

"Needs Survey" under the  
Governmental Commission on the  
Projects for ODA Overseas Economic  
Cooperation in FY2013

Summary Report

Kingdom of Thailand  
Republic of Turkey  
People's Republic of Bangladesh  
Republic of Chile

Survey on Construction of Disaster-  
Resilient Information-Sharing Based  
Community

March, 2014

IC Net Limited

The content of this report is a summary of the needs survey, which is commissioned by the Ministry of Foreign Affairs of Japan in the FY 2013 and was carried out by IC Net Limited. It does not represent the official view of the Ministry of Foreign Affairs.

## **Introduction**

This survey was conducted for identifying the basic needs and challenges in the field of disaster management, to be addressed by technologies and products from Japan, which is one of the most disaster-prone countries in the world. Japanese enterprises including a number of small-medium enterprises (SMEs) have developed a variety of advanced technologies to handle disaster. This survey aims primarily at promoting the overseas operation of the Japanese SMEs experienced in disaster management, taking advantage of the scheme provided by Official Development Assistance (ODA) by Japan.

### **I. Description of the current situation and development needs of the concerned development issues in the surveyed countries**

The following four countries were selected to be surveyed from the respective regions: the Kingdom of Thailand (hereinafter “Thailand”) from Southeast Asia and Oceania, the Republic of Turkey (hereinafter “Turkey”) and the People’s Republic of Bangladesh (hereinafter “Bangladesh”) from South and West Asia, and the Republic of Chile (hereinafter “Chile”) from Central and South America. Each of these surveyed countries has historically had friendly relations with Japan. Moreover, despite occasional reports of intense political struggles between their ruling and opposition parties, they have each established political systems consistent with democratic principles, and their active involvement in the international community has been remarkable. Thailand, Turkey and Chile have survived the global economic slump, maintaining stable economic growth, and continuing their way to shift from aid-recipient to become an aid-donor country. As a least developed country, Bangladesh has received a large amount of assistance in the past. Nevertheless, its economic growth rate has been stable for the past ten years, and is expected to continue developing.

Given the geographical location and natural environment of each country, Thailand, Turkey, Bangladesh and Chile experience frequent natural disasters, and in recent years, the degree of damage sustained has increased due to climate change. Another issue that has surfaced is the fragility of their essential utility systems caused in part by population growth and concentration. Thailand is prone to monsoon flooding, landslides, mud slides and flash flooding. Turkey and Chile are prone to earthquakes, and in the past five years, have suffered many casualties due to earthquakes. Bangladesh is heavily affected by cyclical tropical storms (cyclones) and floods, as well as earthquakes and droughts. The governments of each country have strived to strengthen their capability to respond to disasters and to prevent damage caused by disasters, including building the systems for predicting disasters and for transmitting information at the time of disaster. They have become acutely aware, especially within government organizations, of the concepts of “preparedness for disasters” and “public assistance.” Nevertheless, in terms of disseminating these systems to the lower levels of government administration and using them effectively at the local level, each country still has a number of issues to be solved. The awareness of the general public toward disasters is also low. In particular, the concepts of “self-help and mutual aid” have barely taken root, with guidance on disaster education often being unstructured. In Thailand and Chile, the populations have been ageing progressively, so there is a growing need to provide support to the elderly, both at times of disaster and during normal times.

## **II. Analysis on the products and technologies developed by the Japanese SMEs**

As a nation with advanced disaster management systems, Japan has put a great deal of effort in countries around the world into supporting measures for responding to disasters and for preventing damage they may cause, drawing on the technology and knowledge nurtured through its own experiences. Japan has designated such measures as a priority area for its ODA projects, and as such, has provided a variety of support to countries where the impact of disasters is large, including the four countries abovementioned. The importance of measures for responding to disasters and for preventing damage caused by them has grown internationally as well. In recent years, in addition to support for large-scale infrastructure development and for various policy and institutional reforms, other donor organizations have also advanced initiatives for planning and implementing effective measures at the community level which are adjusted to local circumstances. Above all, though, importance has been attached to building platforms for the sharing of information on daily life and on disaster management. It is widely recognized that sharing information on disasters and on daily life within a community not only prevents the spread of damage due to disrupted or delayed communication in the event of a disaster, but also strengthens the community's preparedness for disaster.

In this way, the approach to disaster management from a community level, and in particular, from a perspective of "soft (non-physical)" infrastructure, is becoming the mainstream, even in the area of international cooperation for disaster risk management. Moreover, utilizing SMEs here, with their advanced technical capability and unique products, is also consistent with the recent trend in development assistance of promoting partnerships between ODA and the private sector. Therefore, based on a theme of community disaster risk management from a primarily "soft" infrastructure approach, this survey carried out investigation to find out whether the products of SMEs and a combination of their technologies matches the local needs. The objective of the survey is to provide mechanisms through which essential information can be shared both at times of disaster and during normal times. Specifically, information was collected and analyzed on the needs of combination of technologies towards products in the area of disaster risk management, such as those based on information and communications technology (ICT) that can help in building platforms for sharing information on daily life and on disaster risk management.

For the purpose of collecting information on the main theme of this survey, namely the building of systems for sharing information in the area of disaster risk management, a visit was also made to the ASEAN Coordinating Centre for Humanitarian Assistance on disaster management (AHA Centre). Located in Jakarta in the Republic of Indonesia (hereinafter "Indonesia"), the AHA Centre coordinates countermeasures against natural disasters for ASEAN member states, including Thailand, which is one of the target countries in this survey, and is engaged in collaboratively promoting such initiatives as countermeasures against natural disasters, disaster responses and post-disaster reconstruction. Furthermore, in conjunction with this survey, from the perspective of regional revitalization through the promotion of SMEs, the potential for regional collaboration in the area of disaster risk management was also taken into account, using the example of the industry-academia-government cluster in Koriyama City, Fukushima Prefecture, which is also deeply connected to the Great East Japan Earthquake.

Through a field survey, four issues and needs were identified primarily in relation to the theme of this survey: 1) disaster prevention and damage mitigation measures; 2) weather forecasting and early warning systems at the regional and community level; 3) ensuring essential utilities; and 4) the building of information-sharing platforms in local communities. The technology and products of SMEs were proposed which have potential application to each of these four issues and needs.

1) In terms of disaster prevention and damage mitigation measures, proposals were made for: compact nondestructive testing equipment for identifying the risk of damage to structures; micro tremor measuring services; educational content on disaster mitigation aimed at increasing the responsiveness of residents to disasters by improving their awareness for disaster risk management; and portable seismic vibration simulators. 2) In terms of weather forecasting and early warning systems at the regional and community level, proposals were made for: weather forecasting and early warning systems which assist in the prediction of disasters in specific areas by conducting detailed analyses of weather information; compact digital seismic intensity meters and earthquake alert systems with exceptional performance in the early detection of earthquake waves; and landslide monitoring equipment which is easy to transport and install. 3) In terms of ensuring essential utilities, proposals were made for: water purifiers for disasters which are inexpensive and highly efficient and do not use electricity; high-performance and light-weight desalination equipment; small-size doctor cars which are equipped with a detachable sub-battery as an emergency power supply; and autonomous dispersed communications infrastructure which serves as a router ensuring the minimum level of communications in the event essential utilities are disrupted. 4) In terms of building information-sharing platforms in local communities, proposals were made for: community-based information-sharing platforms that have multiple possible applications both at times of disaster and during normal times and which can be provided at low cost by utilizing the cloud computing system; systems for checking whether people are safe by sharing real-time information at the time of a disaster by utilizing mobile phone applications; and vital sensors that enable health care providers to keep track of the health information and location information of patients requiring assistance or nursing care.

### **III. Possible applicability of the SMEs' products and technologies to the future ODA projects**

Based on development issues in the four countries, this chapter proposes ODA projects which utilize the technologies of Japanese SMEs mentioned in Chapter II, and analyzes the anticipated effects.

In Thailand and Bangladesh, where torrential rains cause severe water damage, weather forecasting systems for specific regions and early warning systems could be developed, which help to improve the livelihoods of residents while being used in the economic activity of the local region, such as in agriculture and fisheries during normal times as well. In Thailand, which is prone to landslide, a landslide detection and warning system using compact equipment and sensors for measuring inclination could be introduced, thereby mitigating the risks, including the risk of secondary disasters.

In Thailand and Chile, where the populations have progressively aged and initiatives are underway for ICT-based telemedicine, applications for managing and sharing personal information could be introduced, as well as for video conferencing systems, and small-size doctor cars which are equipped with communication and telemedicine functions. Such system would be effective in improving the overall responsiveness of medical services at times of disaster.

In Turkey, Bangladesh and Chile, where initiatives for disaster mitigation education have begun, hands-on disaster mitigation education utilizing Japan's knowledge and technology could be implemented, thereby raising awareness for disasters. Building of a system that uses ICT to combine the functions of collecting and transmitting local disaster-related information could also be promoted

In Bangladesh and Chile, which face challenges in their water supply systems even during normal times, portable water purifiers and desalination equipment that take into account the respective natural conditions and types of pollution in each area, could be introduced. In Turkey, which aims to make its structures more quakeproof, relevant nondestructive testing technology could be disseminated for the purpose of mitigating the risks from earthquake disasters.

The proposed projects are designed with the measures needed at the community level, and therefore primarily intended to be implemented by local governments, non-government organizations (NGOs) or residents. Furthermore, projects are not limited to the introduction of just one product. In addition to combining different technologies and products and devising technology transfer and training programs aimed at enhancing the community's overall capacity to respond to disasters and to prevent damage caused by disasters, consideration is also given to collaboration, such as by verifying the consistency of proposed projects with other already existing ODA projects.

#### **IV. Possibility of business development by utilizing the SMEs' products and technologies in the surveyed countries**

Thailand, Turkey and Chile have joined the ranks of medium-developed countries, and they are not expected to experience any significant growth in the needs for ODA in the future. Still, it seems that disseminating community-based solutions for disaster management from both “hard (physical)” and “soft (non-physical)” infrastructure perspectives through the implementation of ODA projects could lead to government procurement, and in the future, could successfully develop into business targeted at the private sector. Most effective of all would be to introduce technology and products into those industries likely to suffer extensive economic damage due to disaster. In recent years, these three countries have experienced growth in personal consumption and increased interest in advanced telecommunications and medical technology. These markets also have strong confidence in Japanese-made products. If awareness for disaster management grows among the general public, then there is also potential for development into services targeted at the wealthy and middle classes. Another prospect for Thailand, Turkey and Chile is the spillover effects onto neighboring countries and into the respective economic blocs led by each country. As for Bangladesh, with prospects of being a huge market in the future, it has the potential to act as a litmus test for Bottom/Base-of-Pyramid (BOP) business expansion. In Thailand, there are a large number of local businesses that provide specialized services to Japanese enterprises, and while the risks associated with SMEs expanding their business operations are relatively low, it is essential that they differentiate themselves from other enterprises from Thailand and other countries that have advanced technical capabilities. Turkey and Chile have strong economic and diplomatic ties with European countries and the United States of America (hereinafter the “US”) respectively, and so competition with the technologies of these countries needs to be considered. Chile has a highly transparent and open market, but few Japanese enterprises have made inroads into this market, and so there are hardly any business-related services, such as law firms and accounting firms that have Japanese speaking staff. In Turkey, meanwhile, a top-down chain of command has also been reflected in business practice, so in addition to the need to engage with the Investment Support and Promotion Agency of Turkey (ISPAT), similar to Chile, it would be important to find local businesses to partner with. It seems that some locally produced technologies owned by these SMEs could also be effective in achieving cost reductions. In Bangladesh, although the business environment has not been conducive, donor organizations and NGOs have a strong presence, so it seems to be important to give a thought to the spread of products through these institutions.

When SMEs attempt to expand their business operations overseas as a consequence of this survey or the ensuing schemes for support, it is important to confirm the significance of using ODA. This applies to the following case: the technology and products of SMEs help to resolve development-related issues in developing countries, and it is difficult for SMEs to expand overseas unaided, which means support by the government is needed. Measures for responding to disasters and for preventing damage caused by them benefit the public, and are highly consistent in terms of contribution to resolving development issues. Apart from Thailand and some other countries, making inroads into many developing countries and emerging countries remains difficult for SMEs, so using ODA projects as a stepping stone for overseas expansion can be an effective means. Furthermore, systems of support based on industry-academia-government cooperation in Japan, which also include government administrations and universities, are important for maximizing the ripple effect into regional economies which is attributable to SMEs' business expansion overseas. Bearing in mind that the cooperation is with the regional cluster in Koriyama City, Fukushima Prefecture, which had an objective of post-earthquake reconstruction, during this survey, consideration has been given to a model of disaster-resilient community-building in the same area, and there is also an expectation that this model will be expanded overseas in the future.

## Attachment: Outline of the Survey

### Needs Survey (Thailand, Turkey, Bangladesh, Chile)

#### Survey on Construction of Disaster-Resilient Information-Sharing Based Community

##### Enterprise and Counterpart Organization

- Name of Research Agency: IC Net Limited
- Location of Research Agency: Saitama, Japan
- Survey Site, Counterpart Organization: Public, private and academic organizations concerned in disaster risk management

##### Concerned Development Issues

- Early disaster warnings and weather information are not fully utilized at the regional level. (Thailand, Turkey, Bangladesh)
- Platforms have not been sufficiently developed for the sharing of information for people who are vulnerable to disasters. (Thailand, Bangladesh, Chile)
- The public have a low sense of crisis regarding disasters and have a low awareness for disaster risk management. (Turkey, Chile)
- Essential utilities at times of disaster are inadequately ensured. (Bangladesh, Chile)

##### Products and Technologies of SMEs

- Weather forecasting systems at the regional community level, early warning systems using compact digital seismic intensity meters and landslide monitoring equipment.
- Routers ensuring a minimum level of communications in the event in which infrastructure is disrupted, and community-based information-sharing platforms utilizing the cloud computing
- Persuasive educational content on disaster mitigation and earthquake simulators, which incorporate Japan's experiences
- Inexpensive and maintenance-free water purifiers, compact desalination equipment, and X-ray nondestructive testing equipment

##### Proposed ODA Projects and Expected Impact

- Develop weather forecasting and early warning systems for specific areas and applications, which help, not only at times of disasters, but during normal times as well, to increase agricultural efficiency and to improve the livelihoods of residents
- Strengthen the communications and network systems for community residents at times of disaster, thereby mitigating risks, including the risk of secondary disasters
- Raise awareness for disasters by implementing hands-on disaster mitigation education utilizing Japan's experiences
- Strengthen the systems supplying essential utilities, such as water at disaster risk management bases, and disseminate technology for the nondestructive testing of structures so as to reduce disaster risk

##### Future Business Development of SMEs

- Open up new markets in developing countries, by utilizing ICT and other advanced technologies and by drawing on the experiences of Japan as a nation with advanced disaster risk management systems
- Provide community-based solutions for disaster risk management from both "hard (physical)" and "soft (non-physical)" infrastructure

