

# Global Environment

## For the Termination of the Vicious Cycle of Poverty and Environmental Destruction



Of the eight Millennium Development Goals (MDGs), relevant goals are shown in color.

In developing countries, a vicious circle occurs as the destruction of the environment, which is a basis for human life, causes the further escalation of poverty. Each passing moment brings the further destruction of the irreplaceable natural environment on which humanity depends, driving the need for the creation of a sustainable society based on the concept of harmony with the environment. JICA is implementing cooperation widely for the conservation of the global environment. Key initiatives focus on nature conservation, environmental management, water resources, disaster prevention and management, and climate change.

## Nature Conservation

### Overview of Issue

Over the past decades, excessive resource consumption and large-scale development have led to the rapid destruction of nature worldwide that includes deforestation and reduction in wetland, soil degradation and the extinction of wildlife species. It is reported that the area of forest land is declining by approximately 13 million hectares, equivalent to one-third of the land area of Japan, every year due to factors such as logging wood to be used as fuel or construction material, conversion to agricultural land, and slash-and-burn cultivation that does not provide adequate time for forests to regenerate. As a result, more than 60,000 wildlife species are considered to be in danger of extinction.

Our existence depends on the bounty of nature. Destroying the balance of the ecosystem has a huge impact on people's lives. In particular, since many of the poor in developing countries rely on the surrounding forests for the water, food, medicine, and other natural resources needed in their daily lives, the destruction of the natural environment leads to a further deterioration in their lives.

We are faced with conserving the natural environment that forms the basis for the survival of humanity, including forests and wetland that are rapidly vanishing from the earth. We need to achieve a society that can maintain harmony between human activities and the ecosystem.

### JICA Activities

During the period from 2000 to 2011, JICA pursued natural conservation activities on 13.62 million hectares of land (forest conservation, 11.3 million ha; ecosystem conservation 2.32 million ha). In addition to conducting activities such as collecting forest data, formulating management plans and improving the lives of local residents, JICA carried out afforestation activities for forest restoration on 3.05 million hectares in various countries. A total of approximately 10.69

million people benefited from these activities. Because eliminating the vicious cycle of environmental destruction and poverty and promoting the formulation of a society in harmony with the ecosystem has become an important issue, JICA provides cooperation on nature conservation in the following three areas, with the aim of facilitating harmony between the maintenance of the natural environment and human activities.

### 1. Sustainable Use of Natural Resources by Local Residents

In developing countries, many people use natural resources in their daily lives. A steep rise in population, however, has meant that the use of those resources exceeds nature's ability to recover, causing the deterioration of the environment that supports human life.

Working in partnership with governments and citizens of other countries, JICA aims to build an organization for systems that can promote the sustainable utilization of natural resources. It undertakes to spread technology that targets improving living standards while making effective use of surrounding natural resources.

### 2. Conservation of Biodiversity

The blessing of biodiversity sustains our daily life in forms such as food, clothing, medicine, and wood products. However, because of such factors as the excessive utilization of natural resources due to deforestation, overgrazing, and the harvesting of firewood and charcoal materials, as well as to overhunting of wildlife, introduction of alien species, and the threat of climate change, it is considered that a large number of wildlife species, including unknown species that remain undiscovered, are becoming extinct every year, and the functions of the ecosystem are deteriorating all over the world.

With the aim of establishing a sustainable society in which human activities co-exist in harmony with the natural ecosystem, JICA is developing protected area management plans in cooperation with governments and citizens, setting up

survey and monitoring and management systems, providing technical assistance for improving the capabilities of administrative officers and researchers, introducing and promoting eco-tourism, and developing and disseminating agricultural technologies that can help strike a balance between the improved productivity and ecosystem conservation. In particular, JICA is prioritizing activities for the conservation of important regions such as Ramsar Convention registered wetlands, national parks and biodiversity hotspots.

JICA is supporting the efforts of developing countries to contribute to achieving the world's goals for conserving biodiversity. These goals were set by the "Aichi Target" that was adopted at the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 10) held in Nagoya, Japan in October 2010.

### 3. Sustainable Forest Management

Forests not only function as lumber resources, they also have the function of retaining and providing stable supplies of water, conserving soil while absorbing and accumulating CO<sub>2</sub> and prevent climate change, conserve nutrients in soil and prevent natural disasters such as floods and landslides. Amid accelerating deforestation around the world, not only is it critical to replace forests by planting trees, it is becoming increasingly important to make sure existing forests are not depleted above current levels via adequate conservation and management.

JICA provides technical guidance for determining the state and monitoring of forests and develops reforestation technology to regenerate wooded areas. It also works to raise awareness among citizens of the importance of forests and offers support

in establishing systems for properly conserving and managing forests. In addition, JICA is extending cooperation on the conservation of forests, with a view to contributing to the establishment of the REDD-plus system, which has been advanced by the international community in recent years as part of the measures against climate change [[See the Case Study](#)].

\* REDD-plus: In addition to Reducing Emission from Deforestation and Forest Degradation (REDD), REDD-plus seeks to support the conservation of forests, the sustainable management of forests and the enhancement of forest carbon stocks.

## Environmental Management

### Overview of Issue

Along with recent economic development, environmental issues such as water and air pollution and inappropriate disposal of waste have spread throughout the world. This threatens the health and life of humans and other wildlife, and inhibits the sound development of economic activities. Japan's experiences in the past prove that it is too late to address environmental issues once our ecosystems and human health are tangibly damaged. Measures that emphasize precaution are needed. It is very important to strengthen the capacity to respond to environmental issues such as the ability to assess and manage the environment and create a framework for implementing environmental measures.

### JICA Activities

Because many environmental issues involve complex factors in a multilayered manner and are spread over a wide spatial area, it is difficult to find solutions in a short period of time.

#### Case Study

### Reducing Greenhouse Gas Emission by Preventing Deforestation and Forest Degradation

#### Providing Assistance for REDD-plus and Forest Conservation as a Climate Change Measure

**REDD-plus is a concept that adds promoting strategic forest conservation and sustainable forest management with the goal of increasing forest carbon stock to the purpose of REDD—reducing emissions from deforestation and forest degradation in developing countries. JICA is providing cooperation and assistance for REDD-plus measures in various developing countries, including forest management in Indonesia, forest policy development in Laos, and enhancing forest resource monitoring capabilities in Papua New Guinea.**

JICA began working with Indonesia, Laos, Papua New Guinea, and other developing countries on REDD-plus measures after the concept was highlighted as a major issue in the 2009 Conference of the Parties (COP15). In 2010, JICA signed a Memorandum of Understanding with the International Tropical Timber Organization (ITTO), planning to cooperate with ITTO on promoting REDD-plus measures.

In 2011, JICA commenced a project to assist Cambodia in initiating a REDD-plus strategy and formulating policy. Cambodian forests are shrinking by 1% annually because of the

conversion of forests to farmland, excessive harvesting and other factors that come with economic growth. In 2010, the Cambodian government formed a national forestry plan, establishing boundaries for the country's forests, strengthened administration of these resources, and promoted their sustainable use. In addition, with the assistance of the United Nations, the World Bank, and other institutions, the government formulated and began implementing a REDD-plus Road Map.

Over the period of five years up to 2016, JICA will be assisting Cambodia with its

implementation of the road map. It will be involved with a variety of activities, such as the setting of a national REDD-plus strategy, on-site forest conservation activities, measuring forest carbon stock, and research and development.



Forest observation station in Indonesia

JICA is also planning to extend the reach of its cooperation with REDD-plus programs beyond Southeast Asia. JICA will be working with such countries as the Gabonese Republic and the Democratic Republic of the Congo, home to Central Africa's Congo Basin, which along with the Amazon Basin is known as "the lungs of the world," and Southern Africa's Republic of Mozambique.

Sound “environmental management” is important as a means of achieving sustainable development while keeping the overall burden of human activity on the environment to a minimum.

JICA provides various forms of support in accordance with the development status of each developing country or region. In so doing, JICA recognizes that it is essential to enhance the capacity of the organizations and individuals to conduct environmental management. Accordingly, in recent years, JICA has been further strengthening the capacity development of the environmental management.

### 1. Water Environment

JICA supports measures to prevent pollution in rivers, wetlands and oceans. This includes support for increasing the capability to monitor water quality, for drafting management plans and making policy proposals. JICA also provides support for the drafting of plans and the operation and management of facilities needed to treat waste water from households and industry and improve the hygienic environment, such as support for the improvement of sewage facilities.

### 2. Atmospheric Environment

JICA supports measures to prevent air pollution, such as increasing the capability to monitor air quality, and improving capacity for drafting management plans and making policy proposals. JICA is also providing support for the development of air pollutant removal facilities, and new methods to measure contaminants.

### 3. Waste Management

JICA supports measures for improving waste management, such as increasing the administrative service capabilities for the collection, transportation, intermediate treatment and final disposal of waste, and improving capacity for drafting management plans and making policy proposals. Recently, JICA is increasing its support to create a sound material-cycle society by promoting the 3Rs (Reduce, Reuse, Recycle) of waste [\[See the Case Study on page 63\]](#).

### 4. Other Areas of Environmental Management

In addition to supporting the formulation of a basic plan for environmental management, JICA also supports more advanced environmental management such as measures for treating chemical substances.

## Water and Sanitation

### ■ Overview of Issue

Water is essential for human life. In addition to drinking water, water directly and indirectly supports human existence as a necessity for food production and various economic activities to maintain lives of people.

However, the water resources available to humans are not unlimited. The amount contained in relatively easily accessible rivers and lakes is a mere 0.01% of all water on the earth.

Nevertheless, the demand for water continues to rise in developing countries as their populations expand. Consequently, these countries are now facing the extremely difficult problem of how to allocate limited water resources for the survival of their citizens, for national economic development as well as for the preservation of the natural environment.

Another issue closely related to water is sanitation. Around the world, 1.5 million children 5-years old or younger die from diarrhea annually. Diarrhea in many cases is caused by infection with pathogenic bacteria discharged from feces transferred to people’s mouths through water, food, fingers or other means. Therefore, building sanitation facilities (toilets) is extremely important to isolate human excreta from the living environment. In addition, the infection routes can be cut off by such hygienic practices as washing one’s hands after defecation and keeping areas around water supply facilities clean. In other words, a mutually complementary relationship exists between improved sanitation that is essential to keep water safe to drink, and water that is vital in such hygienic behaviors as washing one’s hands. The simultaneous improvement of water supply and sanitation is extremely important to reduce water-related diseases.

Japan has experience in steadily developing water supply and sewage systems to build sanitary society, while overcoming flooding and drought during postwar economic growth. On the other hand, Japan remains a major water-consuming country, importing large volumes from other countries directly or indirectly. This makes Japan responsible for taking part in solving the water and sanitation problems of developing countries.

### ■ JICA Activities

#### 1. Water Resource Management and the Efficient Use of Water

The appropriate management of water resources is essential in the situation where available water resources are limited against the growing demand for water. This refers to a need for coordinating water allocation to different sectors while preserving the water environment. Avoiding this coordination would increase the disorderly use of water, resulting in repeated environmental destruction such as “the Tragedy of the Aral Sea”. Effectively using limited water resources to improve sanitation through a stable water supply, and reducing poverty by simultaneously maintaining stable food production and promoting industrial development, while protecting the water environment, are extremely difficult and complex tasks for developing countries that require mobilization of the wisdom of Japan and the international community. From the perspective of promoting integrated water resource management, JICA actively supports developing countries mainly in the formulation of water resource management plans.

One of the most important factors in these daunting challenges is to improve efficiency of water use. This includes the promotion of water-saving and reuse of treated wastewater. JICA is proactively providing assistance in this area, particularly

in the reduction of non-revenue water caused by leaks from pipes, etc., where Japan's experience and technology can be put to good use.

## 2. Improving Access to Safe Drinking Water and Sanitation Facilities

The access to safe drinking water and basic sanitation facilities (toilets) is included in the Millennium Development Goals (MDGs) and is one of the major development challenges of the international community. Moreover, the access to safe water and sanitation was declared a "human right" at the

United Nations' General Assembly held in July 2010.

Nevertheless, in 2010, 780 million people around the world still did not have access to safe drinking water and 2.5 billion were without access to basic sanitation facilities.

As a member of the international community, JICA is working proactively to accelerate the progress towards improving the situation. Specifically, JICA is promoting construction of water supply facilities through financial assistance while strengthening operation and maintenance of the facilities through technical assistance both in urban and rural settings. Particularly in urban water supplies, JICA deals with the

### Case Study

### Bhutan Study on Glacial Lake Outburst Floods

## Using Japan's Science and Technology to Study Glacial Lake Outbursts

**In recent years, global warming has caused glaciers in the Himalayas to retreat. As they shrink, they have left many glacial lakes behind, raising the concern of damage from outburst flooding.**

**Since 2008, JICA has been implementing projects under a new ODA category of Science and Technology Research Partnership for Sustainable Development (SATREPS). As part of the program, JICA conducted joint research on glacial lake outburst flooding in Bhutan that began in 2009 and ended in March 2012.**

### Joint Research on Sustainable Development

Situated on the southern slopes of the Himalayan mountain range, Bhutan is said to have more than 2,000 glacial lakes. Most of these lakes have been created by damming of the water from the melted ice by moraines built up from soil and rock carried by the glaciers. Since the moraines are poorly formed, there is the concern of a sudden outburst of water should they be broken by glacial ice slides or other causes. In 1994, there was an outburst from one such moraine that sent tons of soil and rock down on the ancient capital of Punakha, causing substantial damage.

Since fiscal 2008, JICA has been collaborating with Japan's Ministry of Education, Culture, Sports, Science and Technology and Japan Science and Technology Agency on the SATREPS program to promote science and technology partnerships between Japan's universities and research bodies and counterparts in developing countries. These partnerships aim to find solutions to global issues, such as weather change, food, energy, biological resources, destruction of nature, and infectious diseases. During the first year of the program, JICA initiated 12 projects.

One of those projects was the study on glacial lakes in Bhutan that commenced in 2009. Professor Kouichi Nishimura of the Graduate School of Environmental Studies at Nagoya University led the Japanese team of scientists. The team included researchers in the fields of snow and ice, disaster prevention, and remote sensing. In partnership with the Bhutan's Ministry of Economic Affairs' Department of Geology and Mines, they formed the Study on Glacial Lake Outburst Floods in the Bhutan Himalayas Project.

### Visualization of the Degree of Risk and Potential Scale of Flooding

Project research targeted a wide range of

topics, including assessing the degree of risk of outbursts by glacial lakes, investigating the mechanism of the swelling size of glacial lakes, establishing an early warning system when outburst flooding occurred, and creating a hazard map.

To start with, the project team used satellite data to identify and analyze glacial lakes in the Bhutan Himalayas and surrounding region that were considered to be at high risk. Following this step, the team initiated an actual study of the Mo Chhu river basin. The glacial lake sits in a highland more than 5,000 meters above sea level. The study was carried out under difficult conditions, occasionally having to clear blocked mountain paths and fighting with high altitude sickness. In addition, to investigate what the impact of floods would be, the team had to measure the lower valleys and study the remains of previous landslides. In the second year of the project, the team also began active fault surveys to study the possible earthquakes that could instigate an outburst.

Over the approximately three years of study up to March 2012, the team was successful in building a model that visualizes the degree of risk of outburst by glacial lakes and the potential scale of flooding. The team also revised the assessments of the 25 glacial lakes in greatest danger of outbreak floods. In addition, they produced a distribution map of the potential landslide and active fault areas, distributing the results to Bhutan's Ministry of Economic Affairs, but also to regional government and educational bodies.

Another major success of the project was the transfer of technology to the Bhutan project members and the training of a core of people to carry on the work. Thanks to JICA's assistance, steps are being taken in Bhutan to rapidly respond to the threat of outburst flooding by making municipal bodies and communities more



Surveying of Himalayan glacial lakes in Bhutan

aware of the dangers. The government is producing hazard maps for other river basins, proposing setting up other early warning systems, and using the results of studies to plan locations for hydroelectric power stations.

### From Our Expert

**Jiro Komori**  
Project Assistant Professor, Graduate School of Environmental Studies, Nagoya University (Currently affiliated with Teikyo Heisei University)

I was previously involved with a partnership study done by Japan and Bhutan on glacial lakes that started in Bhutan in 1998, joining the project in 2002. That experience provided me with the opportunity to work on the current project. The people of Bhutan have a great deal of trust in the Japanese and my experience with it on location left a deep impression on me. One of the major reasons for their trust is the long history of international assistance provided by Japan that began with the work done by the late Keiji Nishioka. He was a JICA advisor who contributed to the modernization of agriculture in Bhutan for 28 years, starting in 1964. In addition, the long years of experience and record of Japanese researchers in Nepal also contributed to the progress of the project. Since the global warming problem is serious not only for Bhutan, but also other countries in the Himalayas, the technology and knowledge gained on this project must be widely applied in other regions as well. Clearly, the SATREPS scheme offers a range of benefits for Japan and the partnership country in the areas of assistance and research. As a result, I am confident that this type of partnership activity by countries can only continue to grow.

improvement of water supply utilities' management, mobilizing private sector financing to meet the huge needs for developing water supply facilities.

With regard to the stagnant progress towards improving access to sanitation facilities, JICA is steadily expanding its intervention primarily in Sub-Saharan Africa.

## Disaster Risk Reduction

### ■ Overview of Issue

The prevalence and damage of disasters has increased in the past 30 years or so, as storm and flood damage, earthquakes, volcanic activities and other disasters occur across the globe almost daily. People in developing countries are particularly vulnerable due to urbanization, which accelerates the concentration of people in cities and delays the provision of social infrastructure. Natural disasters do more than claim life; they directly impact people's livelihood and aggravate the poverty cycle. Whereas the previous mainstreams of disaster assistance were centered more on structural measures such as construction of dams and levees, there is also a need for compound measures that emphasize non-structural assistance such as installation of disaster warning systems, creation of hazard maps, and evacuation drills to improve the emergency response of people and society to disasters.

### ■ JICA Activities

#### 1. Activity Policy

Based on a disaster management cycle (DMC), which entails emergency response, recovery and reconstruction, and prevention and mitigation activities, JICA leverages its experience to provide assistance in the following areas.

##### 1) Efforts toward a Safe and Secure Society

The risk of natural disasters is increasing in developing countries. JICA makes use of Japan's leading technical capabilities in disaster prevention to evaluate risk in developing countries, propose measures to mitigate latent risk and preventive measures for conceivable disasters so that people can live with peace-of-mind.

##### 2) Supporting the Formulation of Integrated Disaster Management Plans

JICA supports the formulation of integrated Disaster Management plans and action plans that include identifying disaster-related hazards and risks, improving the disaster management systems and capabilities of administrative institutions, establishing the relevant legal framework, enhancing awareness and strengthening response.

##### 3) Support from the Viewpoint of Human Security through Community-Based Disaster Risk Management

Based on Japan's experience, in addition to "public-help," "self-help" by developing countries and "mutual-help" are important. However, community-based measures are especially key in developing countries where the disaster management capabilities of administrative institutions remain insufficient. To

keep such measures operating on an ongoing basis, JICA directs assistance toward strengthening such capabilities among communities and individuals, as well as reinforcing collaboration by these groups with public organizations.

### 2. Major Activities

JICA collected and analyzed training and other materials used during the Great East Japan Earthquake [🔗 See the Case Study on page 97]. Based on that analysis, JICA proposed a new international disaster cooperation approach aimed at creating a "Disaster-Resistant, Flexible Society." The three points of the approach are 1) The ability to recognize risk and take action properly (Risk Literacy), 2) mitigating the risk of disaster by formulating disaster measures for multiple cases and including a disaster prevention perspective of activities in other fields (Redundancy) and 3) continuously upgrading disaster measures to adapt changes in society and scientific verification (*KAIZEN*).

Among other activities, major flooding occurred in Thailand for more than three month commencing in July 2011. The flooding affected as many as 2.3 million people. Industry, including Japanese-affiliated companies suffered serious damages. JICA quickly dispatched investigative and expert teams and pumper trucks, implementing an emergency response and activities to support recovery and reconstruction [🔗 See the Case Study on page 15 and 139].

## Climate Change Measures

### ■ Overview of Issue

The issue of climate change has an impact on the entire infrastructure of human life, including the ecosystem, society and the economy. It is a global challenge that poses an enormous threat to equitable economic growth, poverty reduction and human security. Recently, phenomena considered as negative effects of climate change, such as the submersion of coastal lowlands due to rising temperatures and sea levels and increases in extreme weather and natural disasters including droughts, torrential rain, floods, and declines in food production and water resources, have been reported in various places. The impact of climate change is expected to seriously affect our lives more intensively and extensively in the future.

### ■ JICA Activities

#### 1. Supporting Efforts for the Reduction of Greenhouse Gases

In recent years, greenhouse gas emissions from developing countries have been increasing rapidly. In order to minimize the negative effects brought by climate change, it is essential that the ongoing efforts to reduce emissions of greenhouse gases or "mitigation measures," involve not only developed countries but also developing countries.

For developing countries faced with a large number of issues including poverty reduction, it is important to take an approach that both reduces greenhouse gas emissions and bears benefits such as improvements in livelihood and economic development.

JICA extends cooperation in areas including the introduction of renewable energy, promotion of energy saving, improvement of urban public transportation system, solid waste management, forest management and support for afforestation. JICA also provides extensive support for the formulation of policies and strategies, such as development of national greenhouse gas inventories, establishment of energy-saving laws and low-carbon urban development.

## 2. To Protect People in Developing Countries from the Negative Impact of Climate Change

Developing countries, and the poor in particular, are extremely vulnerable to the impact of climate change.

JICA provides support to adaptation measures in accordance with each country's needs. These include developing capacity in shore protection and embankments, construction of drinking water supply facilities, appropriate management of water resources, ecosystem protection, promoting irrigated agriculture and dissemination of drought-resistant agricultural crops.

Furthermore, JICA is formulating and implementing adaptation measures tailored for each region and country based on meteorological observation, climate change prediction and impact evaluation. Such cooperation will become increasingly important in the future.

The climate change issue is closely related to a variety of issues faced by developing countries in such areas as energy, transportation, forests, water resources, disaster prevention, agriculture, and health and sanitation. For the developing countries, the climate change issue is inseparable from development.

By drawing on past experiences and achievements in supporting sustainable development, and on the basis of international discussions, JICA provides support for climate change measures in developing countries from a number of angles, from the policy level to implementation of projects, research, etc., while collaborating with concerned domestic and international organizations.

### Case Study

### Lesson from the Great East Japan Earthquake

## Sharing the Experience of the Major Earthquake with the World

**The March 2011 Great East Japan Earthquake and following tsunami caused enormous damage primarily to Eastern Japan as well as great loss of life. After the disaster, JICA opened up its research facilities as evacuation centers for the victims of the disaster and cooperated with the aid efforts of NPOs active in the disaster region and with the tsunami damage assessment efforts of Tohoku University and other institutions. Furthermore, JICA took action to apply the experience of this major earthquake to disaster prevention measures in developing countries. Cooperating with Tohoku University in conducting a survey and study to review the experience gained and lessons learned from the Great East Japan Earthquake, JICA is making efforts to reflect those lessons in its operations and share them with others.\***

### Three Approaches

In Japan, disaster plans are formulated by establishing a scenario of the damage that would be done by a possible disaster, and then combining hardware and software to create a disaster plan and prepare countermeasures. Hardware includes such measures as building levees and dams, while software covers non-structural measures, such as disaster drills, warning systems, and disaster prevention education. Despite this thorough approach, regions and communities that had taken these measures suffered substantial damages in the Great East Japan Earthquake. This result forced Japan to recognize that implementing various measures was not enough, it was necessary that the measures be effective. The survey and research done by JICA aimed to review the major cases of damage done by the major earthquake and produce a list of points regarding "the necessary perspective for implementing effective disaster measures."

As a result of the study, the team considered that there were various gaps between the expected capacity of regions and communities to respond to disasters at the planning stage and at the point of occurrence of a disaster. Furthermore, they discovered that developing countries had these gaps in common with Japan.

In response, JICA set its disaster prevention cooperation goal as the "establishment of disaster-resilient communities." To reach this goal, it is important to fill in the gaps in planned and actual capacity. JICA formulated an integrated approach based on an overall strategy of reducing the risk of disaster. The approach incorporates three points of view—*KAIZEN*, Risk Literacy, and Redundancy—and has been termed the Three Principles Approach.

### Mainstreaming Disaster Risk Management

Within the Three Principles Approach, redundancy measures are particularly important, and therefore require adequate discussion. In



Mr. Saroj Jha, Ex-Manager of the World Bank's Global Facility for Disaster Reduction and Recovery exchanges opinions with others at the Disaster Measures Headquarters in Higashi Matsushima's City Hall.

developing countries, it is not easy for the disaster prevention center alone to invest sufficient funds to deal with all issues. However, if a disaster prevention perspective is added to road, harbor, and other infrastructure management, it is possible to further reduce disaster risk.

Adding a disaster risk management perspective to various fields in this manner is called disaster risk reduction mainstreaming. Other countries providing aid to developing countries besides Japan have also begun to promote this concept. The question now is what is the most effective method of achieving disaster risk reduction mainstreaming. Collaborating with developing countries and other aid-providing institutions, JICA intends find answers to that question and contribute to reducing disaster risk.

\* [http://www.jica.go.jp/english/operations/thematic\\_issues/water/earthquake/index.html](http://www.jica.go.jp/english/operations/thematic_issues/water/earthquake/index.html)