

[MUSIC PLAYING]

**DICK SAMUELS:** Hello, everyone. I'm Dick Samuels and I direct the MIT Center for International Studies. And I want to thank everyone for joining us here today. And as you all know, we're gathering here 10 years to the day after nearly 20,000 innocent people-- and most of what they possessed-- were washed away in a matter of minutes by the tsunami that was only one part of the traumatic triple catastrophe that started as an earthquake and came to be known as the great Eastern Japan disaster and simply as 3.11.

Well, well more than 300,000 survivors were displaced. And only a fraction ever returned home. For some survivors, these years in the interim have passed with the speed of light, while for others, many others, we can only shudder to imagine how time has lumbered along, encumbered by reminders of their loss.

In the days and in the months after the tsunami and the meltdown of the Fukushima Daiichi nuclear power plant, the nation and the world closed ranks to support the survivors under the banner [JAPANESE]-- let's hang in there, Japan.

And these were moments of great promise. Well, at least they were moments of grand promises. Politicians promised that Japan would be reborn, renovated, revitalized, rebuilt. But as time passed, many of these promises became hopes. And many of these hopes remain unrealized a decade later. Indeed, a shroud of disappointment covers many communities in the region, and elsewhere in Japan.

In a survey by the *Asahi Shimbun* in January of this year, nearly 2/3 of the Japanese people do not trust the government to ensure the safety of nuclear power generation. And an even greater number disapprove of how the government has handled the Fukushima Daiichi nuclear power plant in particular. And in a Kyoto survey taken in November of last year, only 30% of Fukushima prefecture residents say that reconstruction of their communities has been sufficient.

"There is nothing left for me to return home to" has become a common elegiac refrain. The discourse in Japan was about change from the very beginning. For

some, 3.11 was a warning for Japan to put it in gear and head off onto a new, more productive, and safer path. For others, the catastrophe was simply once in a millennium black swan so Japan should simply stay the course and put things back where they were.

And still others declared that 3.11 taught that Japan must return to an idealized past and rebuild what was lost to modernity and to globalization. And battles among these perspectives on change and contested appeals to leadership, to community, to risk has defined much of post-3.11 politics and public policy in Japan.

Now, more generally, much of social science is predicated on the idea that catastrophes of this sort can be so shocking that the status quo can't be reconstructed. And indeed, wholly new sets of institutions and practices and preferences and ideas are freed up to shape the future. So now here we are 10 years later. And it's natural to ask what has changed.

We're taking stock today of what was, what might have been, and what is. And helping us to do that are three experts, each deeply connected by their scholarship and their professional practice, to 3.11 and its aftermath. Let me introduce them to you in the order of their presentations this afternoon. First up will be Tatsujiro Suzuki, who was vice chairman of the Japan Atomic Energy Commission on 3.11.

In addition to his considerable responsibilities in that post, he became a beacon of light during the 3.11 darkness by blogging accurate data on the catastrophe to the world. The world depended on Tatsu. He's an old friend, an old friend of many of us here. He took his MA at MIT before moving on to Tokyo University for his PhD in nuclear engineering.

He became associate director of MIT's International Program on Enhanced Nuclear Power Safety, and was a research associate here at the Center for International Studies. He's now a professor and vice director of the Research Center for Nuclear Weapons Abolition at Nagasaki University. And he also serves as a member of the advisory board of the Japanese parliament's Special Committee on Nuclear Energy.

He's going to speak to us this afternoon about what he will tell us are the common issues and lessons learned from both 3.11 and COVID-19. Miho Mazereeuw is an

associate professor in architecture and urbanism at MIT. She's the director of the urban risk lab, an interdisciplinary organization of researchers and designers at MIT who are working to embed risk reduction and preparedness, resilience, into the design of the regions and the cities and urban spaces.

With a global network of partners, her lab is an innovative center for new prototypes, for new processes and systems to address the complexity of seismic, climatic, and hydraulic risks-- I'm sorry, hydrologic risks. Her forthcoming book, *Designed Before Disaster*, delves into disaster preparedness culture in Japan, highlighting both historic and current cases.

She and her students and her colleagues have worked in Northeastern Japan for many summers after the 3.11 triple disaster and have since launched Risk Map Japan with the support of the MISTI ULVAC-Hayashi Seed Fund. This has led to additional support, most recently a grant from Google in Japan, to tackle flood impacts-- to use AI to tackle flood impacts in Japan in collaboration with the University of Tsukuba and the NGO, Mercy Corps.

And finally, Daniel Aldrich is a professor of political science and director of the Security and Resilience Studies Program, which is part of the Global Resilience Institute at Northeastern University here in Boston. His research is focused on countering violent extremism, on the siting of controversial facilities, and on the interaction between civil society and the state.

And most relevant for us today is his 2019 book-- *Black Wave, How Networks and Governance Shaped Japan's 3.11 Disasters*, which focused on post-3.11 disaster recovery in Japan. Daniel has been a Fulbright research fellow, an Abe Fellow, and a AAA science and technology fellow with USAID. And his field research has taken him across Asia, Africa, and the Middle East. So I'm going to get out of everyone's way and turn it over to Tatsu. Thank you all very much.

**TATSUJIRO**

**SUZUKI:**

Thank you. Good morning from Japan. I thank you very much for inviting me to this very important forum. I was there five years ago when you had a five year anniversary of 3.11. And time flies so fast. It just still is like yesterday.

So today I will talk about the common lessons I learned personally from the Fukushima accident and also COVID-19. And as I have to tell you that I'm not an

expert on COVID-19. But when I saw the government response to the pandemic, it's kind of deja vu in terms of dealing with the crisis.

So I will talk about five lessons that I learned from Fukushima, which also come on to the COVID-19 response. The first one-- the protecting people's lives is the top priority. And this is very, very, of course, very important for the government. But sometimes that's not the case. So I will show you how it did in the case of Fukushima, and also COVID-19.

The second-- explore and analyze alternatives. It's easy to say when you are spending your daily life. But it is difficult during the crisis. So I will show you also what happened to the Fukushima case and then compare with experience in COVID-19.

The third one-- to gather and utilize the best wisdom from all over the world. In order to solve the Fukushima-- I mean, shut down the reactor at that time-- it was so difficult. And we need help and assistance and wisdom for all over the world. And this could be also the same for the COVID-19.

The fourth one, need an independent science advisor-- it is definitely the case for the Fukushima accident. Fortunately, during that crisis, we didn't know, actually, what was happening. So it was difficult to give a scientific advice. But under that circumstances, what was the role of the science advisor?

And this is probably the same case for the COVID-19. Finally, I would say this is probably the most important lesson we learned from Fukushima is the public trust, and particularly the transparency. Again, it is not easy during the crisis, particularly to keep the transparency. So those are the five important issues-- lessons.

First, as you know, they're both for nuclear accident pandemic, protect the people the right way is probably the most-- the top priority. It means, basically, when you're a policy maker, you have to consider to minimize the risk to the whole society. Again, it's easy to say, but it is difficult to judge the way the crisis is often or probably always the trade off among different risks.

These trade-offs of different risks, sometimes it is-- even within a technical judgment, there's a trade-off. But if you consider the all society-- economic, social

risk, also have to consider. So this is making policy decisions very, very difficult, particularly all these decisions can be influenced by many stakeholders, and often [INAUDIBLE] by the power of politics or short term gains.

But my lesson is, the leaders should-- do not hesitate to make a decision to minimize the risk. So the left side is the lesson-- the example of the policy decisions during the Fukushima case. Prime Minister Noda at that time-- we are still working on the managing the aftermath of the accident. He decided to start up the reactor, return electric power to reactors. All of the reactors were shut down that time.

And the comment he made is this-- reactors number three and four should restart to support people's lives. That's my decision Noda said. And at that time, there was a strong concern still on the safety of nuclear power plants. Because of this statement, there were huge demonstrations against the government just in front of the prime minister's office.

And I was just five minutes away from that office. So I hear every Friday evening the big chanting, no more nuclear power, no more accident. So that was a big decision for the government. Eventually, prime minister Noda met the leader of the demonstration to discuss what should be done. Actually, they kept operating the nuclear reactors eventually.

The right side is the COVID-19. Prime minister Abe insisted that the Olympics should go ahead. This is a major political decision the government made. And eventually, they had to postpone. But this decision was made either to probably put the priority on economic and maybe political benefits over the people's lives. This is a difficult decision also for the government.

OK. Second-- alternatives. There are always options or alternatives. And if only one option prevented the decision is with a yes or no. But it is important to present more than one options for better decision. This is very simple lesson.

But during the crisis, it is very difficult. And policymakers should be prepared for the worst case. And that's an important lesson. And assessment should be done constantly. If you make one decision, the next crisis will come. So you have to do all the time to compare all the options.

OK. The left side is the Fukushima case. The government decided to build an ice wall, called ice wall, which is very expensive. Operating maintenance is very expensive because you need huge electricity also. To protect the area, in the Fukushima area, the water is coming down-- underground water is coming down from the mountain and going to the Fukushima reactors. It becomes contaminated water.

So in order to reduce the number of-- volume of the contaminated water, they need wool to protect the-- hold on, please. So the decision to build this wall was made by the government. There are alternatives to protect the area. It's much simpler technology is available.

This is the statement made by the former head of the US Nuclear Regulatory Commission saying this is not the best option. And it's not clear whether the government compared with other options. The right one is the law that the Japanese government is trying to introduce during the crisis. And this new law just passed last year-- last month-- in January, I think.

This is a law to punish the stores or people who do not follow the government advice. And there are many big arguments that the punishment is too strong. But this is one of the controversial law to facilitate the government's policy to protect the people.

The fourth one is-- the third one is the best wisdom. Again, we thought that it is essential to have advice and knowledge from the rest of the world to solve the nuclear crisis. And in case of the COVID, probably the national responses seem to be different, but we can still learn lessons from the rest of the world.

And also global cooperation is essential to contain the virus. So in any case, this [INAUDIBLE] best wisdom from the world-- the rest of the world is essential to solve the problem. OK. The left side is the statement we made at the Japan Atomic Energy Commission. I was a member right after the accident.

And it is critical for us to advise the typical to utilize the best knowledge available from all over the world. And unfortunately, I'm not sure it has been done still. And the typical established decommissioning company specialized in handling this decommissioning process. The company is, too, depending on most of the

knowledge depending on the Japanese manufacturers.

It is true they are familiar with the plan. But I would add still the typical together utilize the best knowledge available from the rest of the world, still not going at this moment. The right hand side is COVID-19. There was a big database, open database established. I think this is a United States initiative to have an open science data set so that all scientists all over the world can access to the most updated scientific research result to learn the lesson, and also the know how from the rest of the world.

This is a very innovative way to share the world's knowledge. I learned the lesson from this particular case. So this is very important to know. OK, science advisor-- this is a statement-- I like this statement that David Gray of the head of the IIASA long time ago. He said that the science without policy is science, but policy without science is gambling.

This is exactly the case for a nuclear accident at that time. Important to have a policy making process to utilize scientific advice. The problem is science advisor is sometimes trapped by the politics. And they were not allowed to speak up. And that's not good.

And this case, United Kingdom, UK, had a very nice system for scientific advisory group for emergencies. I urge the government at that time to learn the lesson from such experiences. Unfortunately, we still don't have a so-called independent scientific advisor in Japan.

OK. Left side is the SAGE experience for Fukushima. And right side is the distrust of science in many countries regarding the COVID-19. This is the statement also made by the-- sorry. By the scientific advisory institution, international scientific advisory institution. This is very also difficult in the case of crisis.

Science always should be the base. But the government often takes other factors into consideration. And sometimes the public is confused without the scientific advice. OK. Finally, the public's trust-- and I learned a lot also personally from this experience. I was head of the committee-- subcommittee-- to discuss the compared alternatives of the fuel cycle options in the aftermath of the accident.

But I was shocked by the newspaper scandal saying that we had the secret meetings behind the scenes. And it was not a secret meeting. He was a secretary at the meetings. But unfortunately, some of the secretive meetings, the documents were leaked to the press. But anyway, we were criticized for not transparent in terms of policy making process.

So we made a big change to keeping all the records even during the preparatory meetings, and also track the changes of the documents we prepared. Unfortunately, this kind of transparency has not been kept for the COVID-19, and also even at current government practices.

Finally, we need independent oversight organizations to check the government-- what the government is doing and also assessing alternatives and also the policy making process. I think this is the final slide. And if you look at the deficit, I think you already mentioned the public's trust in Japan, that the polling said that nuclear power industry is-- before the accident was almost 80%. Now it's only 25%.

And also only 12% of the public saying nuclear power is necessary or should be maintained or expanded. Almost 60% of the public saying that nuclear power should be phased out or should be abandoned immediately. And the lack of transparency was a big issue in the Japanese government, also, as you can see from this statement. I think this is the last-- yes. Thank you very much. This is my talk. Thank you.

**DICK SAMUELS:** Thanks very much, Tatsu. There's a lot to think about there. And for the American audience, there's a lot that resonates very clearly on the COVID front with what you've described. Just a reminder to the audience that we'd like you to please post questions to chat so that we can try to do our best to make sure that the speaker you want to address them will have the chance to do so. So please use the chat function.

Thank you, Tatsu. So we're going to move on to Miho and her presentation. Thank you.

**MIHO** Thank you. I'll share a slide now. OK. Are you seeing it?

**MAZEREEUW:**

**DICK SAMUELS:** Yeah.

**MIHO**

OK, great. So thank you, Samuel Sensei, for having me to present. And nice to

**MAZEREEUW:**

reconnect with you, Suzuki Sensei. It was exactly five years ago but in person last time. And then the neighboring institute friend, Aldrich Sensei, it's nice to see you again.

So 10 years later, we really need to hold in memory those lives lost by the tsunami itself, lives lost during the complicated recovery process, and reflect on what we have learned and what we need to prepare for during blue sky days. As Professor Suzuki aptly points out, we are not in blue sky days right now, as a different type of disaster is consuming our planet.

But for the purposes of our presentation, I'd like to share some reflections on the reconstruction process in order to prepare for potential future events. So last year-- last time we met, five years ago, I reported out this number. 67,583 people were still living in temporary housing in 2016. This year we can celebrate that those numbers have come down. Miyagi prefecture's temporary housing, the prefabricated kind, was all dismantled in December 2020.

Iwate and Fukushima prefectures only have seven and three families, respectively. But I would like to pause and recognize, beyond the small statistics, there are families 10 years later who are still living in temporary housing. That's not very temporary. The [JAPANESE] program is a different type of temporary residence in which survivors are helped with the cost of rent and matched with vacant apartments.

Given it's been 10 years in their case, the temporary may have become the permanent solution. But for those families still in the small, prefabricated units, recovery is still ongoing. So with the 10 years of tremendous amount of hard work on the part of the residents, governments, and a variety of institutions, I thought it's worth reflecting on some history.

After the 1896 tsunami, which was nearly as severe as the 2011 event, some settlements relocated to higher ground. But then many eventually returned to the coast where their houses were again destroyed by the 1933 tsunami. Then post-1933 reconstruction reshaped the Tohoku coast with its emphasis on relocating

urban, residential areas to high ground. At the end of that nationally-funded process, which only took one year, 98 villages in Miyagi and Iwate prefectures were relocated to high ground. And most of the 1993 hilltop communities safely survived the 2011 tsunami.

In case you missed it-- yes, in 1933, the population was much smaller. There were villages, not like the enormous urban areas that were affected in 2011. But the relocation to high ground happened in one year. I wonder if all our advancements and construction methods, land moving methods, investments, and enormous influx of funds did a sum demerit? And perhaps there are other methods to explore, too, when planning for future events.

I don't have those answers right now. But we are currently researching those questions in the lab. So for those who are wondering why the recovery has been taking so long, it's complicated. And to unpack just a few of the strategies provided-- in addition to seawalls, there are big projects of leveling mountains and moving whole communities to new highground sites.

The land readjustment program, [JAPANESE], controlled by the Ministry of Land, Infrastructure, Transport, and Tourism was used in Kobe after the 1995 earthquake. But in Tohoku, there was an added complication of raising the land. The program was used to raise land in zones of level two tsunami inundation, which could then allow for commercial, industrial, and residential mixed uses on those coastal areas. For example, in [JAPANESE], the 300 hectare reconstruction project of seawalls, raising ground, terracing hills for new residential areas exceeded 189 billion yen. And the ground was raised from 10 to 12 meters for the housing and commercial buildings in the city center of the [JAPANESE] district.

One hill adjacent to the town was cut down from 120 meters to 50 meters through the excavation process. During our 2015 visit, dynamite blasts and heavy machinery were actively removing hilltops, bringing fill via 3 kilometers of conveyor belts to speed up the delivery to lowlands. The system cost \$12 billion yen and was intended to shorten the construction phase from nine to 2.5 years. The conveyor belt system was dismantled in 2015, but massive earth quirks were then needed for compaction.

So land readjustment is still ongoing and is targeted to be completed this year. Many parts of the city have recently been completed. But it has been such a long time that many families have also migrated away. [JAPANESE], a professor at Kansai University, found this paradox to the notion of "build back better" in Tohoku, where his evidence points to towns with larger scale reconstruction programs typically have higher rates of outmigration and associated population decline. Nakamatsu emphasizes that better is not only about disaster risk reduction but also about the revitalization of community activities.

Another program is the relocation of homes to highground program, [JAPANESE]. Residents owning property-- residential or farmland-- in the tsunami-inundated area, which became rezoned as high risk, were encouraged to sell their land to the municipality and relocate. The municipality purchased the inundated plots from the residents. Those programs also led to big projects with long timelines. In some areas, people finally moved to their new homes in 2019.

By the time the plots were finally ready, some had passed away or their health had declined and they no longer could live on their own. Or their finances changed and they could no longer shoulder a full mortgage. Or they grew roots in new locations. Many dropped out of the program, leaving municipalities with new complications of vacant lots. I'm not the only researcher who writes about these factors.

Having said that, I have also been spending the last several years not only untangling the results of these programs and their complicated effects, but also studying successes. Certainly, smaller municipalities had an easier time. One of many is [JAPANESE], a small peninsula boasting seven beaches shown here in this slide. It is the smallest municipality in the tsunami-affected area. Due to its topography, which is surrounded by the ocean, 36% of the town was inundated and 99 residents passed away. The town's 13 districts had many generations of fisheries with a tight knit community, each proud of its own unique culture.

And in the immediate aftermath of the disaster, the most common requests from residents was that they would like to resettle to the high ground with their original district with their neighbors. In the reconstruction process, the town established a vision with the community in an early stage to remain and rebuild together through clear, transparent, bidirectional communication from both town officials and

residents.

For example, the town published the estimated price of inundated private property really early so that the residents could consider the sale price into their recovery plan. Many workshops were held over the course of the year where the future residents gathered to discuss how to allocate residential units to satisfy all of their needs. The workshops included many people-- the mayor, town officials, NPOs in charge of community support and temporary housing, and [JAPANESE] of Tohoku University, who helped draft the public housing guidelines to include strategies to increase communication between neighbors.

So [JAPANESE] explains the municipality communicated carefully with residents and encouraged many victims to remain, enabling officials to put together a more accurate reconstruction plan for housing. For those calculations, the design of public housing was carefully considered, especially in settlements with single occupants and aging households. And as a social measure, [JAPANESE] stressed the importance of building a guardianship system using existing organizations and networks.

For spatial design, he proposed this living room access housing typology that enhances residents' awarenesses and allows them to care for each other every day. With this design, he hopes to prevent this depression and even solitary death. With this living access design, if there are deviations from people's everyday activities, such as prolonged inactivity, there's a higher possibility that neighbors can notice at early stages. And so the living room and the entrance is shared.

In this particular example in this district, they selected Atelier Hitoshi Abe's proposal, which divided 100 units into five separate blocks in accordance with the pre-disaster neighborhoods, keeping the neighborhoods together. Each block is paired with three story wings connected by a community desk with a courtyard in between, shown in the photograph. The living rooms of the 20 households face the shared courtyard and the courtyard not only serves as a place for community, but also provides appropriate distance between units facing each other and sharing some level of privacy as well as increasing awareness of other residents.

The design allows for someone to watch over the children playing in the courtyard

from the community deck, that connects the two buildings. So the recovery process has taught us a lot in how to communicate the importance of transparency, building trust, and how to connect that to the design of spaces during recovery. But reconstruction is difficult. Resettlement is even more difficult. And it's really important to prepare.

The Tohoku disaster highlighted how complex reconstruction processes can be. In the midst of grieving lost lives and livelihoods, residents scattered in temporary housing across the region and time pressures from funding streams. Lessons learned were incorporated into amendments for existing programs currently running to preemptively plan more prudently for anticipated disasters. After the Tohoku earthquake in 2011, the [JAPANESE] earthquake disaster management law was enacted, designating 139 municipalities in 14 prefectures as special strengthening of tsunami countermeasures area.

And recently, tsunami evacuation facilities have come in several types-- artificial high ground, tsunami evacuation buildings, and tsunami evacuation towers. And they range from pedestrian bridges to small museum fire stations. And this collection has brought about a host of new ideas and design explorations in the lab as we research planning policies and how to prepare for the future.

Very briefly-- beyond the design and planning research we're currently doing in our lab from lessons learned from Tohoku, another one of the projects is to prepare for future events through real time communication and using communication and coordination. This project is supported by the MISTI ULVAC-Hayashi Seed end line.

So this taps into-- and this is our project. It taps into social media platforms where citizens can actively make reports and it brings them into the disaster response process. Reports from citizens are then gathered into these channels and they report using mechanisms that they already normally use such, as Line or Twitter or Facebook. And then they're visualized on the open, real-time map.

So this also fosters peer-to-peer information sharing. Then these reports are fed into the dashboard for the emergency operations center, along with other time-critical live stream data sets, to maximize the kind of real-time information necessary. Disaster managers can then share that information back on the public map, thus

making this a two-way dialogue. And by connecting citizens and the government disaster managers into this loop, it produces this common, shared operating picture in real time.

So just really briefly, these are examples of the flood situation cards. Users can select their location, drag the slider, indicate the height of flooding, and upload a photo. And the above interaction takes under 20 seconds. And this here is a map that shows the actual reports submitted by local residents in October 21 of 2019, when Typhoon Hagibis made landfall near the Tokyo area and brought about heavy rainfall, flooding, and landslides to the wider area.

This is now also being used for emergency shelter coordination and drills. This is a photo of the mayor of Kumamoto trying it out on his iPad during a citywide disaster drill, exclaiming that he could get a picture of what's happening before even arriving at the emergency operations center. So again, creating a better mode of communication and transparency with residents, both each other and with the government, in a bidirectional, real time information is something that we have been working on from lessons learned in Tohoku.

And as Samuels Sensei mentioned in the beginning, most recently we received a grant from Google Japan to develop a machine learning module on top of this platform. And we'll be working with Tsukuba University and Mercy Corps. And many MIT students and research scientists are involved in this program. And so we hope this program grows in Japan. It started with a small MISTI Seed Grant about four years ago. And we hope that it'll help people to prepare, react, and recover more smoothly.

So early this morning, I listened to a panel of women entrepreneurs in Tohoku, supported by the Japanese Women's Leadership Initiative. And amongst a lot of amazing projects and news of strength and perseverance, there's still a lot of pain and still people struggling to recover. And now they're isolated by the COVID-19 pandemic.

And so beyond remembering and hopefully visiting Tohoku region in the near future, there was a request to please think about connecting online with women and with children in Tohoku. Although many or most people have now moved into their

new homes, this photo here is an image from [JAPANESE], which is a small hamlet in [JAPANESE] prefecture that we took during field work.

And some statistics would consider this as having recovered. But I'd like to remind us that people are still struggling to rebuild other aspects of their lives and think about how we can still find ways to support them. And I pass that on as a task for myself, but also for the larger MIT community at large. In closing, I'd like to thank several teams at the Urban Risk Lab working on these projects with a special shout out for [INAUDIBLE] and [INAUDIBLE].

And lastly, to thank the MISTI ULVAC-Hayashi program, because without them, the research, the workshops, the book, and the more recent real-time co-ordination projects would not be possible. So beyond this Zoom environment, if anyone has questions or thoughts or would like to chat with me, please email me. I have this great, easy-to-remember email address. It's just risk@mit. And with this, I'll hand it back to Samuels Sensei.

**DICK SAMUELS:** Thanks very much, Miho. Am I up there at this point? There we go. Thanks very much. I'm very pleased that you mentioned the Hayashi seed fund, because it reminded me that I was derelict in my duty in not acknowledging the role of the MIT Japan program in cosponsoring this event and introducing Christine Pilcavage, who is with us here this evening, as well.

And it's seed funding. And it's done what it's supposed to do. It got you started and made what you've done attractive to more deeply pocketed donors. So it's wonderful. And we're delighted that you'll keep up the good work.

All right, let me turn-- again, apologies to Chris-- to Daniel Aldrich and ask him to bring this home. One thing before Daniel starts is to correct some instructions that I gave to the audience earlier. Sometimes I forget which platform we're using. I asked you to please put your questions in chat. There is a separate button for you to put your questions into for Q&A. And we're assembling quite a few very good questions. So please use the Q&A button. So Daniel, thank you for being patient.

**DANIEL ALDRICH:** Thank you all so much. It's a tremendous honor to be here. Thank you Dick and Mijo and Tatsujiro for your great talks. Hard going last. So I'll begin by saying, I've had a few moments to think through how to connect what I'm talking about to what we've

heard already. And I think the broader issues of trust and networks, I think, are pretty consistent across the three of us talking today. So I'll begin by trusting you. Here's my email address and also my Twitter handle. If you want to communicate with me outside this platform, I'm happy to have the conversation.

Now, I want to begin by talking about sort of three puzzles that I've noticed, at least, in the last decade since the triple disasters in Japan. One is about the different rates of survival across the cities, towns, and villages in Tohoku which bore the brunt of the tsunami there. And this image shows a density of the mortality in those communities. And the good news for us, beginning with some good news, is that the vast majority of cities, towns, and villages in Tohoku had no casualties at all. That's really great news given the incredible power of the earthquake and then the tsunami.

So that's really good news. The bad news or the difficult news is that some communities along the Tohoku coast lost up to a tenth of their population. That's really hard to fathom, you know, tremendous losses and tragedies for us as outsiders, but also to understand as social scientists what happened in some of these communities. So I'll begin-- that's one of the questions I want to ask.

I want to ask a little bit, also, about recovery. I've just chosen out of all those hundred and something odd communities in Tohoku, we had nine communities with very different recovery times. Some of them in a year or two or even three years built back all the infrastructure. Most of the businesses had schools up and running again, transportation systems. Others did not.

And why some communities managed to build back more quickly, I think it's an important question also to talk about. And the last question I'll talk about is mental health. And we've already heard a little bit about the challenges that people, especially in communities in Fukushima have faced with the triple disaster. And obviously the worries, the anxieties about nuclear radiation have been pretty severe.

And I've just mapped out here a few of the different types of mental health that we've seen among evacuees that we've spoken to, the top level there being pretty good, either going through it without much of a shock or bouncing back, the next

level of responses being a little bit of an overall drop in ability to focus, let's say. And the bottom two being unfortunately things like PTSD and constant anxiety. And we've seen all three different types. So again, to wonder the variation in these different patterns.

So I'll start with an argument that I think I've made in every book I've written, actually, now, which is the critical importance of social capital, the critical importance of trust. And we can break these into three different types-- bonding, bridging, and linking. Bonding social ties connect people who are quite similar. So people who, for example, are from the same race, ethnicity, background, same hometown. Bridging networks, in contrast, often come through institutions. They might be workplaces or schools or even clubs.

And where bonding and bridging are horizontal ties, linking ties or vertical ties between me and someone in power and authority. I'm going to argue that the combination of these ties was really the most important element in determining how communities across Tohoku did or didn't do afterwards. And here is really the theoretical reasons why.

In the same way that Albert Hirschman a long time ago argued that consumers at businesses have exit or voice as their option, I'm going to begin with the argument that any survivor of a major shock-- and I myself went through Hurricane Katrina back in 2005-- has to decide whether or not to go back to a damaged home, to return to a damaged business and invest the time, psychological energy, opportunity cost it would take to rebuild, or to move someplace else.

And what we've found around the world, including in the Tohoku disasters, is that a sense of connection, a sense of place, stronger horizontal ties, they make you want to use voice rather than leaving the area. You'll go back and invest whatever it takes to rebuild your home and your business. Another reason these kind of ties matter is because with challenges like a disaster come collective action moments when you have to really work collectively.

Mask wearing right now in COVID-19 is a pretty good example. But even trying to clean up a neighborhood to make it livable again requires more than just one family or one organization. So we need people to cooperate, to work together.

That's easiest when people trust each other, when they've worked together in the past.

And finally, social ties bring with them mutual aid and informal insurance-- the ability to draw resources, information, and assistance from other people, especially when you built those ties beforehand. So this is pretty abstract. It talks specifically now about mortality during that tsunami, which really was the most devastating in terms of immediate loss of life. And there's a number of theories out there that try to explain why different communities faced different mortality rates.

One of the most common, perhaps, is the argument about demographics, that certain communities in Tohoku were older, and therefore they were more vulnerable to the shock. Another argument is about the power of the wave, the argument being that the more powerful the wave, the stronger the wave, the more individuals would pass away in the community.

Another argument comes from our engineering friends, and it's focused on physical infrastructure. And the argument is quite simple. If you have a seawall that's big enough and strong enough to stand up to that kind of devastation, then you'll keep your people safe.

We also have a political argument, which I appreciate, personally, which is the argument that, what if you've supported the wrong party over time? What if the LDP is in power but your town supported the communists or the socialists or any other party that has never really managed to hold on power for very long? Would you lose funding for your disaster preparation? Would you lose funding for your early warning systems?

The final argument I want to raise is the possibility that, what if survival during a shock is really more of a function of the social networks that you have? And one of the stories I heard over and over again in doing interviews in Tohoku was from especially elderly survivors. When I asked them how they got through this massive earthquake and tsunami, most of them said it was only because a neighbor, a friend of a friend, a caregiver had come to their home immediately after the earthquake and literally helped them out of their wheelchair or bed onto a car, a bicycle, even under some people's shoulders and carried them to higher ground.

Those kind of moments of heroism really depend on knowing that there is a neighbor who needs help, willing to put yourself at risk to help them out, and sometimes working collectively, because getting someone out of a wheelchair or a bed can be quite challenging. And in fact, if you look initially at things like the height of the tsunami and try to correlate it with people that were missing or dead, the simple reality is a number of communities had pretty low tsunami with relatively high-- we see [JAPANESE] among them-- relatively high fatality rates with low tsunami. [JAPANESE] had relatively moderate tsunami and very high mortality rates. [JAPANESE] had a 19 meter tsunami. So we see that that's not the best explanation.

So instead, the data that we have shows very strongly that one of the best predictors for surviving this major tsunami but also other events comes from communities where there are stronger social ties. To the degree that if you had a strong set of networks, the number of fatalities in your community was about 100th compared to communities where, for example, people didn't know each other, or they didn't cooperate beforehand. So in answer to that very first question, who survived, I would argue it comes very much from our ability to connect to other people nearby.

Moving on to the recovery question-- who bounces back? Which communities rebuild? Here's ishinomaki about a week and then a year later. Of course, the debris is gone and the Japanese government talked about debris for a long time. But we don't know about things like business restarts. Are the students back in schools? Is there a market again for real estate? And so, too, looking at images outside Sendai-- we see the gradual clearing of debris and fields becoming plowable again. But we don't really know from the outside what helped them get where they were, what factors helped them bounce back.

Before I tell you my argument about this, I want to show you a story you've heard a little bit about from a colleague of mine on this panel. And I'll call this area Coastal City in an attempt to keep the identity a little more secret. And this is that broader conveyor belt we've heard about already that conveyed from crushed up mountains to the downtown-- a 230 million US dollar project that helped to raise the downtown.

This is one of actually a few cities in the area that got this level of funding. Overall

spending so far in the coastal city has been closer to 2.6 billion US dollars-- far beyond local resources and regional ones, as well. And when I poked around in Coastal City and elsewhere, I heard an interesting story about what happened. It turns out one of the mayor's advisors in Coastal City went to school with one of the members of the [JAPANESE] of the reconstruction agency.

And about less than a week after the tsunami called that old [JAPANESE], old member of the network, and said, we need a lot of money. And according to my version of the phone call, the person said, sure. Pretty straightforward phone call with a lot of results. A number of other communities did apply for this level of funding and did not receive it. This Coastal City funding was quite spectacular.

I thought initially this was a positive example that was relatively rare, this kind of vertical tie making a difference. But in fact, we looked across a number of cities in the Tohoku region. In fact, it turns out having those powerful politicians on your side make a huge difference. This graph shows you what would happen if the village that you came from or the town had very few supporters, these powerful politicians serving six terms or longer, versus having more of them.

It turns out that the more of these strong politicians-- think Ted Kennedy or Reid or whoever else you think has been there a long time-- the better bounce back you had, controlling for a number of other factors including damage-- for example, local wealth-- all kinds of other factors. So in the first stage of surviving a shock, horizontal ties help to save lives. In the second phase of recovering, vertical ties help to bring in resources.

One last question, which is about mental health-- we've heard already about the large scale evacuation of 140,000 or so members from Fukushima cities, including, for example, [JAPANESE], Futaba. Futaba, I heard this morning, has around a 2% population rate so far because of areas still being shut down. But in any case, these 140,000 people who evacuated, of course, not only had the stresses and shock of the earthquake and tsunami, they also had to worry a bit about radiation exposure, what's going to happen to their health and their long term recovery into their homes.

So using a really simple measure, my team and I measured the mental health of

people from Futabam which is right near the nuclear power plant, Ishinomaki and Yamada. Ishinomaki and Yamada only went through the earthquake and the tsunami. And the higher the K6 score, the worse mental health would be. You see in [JAPANESE] and [JAPANESE] about half the people had the lowest level. And then the bars of worse and worse mental health get smaller.

Futaba, it's not like that. Futaba, 50% of the community there had the highest level measurable levels of these mental health challenges. So the next question for us then was, what helps people bounce back from these kind of mental shocks? And we assume things like income and wealth. Sorry, income and health would be helpful.

Unfortunately, that's not true. The very poorest middle class and the richest people that we talked to out of 800 people in our surveys, none of them got away from this-- worries and anxieties about radiation and so forth. And in terms of physical health, those of you who eat kale every day and run your marathons, that's great. But it won't help you here, either.

In fact, what we did find was people in worse physical shape-- people with cancer, with diabetes, with asthma-- there was negative interaction there. But neither having a lot of money or being in physically good shape helped reduce these kind of anxieties. But in fact, once again, the factor of social ties did. The only factor we found consistently reducing anxiety post shock was having neighbors and people that you knew that went through the shock with you. Having them with you, those neighbors, made it much, much easier for you.

So I wanted to wrap up there. I would try to argue here today that oftentimes with disasters, we think really about disasters in terms of individual preparation. Is my kit ready? Do I have grit? Or national level-- has the national government built a seawall, that kind of stuff. I would argue that the real moments or the real important factors for recovery, instead, are the middleground of the community, of the neighborhood.

And I try to show using qualitative and quantitative data that really, what drives these recoveries, what drives the survival rates and also drives mental health recovery comes from social infrastructure, the ties that connect it to other people,

which is interesting, because of course, I would argue at the same time, Japan is heavily overinvested in physical infrastructure. They've built \$220 billion worth of seawalls over the last 30 something years, huge amounts of money going into [JAPANESE], these large-scale public works projects, and very little of that money going into social infrastructure.

In fact, we have a study right now comparing Japanese and North American spending on these two categories-- physical infrastructure, seawalls, berms, other kind of stuff and social infrastructure. Regrettably, both communities in North America and in Japan are spending over 90% of the money even on climate change mitigation, but also on disaster preparation, in the physical infrastructure space. So I would argue the lessons I'm drawing from Tohoku are the critical importance of having social ties. Thanks so much.

**DICK SAMUELS:** Thank you very much, Daniel. And if people didn't have enough time to see the slide with his book on it, I hope he'll show it again. It's a terrific book. And it's one that should be read in conjunction with this presentation. We have about a half hour left, a little less, and a number of very good questions. So let me try to field them and maybe bundle a few together.

For example, let me start with a question that was posed by Nina [INAUDIBLE], which I apologize, I don't know-- I presume Nina is a woman. But anyway she-- maybe he-- says that it's a question for all. But it sounds to me like Tatsu should probably take the first cut at it, which is, the question is, which previous disasters in other countries-- for example, Three Mile Island, Chernobyl, or others-- proved most useful to the Japanese policy community when they were handling Fukushima?

And I think Miho might be able to make comparisons, too, given the breadth-- well, actually, Daniel, as well. Anyway, why don't you all take a cut at it. But we'll start with Tatsu.

**TATSUJIRO**

**SUZUKI:**

Thank you for the question. Well, of course, all accidents are useful. But the TMI, Three Mile Island, case was probably the most useful at that time, because actually, the similar reactor type and also the experience of managing a core meltdown accident cooling problem at that time also in Three Mile Island. So Three Mile Island is probably most relevant even for aftermath of the accident, how to deal with the

debris, melted debris in the reactor core.

I think Three Mile Island was probably considered to be the most useful.

Unfortunately, at this moment, three reactors core meltdown is much, much more serious than Three Mile Island. It's very close to, actually, Chernobyl. So people start to think now, maybe Chernobyl accident is more useful.

**DICK SAMUELS:** Tatsu, could you say something about that? Because we read often that Chernobyl and Fukushima Daiichi both are ranked number 7. And could you tell us what number 7 means? Because it sounds like it's often described as as bad as it can be, or as it has ever been, put it that way. I suppose it could always be worse.

**TATSUJIRO SUZUKI:** This is the scale of the seriousness of the accident, scale of 1 to 7. This actually created by the IAEA. Scale 7 is the more serious core meltdown or even actually the radioactive release to the environment was more serious accident. And some people say this is beyond 7. Three core meltdowns at the same time, three explosions on one side, four units caused an accident. So this is much more serious than, I would say, in terms of the amount of the radioactivity and dealing with all the aftermath of the environment.

This is probably the most serious accident ever happened in history.

**DICK SAMUELS:** Thanks. Miho or Dan, do you want to weigh in on this question?

**DANIEL ALDRICH:** I have a 30 second answer. I remember an interview I did in Fukushima prefecture. And actually, it was a fisherman who told me, Daniel, do you know what [JAPANESE] means? And I said, yeah, of course. [JAPANESE] was, as our listeners probably all know already, the site of a horrible ethylmercury poisoning by a company called [JAPANESE] that began more than 70 years ago and continued for some time.

And he said to me-- and I said to him, yeah, of course. But what's the-- He said, we-- we, Fukushima-- we are the new [JAPANESE]. And I think what he meant to say was that in the same way that I knew instinctively that he meant [JAPANESE] was a dangerous place-- I wouldn't buy fish or sashimi from the area-- so, too, I think Japanese consumers still-- and maybe foreigners, also-- wouldn't buy that.

So people in Japan have been telling me for a while that [JAPANESE] is the disease that they think about now because there was reputational damage that's been

done.

**DICK SAMUELS:** Thanks. Miho? Or should we just go on to the next question? It's up to you.

**MIHO** We can go. We can go on to the next question.

**MAZEREEUW:**

**DICK SAMUELS:** OK. Well, there was one for you from Michael [INAUDIBLE]-- let me pull it up-- asking about the long-term lessons learned from 3.11, especially preserving Japan's international reputation and fostering trust, and wonders-- I'm just losing it here. Let me find it again.

No, I'm sorry. He's posted twice, and I read the wrong question. Let me start over, because it's this question which I think is best directed at you, because he thanked you for sharing your maps. And the question is, how can local and central authorities and governments use or partner with outside organizations to protect, improve, expand public health utilizing information communication technology, including surveillance, monitoring data to share and inform residents and foster trust in the data that's disseminated?

I mean, you addressed this in your main presentation. But is there anything else you'd want to add to directly answer Michael's question?

**MIHO** Sorry, can you repeat the beginning of the question?

**MAZEREEUW:**

**DICK SAMUELS:** Yeah, how can government authorities use or partner with outside organizations to protect, improve, expand public health information, communication technology?

**MIHO** So I think there are a lot of outside organizations that are trying-- there's been a  
**MAZEREEUW:** shift from thinking that disasters are the responsibility of the government to disasters being something that we are all responsible for responding to. And so I think amongst people and amongst companies and all types of players, there's a tremendous amount of effort in order to contribute to this dialogue. And it is this combination of trust and working relationships that actually need to be mended and more bridges created in order to facilitate that. And so I think there's a lot of effort in both directions. And just those bridges need to be created.

**DICK SAMUELS:** This may be for you, too, so don't go away. Paul Krieger asks-- actually, he claims that green government representatives have not had success in securing funding to reconstruct their communities. And he says, what's being done, if anything, to rectify-- first of all, is that your impression, as well? And maybe for Tatsu and Daniel. What's being done to rectify this and support a green government in the reconstruction?

**DANIEL** Do you think he means the Green Party, as in the German Green Party kind of green  
**ALDRICH:** government? Certainly--

**DICK SAMUELS:** It's not clear.

**DANIEL** I mean, I would-- that's an easy answer, because I've interviewed the single member  
**ALDRICH:** of the dyad who claims to be the member of the Green Party. It doesn't really have support broadly. So there really isn't a formal Green Party like Germany had, which of course, helped move it away from its nuclear power. If you talk about Germany's moratorium on nuclear power after Fukushima, the Green Party was incredibly important there. So there really isn't that level of a formal Green Party in the dyad in Japan to make those kind of--

**DICK SAMUELS:** I'm going to guess-- I don't want to put words in Paul's mouth-- but I'm going to guess that he has in mind groups in civil society, which is where you come from, really, and your analysis, groups in civil society that are dedicated to environmentally safe reconstruction. And in his view, they're not getting the attention and the resources that they deserve. Is that your sense?

**DANIEL** I mean, 30 second shot, I would say between green tech and green NGOs, there is  
**ALDRICH:** some interest, especially in Fukushima, which is unfortunate. It seems to be very localized. A lot of the investments in offshore wind, for example, and large scale solar seem to be coming in Fukushima, which has vowed not to return to nuclear power.

But we know as a whole-- I think we talked about this a little bit already-- unfortunately, post 3.11, Japan's had to reactivate coal-fired plants and oil-fired plants, taken out of position fossil fuel plants. And of course, it's spiked its carbon dioxide emissions because it didn't simply have the renewable energy footprint in

place beforehand. And nuclear power was assumed to be a critical element of its overall energy plan. So I would say there isn't a huge national push right now as there might be-- we might have expected.

**DICK SAMUELS:** Good. Now Paul is posting for me to say that that's what he was after. So good. We got there. Apologies to Paul for taking the long way around. Charles [INAUDIBLE] has asked-- and he asked this of Daniel and Miho-- how can communities with social ties be built intentionally?

**DANIEL** Miho, do you want to jump on that one first?

**ALDRICH:**

**MIHO** You can go first. I'll go second.

**MAZEREEUW:**

**DANIEL** OK. So we have an experimental project called [JAPANESE]. I can put it in the chat in a few minutes. But it's a program that began in [JAPANESE], a community center that tries to bring together people there who are placed randomly after the shock. And we've been able to monitor what's happening there in terms of social ties. And that's been pretty successful at broadening networks, creating efficacy, and creating more trust.

**ALDRICH:**

So there are a number of programs-- [JAPANESE], community currency programs, programs to help neighbor to neighbor connections, bottom up programs involving schoolchildren and adults meeting together after school to read. So I think there are a number of ways to intentionally build communities. At a number of NGOs, this is their core effort now-- recognizing, again, that we don't know what every shock Japan will face in the future will look like. But rather, we want a more resilient society based on those social ties.

So I can drop the [JAPANESE] in there. But yes, I think there are successful examples, best practices of deliberate creation of social ties.

**MIHO** Yeah, I agree completely. The [JAPANESE] that Daniel mentioned is a great example.

**MAZEREEUW:** There are many, many NGOs that are working on this. And I think beyond those types of efforts, I think school networks have also been working on this quite a bit. And then from my own sort of position as an architect and a designer, I think the

way that we create public spaces and housing and all of those things also really contribute to the way that we can create community networks within our built environment.

**DICK SAMUELS:** Great. Thanks. [INAUDIBLE] asks a question to Dr. Suzuki, Tatsu Suzuki. He wants to know about the notion of protecting people's lives, one one of your first points, really an important point, as a fundamental principle to give guidance for decision making. He asks whether it's workable in an environment under uncertainty, and how does uncertainty potentially derail the ability of governments to do their job, which is job number one, to protect people's lives?

**TATSUJIRO SUZUKI:** That's a very fundamental, very important question. During the crisis, first of all, in the nuclear accident case, we don't have enough information to make decisions definitely. And so we have to make decisions under huge uncertainty. We didn't know what was happening. Under that case, I think we learned the lesson that we have to be prepared for the worst, not, thinking about the positive way.

Unfortunately, people have a positive bias. Maybe this is going to work out. Maybe this is working. And so people tend to think-- to minimize, actually, the worst consequences. That was a wrong decision, actually, that made.

We have to be prepared for the worst case. Maybe this is not working. Maybe this is not the right information we are getting. But that wasn't the case. People have a positive bias during the crisis. So that was one lesson I learned.

And the second thing is to share the information with other people. During the crisis, we tend to make the decisions within the very small group of people. And that led to the very limited options to decide. I think it's very important to share the information with the wider area.

It is difficult during the crisis. But that was the lesson I learned. Eventually-- right now, even the aftermath of the accident, right now in the Fukushima case also, TEPCO was the sole organization responsible managing the decommissioning.

But I think it's much better to reorganize the decommissioning authority to create a broader institution to incorporate more ideas to deal with the crisis. But that's my short answer.

**DICK SAMUELS:** Let me follow up with you with another question. And it's this time from an anonymous attendee. But it really is to another one of your central points, which was the importance of a science advisor.

**TATSUJIRO** Right.

**SUZUKI:**

**DICK SAMUELS:** And this attendee says that a science advisor is important. But even more important is a science communicator, someone who can put complicated concepts and principles into simple, accurate, and understandable content for the general public.

And this attendee also connects back to the contributions that would make to public trust. So the question here is, did the Fukushima incident have an effective-- generate an effective science communicator, or several, or none?

**TATSUJIRO** The answer is no. No one actually was good at it. And it was very difficult also. At that time you remember first that there were [INAUDIBLE] press conferences. TEPCO had a press conference. Regulators had a press conference. Cabinet office had a press conference. And then different times and different information.

**SUZUKI:**

That was a pretty bad science communication. And after a couple of days, the government decided to have one press conference. That was a good decision. I think it was much better to have three different press conferences. Unfortunately, the cabinet secretary, Mr. Edano, was not a nuclear expert.

So I think if you have one press conference, you should have different groups of experts, TEPCO regulators, and nuclear engineers and health experts and so on, so that the information comes from the one place. Unfortunately, we were not prepared to do that.

So [JAPANESE] had a hard time answering to the very critical questions. And his statement was prepared by the assistant without having any good scientific knowledge. So the short answer is, unfortunately, was none good science communicator. That was a problem.

**DICK SAMUELS:** Thank you. Diana [INAUDIBLE] asks the question that's been on my mind for some time as well. The Japanese public, when polled, as you said, Tatsu, and we read

about in the papers, when polled, the Japanese public is now strongly opposed to nuclear power. And it had been strongly in favor.

And so there's this major change in public opinion. And yet, in the first electoral tests after the catastrophe, they returned the pronuclear power party to government, to run the government. Now, that may reflect on the dissatisfaction with the Democratic Party of Japan, which was governing, the one you just described.

Or maybe the polling is wrong, or some other reason. But she asks, how do you reconcile the construction sheet? This makes it very specific. But it's a general question, as well. In her specific question, how do you reconcile the construction of the [JAPANESE] nuclear power plant, the largest in the world? How do you reconcile that with the increasing lack of public support for nuclear power in Japan?

**TATSUJIRO**

Well, the first is economic reason, that TEPCO is responsible for all the compensations and the payments for the reconstruction-- I mean, the decommissioning. In order to pay, TEPCO was supposed to generate the income. And nuclear power plant is necessary for generating income. That was their idea.

**SUZUKI:**

Is that true? I don't know. But that's the official explanation to start up the [JAPANESE]. But it is probably-- Daniel is more of an expert on this. But the local community actually supported the nuclear power because of the job unemployment and the economy development. That's still the case, because the law to provide that so-called [JAPANESE], which is the supplementary budget to support the local community, to host the nuclear power plant-- still there.

Actually, they continued to extend that kind of law. So the local community depend on the operation of nuclear power plants, despite the fact that all the nationwide public opinion polls are against nuclear power. If you go to the polling, near the site, still in favor of nuclear power plants.

**DICK SAMUELS:** So that explains the specific of a particular siting.

**TATSUJIRO**

Right.

**SUZUKI:**

**DICK SAMUELS:** But what about returning the [JAPANESE]-- the LDP to power after the-- within one

year after the catastrophe, when the general public's idea about nuclear power had shifted so dramatically?

**TATSUJIRO**

I think that you have a better answer than me in that question. Your book, *3.11*, actually was very accurate in predicting Japan would not change, that would happen. So you should explain.

**SUZUKI:**

**DICK SAMUELS:** Let me deflect that possibility and go to Daniel, also a political scientist. Do you have a sense of the answer to that, Daniel?

Polled opinion in Japan is one thing. Actual behavior in the polling place is different. What's up?

**DANIEL**

**ALDRICH:**

Yeah, and this is the age old-- you know, James White was my advisor as an undergraduate. And he always loved to say that this is the best situation to write why no one else wins against the LDP even if everyone hates the LDP. I think there's a lot of things going on. One is a lack of experience from the alternatives to the LDP.

People that I've talked to simply don't trust them to run the government, especially during a crisis. And I think that was one of the things that people told me over and over again was that when you had something really bad happening, they wanted the LDP-- as much as they disliked them-- back in power.

I also think it's easy for them to separate out that, let's say nuclear power as an abstract-- if you live in Tokyo, where one third of the Japanese people in the world do, then [JAPANESE] or all the other-- [JAPANESE], all the other communities-- are really peripheral. They're literally peripheral. They're thousands of miles away from you. You don't really see them. You don't hear about them.

And Fukushima was the first time the externality as the actual costs of nuclear power to communities became clear. Right that was really the first time. So I think the challenge is connecting people's voting behavior to this disaster is really going to be a challenge for anti-nuclear groups.

**DICK SAMUELS:** Thanks. Here's a question from [JAPANESE]. And she asks-- first of all, she thanks all three of you speakers for your presentations. And there's an exclamation point after that. And I want to second that sentiment.

And she asked for Miho, she said, you asked people to connect with women and children in Tohoku online. Are you aware of any projects or methods to do this? And for Daniel, she says, I know your work focuses on natural disasters. But do you think there are lessons Americans could draw from your work around the shock of the 1/6/21 insurrection of the US capitol and growing polarization across the country? Two great questions. Why don't we start with Miho?

**MIHO**

Yes, I would love to connect with the person who asked the question so that I can

**MAZEREEUW:**

share some information and make some connections. If there is-- you can email me at risk@mit. Then I can put you in touch, as well.

**DICK SAMUELS:** Great.

**DANIEL**

And the question about the insurrection is an incredibly important one, I think

**ALDRICH:**

especially for those of us who worry about the future of our democracy or the undermining of our democracy over time. I think it understands two things. One is how polarized we are, how divided we are in so many ways. We often think about ourselves as one nation. But voting patterns and a lot of other evidence shows we're kind of two nations-- different news sources, different types of jobs, different mobility.

And there's a bicoastal, just a few small cities, versus the rest of America. And I think that should be a real concern for all of us. And part of the good news, I guess, is that because social ties can be built-- we can deliberately build them. And I've seen this in my own community here in Boston, for example. People knocking on doors, slipping notes under doors. Do you need toilet paper? Or do you need-- do you need help or want someone to talk to? Here's a phone number for someone who doesn't have access to Facebook or whatever else.

I think there are ways we can think about this in a deliberate manner. But I think part of this has to start with recognition. We do take, I think, the social infrastructure in our lives for granted until it crumbles, and we see these huge divides. And at those moments, we really feel powerless, because it's almost too late. To fix that challenge, we have to go to the next one.

So yes, I think the insurrection is a really negative example, a powerful one, of when

we have split internally and simply do not talk to each other directly.

**DICK SAMUELS:** Well, we are almost out of time. But I'm going to sneak in one last question from my esteemed colleague here at the Center and the Security Studies program, Jim Walsh, who asks-- and whoever wants to take it can-- he says, what time frame are people talking about in terms of the two different issues? One is resolving issues with nuclear facilities and the second is recovery by the population. And he says, I presume those are different time frames. But I'm curious about your estimates for both.

Put another way, he says, what will we be talking about 10 years hence when we reconvene? It's the perfect way to end. But let's hear what you have to say.

**TATSUJIRO**

I think the decommissioning of Fukushima Daiichi is closely related to the

**SUZUKI:**

reconstruction. You cannot separate. The government, of course-- the local government and both central government-- wants to reconstruct the area first. And already people are returning, allowing the people to return to the area.

But unfortunately, the people are coming back very slowly because they are concerned still about the safety of the decommissioning of the Fukushima. So I think it is closely connected. Unless you have a trust in a decommissioning process, people will not come back soon.

**DICK SAMUELS:** Daniel or Miho, do you want to add anything to that?

**DANIEL**

Just really quickly I would say, yeah, the time frame for the technical aspects of

**ALDRICH:**

decommissioning probably is decades, 40 to 50 years, which means, of course, that nuclear power will be part of Fukushima prefecture, even though the prefecture itself isn't using nuclear power anymore. But the visitors staying at the hotels, people coming to the restaurants, most of the work that can be done on storage of spent fuel or spent waste, will be around this industry, which is sort of the cruel irony for Fukushima.

In my mind, honestly, for some people a recovery-- if that means returning to normal rhythms again or to hometowns-- will not be happening, I think. Places like Futaba, we just mentioned, the 2% or 3% population-- re-population rate right now, with 97% of people moving away, I think that's going to be hard to see. I think the

new Japan will be one where we will have this long term diaspora out of Fukushima. It's certainly a lack of trust in many ways in the the central government's claims about nuclear power.

And I think now with COVID we're seeing, as well, that can spill over to other areas. We need trust in society. We don't want Fukushima to be the last time that we had that moment of trust.

**MIHO**

I think I'll answer the last part of that question of what are we going to be seeing in 10 years. So I think unless we find a way to really inject economy into the area that we are going to see a lot-- there is already a lot of depopulation. But I think we will be facing a different kind of disaster looking at this region where there has been so much money invested in rebuilding.

And so hopefully we don't see that in 10 years and there's a way to inject more economic sources into that region.

**DICK SAMUELS:** Well, you want to end on a more upbeat note than I think we're ending. In fact, I'll make it worse. I have a note to myself, just something I ran across, which was a TEPCO claim, the Tokyo Electric Power says that the decommissioning of the Fukushima Daiichi plant, including the disposal of contaminated water, could take until 2051.

So I only invoke that now because Jim asked the question about time, time frames. 2051 is a long time from now. And a long time from the event. And in fact, 40 years from the event. And one hopes that they're wrong about how long it takes. And one hopes that we're all wrong about being as pessimistic as we sound.

Thanks, everyone, really. Thanks so much. This was a wonderful memorialization of the event and retrospective on what happened. And the analysis was first rate. And I'm very grateful to you. I'm grateful to Laura Kerwin and to Michelle English for working behind the scenes, and of course to Christine Pilcavage for stimulating this thing early on back last fall. She said, what are we going to do about 3.11? The 10th anniversary is coming up. And she put this in gear.

So thanks to everyone. And thanks to you all for coming. Bye bye now.

**DANIEL**

Thanks so much.

**ALDRICH:**

**MIHO** Thank you.

**MAZEREEUW:**

[MUSIC PLAYING]