

# A Sampling of JICA's Climate Actions

There are many different approaches to fighting climate change. These projects are aimed at controlling or preparing for climate change.



**India**

## Metro System Contributing to CO<sub>2</sub> Emission Reduction

**MITIGATION**

### Metro Development in India

As India accelerates economic growth, the number of car owners has been increasing, resulting in air pollution and traffic congestion that cause serious problems in the major cities. The Delhi Metro Project, which was developed under Japanese ODA loan, contributes to reducing CO<sub>2</sub> emissions and air pollution. Mr. M. P. Singh, Chief Development Specialist of the JICA India Office explains the development impact of the Project: "With the introduction of the metro system, the daily volume of vehicles on the road in 2018 decreased by about 700,000. When converted to CO<sub>2</sub> emissions, there is a reduction of approximately 990,000 tons. Owing to the use of an energy-efficient braking system developed by Mitsubishi Electric Corporation, the Project earned Japan its first Certified Emission Reduction Credits for the railway sector under the UN's Clean Development Mechanism\* (CDM)."

As air pollution is a big concern, not only in Delhi but also in all major cities throughout India, the government of India intends develop more metro systems. "The Delhi Metro is highly regarded in India as a "Shining Example" that is representative of the cooperation between India and Japan," continues Mr. Singh. "Other Metro projects modeled after this project are already underway in and outside India, including Bangladesh."

\*The CDM is a system established under the Kyoto Protocol whereby Certified Emission Reduction Credits are issued to developed countries that help reduce greenhouse gas emissions through projects carried out in developing countries.



After 25 years since its founding, the Delhi Metro now stretches for 373 km, a distance greater than that of the Tokyo Metro.



We aimed to cover all electricity needs by using solar power, making our railway project very earth-friendly!



**M. P. Singh**  
Chief Development Specialist,  
JICA India Office

In 2017, the number of people using the Delhi Metro reached 1.8 billion people, making it the seventh most used subway in the world.



**Costa Rica**

## Developing Clean Energy

**MITIGATION**

### Geothermal power generation key to becoming a carbon-neutral nation

Costa Rica, a Central American country, relies on hydropower generation for most of its power supply. However, in the dry season the amount of hydro power generation decreases making it necessary to generate power with imported fossil fuels to cover the shortage. Under these circumstances, Costa Rica has been developing geothermal power generation as a means to achieve stable power supply at a lower cost. Japan has been providing assistance in constructing a geothermal power station, and presently work is underway in Las Pailas, Guanacaste.

Chika Takahatake, JICA Panama Office, says, "When Las Pailas 2 is completed, it is expected to help reduce the annual greenhouse gas emissions by 14,000 tons compared with those from oil-fired thermal power generation." The great value of this project lies in the fact that the conservation of the surrounding environment and mitigation of

climate change are both addressed at the same time.

"The steam pipeline and the power station building are designed and installed in consideration of the natural habitats of animals and plants, and also the surrounding landscape," remarks Takahatake. "We also implemented a technical cooperation program for evaluating the impact of the project on ecosystems accurately, collaborating and strengthening our ties with local NGOs and the government."



The site is filled with steam. Costa Rica is a volcanic country with great potential for geothermal power development. Although the estimated power generation potential is approximately 865 MW, the installed capacity has remained around 217 MW.



Drilling site for Las Pailas 2. Geothermal power uses hot water and steam taken from deep underground.



**Chika Takahatake**  
Senior Representative,  
JICA Panama Office

This project is an excellent example of coexisting with the environment.



**Republic of South Africa**

## Protecting People from Infectious Disease

**ADAPTATION**

### Using science to control the increased risk of infectious diseases due to climate change

Climate change is exacerbating the threat of infectious disease in developing countries. For example, extreme cases of El Niño and La Niña are accompanied by flooding. This accelerates the breeding rate of mosquitoes, which are a known carrier of pathogens, resulting in the spread of diseases such as malaria. The deterioration of the quality of water supply due to flooding also leads to the spread of cholera.

This relationship between climate and infectious disease epidemics was recognized by Japan and the Republic of South Africa, which have launched a joint research effort aimed at predicting potential epidemics and providing early warnings. Using artificial intelligence and other methods, the research team analyzes the weather forecast for Southern Africa acquired from one of the world's most advanced climate models, which was developed by Japan. This data is then combined with local environmental fac-

tors to predict infectious disease epidemics.

Speaking of the importance of this project, Noboru Minagawa, Project Leader for JICA and Professor at Nagasaki University, says, "If we can predict epidemics, we can prepare preventive measures, drugs, and diagnosis kits at an early stage. This will reduce the number of cases of infection."

It is expected that the results of this project can be further developed and applied in other parts of the world to control climate-related infectious disease.



Team members collecting malaria-carrying mosquito larvae for use in clarifying the correlation between mosquitoes and climate as part of an ecological survey.



**Noboru Minagawa**  
Professor, Institute of Tropical  
Medicine, Nagasaki University

For the first time in 20 years, we succeeded in predicting an outbreak of malaria in South Africa!



The predicted number of malaria cases shown on a tablet. Artificial Intelligence predicts potential epidemic areas using the data collected.