

JICA's WORLD

The Magazine of the Japan International Cooperation Agency | www.jica.go.jp/english | January 2018 Vol.10 • No.1



Disaster Risk Reduction

Building a Foundation for Our Future



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Japan has learned through hard experience the importance of investing in disaster preparedness, and it is using those lessons to help other countries. Japan experiences 20% of the earthquakes of magnitude 6 and higher that occur in the world, and it is exposed to uncountable natural disasters like typhoons and active volcanoes. Japan thus has a long history of awareness of the importance of disaster risk reduction. Today, it is one of the few countries in the world where proactive disaster risk reduction measures are widespread. Japan's history shows that disaster risk reduction must become a cultural norm in society to minimize disaster-related damage.

The culture of disaster risk reduction greatly varies by country. In the southern United States, which is hit frequently by hurricanes, people often buy insurance to be able to move or rebuild houses damaged by a disaster. This approach is simple, but it results in a big disparity in disaster impact, leaving those who cannot buy insurance vulnerable. Moreover, insurance itself cannot reduce damage caused by a disaster.

The perception of disasters also differs in temperate/tropical countries like those in Asia, where typhoons and cyclones occur frequently, and Europe or North America, where natural disasters are relatively few. Europe mainly experiences floods and forest fires, and the scale of destruction affecting the infrastructure is significantly smaller than that of large earthquakes and typhoons that can damage vast areas several times a year. With its experience with frequent, diverse natural disasters, Japan can understand the viewpoint of disaster-prone developing countries.

For example, while Southeast Asia is often affected by tropical cyclones, Africa is more often hit by droughts than by water-related disasters. Planning appropriate projects using the knowledge of each region is necessary to improve the disaster risk reduction capacity of each country. Japan has earned the world's trust for their assistance with international disaster risk reduction efforts.

Japan applies its accumulated knowledge in cooperation with developing countries to help train personnel and develop research in this area. It will ultimately lead to spread a culture of disaster risk reduction and economic growth in the affected countries.

The international community shares the view that disaster risk reduction is indispensable for sustainable development. Since 1994, the UN World Conference on Disaster Risk Reduc-

tion has been held every ten years to discuss policies related to disaster risk reduction.

The first session in 1994 adopted the Yokohama Strategy, composed of ten principles designed to make a safer world. The second session in 2005 identified five priorities for action as part of the Hyogo Framework for Action, to build disaster-resilient communities. And in 2015, the Sendai Framework for Disaster Risk Reduction set seven global targets in coordination with the Sustainable Development Goals (SDGs). It also identified 38 indicators to measure the progress of implementation of these seven global targets. Member countries are now working on disaster risk reduction measures as 2030, the target year for the fulfillment of the goals, approaches.

Because disaster risk reduction initiatives are slow to produce results, it can be difficult to obtain the public budget they require. The adoption of the Sendai Framework for Disaster Risk Reduction, which promotes the importance of investing in disaster risk reduction, can encourage the allocation of national and international budgets for disaster risk reduction in developing countries.

Some criticise that Japan, as a rich developed country, can implement disaster risk reduction measures that are unavailable to poorer countries. However, this is not entirely correct. Until the end of the Second World War, Japan's national budget was mainly spent on war, and other fields including disaster risk reduction were neglected. This led to severe damage caused by numerous typhoons and floods after the war. Foreseeing that disaster risk reduction would be key to post-war reconstruction, Japan began to allocate a fixed amount of its limited national budget to disaster risk reduction measures to minimize the damage caused by large typhoons and floods. Such efforts later led to Japan's economic growth, demonstrating that disaster risk reduction is an investment for growth. Investing in disaster risk reduction for growth, instead of considering it an expenditure, is the essence of the Sendai Framework for Disaster Risk Reduction.

Large earthquakes of magnitude 8.1 and 7.1 occurred in Mexico in September of 2017, reminding us again of the horror of disasters. However, severe damage can be prevented by learning from past disasters and preparing for the future. It is essential to cooperate with other countries and develop a new culture of disaster risk reduction to make a better world.

Sendai Framework for Disaster Risk Reduction (2015)

Seven global targets

- A. Substantially reduce disaster mortality
- B. Substantially reduce the number of affected people
- C. Reduce direct economic loss
- D. Reduce disaster damage to critical infrastructure and basic services
- E. Develop national and local disaster risk reduction strategies
- F. Substantially enhance international cooperation
- G. Improve access to early warning systems and disaster risk information



Priorities for action

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction to increase resilience
4. Enhancing disaster preparedness for effective emergency response and better recovery, rehabilitation, and reconstruction (Build Back Better)

Making a Fresh Start toward a Safer Society



Brazilian project members participated in a month-long disaster risk reduction training session held in Japan in 2017. They visited the construction site of a sabo dam in Nara Prefecture.

In Brazil, sheer population density leads too many people in urban areas to build their homes on or near unstable hillsides, despite their vulnerability to landslides. These construction practices led to numerous casualties when a landslide occurred in 2011. To prevent similar tragedies in the future, the country's government is now urgently prioritizing the development of strategies to prevent disasters and to secure a safer living environment for its people.



Site affected by a landslide in 2011 (Nova Friburgo)

REGULAR MEETINGS HELP AGENCIES COLLABORATE AND BUILD CONSENSUS

In January of 2011, Brazil's state of Rio de Janeiro suffered an enormous sediment-related disaster. It caused over 800 deaths and left 400 people missing. It also destroyed the homes of approximately 20,000 people, turning out to be the worst natural disaster in Brazil's history.

"The rainstorm started suddenly and reached its heaviest around 4 a.m. It was still completely dark," reflects João Mori, who was then the chief firefighter of Nova Friburgo City, which is located in the region that was severely struck by the disaster. Nova Friburgo City is hilly and mountainous, and a landslide occurred on hillsides because of the rainstorm, causing heavy casualties. "Back then, we did not have any system for predicting landslides or warning against them," Mori says. "No one could predict that such a serious disaster would happen."

In response, the government of Brazil announced a policy to strengthen its disaster risk-management system. In December of 2011, to reinforce the country's capacity to predict and monitor rainfall, the government established the National Center for Monitoring and Early Warning of Natural Disasters (CEMADEN) within the Ministry of Science Technology, Innovations and Communications. In 2012, Brazil also set up the National Center for Risk and Disaster Management (CENAD) within the Ministry of National Integration to address disaster risk evaluation and disaster response. However, despite the establishment of these centers, the country still faced numerous problems, such as lack of infrastructure to prevent disasters, urban development plans that did not take disaster risks into consideration, and, most of all, no risk map to identify vulnerable spots. The Brazilian government requested Japan's cooperation to help improve these shortcomings. In 2013, a

four-year disaster risk reduction (DRR) project was launched.

"This is such a huge project. It's like running several technical cooperation projects at the same time," says Toshiya Takeshi from Japan's Ministry of Land, Infrastructure, Transport and Tourism. He is an expert who worked on the project as Chief Advisor for two years, starting from its launch. One major feature of this project is that it covers a broad range of fields: risk mapping, urban planning, prevention and rehabilitation, as well as prediction and warning. The project's aim is to make manuals for each respective field and to conduct pilot projects based on those manuals. Another unique aspect of the project is that it involves many different agencies, including four ministries of the Brazilian federal government (Ministry of Cities, Ministry of National Integration, Ministry of Science Technology, Innovations and Communications, and Ministry of Mines and Energy), and the governments of two states and three cities where the pilot projects are to be conducted.

"Since Brazil is a federal state, state and municipal governments have almost the same authority as does the federal government. So they used to issue warnings and predictions separately, and I found this system to be quite complicated," says Takeshi. "This is why I put special emphasis on reinforcement of cooperation across agencies and fields."

As part of this effort, Takeshi organized weekly liaison meetings where lead staff from federal agencies in each field could meet up. When conducting the meetings, Takeshi was careful not to push Japa-



Takeshi visiting a landslide site (Petropolis)

Disaster Risk Reduction : BRAZIL

Left: Weekly liaison meeting with members from four federal ministries

Right: After a lecture at the Nara Prefectural Office, trainees received a message of encouragement from Vice Governor Hiroshi Murai (center).



nese methods, but to find ways that best catered to local needs. He carefully considered pros and cons of both Japanese and Brazilian ways. “Instead of just introducing methods that were successful in Japan, I explained how Japan had tackled challenges that are similar to what Brazil faces now, highlighting Japan’s experiences and processes,” he explains.

Even the name of the project is an important example of this. Takeshi says that referring to the project as a ‘JICA project’ led some Brazilian staff members to perceive it as a Japan-initiated project, and to feel as if it were something external. “I encouraged the members to give a nickname to the project, and we decided to call it GIDES, an acronym for Comprehensive Sediment Disaster Management in Portuguese,” he says. “I felt that this name generated a sense of ownership over the project among the staff members.” The project members also held technical meetings organized by field once every two or three months, inviting not only federal government officials, but also officials of state and municipal authorities, as well as experts and researchers from the academia. As a result of these liaison meetings, cooperation across agencies became more intense, and in some meetings, federal government staff members even took the lead. Marcel Sant’Ana, an officer of the National Secretariat for Urban De-

velopment under the Ministry of Cities, says, “Since there was no opportunity for us, members of four different ministries, to collaborate together, we did not know how other ministries processed their work or what technologies they used. Now we clearly know the role of each agency and are able to consider measures based on that knowledge.” He adds, “It’s a great advancement.”

SHARING JAPAN’S EXPERIENCES AND EFFORTS FOR DISASTER RISK REDUCTION

The Brazilian project members also had an opportunity to participate in training courses on DRR held in Japan. The majority of trainees say they found them beneficial. In July and August of 2017, nine staff members in charge of disaster prediction and warning at federal, state, and municipal governments took part in a hands-on training course held in Nara Prefecture, which in 2011 experienced several catastrophic landslides caused by a rainstorm. The trainees first received a briefing on measures against sediment-related disasters developed by Nara Prefecture. When one of the trainees asked how they evacuated local residents, the lecturer explained various approaches, such as collaboration between the prefecture and local meteorological observatory to issue a sediment disaster alert, which municipal governments then used to issue evacuation advisories and orders. The lecturer also explained that sirens have been installed in spots that are vulnerable to disasters.

Then, the group visited actual sites where disaster control measures had been taken. Upon visiting a site where a sabo dam, which is a debris dam that is used to reduce the impact of debris torrents in mountain areas, was installed to prevent a mudslide from hitting a nearby retirement home, Jackson Laurindo, an official of Santa Catarina State government raised a question. He asked about costs – which is more cost-effective, to build a sabo dam or to relocate the retirement home? “In Brazil, we tend to pay more attention to costs when considering measures. But the Japanese said, ‘We determined that relocation of the retirement home is not feasible because many of its residents need nursing care.’ I learned something from this Japanese way: They also take into account social factors when deciding on measures.”

Wesley Felinto, leader of the group, reflects on



Staff members of the Company Research of Mineral Resources and Blumenau City learn about risk mapping from an expert.

the month-long training saying, “In Brazil, up to now, we’d put more emphasis on measures to respond to disasters that already happened, but I realized that we also need to focus more on preparation and prevention, as is the case in Japan. I also learned about intangible measures such as DRR education and reinforcement of local communities. I think that such measures can be adopted in Brazil, even with limited financial resources.”

PRACTICAL MANUALS STRENGTHEN DISASTER PREVENTION MEASURES

Now, field-specific manuals have been created and pilot projects conducted in three cities: Nova Friburgo, Petropolis, and Blumenau. In the risk-mapping pilot project, the project team used drones to obtain topographical data in some regions where such data were scarce or unavailable. Jorge Pimentel, an official in charge of risk mapping at the Company Research of Mineral Resources, an organization under the Ministry of Mines and Energy, says, “By adopting Japan’s approaches to our original mapping methods, we are now able to indicate spots that are vulnerable to specific risks, such as steep slope failure, landslides, debris flows, or rockfalls.”

Urban planning efforts often go hand-in-hand with prevention and rehabilitation projects. Participants discussed how to safely zone urban areas. They used the risk maps made by the risk-mapping team to formulate urban development plans that avoid locating residential zones in vulnerable spots. When there was no other way to avoid such spots, they took a “hardware” approach to ensure safety, such as the construction of protective structures. Paulo Falcão, an official in charge of prevention and rehabilitation at the National Secretariat for Protection and Civil Defense under the Ministry of National Integration says, “In Brazil, many people live in areas that are highly vulnerable to landslides, including slums called ‘favela’. Those slums are so vast that the relocation of residents would be quite difficult. So we need to build structures to address the risk. As we had almost no experience in constructing structures that protect against debris flows, it was beneficial for us to learn about efficient methods from Japanese experts.”

Officials working in the field of prediction and warning reviewed their emergency response plans to determine the best timing, routes and places for smooth evacuation of residents. They are also working to strengthen ‘vertical’ cooperation. For example, CENAD now forwards early warnings issued by CEMADEN to relevant municipal authorities, who then call for evacuation of residents. Akinori Naruto, an expert dispatched from Nara’s prefectural government to take charge of pilot projects, explains a challenge he faces. “Federal government and municipal authorities need to discuss issues related to manuals with each other. But since the country is so vast, it’s not easy to set up meetings,” he says. “So whenever I find a problem, I do my best to share it with concerned parties as soon as possible so that we can schedule a federal government visit to the municipal authority efficiently, based on the project’s timeframe.”



Yamakoshi (right) and Naruto (center) discuss the outbreak mechanism of debris flows.

“JOY AND HAPPINESS IN TEN YEARS’ TIME”

“What has become most important now is to establish a system that allows Brazilian staff members to modify the manuals they have made in this project on a long-term basis, so that they can cater to the actual needs of the country,” says Takao Yamakoshi, an expert who replaced Takeshi as Chief Advisor in 2015.

Takeshi, who has completed his two-year term as Chief Advisor, made a promise to one of his Brazilian co-workers right before going back to Japan. The co-worker is Yuri Giustina, the Director of the National Secretariat for Urban Development under the Ministry of Cities, and one of the original members of this project. As the leader of the team and a coordinator of the entire project, he could reasonably be called the “front-man of GIDES.”

Giustina says, “I remember the time when I invited the experts to my house. I always have my guests write their wishes in my notebook, and Mr. Takeshi wrote his. It says, ‘May our efforts bring joy and happiness to Brazil in 10 years’ time.’”

Giustina himself left his position in July of 2017, and he is not directly involved in the project now, but he is still as passionate and enthusiastic about the future of disaster mitigation and prevention as ever, with a desire to live up to Takeshi’s promise. “In light of the current economic situation in Brazil, we need to make efficient investments, with clear understanding of the needs of the target regions. The GIDES project terminates in 2017, and our next goal is to strategically disperse what we have learned in this project to all the cities that have disaster risks.”

Brazil has overcome disasters in the past and it is about to make a fresh start. The teammates, both Brazilian and Japanese, shared joys and sorrows throughout this project. They will meet again someday and share the delight of further success.



Takeshi and Giustina discuss disaster risk management.
(photo by Atsushi Shibuya, 2014)

Creating a Typhoon-Resilient Aquaculture Industry



Submersible fish cage introduced in the Philippines. Tied with ropes, the fish cage is designed to float and sink.

On November 8, 2013, Super Typhoon Yolanda hit the central Philippines. Tides as high as six meters swept into urban areas, leaving devastating damage. Disaster-hit Filipino regions are working to build communities that can avert future disasters and to restore aquaculture, the basis of the local industry. Seeing a need they can relate to, Japanese communities hit by the 2011 Great East Japan Earthquake, along with fishnet makers from Hiroshima Prefecture, are helping to rebuild the battered Filipino regions.

LEARNING SELF-RELIANCE FROM THE EXPERIENCES OF HIGASHI-MATSUSHIMA

On November 8, 2013, Super Typhoon Yolanda (internationally known as Haiyan) struck four Filipino islands including Leyte and Samar. According to the Japan Meteorological Agency, the typhoon had record winds with gusts of up to 90 meters per second. Its power was described as unprecedented. In the central Philippines alone, the number of dead and missing reached 7,986 people. Approximately 1.14 million houses were damaged. Immediately, Japan provided large-scale emergency assistance. In February of the following year, JICA started a project on rehabilitation and recovery from Typhoon Yolanda in 18 municipalities in coastal regions including Tacloban City, which was severely damaged. With the aim of building disaster-resilient communities,

that work entailed formulating rebuilding plans, refurbishing public facilities, and supporting efforts for the recovery of the livelihood of the people.

Using hazard maps that the project produced, land-use plans and evacuation plans were made for areas severely affected by high tides, including Tacloban City and the towns of Tanauan and Palo. These plans addressed the relocation of residents living within 40 meters from the coastline and indicated evacuation locations and routes.

In making those plans, JICA was guided by the experience of Higashi-Matsushima, a city in Japan's Miyagi Prefecture that was devastated in 2011 by the Great East Japan Earthquake. The Philippines' officials in charge of rebuilding, such as municipal officers in charge of disaster risk reduction management and planning, had previously visited Higashi-Matsushima four times to learn about relocating people, planning for rebuilding, and promoting disaster reduction measures.

In particular, Ildebrando Bernadas, an officer in charge of disaster reduction in Tacloban City, introduced a series of disaster mitigation measures based on what he had learned from Higashi-Matsuyama's experience. The measures include evacuation planning, early warning systems, and strategic storage of disaster relief supplies and lifesaving boats. Although Tacloban City is a large port serving trade cargo and large vessels, the city remained isolated from all outside help for three days following Typhoon Yolanda. From this experience, Bernadas and then-mayor Alfred Romualdez stress the importance of having the



Areas affected by Typhoon Yolanda

capacity to survive for at least three days without any outside help. In order not to depend solely on the government or military assistance, they have introduced action plans with timelines, in which the roles of the mayor and each city bureau during and after a disaster are described in chronological order, based on the Japanese model.

DISASTER MITIGATION WITH SUBMERSIBLE FISH CAGES: A SENSE OF MUTUAL HELP IS ALSO KEY

In 2014, in an effort to support the rehabilitation and recovery of local residents' means of livelihood, JICA began implementing projects that were aimed at promoting the cultivation of oysters and milkfish, popular seafood for many Filipinos. These projects incorporate special measures to help local residents prepare for disasters of the same magnitude as Typhoon Yolanda. Specifically, a new approach for milkfish cultivation is the use of submersible fish cages. This type of fish cage was developed first by Nitto Seimo Co., Ltd., a fishnet company in Fukuyama City, Hiroshima Prefecture. The cage submerges and resurfaces easily using a technology originally developed for pacific bluefin tuna cultivation in typhoon-prone Japan. By lowering itself as the typhoon approaches, the cage becomes less vulnerable to the effects of waves. Apart from the JICA project, in September 2013, Nitto Seimo had set up submersible fish cages for its own business in Palawan Island in the Philippines. The cages remained intact despite the fierce waves of Typhoon Yolanda. Fukuyama is a sister city of Tacloban, so it was only natural for Nitto Seimo to join in this project aimed at rehabilitating the aquaculture industry.

Takashi Hosokawa, who works in the Net Research and Development Section of the Technical Department at Nitto Seimo's Hakodate factory, reflects on the work. "If we had imported parts and materials from Japan for the submersible fish cages, costs would have been higher," he said. "That's why we started by doing field research and product development. That way, we were able to make the cages using locally available materials."

In addition to using local building materials for the compressors that submerge the fish cages, the project uses devices that are compatible with the fishing boat engines which are already familiar to local fishermen. This work culminated in October of 2014 when a total of 40 remodeled cages were set up in four disaster-stricken villages. Two months later, Typhoon Ruby (internationally known as Hagupit) with an equivalent power of Typhoon Yolanda approached the Philippines, again causing high waves. Despite the storm, every submersible fish cage was safe and undamaged while nearly all the conventional fish preserves made of bamboo and metal were destroyed.

Since 2015, as part of JICA's efforts to support small- and medium-sized Japanese companies doing business in developing countries in order to promote economic development, Nitto Seimo has been attempting, with the help of JICA, to further spread submersible fish cages across the Philippines. The company guides local businesses not only in how to operate and maintain the fish cages, but also on

management issues related to the aquaculture industry, for example, on how much revenue to allocate to purchase fry and bait for the next fishing season. Now, as envisioned, some locals are successfully making a living in aquaculture. Hosokawa proudly recounts, "In a town called Guiuan, the whole community began to flourish thanks to the fisheries business with the fish cage as its basis. Local women got involved in processing fish raised in the cages, and they also raised young fish."

Similarly, Philippine oyster cultivation is supported by the city of Higashi-Matsushima, where the industry thrives. The city has hosted trainees from the Philippines at its aquaculture sites and processing facilities. In some cases, local fishers acted as instructors to share knowledge of how best to cultivate oysters. Advising their Filipino counterparts involved in aquaculture, the Japanese fishers talked about selecting suitable locations for cultivation, different kinds of quality oyster spats, and improvements such as how to attach as many spats as possible on the ropes. Thanks to these efforts, large oysters are now being cultivated in the field and are sold to local restaurants in the Philippines. In addition to raw oysters, cheese and smoked oysters have become popular items on local restaurants' menus. Atsutoshi Hirabayashi, JICA's senior advisor, says, "In the process of building a value chain from production to processing to sales in the community, a sense of mutual cooperation has been strengthened among the local residents. Such collaboration helps people recover from a disaster in a sustainable way." He adds, "Mutual help is essential in building a community that is well prepared for natural disasters."

Although JICA's project on rehabilitation and recovery from Typhoon Yolanda officially ended in February of 2017, the city of Higashi-Matsushima continues its commitment to oyster cultivation in the Philippines through a grassroots cooperation initiative with an NPO based in Ishinomaki City, another city in Miyagi Prefecture that was devastated by the 2011 Great East Japan Earthquake. This initiative is part of The JICA Partnership Program, which aims to support local communities in developing countries.

Tacloban City and the surrounding areas are now experiencing post-disaster economic recovery with domestic investment flowing in from across the country for hotel construction and other related support. However, the wounds of the people are not entirely healed, and their livelihoods are yet to fully recover. With these goals as guidance, rebuilding efforts in the Philippines continue to move ahead in partnership with Japanese companies and the city of Higashi-Matsushima.



Using the experience of Higashi-Matsushima as reference, local Filipino residents in the disaster-stricken area check to see if evacuation routes are free of obstacles.

Left: Evacuation center during Typhoon Ruby. Lessons learned from Typhoon Yolanda allowed better management of the evacuation center.

Right: Meeting convened for Typhoon Ruby. Alfred Romualdez, mayor at that time, is in the right-hand corner in a red shirt. To his left, with folded arms, is Bernadas.





Sri Lanka



Lessons from Japan for a Safer Sri Lanka

SLOW RESPONSE TO FLOOD AND LANDSLIDE DAMAGE MORE THAN ONE MILLION VICTIMS

In Sri Lanka, more than 20 million people live on the Island of Ceylon. The northern area of Ceylon is a plain and the central and southern areas are mountainous. The climates are completely different, too: The north is dry and the south is humid. The living environments are also distinct. Agriculture relies on the once-yearly rainy season and reservoirs in the north and double cropping in the south, thanks to abundant water. Disasters on the island represent those local characteristics: floods, landslides and droughts.

The most frequent disasters are floods and landslides, which affect the largest number of people. Of all the disasters in the past 10 years, 37% have been floods, and 35% of deaths and missing persons were due to landslides caused by rain. The scale of flood damage, which frequently affects urban areas, is becoming larger each year. At the same time, landslides occur more in rural areas, taking human lives.

The last few years have seen repeated floods. In December of 2014, there were 31 dead or missing, with 1.03 million persons affected overall; May 2016 saw 217 dead or missing, with 460,000 persons affected; and in 2017, there were 290 dead or missing, with 600,000 persons affected. Although aware of the disaster risks, the government of Sri Lanka took measures only after the disasters had occurred. The National Council for Disaster Management and the Disaster Management Act were developed after the 2004 Sumatra Earthquake, which killed 220,000 people in Asian countries including Sri Lanka. However, the establishment of a culture of disaster risk reduction still has a long way to go.

Japan provided various kinds of support when Sri Lanka was stricken. In response to the damage caused by the heavy rains that continued for two months in April and May of 2017, Japan provided emergency relief goods and dispatched Japan Disaster Relief team of experts for local surveying. Based on the surveyors' results, Japan made suggestions to the Sri Lankan government and administrative organizations, including the Executive Office of the President, concerning mid-to-long term measures as well



Bird's eye view of the area affected by the flood in May of 2016. Water covers part of the road.

as short-term ones. Takayuki Nagai, a JICA expert and a Disaster Risk Reduction Advisor for Sri Lanka, says, "Full cooperation, including Air Force helicopters, was provided for the survey."

INITIATIVE WITH A LONG-TERM PERSPECTIVE TO MAKE THE NATION SAFER

Like Sri Lanka, Japan has also experienced damage from floods caused by typhoons. JICA decided to draw on Japan's accumulated experience with disaster risk reduction to try to reduce the impact of disasters in Sri Lanka and make the country safer. To do so, JICA helped develop a national initiative for disaster risk reduction called "the Roadmap for Disaster Risk Reduction" to suggest measures that Sri Lanka should take.

The initiative was motivated by the heavy rains in May of 2016, which caused floods and landslides. Japan provided emergency-relief goods for that disaster as well, and, as a result of discussions with the minister and government officials in charge of disaster risk reduction, all parties realized the importance of funding for disasters, development of mid-to-long-term policies, and mainstreaming of disaster risk reduction. Special priority was given to the idea encapsulated by the phrase "build back better." The Sri Lankan government was highly motivated by the philosophy of rebuilding a safer community and one that was more resistant to disasters instead of reconstructing the same one as before. The idea of supporting social development was the seed for the development of a specific plan.

In addition to JICA members and consultants, Ambassador Kenichi Suganuma, who was Japan's representative at the UN World Conference on Disaster Risk Reduction in Sendai in 2015, participated in the development of the Roadmap. From the Sri Lankan side, a diverse group of people participated in the project, including specialists in disaster management, national land management officers from the Ministry of Irrigation and Water Resources, and members of the Department of National Planning.

JICA expert Nagai says, "To aid continuous progress and maintain economic growth in Sri Lanka, where natural disasters occur frequently, it is neces-

sary to reduce disaster risks in every sector." He says that this philosophy, based on the idea of "build back better," seems to be embraced by more Sri Lankans at each conference. The approach of preventing new risks follows guidelines laid out in the Sendai Framework for Disaster Risk Reduction. They include investing actively in the disaster risk reduction sector, aiming to reduce the damage caused by disasters, researching disaster risk in each area, and preventing the construction of residences and industrial estates in areas with inundation risks. These concepts all fall under the idea of positive investment in disaster risk reduction, laid out in the Roadmap for Disaster Risk Reduction, which incorporates the goals of promoting a disaster risk reduction plan in areas prone to floods, landslides, and droughts; constructing an early warning system; and establishing water resource management that includes disaster risk reduction as well as water utilization. The disaster risk reduction plan aims to develop a plan for wide-area water supply for each river basin, promote large-scale land use and infrastructure improvements at the national and state levels, and take risks into consideration at the municipal level. The ultimate goal is to create a society that is multilaterally resistant to disasters.

Based on the Roadmap for Disaster Risk Reduction, Japan is considering mid-to-long-term support for Sri Lanka. The Sri Lankan government itself intends to reflect the recommended contents of the Roadmap in the 5-year national disaster risk reduction plan covering the period from 2018 to 2023. International organizations including the World Bank are also showing interest in the Roadmap, and there have been many international inquiries about Japan's experience with disaster measures and support know-how. "I think that Sri Lanka's disaster risk reduction system is gradually improving, thanks in part to Japan's support," says Nagai. "As the proper people in Sri Lanka are now enthusiastic about disaster risk reduction, we expect further strengthening of the disaster risk reduction system."

Nagai is currently focused on increasing disaster awareness and active participation by the general public instead of the government. He says, "Natural phenomena vary depending on the area, and it is impossible to discuss these matters in a general way." He emphasizes, "What works, in the end, is the power of local residents." Establishing a culture of disaster risk reduction and building a country resistant to disasters are vital steps to ensuring further prosperity for Sri Lanka.



Floods and landslides are exacting a great economic and human toll in Sri Lanka. The disasters occur because of the land's abundant water.

When Nagai was dispatched to Sri Lanka in July 2017, Minister Yapa himself organized a meeting to discuss technical support.



A road that withstands disasters

Nepal is a landlocked country located between India and China. The country is dependent on importing various goods, mostly from India, which are transported by vehicles. The Terai plain, which lies near the border with India, is the country's center of agriculture. The route from the capital city Katmandu through the Terai region to India is a life-line for Nepal. However, there was only one road connecting these areas in the past. A road closure due to landslides or other disasters caused serious problems, as it shut down logistics completely.

The JICA-assisted construction of the 158-km Sindhuli Road as an alternative road to be used if the existing road was damaged and became unusable began in 1995. The new road was completed in 2015, its construction overcoming various obstacles such as land- and mudslides.

The Sindhuli Road demonstrated its value when a large earthquake hit Nepal in the month following its completion. The Sindhuli Road became the main road for transporting goods to the areas hit by the earthquake. The project was recognized not only in Nepal but also in Japan, where in 2016 it received an Outstanding Civil Engineering Achievement Award. JICA also undertook a technical cooperation project to improve the road maintenance capacity for disaster risk reduction. Japan continues to work to improve infrastructure to mitigate damage caused by disasters.



Japanese companies tackle the technically difficult maintenance of mountainous roads using cutting-edge technology.



Small shops beside the Sindhuli Road are evidence that logistics sustain people's livelihoods.



Building disaster-resilient infrastructure



Primary schools as shelter, protecting people from cyclones



The ground floor is designed so that water can easily drain during a storm surge. The local community can evacuate to the second floor and to the rooftop.

The school building is designed so that it can accommodate an increase in the number of students and improve their study environment.

Cyclones form in the Bay of Bengal between Southeast Asia and the Indian sub-continent. In April of 2008, the massive Cyclone Nargis hit Myanmar, which was one of the poorest countries in the world at that time. The country was run by a military regime, and disaster risk reduction measures were not sufficient. The damage caused by the cyclone was among the worst in the history of Myanmar, and the number of dead and missing totaled 140,000.

A follow-up survey after the cyclone revealed that there were no cyclone shelters in the region. Primary schools destroyed by the cyclone remained unrepaired. Therefore, it seemed logical to build a primary school that could double as a cyclone shelter for the community.

The Ayeyarwady region is a delta area which suffers from floods and storm surges during the monsoon season. Therefore, the building of the new primary schools has been designed to withstand various disasters, and the ground floor has been designed to quickly drain water if it becomes inundated during a flood.

The Ayeyarwady delta region is fertile and suitable for agriculture. The people there, supported by JICA, are taking various steps to build a resilient society, including planting mangrove trees for the windproof protection they provide against high tides.

Thailand



Safer design for daily transportation

Bangkok's traffic congestion has worsened dramatically with the city's economic growth. The increasing traffic congestion requires urgent improvement, as it is not only inconvenient but also creates dangerous air pollution.

To alleviate this problem, an underground system, the Mass Rapid Transit (MRT) Blue Line, was developed in cooperation with JICA. The main purpose of the system is to improve Bangkok residents' living conditions and convenience. At the same time, this underground system is designed to be disaster-resilient. For example, Bangkok's underground stations are more spacious than those in Japan because they comply with the strict safety standard of the US National Fire Protection Association. In accordance with this standard, all passengers must be able to evacuate from the station within six minutes of a disaster.

In addition, the station entrance is elevated at a height of approximately 1.2 meters from the road—a design that takes into consideration Bangkok's tendency to flood. This is the height of the water level in what is called a "200-year" flood—one that would be expected to occur only once in 200 years. This elevation should be able to withstand most heavy rain. The station is also equipped with a flood-protection barrier to stop flood water from coming inside the station.

Such resilient public transportation gives a sense of security and assurance even in times of unexpected events, supporting daily activity in the growing city of Bangkok.



The entrance to the Bang Sue station of the MRT Blue Line. As a flood prevention measure, the station entrance is elevated from the road.



The inside of the station is spacious so that it is easier to evacuate in a disaster.

It may be impossible to stop natural disasters from occurring. However, it is possible to use human ingenuity to reduce the damage they do. Novel ideas put into effective practice can protect people's lives and livelihoods in times of disasters. JICA has assisted in a variety of projects to create innovative disaster-resilient infrastructure around the world.

Philippines



A disaster-resilient hospital to protect people's lives



The brand new outpatient building with disaster-resilient design

Light-filled and open waiting room

Typhoon Yolanda hit the Philippines in November of 2013. The Eastern Visayas region, which was directly hit by the typhoon, experienced catastrophic damage, with 80% of the houses collapsing. At that time, JICA was implementing a technical cooperation project called Strengthening Maternal and Child Health Services in Eastern Visayas with the Eastern Visayas Regional Medical Center (EVRMC), which was also badly damaged by the typhoon, with its ground floor flooded.

Whenever a disaster hits, the need for medical services increases. When Yolanda hit the Philippines, Japan, together with other countries and international organizations, provided medical services and supported administrative agencies in charge of healthcare services so that the provision of medical services did not stop. In addition, Japan supported the reconstruction of the EVRMC outpatient building, which was damaged by the typhoon. Screen blocks were set up outside the building as protection against the sun as well as to protect the building's openings from flying debris caused by typhoons.

A handover ceremony of the EVRMC was held in September of 2017. The center's goal is to continue to protect the health of the local people.

· TRENDS ·



Japan

JICA Sends a Message about Disaster Risk Reduction on World Tsunami Awareness Day



During the UN General Assembly in December of 2015, Japan led 142 countries in proposing a resolution to designate November 5th the World Tsunami Awareness Day, and the proposal was approved. On November 5, 2017, various events took place around the world to raise awareness of and reinforce measures for tsunami disaster risk reduction. On that occasion, JICA hosted the World Tsunami Museum Conference while also providing support for projects organized by the Japanese government, international agencies, and other countries for the event.

The conference was held in Ishigaki, Okinawa, on November 5th. Seventy people from eight countries, including the staff of tsunami museums, government officials involved in disaster risk reduction, and academics gath-

Conference participants

ered to discuss how to hand down to the next generation experiences of natural disasters including tsunami and what role tsunami museums can play in this process. The results of the conference were reported at the High School Students Islands Summit on World Tsunami Awareness Day 2017, which was held in Ginowan, Okinawa, on November 7th.

JICA also hosted seminars related to the World Tsunami Awareness Day in Peru, El Salvador, and other places. In the Maldives and Solomon Islands, JICA staff and their counterparts participated in evacuation drills that were part of a tsunami disaster education project implemented through the Japan-UNDP Partnership Fund. These activities were covered by the media and they provided an opportunity for people to learn about JICA's disaster risk reduction efforts and Japan's tsunami disaster prevention measures.



Morocco / France

JICA President visits Morocco and France, speaks at the 10th World Policy Conference



On November 3, 2017, JICA President Shinichi Kitaoka visited Marrakesh, Morocco, where he spoke at the 10th World Policy Conference (WPC), an international forum for world leaders and experts to discuss constructive solutions to major regional and global problems. The event was sponsored by the Institut français des relations internationales (IFRI).

At a plenary session on investing in Africa, Mr. Kitaoka praised the strong sense of ownership that African countries had demonstrated at the sixth Tokyo International Conference on African Development (TICAD VI), which was held in Kenya in 2016. At the same time, he pointed out that one challenge facing Africa was securing adequate food supply to stabilize prices and wages in the region. He talked about successful initiatives in Senegal, where

JICA President Shinichi Kitaoka (center) speaks at the WPC

JICA established the Coalition for African Rice Development (CARD) to improve rice production, as well as the importance of developing human capital, emphasizing in this respect the crucial role of universal health coverage (UHC) and JICA's efforts to improve food and nutrition in Africa. Mr. Kitaoka also stressed the importance of promoting private investment and described JICA's pilot project that utilizes innovative ideas of small businesses in Africa to accelerate regional development. He expressed hope that African students who had studied in Japan under JICA-funded programs would use their experiences to lead regional industrialization.

On November 5, Mr. Kitaoka visited France, where he attended a panel discussion at the IFRI on Japan's approach to developing countries. He talked about the history, philosophy, and current direction of JICA's development cooperation.



Cuba

Increasing Cuba's Rice Production with Improved Agricultural Machinery



JICA signed a grant agreement with the Cuban government in November of 2017 to provide grant aid of up to 1.215 billion yen for a project to help the country improve rice seed production techniques with the use of agricultural machinery.

Although rice is a major staple food in Cuba, the country's self-sufficiency in the crop is low, and it needs to increase domestic rice production. However, only a small number of farmers have sufficient machinery, which makes plowing and farm consolidation inefficient and rice growth uneven. Due to the shortage of "transplanters" for planting seedlings on paddy fields, direct seeding is the mainstream method, which results in many weeds.

The project will provide the machinery need-

Signing ceremony

ed for producing rice seeds in the eight targeted provinces and one special municipality in Cuba. The goal is to increase transplant crop production on paddy fields by 20% and secure a stable homegrown supply of rice in Cuba.

JICA has provided technical cooperation for rice production in Cuba on a continuous basis since 2003. For example, in a certified rice seed production project, which was implemented in five provinces in the central area for four years starting in 2012, JICA supported the extension and diffusion of technology for producing good-quality rice seeds. In the ongoing project to extend technology for grain production, JICA is providing support for improvement of cultivation techniques. Through this project, more comprehensive support will be provided to increase Cuba's rice production and therefore its self-sufficiency.

JICA Turkey Office



Emin Ozdamar

Senior Program Officer

When Emin Ozdamar was a student at Ankara University in 1981, he was interested to learn about one of his professors' experiences with JICA. He started collecting information about Japan and JICA and later became a Japanese Government Scholarship student at then Tokyo University of Fisheries, where he studied from 1989 to 1991.

The JICA Turkey Office was established in 1995. At the time, Ozdamar was Assistant Professor at Ondokuz Mayıs University in Turkey. He later worked in the aquaculture department of the Ministry of Agriculture and Rural Affairs, through which he became involved in the early stages of a JICA project to develop fish culture in the Black Sea. He utilized his abilities, knowledge, and experience to ensure the project's successful start-up and implementation. His success working on that project further motivated him to join JICA in 1997.

Ozdamar's first involvement with JICA was with fishery and disaster risk reduction (DRR) projects. He has since worked as a national chief of technical cooperation projects in DRR, agriculture and fisheries, regional development, and related third-country training programs.

His work with JICA has had an impact on land as well as at sea. In 1999, two huge earthquakes

on the Northern Anatolian Fault Line resulted in more than 18,000 deaths. When Japanese disaster relief teams arrived in Yalova province after the earthquake, Ozdamar was with the mission. The team rescued one person and helped the victims. After observing the poor construction quality and the disorder in the community, Ozdamar realized that Turkey needed disaster awareness programs. He began working creating and implementing DRR projects. He supported training of more than 250 district and deputy governors and 300 city mayors; some are now governors or mayors in such disaster-prone provinces as Istanbul and Bursa.

The number of JICA's projects in Turkey has been declining over the past decade. However, Japan's experience is still needed; sharing both countries' experiences will also be beneficial to other disaster-prone countries. Ozdamar hopes that exchange between Japan, Turkey, and other countries will make his country more disaster-resilient, in addition to raising awareness of other essential topics such as the environment, education, and food security. He continues to work as a bridge between Turkey and Japan, facilitating the exchange of knowledge and experience to build a safer and better world.

Mainstreaming Disaster Risk Reduction:

The Role of Philippines' Socioeconomic Planning Agency

Ernesto M. Pernia

Secretary of Socioeconomic Planning, NEDA

Development is not only about the economy but it also encompasses a whole host of human concerns. Not least of these are social and environmental issues, with which economic development is inextricably intertwined.

The National Economic and Development Authority (NEDA) is the Philippines' highest socioeconomic planning and policy coordinating agency that spearheads the formulation of national and regional plans to spur inclusive growth. Accordingly, environment-related concerns, such as disaster risk reduction (DRR), logically fall under NEDA's mandate.

In pursuit of attaining inclusive and self-sustaining growth, NEDA integrates DRR in its plans, policies and programs for a disaster-resilient country. The Philippine Development Plan (PDP) 2017-2022 highlights key strategies and interventions for building the resilience of agriculture, economic and social sectors, and infrastructure to calamities. In addition, the Regional Development Plans, a companion document of the PDP, deals with specific strategies to ensure safety and resilience at the subnational level.

Through a JICA-assisted project, NEDA has initiated a capacity building program for planners and stakeholders to facilitate the completion of DRR-enhanced provincial plans that will increase the adaptive capacity of communities, particularly the vulnerable groups (i.e., women, children and indigenous peoples). This project is deemed critical to mainstreaming DRR in the regional plans and programs. Similarly, NEDA is currently crafting a comprehensive disaster rehabilitation and recovery document that will serve as a guide for increasing the resilience of local communities to future catastrophes and disasters.



With the Department of National Defense as Chair, NEDA is the Vice Chair of the National Disaster Risk Reduction and Management Council (NDRRMC) for Rehabilitation and Recovery. In this vein, NEDA has been actively involved in coordinating various post DRR-related rehabilitation and recovery projects of calamity-stricken or conflict-affected areas, following the strategies spelled out in the PDP. For instance, in the aftermath of Typhoon Yolanda (internationally known as Haiyan), NEDA was responsible for the post-disaster assessment and operations required for the recovery of the affected areas. This task had been transferred by the President from the Presidential Assistant for Rehabilitation and Recovery to NEDA for more integrated and inclusive planning that is consistent with the government's

strategic framework. To that end, NEDA utilized its Regional Project Monitoring and Evaluation System (RPMES) in tracking the status, outputs and outcomes of projects for more judicious and results-oriented interventions. Moreover, NEDA spearheaded the formulation of the Reconstruction Assistance on Yolanda: Build Back Better and Implementation of Results which served as the planning and monitoring frameworks, respectively, at the national and regional levels.

In the special case of Marawi, NEDA, together with the Department of Finance and the Department of Budget and Management, is in charge of resource mobilization to rebuild the city. It also leads the Task Force Bangon Marawi's (TFBM's) planning process and integrates inputs of the local governments of Marawi City, Lanao del Sur, and the Autonomous Region of Muslim Mindanao (ARMM) in the rehabilitation plan.

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JICA^{WORLD}
is published by JICA

Publisher:
Kiyoshi Amada
Office of Media and
Public Relations

Nibancho Center Bldg
5-25, Niban-cho
Chiyoda-ku
Tokyo 102-8012 JAPAN

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www.jica.go.jp/english/

Cover:

Women embracing each other after the earthquake in Armenia in 1988 ©Getty Images

Photo on pages 2-3:

Tsunami warning sign in Seiro City, Niigata Prefecture. The sign urges people to swiftly evacuate in the event of an earthquake ©amanaimages



The Japan International Cooperation Agency (JICA) is one of the world's largest bilateral development organization, operating in some 150 countries to help some of the globe's most vulnerable people.