Building disaster-resilient infrastructure

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.

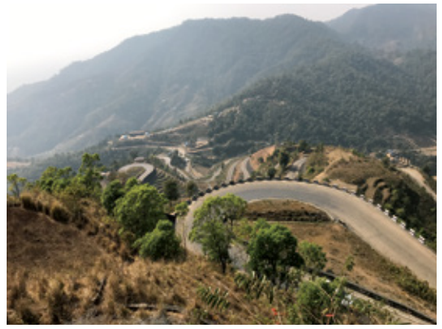
Nepal

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 lifeline 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.

Thailand

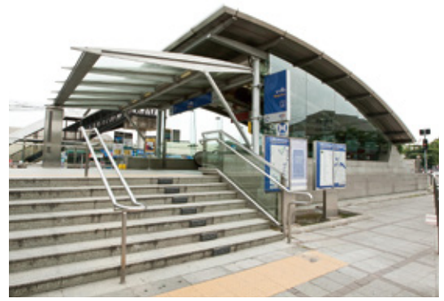
Safer design for daily transportation

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.

Myanmar

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.

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.