can enjoy the benefits of both urban and rural life through dual-location living. People would gain ties with local communities, experience rural culture, and share the culture of Tokyo in return. The benefits would go both ways.

After the Great Kanto Earthquake, many people were able to evacuate because they had family homes in rural areas. Today, most people no longer have such destinations. That is why I believe people should intentionally maintain a place they can retreat to in an emergency. I think this would make people happier overall. In a sense, it would be a modern-day version of the *sankin-kōtai* system (requiring feudal lords to spend alternating periods in their domains and in Edo, now Tokyo) helping to create a more autonomous, decentralized, and cooperative society.

JS: There are benefits in lifestyle and living environments.

Fukuwa: Yes, I agree. Sell your current condo, keep a small apartment in Tokyo, and own a spacious home in the countryside instead. You could enjoy fresh food, spring water, a vegetable garden, and a much healthier lifestyle.

Rural Japan can serve as a testing ground for technologies that may also benefit developing countries. Solutions designed for

Tokyo's highly urbanized environment are often difficult to export, whereas technologies developed for depopulated rural areas may be far more transferable.

Developing countries need solutions that do not rely on extensive infrastructure. Instead, they need self-sustaining, decentralized technologies – such as flying cars, off-grid solar power systems, wells, and other technologies that enable local self-sufficiency.

If Japan is to maintain its depopulated rural and mountainous communities, it will need self-sufficient housing. Homes equipped with solar power, batteries, fuel cells, and plug-in hybrid systems can provide that independence. In time, even road maintenance may become unsustainable, which could lead to the widespread adoption of flying cars.

JS: Ultimately, this would be part of Japan's growth strategy.

Fukuwa: That's right. In other words, it's about turning adversity into opportunity. That is what I call a "Disaster Risk Reduction Renaissance" – using our heads in a positive, optimistic, and forward-looking way. And while we're at it, we might as well make some money from it too.

Until now, we have been so focused on short-term profits that safety has often been overlooked. But if we take a long-term perspective, view things from a broader vantage point, and pursue overall optimization rather than piecemeal solutions, a completely different future comes into view. This is what the Disaster Management Agency is for.

JS: And given that we live in an aging society, this could offer hope as well. It shows that even in an aging society, there is still tremendous economic potential.

Fukuwa: This is a new government agency unlike any that has existed before, so it must strive to adopt new perspectives. I hope it will inspire not only older generations, but young people as well, and give them hope for the future.

JS: Thank you very much for sharing your valuable insights today.

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Translated from the original Japanese by Naoyuki Haraoka, Advisor of Japan SPOTLIGHT & the Japan Economic Foundation (JEF)