



When a disaster strikes, emergency response is taken then recovery and reconstruction work follows. Society learns lessons from the disaster and takes countermeasures for future disasters to prevent and mitigate possible damages. Then, preparedness is taken for future disaster. This cycle is called as the “disaster management cycle.” It is significant to carry forward this cycle seamlessly by incorporating the viewpoint of “Build Back Better.” Eco-DRR also aims at seamless program operation, including the performance of need surveys in parallel from the stage of emergency aid, the restoration of affected forests and other ecosystems, the reconstruction of daily life of local people reliant on forests and other ecosystems for their livelihoods, and the enhancement of disaster risk reduction functions of forests and other ecosystems to prevent future disasters. Moreover, seamless cooperation is expedited not only in temporal axes but also in terms of approaches, including the promotion of the collaboration between Eco-DRR and other disaster risk reduction programs and cross-sectoral initiatives in recognition of the mainstreaming of DRR, as well as structural measures such as the construction and installation of disaster prevention facilities in addition to the conservation of forests or other ecosystems, and efforts for non-structural (soft) measures such as the establishment of evacuation systems through building communities resilient.

In this manner, JICA has decided to support the stable development of developing countries from the perspective of disaster management including Eco-DRR, setting the Development Strategic Goals focusing on Disaster Risk Reduction.

* For more details, please refer to the “Disaster Risk Reduction Position Paper.”

You can download it by clicking “Toward Mainstreaming Disaster Risk Reduction” at the following site:

<http://gwweb.jica.go.jp/km/FSubject0301.nsf/VIEWALL/3958A0A725ABA98549257A7900124F29?OpenDocument>



Ecosystem-based Disaster Risk Reduction (Eco-DRR)

JICA's Eco-DRR Cooperation in Developing Countries

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JICA's efforts for disaster management in the Nature Conservation Sector

JICA has supported the Ecosystem-based Disaster Risk Reduction (Eco-DRR) in developing countries around the world. In Chile, for example, a Technical Cooperation Project (TCP) "The Erosion Control and Afforestation Project in Watersheds of Semi-Arid Area in Chile" was implemented from 1993 to transfer *Chisan* (forest conservation) technologies as mountainous disaster counter-measures and have disseminated the technologies transferred to the country further across Latin American countries by carrying out third-country training based in Chile until now.

The Government of Japan has proactively disseminated this Eco-DRR that performs disaster management by utilizing ecosystems such as forests against natural disasters, attracting worldwide attention in recent years. During the International Seminar on Role of Forests in Natural Disasters and Revival of Forests and Forestry hosted by the Forestry Agency of Japan and co-hosted by JICA in Sendai, Japan in 2012, for example, issues such as disaster prevention function, and utilization of woody bio-mass to serve for reconstruction were discussed, and the recognition of significant roles that forests and forestry play in natural disaster management was shared. This result was reported to the FAO Asia-Pacific Forestry Commission held in 2013, and furthermore it was decided at the FAO Committee on Forestry in 2014 that information on forests to mitigate natural disasters should be disseminated. In addition, the Asia Protected Areas Charter that was adopted at the 1st Asia Parks Congress also held in Sendai in 2013 states "We affirm our commitment to broaden understanding of the important role that protected areas play in disaster risk reduction and recovery." During the Meeting of the Conference of the Parties to the Convention on Biological Diversity (CBD-COP12) convened in 2014, moreover, the Gangwon Declaration was adopted, which stated under Japan's proposal: "Noting that the conservation and sustainable use of biodiversity and the restoration of ecosystems can improve ecosystem functioning and resilience and thereby contribute to protect coasts and watersheds, and reduce vulnerability to disasters." Roles that protected areas such as national parks play in disaster risk reduction were also discussed during the 6th World Parks Congress.

In addition, Eco-DRR is intended to address, through the management of environmental resources, "Reduce the underlying risk factors" as one of the five Priorities for Action in the Hyogo Framework for Action (HFA) that is an international guidance on disaster management agreed at the second United Nations World Conference on Disaster Risk Reduction convened in Hyogo Prefecture in 2005: it is considered to be an important initiative in the next disaster management guidelines (Post-HFA) that will be formulated during this third World Conference on Disaster Risk Reduction.

As such, in consideration of the growing interest in Eco-DRR in the world, the Global Environment Department of JICA sets forth a policy: "ecosystem (including forest)-based disaster risk reduction" as one of the strategic objectives in the Strategic Plan in Nature Conservation Sector (draft) to further strengthen its efforts.

Eco-DRR in JICA's Strategic Plan 2014-2020 in Nature Conservation Sector

• Overall Goal of JICA

Harmonization between Nature Conservation and Human Activities

• 4 Strategic Objectives of JICA

Sustainable Forest Management against Climate Change

Ecosystem (including forest)-based Disaster Risk Reduction (Eco-DRR)

Sustainable Use of Natural Resources to Improve Livelihoods of Vulnerable Community

Biodiversity Conservation through Management of Protected Areas/ Buffer Zones

• 3 International Agenda

UNFCCC

Mitigation

Adaptation

UNCCD

UNCBD

+RAMSAR etc.

Examples of Eco-DRR initiatives in JICA

Myanmar Enhancement of coastal disaster prevention functions through mangrove afforestation



Myanmar's mangrove forests were severely damaged by the cyclone that made landfall in May 2008, though they helped to mitigate the damage caused by the storm surge. For this reason, design of the TCP "Integrated Mangrove Rehabilitation and Management through Community Participation in the Ayeyawady Delta" that had been implemented from the previous year were modified, and carried out "Prevention/Mitigation" and "Emergent Disaster Response," including the preparation of hazard maps using satellite images and the distribution of restoration materials. In addition, "Seamless Cooperation" is being implemented toward "Recovery and Reconstruction," including the mangrove afforestation under the Grant Aid (1,154 ha) and the construction of a forest monitoring tower with an evacuation facility, from the viewpoint of strengthening of disaster prevention functions of mangrove forests.



Mangrove afforestation under the TCP



Forest monitoring tower with evacuation facility

Coastal disaster prevention forests that also helped the disaster mitigation in the Great East Japan Earthquake

According to the report of the Science Council of Japan (“Evaluating the Multi-functions of Agriculture and Forests Related to the Global Environment and Human Being”) in 2001, forests have the functions of wind prevention, tide prevention, etc., and they can also prevent blown sand along the coast under favorable conditions. Coastal disaster prevention forests are the forests that demonstrate these capabilities, mitigating the damage of tsunami (seismic sea wave) in the Great East Japan Earthquake as well.

For example, a maximum of 170 m of the coastal forest was mowed down by tsunami in Hachinohe City, where the flotsam was trapped inside the fallen forest. In addition, it also offset the wave power of tsunami there, which mitigated the damage to houses and others located on the land side beyond the coastal forest.

The presence of coastal forests also became a kind of land use restrictions, keeping houses and others away from the coast, and consequently damages of house outflow, etc. were mitigated at some locations.

Of course, coastal disaster prevention forests cannot stop tsunami completely, but their disaster mitigation effects can be expected by locating coastal forests in a planned way and maintaining sound forests.

For this reason, the restoration of coastal disaster prevention forests that were affected in the Great East Japan Earthquake is under way in Japan now; whereas it is also necessary to develop coastal disaster prevention forests in developing countries beforehand and include the restoration of coastal disaster prevention forests in recovery and reconstruction plans in the event of disasters, incorporating the perspective of Eco-DRR.



Palau International Coral Reef Research Center



Promoting collaboration for scientific research by both countries

Sound ecosystems mitigate natural disaster risks

The damage to the soundness of coral reefs has become a major problem in island countries, which results in the erosion of sandy beaches on the verge of being submerged in some regions. “Project on Integrated Coastal Ecosystem Conservation and Adaptive Management under Local and Global Environmental Impacts” (the Philippines) aims to mitigate such natural disaster risks by developing a monitoring system and a decision-making system for the adaptive management to conserve coastal ecosystems.



Macedonia Improvement of forest fire crisis management capabilities

Large-scale forest fires occurred in Former Yugoslav Republic of Macedonia in 2007, where the national emergency declaration was issued for 14 days. Thus the Government of Macedonia planned an capacity development of its crisis management center for prevention and early warning of forest fires. JICA helped build a mechanism of risk assessment for forest fires and a system for their prevention and early warning through the TCP for three years from 2011. This system does not simply contain the prevention and early warning of forest fires but also forest resource information to promote sustainable forest management, contributing to the preservation of sound forest ecosystems with a lower risk of generating forest fires. In addition, there is a plan to promote the dissemination of such technologies at a regional level by the third-country training from 2015, as this system attracts attention of neighboring countries that are facing similar damages by forest fires.



Loss of forests by a wildfire



Weather observation facility for prevention and early warning



Palau Crisis due to the climate change and its countermeasures in a coral reef island system

Coral reefs have disaster prevention functions such as the preservation of the coast from storms and erosion, but the soundness of coral reef ecosystems has been impaired by influences such as the rise in sea temperature caused by the climate change and the ocean acidification, in addition to increased anthropogenic impacts in Palau. Therefore, JICA has provided support for maintenance and management of coral reef island ecosystems through the construction of the Palau International Coral Reef Research Center under the Grant Aid and the training of professional staff under the TCP. In 2013, the new Science and Technology Research Partnership for Sustainable Development (SATREPS) was initiated for elucidating impacts of climate change, tourism development, and other factors on coral reef ecosystems with the aim of offering recommendations on comprehensive measures and policy options, supporting the “correct understanding of disaster risk and promotion of common understanding.”



Flood control measures through watershed management

The decline in watershed protection functions due to the loss or degradation of watershed forests surrounding dams and canals has become a problem in Latin American countries. For this reason, JICA carried out watershed management projects in these countries, and further disseminate outcomes of technology transfer to neighboring countries through the third-country training with the aim of improving the disaster management capability of the whole region. The participation of people living in watershed areas in forest management activities is essential for such watershed management projects. Project activities do not only enhance functions of watershed forests but also improve communities' resilience, which are helpful for community-level disaster risk reduction.



Implementation of *Chisan* project in degraded watershed forests (Chile)



Forest functions were improved seven years after tree planting (Chile)

China Restoration of forest vegetation after the Sichuan Earthquake disaster



The Sichuan Earthquake that occurred in Sichuan Province in 2008 caused a great deal of damage to forests as well. Thus JICA has supported the restoration of forests with higher disaster prevention functions than ever by introducing *Chisan* technologies through the TCP and also facilitated the "building of a more disaster-resilient society" (Build Back Better) such as the planting of fruit trees with the aim of improving local communities' livelihoods in the restoration of damaged forest cover and their participation in restoration programs to help strengthen communities' resilience. Furthermore, focusing attention on the outcomes of the project, the Government of China aims to proactively make its investment in disaster risk reduction as a national policy by stipulating "*Chisan*" in its Forestry Law as well as the policy of "Conversion of Cropland to Forest Program" (large-scale afforestation program) that has served as the driving force for forest area recovery in China and accordingly throughout Asia until now. The project has also contributed to the "establishment and strengthening of disaster management system" of the Government of China.



The restoration progresses with Japan's *Chisan* technologies



Japanese products (steel frame retaining wall) are utilized for the restoration

Dissemination of Japanese systems and overseas expansion of Japanese products

Japan's *Chisan* technologies that combine civil engineering works and greening works for restoring denuded lands are said to be a representative example of "Japanese systems," as they have been evolved in the history of *Chisan* for over 100 years. In other words, the leveraging of Japan's *Chisan* technologies is highly appreciated in terms of the spread of the Japanese system.

In addition, a variety of different products have been developed for construction works in *Chisan* projects in Japan, and the construction with the construction methods utilizing Japanese products play an important role in introducing them to overseas countries.

Apart from it, remote sensing technologies have been developed with the use of satellites and UAVs (unmanned aerial vehicles) in the project: Wild Fire and Carbon Management in Peat-forest under the SATREPS implemented in Indonesia, and the Japanese system in such field is also attracting global attention.

Reference 1 What is Eco-DRR?

According to the "Evaluating the Multi-functions of Agriculture and Forests Related to the Global Environment and Human Being," forests demonstrate multiple functions such as sediment disaster prevention, soil conservation, and watershed conservation, which can prevent erosion, landslide, sediment disasters, avalanches, wind damage, snow damage, etc. and mitigate flooding. In addition, ecosystems have various functions of disaster risk reduction such as coral reefs that protect the coastline and wetlands that mitigate the flooding.

For people that rely on these ecosystems for their livelihoods, additionally, the ability of acquiring materials required for maintaining or restoring their livelihoods from ecosystems in the event of disasters, including timber, firewood, food and raw materials of medicine is highly significant for recovery and reconstruction.

Furthermore, social capital is accumulated in communities that utilize ecosystems such as *Satoyama/Satoumi* (Socio-ecological production landscapes and seascapes) in a sustainable manner, which will demonstrate underlying strength during the emergency evacuation and reconstruction in the event of disasters.

These kinds of ecosystem (including forest)-based disaster risk reduction is called Eco-DRR.

Reference 2 Mainstreaming disaster risk reduction (DRR) and efforts in the Nature Conservation Sector

Recently, there is a move to accelerate "mainstreaming disaster risk reduction (DRR)" in the world: (i) A government positions DRR as a priority issue of the country; (ii) A perspective of DRR is to be taken into every development sector; and (iii) Prior investment for DRR should be increased. It would lead to building the "Disaster Resilient Society" in each country. JICA is also expediting the "mainstreaming DRR" to incorporate disaster management perspectives into all of its programs.

With regard to ecosystems including forests, it is also necessary to address their development as the "investment in DRR" in order to build a disaster-resilient society with the perspective of disaster risk reduction rather than simply recognizing them as a means for conservation of forest resources. In particular, it is essential to think of "Build Back Better" instead of restoring forests and other ecosystems to the same conditions as those before disasters occur in the recovery and reconstruction after them.

JICA defines "mainstreaming DRR" as "a goal of protecting lives from disaster, sustainable development, and poverty reduction through comprehensive, multidisciplinary, and continuous implementation and expansion of risk reduction measures against envisioned various scales of disasters at every phase in every sector of development and building disaster-resilient society." Eco-DRR is also one of the risk reduction measures, which requires a comprehensive, integrated, and continuous implementation and evolution on the basis of disaster management perspectives.