

# Training in Earthquake Resistance

*Researchers have developed a number of technologies to improve building safety in earthquake-prone Japan, which is now supplying those technologies to many countries overseas. Osamu Sawaji of the Japan Journal reports on one such case led by the Japan International Cooperation Agency (JICA) in China.*

The 7.9-magnitude Great Sichuan Earthquake, which struck in Sichuan Province, China, in May 2008, caused serious damage, leaving about 87,000 people dead or missing.

In the wake of this massive disaster, the Japanese government held talks with its Chinese counterpart to discuss reconstruction support. Based on these discussions, the government adopted a policy of offering specific assistance in five key areas: “health and welfare,” covering demand such as mental healthcare for the affected people and support for building a disaster medical care system; “society and culture,” dealing with issues such as school and hospital restoration and support for

disaster mitigation training; “industry and employment,” focusing on areas such as reconstruction support for affected industries; “disaster prevention,” which encompassed areas such as cooperation in earthquake disaster prevention studies and support for dyke reconstruction; and “community development,” to address needs such as lifeline restoration support and assistance for new city development.

Based on these five pillars, the Japan International Cooperation Agency (JICA), the organization in charge of implementing Japan’s official development assistance (ODA), is offering support in a broad array of fields, including the restoration of forests destroyed in the earthquake, improvement in post-quake first-aid support technologies, and training for mental healthcare experts for victims.

The Human Resources Development Project for Seismic Engineering and Construction of Buildings, which JICA launched in 2009, is one such support operation. “The aim of this project is to train people who can help to improve the earthquake-resistance of buildings, such as structural engineers for buildings and administrative officials in charge of buildings,” says Shinji



In July 2011, as part of their training under JICA in Japan, participants from China visited temporary houses in Miyako City, Iwate Prefecture for the victims of the Great East Japan Earthquake of March 11.

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Asami, the project leader.

In this project, JICA is inviting participants from China to Japan, to teach them how to test the quake resistance of reinforced concrete buildings and how to strengthen such structures. Participants visit the Building Research Institute in Tsukuba City, Ibaraki Prefecture, and receive other forms of training. At the same time, JICA is dispatching earthquake-resistance design, disaster prevention planning, and other experts to China to provide direct instructions in the field.

Among Japanese technologies for increasing building safety, China is taking a particularly strong interest in (1) seismic isolation, which inhibits the travel distance of the jolts from earthquakes with the installation of devices such as laminated rubber bearings between the ground and buildings, (2) vibration control, which absorbs shaking with the installation of devices such as dampers inside buildings, and (3) seismic reinforcement, using steel braces (diagonal beams) installed on the inside of building frames (such as sections between pillars) and on the outside (wall surface).

In the project, JICA is making active use of Chinese trained in Japan as instructors in China. For example, a system called “emergency safety assessment” has been established in Japan. In this system, experts put stickers, such as “Caution” and “Danger,” on buildings damaged in an earthquake, depending on the degree of damage. Aftershocks destroyed buildings and caused additional deaths and injuries following the Great Sichuan Earthquake. Learning from that experience, JICA offered training on the emergency safety assessment system through this project. Chinese who had

taken part in JICA training in Japan served as instructors for this training in China.

The project also reflects the experience of the Great East Japan Earthquake that struck on March 11, 2011. Visits to the affected parts of the Tohoku region were worked into a training program. Through three programs conducted in Japan by November 2011, fifty-eight Chinese participants visited parts of Iwate Prefecture damaged by the tsunami, such as the cities of Rikuzentakata, Kamaishi and Miyako.

“The scale of damage caused by the tsunami had a great impact on participants,” says Asami. “At the same time, however, they were very impressed by the fact that building damage from the earthquake itself was not so serious. They also expressed their impression that lifelines such as waterworks and roads were being restored at a quick pace.”

JICA has trained about 230 Chinese people through its programs in Japan. Participants in the Agency’s training programs in China have totaled approximately 6,500. In the remaining part of the project, which is due to conclude in 2013, JICA plans to focus its support operations on areas such as training for instructors, preparing teaching materials, and revising quake-resistance standards, so that people in China can distribute earthquake-resistant technologies themselves.

“We want to build a system that lets us train people in a broad range of fields in a sustained manner,” says Seki Matsutaro, who is taking part in the project as an expert in seismic construction. “Nothing makes me happier than seeing the next generation of Chinese engineers absorb my knowledge and apply it to reducing earthquake damage in China.” 