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Institute for the Advanced Study
of Sustainability

**Third UN World Conference on Disaster Risk Reduction, 2015,
Sendai, Japan
Public Forum Side Event**

**Mainstreaming Ecosystem-based Disaster Risk Reduction and Reconstruction:
Lessons Learned from 3/11 for the World and the Future**

**14 March 2015, 13:00–16:00
TKP Garden City Sendai Kotodai**



Report

**United Nations University
Institute for the Advanced Study of Sustainability**

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On 14 March 2015, the international symposium ‘Mainstreaming Ecosystem-based Disaster Risk Reduction and Reconstruction: Lessons Learned from 3/11 for the World and the Future’ was held at the third UN World Conference on Disaster Risk Reduction’s Public Forum in Sendai, Japan. This symposium was organised by the United Nations University’s Institute for the Advanced Study of Sustainability (UNU-IAS), the Ministry of the Environment of Japan (MOEJ) and the International Union for Conservation of Nature (IUCN), and it was supported by the Forestry Agency of Japan and the Global Environmental Outreach Centre (GEOC).

Ecosystems such as coastal forests and wetlands not only support livelihoods through regular ecosystem services but also reduce disaster risks. This symposium exhibited the best practices of ecosystem-based disaster risk reduction and reconstruction (Eco-DRR) and discussed how to mainstream Eco-DRR in Japan and internationally.

Opening Remarks

Opening the symposium, **Mr. Yoshio Mochizuki**, Minister of the Environment of Japan, and **Mrs. Akie Abe**, Spouse of the Prime Minister of Japan, reflected on the significance of the role that ecosystems play in disaster-prone areas. The minister stressed the need to maintain ecosystems that can mitigate natural disasters and noted Japan’s contribution to this field. Mrs. Abe emphasized Japan’s history of coexisting with nature and questioned the effectiveness of constructing huge coastal levees—currently underway in parts of Japan—as a disaster risk reduction (DRR) measure, emphasizing on their environmental impacts.



Keynote Speeches

Prof. Kazuhiko Takeuchi, Senior Vice Rector of the United Nations University, spoke about ecosystem-based approaches towards establishing a resilient society in harmony with nature.



Noting Japan’s location in the Pacific Ring of Fire, an earthquake-prone area that experiences both the bounties and threats of nature, he emphasized the importance of cooperation and information-sharing between Japan and other countries, to improve DRR. He discussed the lessons learned from the 2004 earthquake in Sumatra, where the high number of casualties was attributed mainly to lack of awareness regarding the tsunami risk. For example, one important lesson is that maintaining

community bonds is essential in the reconstruction process. Accordingly, Prof. Takeuchi explained what constitutes a 'resilient society' and how to develop one. He stated that most of the rural areas in Japan, particularly in the disaster-hit areas of Tohoku, are now dealing with an ageing population and low birth rates, and it is essential to revitalise communities by promoting local agriculture, forestry, fisheries and tourism. Referring to the Rio+20 Conference in 2012, at which the green economy was a prominent theme, Prof. Takeuchi stressed the need to build an economic system based on natural infrastructure and biodiversity. He added that the concepts of *satoyama* and *satoumi* will help to build such a society. He also presented several illustrations of strengthening local resilience. One of his examples was the establishment of the Sanriku Fukko National Park, part of the Green Reconstruction Project led by the MOEJ to rebuild sustainable communities in Tohoku. Another was the reconstruction of Kesennuma-Oshima, an island greatly affected by the Great East Japan Earthquake in 2011. In Kesennuma-Oshima, disaster-mitigative trees and an emergency evacuation route have been established to reinforce local resilience while preserving the beautiful landscape. In Ayeyarwady, Myanmar, rehabilitation of mangrove forests around the village has been undertaken to reduce disaster risks such as flooding and typhoon damage. Watari Town, Japan, has a Green Belt Project aiming to reduce disaster risk by recovering the coastal forest that was damaged by the Great East Japan Earthquake. Prof. Takeuchi concluded that Eco-DRR, which integrates ecosystem management, climate change adaptation and DRR, can contribute to building a resilient and sustainable society in harmony with nature.

Ms. Inger Andersen, Director General of IUCN, began by citing the findings of the IPCC Fifth Assessment report and the Global Assessment Report on DRR, which revealed that the frequency and magnitude of hazardous events are expected to intensify in the future. She stated that the third UN World Conference on DRR provides an opportunity to change the impact of death and destruction caused by natural hazards. Ms. Andersen described three choices facing the global community: (1) action or abandonment, (2) stagnation or innovation and (3) solidarity or discord. With regard to the first choice, she called for collective action to implement nature-based solutions that simultaneously contribute to nature conservation, DRR and sustainable development. Second, Ms. Andersen emphasized the need for innovative approaches and ideas to address the increased intensity of disasters and urged proactive investment in nature as a risk reduction strategy, citing several examples. For example, when Typhoon Haiyan hit the Philippines in 2013, 5,500 people died from the strong storm surges, but some communities in the area remained unaffected thanks to the presence of mangroves. Therefore, the Philippine government is now investing millions of dollars in mangrove restoration. Other examples come from the United States, where, after Hurricane Katrina, the Congress approved \$500 million



USD for restoration of ecosystems around the gulf islands. After Hurricane Sandy, the governor of New York State set up a \$400 million USD fund to buy back homes from residents in Sandy-affected communities, with plans to convert these areas into green spaces that would function as coastal buffer zones. Finally, Ms. Andersen called for solidarity rather than discord, saying that nature-based solutions are in everyone's interest and offer benefits for local communities and national governments as well as for the global environment. She emphasized that it is essential to find agreements on Eco-DRR and to place Eco-DRR high on the post-2015 agenda for DRR. She concluded by introducing the new joint publication by IUCN and MOEJ titled 'Protected Areas as Tools for Disaster Risk Reduction: A Handbook for Practitioners'.

Best Practices in Japan and the rest of the World

Ms. Jane Madgwick, CEO of Wetlands International (WI), showcased practices of DRR through wetland management. She stated that wetland loss is a root cause of increasing disaster risk, as 90% of all extreme events are water-related and 70% of total wetlands have been lost since 1900. In the last five years, WI has implemented a programme called Partners for Resilience with partners in nine countries, promoting eco-smart and climate-smart DRR. Ms. Madgwick presented some practices of the programme. In the Mahanadi River delta, India, it sought to address the increase in water scarcity and flooding due to wetland loss and coastal ecosystem erosion, implementing local-level participatory risk assessment and planning that helped the villagers to understand the linkage among the ecosystem, natural hazards and their livelihoods. Ms. Madgwick also described a green growth solution in the Inner Niger Delta in Mali. In recent decades, upstream development in that delta has taken water away from the flood plain system, resulting in reduced productivity of fisheries and farming downstream. Working with the local community, the programme has enabled local residents to restore the flood plain and to gain a voice in water management and sustainable development planning. Ms. Madgwick also demonstrated an integrated solution for DRR in Demak District, Indonesia. To counter the loss of mangroves that was causing flooding and local economic damage, the programme undertook an integrated approach that combined engineering with mangrove restoration. Ms. Madgwick emphasized that managing and protecting wetlands is part of the solution for sustainable and effective DRR and could also deliver other benefits.



Mr. Shoichi Shirahata, Chairman of the Kesenuma-Oshima Tourism Association, talked about the reconstruction of Kesenuma-Oshima, an island located at the northern tip of Miyagi prefecture and populated by approximately 2,800 people. He explained the losses and destruction that the island suffered in the Great East Japan Earthquake in 2011: the sea wall collapsed, fires



broke out, 31 people were dead or missing, 130 houses were damaged and the fishing industry and communications were seriously affected. In the process of recovery from the disaster, the local community strongly opposed a proposal to increase the height of the seawall, as this could destroy the scenic landscape and diverse vegetation on the island's beaches, which were major tourist attractions. Instead, they proposed constructing a new seawall of the same height, covered

with disaster-mitigative trees on the back slope and prohibiting residences in the affected area. As part of the reconstruction strategy, other ideas were also promoted, such as forms of marine leisure that emits no CO₂ and a barrier-free environment for people with disabilities. Mr. Shirahata ended his presentation by promising that the island would continue to pursue sustainable reconstruction in harmony with nature.

Ms. Marlynn Mendoza, Chief Ecosystem Management Specialist from the Department of Environment and Natural Resources in the Philippines, discussed wetlands and DRR. The presentation commenced with a brief description of the Philippines and its vulnerability to disasters such as storm surges, landslides, earthquakes and tsunamis. Ms. Mendoza highlighted strategies adopted by the Philippines to cope with such disasters. These strategies encourage



management of various ecosystems such as wetlands, caves, forests and coastal marine environments. Different stakeholders are involved in implementing the strategies, and their activities include participatory management planning, reforestation, community cleanup, establishment of protected areas, etc. Ms. Mendoza also explained the resolution on wetlands and DRR, submitted by the Philippines to the Ramsar Convention, which calls for global conservation efforts and wise use of wetlands for DRR. Some highlights of the draft resolution include mainstreaming DRR in local policies, integrating ecosystem-based management in DRR and climate change, implementing wetland ecosystem-based management and restoration projects, assessing disaster risk at the landscape level, strengthening communication education and public awareness programs on DRR and collaborating with academics on long-term research.

Mr. Christopher Briggs, Executive Secretary of the Ramsar Convention, emphasized the importance of protecting, managing and restoring wetlands, which can provide protection against droughts and floods. Over the last 40 years, 40% of all wetlands and 76% of populations of wetland species have been lost. Mr. Briggs introduced two efforts to assess the current state of



wetlands. One is the European Space Agency's project that measures the condition of all wetlands across Africa using Landsat; the other is the Ramsar Convention's collaboration with the Japan Space Agency (JAXA) to map mangroves across the whole world. The data from those projects will be used to assess the past, current and future state of wetlands and to set targets for future actions. Mr. Briggs also provided examples of how wetlands are used for

DRR. In Colombo, Sri Lanka, where heavy rainfall caused massive damage in 2010, the World Bank has invested \$213 million USD to recreate natural wetlands around the city and reduce the future flood risk. The Chinese government, after realizing that a \$20 billion USD investment in building dikes did not prevent the increased flooding of the Yangtze River caused by wetland degradation, decided to adopt an integrated solution that includes removal of some dikes, hillside reforestation and conversion of farmlands back to wetlands. In Mali's Niger River Inland Delta, integrated water management including engineered wetlands, land use regulation and community participation has been implemented to manage the water cycle. Mr. Briggs suggested a combination of soft, hard and natural infrastructure to reduce disaster risks and stressed that wetlands are key in defending people and land against disasters and keeping related risks as low as possible.

Mr. Hiroki Katsuragawa, Director of Forest Planning Division from the Forestry Agency of Japan, talked about the functions of forests in preventing natural disasters. Japan is a disaster-prone country with steep topography, high precipitation, frequent typhoon strikes and earthquakes and numerous active volcanoes. Mr. Katsuragawa first introduced the history of forest destruction and rehabilitation in Japan.



During the wartime and through reconstruction period from the wartime devastation, forest resources were excessively exploited in many parts of Japan to meet the growing demand for timber, causing a considerable number of floods, landslides and other natural disasters. Therefore, since the mid-1950s, forest improvement and erosion control projects have been promoted nationwide, and these have contributed to a decline in the occurrence of mountain disasters. Mr. Katsuragawa then explained how forests can help prevent natural disasters. Forests can prevent sheet erosion and sediment discharge, and tree roots can grip the shallow soil thus averting landslides and enhancing resilience against debris flow. Coastal forests can function to mitigate tsunamis by attenuating the tsunami's energy and capturing wreckage. Mr. Katsuragawa added that in order to enhance forests' preventive functions, it is important to design erosion control projects and forest improvement activities, as well as restoration projects where forests have been devastated by natural disasters. He further highlighted Japan's international

cooperation in the field of forest-based DRR. Through JICA technical cooperation, Japan assisted with forest restoration in Sichuan, China, which was severely damaged by the earthquake in 2008, by means of its erosion control technology. Mr. Katsuragawa concluded by describing the intentions of the Forestry Agency of Japan to make continuous efforts to enhance the effectiveness of forests in reducing natural disasters.

Panel discussion

‘To Promote Ecosystem-based Disaster Risk Reduction and Reconstruction’

Coordinator:

Prof. Shiro Wakui, Acting Chair, UNDB-J Committee/Professor, Tokyo City University

Panellists:

Prof. Fumihiko Imamura, Professor, International Research Institute of Disaster Science (IRIDeS), Tohoku University

Mr. Masatoshi Sato, Chairman, Keidanren Committee on Nature Conservation

Dr. Satoquo Seino, Associate Professor, Graduate School of Engineering, Kyushu University

Dr. Srikantha Herath, Senior Academic Program Officer, UNU-IAS

Ms. Radhika Murti, Senior Programme Coordinator, IUCN



Prof. Shiro Wakui started the panel discussion by explaining the background of Eco-DRR. Japan has historically utilised ecosystems in DRR, and today Eco-DRR is gaining increasing international attention. Nature’s function in DRR is recognised in many frameworks such as Japan’s Fundamental Plan for National Resilience, the National Land Grand Design Plan 2015, the National Biodiversity Strategy and the Hyogo Framework for Action on DRR, and it was

also discussed in the First Asia Parks Congress and the Fifth World Parks Congress. Prof. Wakui emphasized that it is time to take concrete actions to implement Eco-DRR.

Prof. Fumihiko Imamura talked about coastal ecosystems' roles in reducing tsunami damage. Coastal forests can stop drifts and mitigate the tsunami's energy, thereby reducing inundation and damage of houses and lives. Prof. Imamura introduced a study in Sri Lanka that determined that vegetation reduced the impact of the Indian Ocean tsunami in 2004. He showed a picture of a school that was not affected by the tsunami due to the surrounding ecosystem and its structure. He also described a study of mangroves in Banda Aceh, Indonesia, which revealed that if the mangroves that formerly existed in the area had been preserved properly, they could have reduced the damage to the city by 44% and saved 30,000 people. He presented a study of the tsunami in the Great East Japan Earthquake, which found that the coastal ecosystems did not function fully for DRR. This study stressed that it is essential to enhance the ecosystem's function by properly integrating DRR measures such as construction of seawalls, raised roads, evacuation facilities and preservation of coastal forests.

Mr. Masatoshi Sato described the business sector's role in protecting nature and mainstreaming Eco-DRR. He explained that the Keidanren Committee on Nature Conservation has supported more than a thousand nature conservation projects with approximately 3.4 billion yen for 22 years, and he showcased one such project that supported mangrove restoration in Thailand. He also mentioned that, although many companies have relied on engineering in DRR, they should acknowledge the role of natural infrastructure and communities' ancient wisdom, such as Waju, a Japanese traditional flood prevention measure that allows a community to coexist with a river. Mr. Sato suggested that companies should incorporate such ancient wisdoms into their business continuity plans (BCPs).

Dr. Satoquo Seino noted the importance of a holistic approach in DRR that promotes the integration of fragmented knowledge and local community involvement. She provided some examples of the implementation of such an approach in Japan. In Aomori, the local government responded to the local community's request to apply traditional knowledge to typhoon protection measures. They decided to replace the existing seawall with a new form of protection made from a combination of the existing concrete blocks and natural barriers, such as stones and sand that can create habitats for seaweed and other sea creatures. Another example is a program implemented for high-school students in Sendai, who, along with their teachers, spoke with the elderly to learn about local history and knowledge. Together, the students developed a plan to make their community more resilient, by integrating the students' modern ideas with the elderly citizens' traditional wisdom. Dr. Seino stressed that implementation of Eco-DRR should incorporate the technology and knowledge of various fields and people, from both the local and global community.

Dr. Srikantha Herath described some case studies of utilizing ecosystem services for DRR in urban areas, such as the ABC (Active-Beautiful-Clean) Waters Program in Singapore and the Green Infrastructure Grant Program in New York. He summarised Sri Lanka's experience of the tsunami of 2004, stating that it demonstrated how quickly nature can regain its functions after a disaster, as well as demonstrating the effectiveness of integrating natural and structural measures in DRR. Dr. Herath emphasized the need for a holistic approach and the promotion of interdisciplinary education in the field of Eco-DRR. He announced the launch, scheduled for the following day, of the International Network for Advancing Transdisciplinary Education (INATE), which aims to develop and implement research projects addressing sustainability and DRR across Asia.

Ms. Radhika Murti explained how the IUCN started to promote Eco-DRR. In doing community based conservation IUCN has long term local presence in many countries, including disaster prone areas. Due to such long term and localized presence, by default, IUCN has been involved in assisting communities and local authorities during and following disasters. Projects such as the Water and Nature Initiative (WANI) were requested by the local community to assist with restoration of ecosystem services following disasters (such as Cyclone Stan). Ms. Murti emphasized that Eco-DRR could produce multiple benefits, such as supporting communities' livelihoods, enhancing biodiversity and promoting cost-effective measures. Furthermore, she noted that Eco-DRR can contribute to multiple international commitments, such as the Aichi Targets and Sustainable Development Goals.

During the discussion period, the panellists reaffirmed the need to promote Eco-DRR in Japan and internationally, and they called for business investments in natural infrastructure, active involvement of local communities, interdisciplinary education in Eco-DRR, and integration of ecosystem management into local and national DRR plans as well as climate change adaptation plans.

Closing

Through the presentations from prominent speakers and discussions, the symposium highlighted the benefits and effectiveness of Eco-DRR and its sustainability from social, economic and environmental perspectives. Mainstreaming Eco-DRR contributes to building a resilient and sustainable society. It will thus be important to further promote recognition of ecosystems' roles and functions in DRR and to strengthen initiatives to implement Eco-DRR.