

Chapter 12

Exchanging Disaster Science Expertise Between Countries—A Japanese Personal Perspective



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Abstract Having experienced firsthand the catastrophic Great East Japan Earthquake and Tsunami of 2011, Tohoku University founded the International Research Institute of Disaster Science (IRIDeS) in 2012. IRIDeS staff, with a broad array of relevant specializations, conducts world-class research on disaster science and disaster mitigation in collaboration with organizations from many countries. As a member of IRIDeS, Prof. Osamu Murao, the founder and manager of the International Strategy for Disaster Mitigation Laboratory (ISDM), has conducted several international collaborative research projects. This chapter briefly reports on the activities of the IRIDeS and ISDM and highlights key factors for successful international collaborative research and exchange experiences with other countries. The author recounts his initial collaborative research experience in a long-term project examining Taiwan's recovery from the impact of the 1999 Chi-Chi Earthquake which was the foundation of the international research collaboration at ISDM. The chapter concludes with a summary of the valuable lessons learned from the author's participation in this research.

Keywords IRIDeS · Chi-Chi earthquake · Taiwan · Japan · Partnership · Local communities

12.1 Introduction

Stories of natural calamities and misfortunes appear almost daily throughout the world. In many cases, these are relatively minor events such as heavy rains or power failure. However, occasionally a major disaster occurs so seriously that it affects millions of people directly or indirectly, as happened with the 2004 Indian Ocean Tsunami or the 2011 Great East Japan Earthquake or in case of 1999 Chi-Chi Earthquake. Damage conditions and post-disaster recovery situations affected by these major events inevitably differ according to regional and social characteristics as well

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as the nature and severity of the hazard. However, similarities can be usefully examined. In fact, it is crucial that we learn from our experiences with urban and regional disasters in order to develop and refine disaster risk reduction measures for the future. This is particularly true for artificial environments such as cities.

When a manufacturer develops a product that might pose a risk to the consumer, the maker carries out repeated tests until the safety and reliability of the product can be assured. The development of a city is far different. The typical city is an artificial environment that has formed and evolved rather than a product that has been thoroughly planned, tested, and delivered with safety guarantees. In most cases, serious safety weaknesses go unrecognized until the city faces a disaster (see also Chap. 9 by Barnes on designing cities considering disaster and gender aspects). It is for this reason that past disasters and recoveries need to be examined and analyzed carefully and the lessons learned from the experience disseminated in order to reduce urban disaster risks.

Japanese society has accumulated valuable knowledge and experiences from past disasters. In recognition of this, the United Nations held influential international events for disaster risk reduction in Japan at Yokohama in 1994, Kobe in 2005, and Sendai in 2015. Emanating from the 3rd World Conference on Disaster Risk Reduction was the Sendai Framework for Disaster Risk Reduction 2015–2030 (UNISDR 2015) (hereafter, the Sendai Framework), which describes the importance of international cooperation to reduce disaster risk around the world:

It is necessary to continue strengthening good governance in disaster risk reduction strategies at the national, regional and global levels and improving preparedness and national coordination for disaster response, rehabilitation and reconstruction, and to use post-disaster recovery and reconstruction to “Build Back Better”, supported by strengthened modalities of international cooperation.

The Sendai Framework, which succeeds the Hyogo Framework for Action 2005–2015, continues to provide global guidelines for disaster risk reduction from 2005 to 2015 (UNISDR 2005). The Sendai Framework suggests gaps exist “in addressing the underlying disaster risk factors, in the formulation of goals and priorities for action, in the need to foster disaster resilience at all levels and in ensuring adequate means of implementation,” as well as identifying “a need to develop an action-oriented framework” (see UNISDR 2015; p. 11). International cooperation and global partnerships are seen as significant factors in the implementation of effective disaster risk reduction measures.

The International Research Institute of Disaster Science (IRIDeS) is designed to address some of the gaps outlined in the Sendai Framework. The IRIDeS was founded in April 2012 by Tohoku University following the costly and catastrophic disaster of the Great East Japan Earthquake and Tsunami in 2011. The mission of the IRIDeS has been to create a new academic area of disaster mitigation that subsumes the lessons of the Great East Japan Earthquake and Tsunami and the findings of world-class researchers. It aims to establish social systems capable of responding promptly, sensibly, and effectively to disasters, withstanding adversities with resiliency, and passing on and extending the lessons learned to future disaster management.

The IRIDeS is committed to assisting on-going recovery and reconstruction efforts in affected areas, conducting action-oriented research, and pursuing effective disaster management to build sustainable and resilient societies. Together with collaborating organizations from many countries and highly specialized experts, the IRIDeS conducts world-class research on natural hazard science and disaster mitigation. The following section describes the IRIDeS, its activities, and outcomes.

12.2 Activities at International Research Institute of Disaster Science (IRIDeS)

The IRIDeS aims to become a world center for the study of disasters and disaster mitigation, learning from and building on past lessons in disaster management from Japan and around the world. To achieve this, the IRIDeS undertakes a range of action-orientated research and collaborative activities.

In the frame of action-oriented research, the IRIDeS has been committed to enhancing cooperation with local municipalities and governments in areas affected by the 2011 Great East Japan Earthquake and Tsunami as part of its contribution to recovery and reconstruction efforts. The IRIDeS established a number of agreements with local governments affected by the 2011 earthquake and seriously hit by the following tsunami in Iwate (Rikuzentakata City) and Miyagi Prefectures (Kesennuma City, Ishinomaki City, Higashi-Matsushima City, Tagajo City, Sendai City, Natori City, Iwanuma City, Watari Town, and Yamamoto Town). The long-term objective of these cooperations is to create disaster-resilient societies that can manage the complex and diverse challenges associated with disasters. Not only doing so by identifying and implementing prevention measures but also by preparing and responding to the challenges they present and achieving recovery and renovation. Broadly speaking, the goal is to engender a culture of disaster-resiliency and incorporate it into our social systems.

The action-oriented research from the IRIDeS (2012) focuses on:

1. Investigating the physics of global scale disasters such as mega-earthquakes, tsunamis, and extreme weather.
2. Reconstructing disaster response and mitigation technologies based on the lessons of the 2011 Great East Japan Earthquake and Tsunami disaster.
3. Inventing “Affected Area Supportology” in the aftermath of disasters.
4. Enhancing the disaster-resiliency and performance of multiple fail-safe systems in regional and urban areas.
5. Establishing disaster medicine and medical service systems for catastrophic disasters.
6. Designing disaster-resilient societies and developing a digital archive system to pass along the lessons of past disasters.

The partnerships with local governments have produced co-organized seminars open to the public, tsunami evacuation drills, efforts to devise a post-tsunami recovery

plan, educational activities related to disaster risk reduction, and an array of additional activities. Based on its close relationships with local residents, the IRIDeS opened a branch office in Kesennuma to organize periodic disaster risk reduction seminars.

The IRIDeS has prioritized partnerships with other academic organizations. Such partnerships are crucial to the conduct of cutting-edge research and the collection of pertinent information for disaster risk reduction. The IRIDeS has established international academic exchange agreements with the Center for Weather, Climate and Disaster Research at the National Taiwan University, the German Aerospace Center, the Faculty of Mathematics and Natural Sciences, the Edwin O. Reischauer Institute of Japanese Studies at Harvard University (USA), Project NOAH at the Department of Science and Technology, the Cabinet of the Philippines, the University of the Philippines, Manila, the Angeles University Foundation (Philippines), the Institute of Geological and Nuclear Sciences Limited (New Zealand), the United Nations Development Program, the Global Risk Forum GRF Davos (Switzerland), the Tsunami and Disaster Mitigation Research Center (TDMRC) and Syiah Kuala University (Indonesia), the Aceh Tsunami Museum (Indonesia), the Institute of Medicine, Tribhuvan University (Nepal), the United States Geological Survey (USGS), and the University of Moratuwa (Sri Lanka).

In collaboration with international and domestic organizations, the IRIDeS investigated damage conditions and recovery processes in areas affected such as the 2013 Typhoon Yolanda (Haiyan), the 2015 Nepal Earthquake (Fig. 12.1), the 2014 Heavy Rain in Japan, and the 2016 Kumamoto Earthquake. The collaborative research on

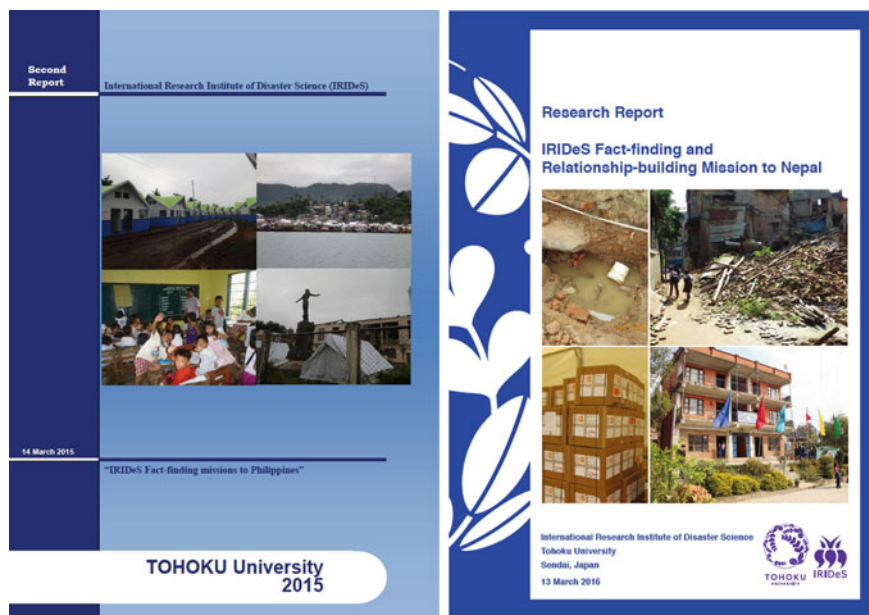


Fig. 12.1 Report on 2013 Typhoon Yolanda (L) and 2015 Nepal Earthquake (R)

the 2013 Typhoon Yolanda was the first big international research project for the IRIDeS.

Using established networks, the IRIDeS embraces opportunities to share and exchange knowledge, experience, and learnings from past disasters among practitioners, government officers, researchers, and ordinary people from Japan and other countries. The 3rd World Conference of Disaster Risk Reduction held in Sendai in March 2015, mentioned earlier, was one of the most impactful events in the relatively brief history of the IRIDeS. Tohoku University, as the most affected Japanese national university by the 2011 Great East Japan Earthquake, joined with Sendai City and the Japanese Government to support and co-organize the main conference. This resulted in two significant outputs. Firstly, the conference symposium entitled *Resilient Communities: Our Home, Our Communities, Our Recovery* was organized by the IRIDeS in conjunction with UN-HABITAT members. The symposium invited community leaders and mayors from several areas affected by the 2004 Indian Ocean Tsunami, the 2013 Typhoon Yolanda, and the 2011 Great East Japan Earthquake to discuss vulnerability reduction in local communities. Secondly, the IRIDeS announced the establishment of its Global Center for Disaster Risk Reduction. The Center was created to play an important coordinating role, collaborating with several United Nations agencies, including United Nations Development Program and the International Strategy for Disaster Reduction (ISDR), to help monitor progress on the new global disaster risk reduction framework.

Triggered by this conference in 2015, the IRIDeS held the inaugural World Bosai Forum in November 2017, the first of a series of biyearly International Disaster and Risk Conferences developed in cooperation with the Global Risk Forum held in Davos, the city of Sendai, and others. The word *Bosai* is a traditional Japanese term implying a holistic approach to reducing human and economic losses from disasters. It represents activities in all disaster phases, including prevention, recovery, response, and mitigation. With 947 participants from 44 countries, the inaugural Bosai Forum marked the successful beginning of what is likely to be a highly productive series of conferences (Fig. 12.2).

12.2.1 International Collaborative Research Projects at the International Strategy for Disaster Mitigation Laboratory (ISDM)

The International Strategy for Disaster Mitigation Laboratory (ISDM), founded and managed by the author, belongs to the Regional and Urban Reconstruction Research Division at the IRIDeS since 2013. Before that it was part of Tsukuba University. The ISDM seeks to provide practical international strategies for disaster mitigation or post-disaster recovery as well as to develop international frameworks that enable the realization of those strategies based on field surveys and data analysis. In order



Fig. 12.2 Poster of World Bosai Forum 2017 (L) and the opening ceremony (R) (Sendai, 2017, taken by Osamu Murao)

to clarify existing problems and make recommendations for future disaster reduction, the ISDM researches the relationship between disaster management and urban-regional space through case studies of vulnerable areas, including disaster-affected cities.

One of the ISDM's most significant research areas is urban vulnerability evaluation. After the 1995 Great Kobe Earthquake, a research associate at the Institute of Industrial Science within the University of Tokyo clarified the relationship between seismic ground motion and building damage using actual damage data provided by Kobe City. As a result, building vulnerability functions were formulated (Yamazaki and Murao 2000) and a method for conducting building collapse risk evaluation for Tokyo was proposed (Murao et al. 2000). Those research activities on urban vulnerability evaluation continued for the research associate.

While the ISDML monitors urban recovery in areas affected by disasters across the world, it quantitatively evaluates urban recovery processes for planning future disaster risk reduction strategies. To date, international field research has taken place in Taiwan, Turkey, Sri Lanka, Thailand, Indonesia, Peru, China, Hawaii, New York, Bangladesh, and Myanmar (Fig. 12.3). Significant domestic field research sites include Kobe, Tokyo, Kanagawa, and the Sanriku coastal areas affected by the 2011 Great East Japan Earthquake and Tsunami. These field experiences, which have included extensive communication with local residents and negotiations to acquire critical data, have produced significant lessons regarding the conduct of international collaborative research.

The following section is a first-person summary of the author's introduction to international collaborative research in a project focused on urban recovery following the 1999 Chi-Chi Earthquake in Taiwan while a member of the University of Tsukuba. This experience with the project served as the foundation for the authors current work in international research collaboration at ISDML.

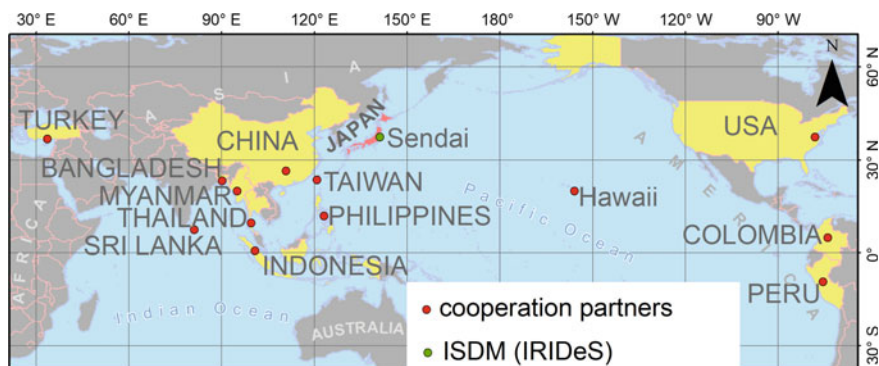


Fig. 12.3 ISDM (IRIDeS) research fields in the world (Author Murao, cartography by Karácsonyi)

12.3 Collaborative Research on Recovery Processes from the 1999 Chi-Chi Earthquake in Taiwan

12.3.1 *Chi-Chi Township and the 1999 Chi-Chi Earthquake in Taiwan*

Chi-Chi Township (shown in Fig. 12.4) is located in Nantou County in the central part of Taiwan. Early in the twentieth century during Japanese colonial rule, it prospered as a center of traffic, commerce, and politics. This was largely due to the building of the Chi-Chi railroad, the construction of the city hall, and a successful banana industry. The township currently has a population of approximately 12,000 across 11 villages.

The Chi-Chi Earthquake, with its epicenter near Chi-Chi, occurred on September 21, 1999 (see Chap. 6, the case of Christchurch earthquake and its population impact for comparison). It caused damage to more than 106,000 buildings and with an estimated 2500 casualties throughout Taiwan. In Chi-Chi itself, 1736 buildings were seriously damaged, 792 buildings were moderately damaged, and 42 people died. It was among one of the most serious disasters in the history of Chi-Chi (and Taiwan). It destroyed tourist attractions such as the traditional Japanese-style Chi-Chi station, historical temples, traditional pottery, and various important public facilities. These cultural resources, representing the area's historically unique background, were significant elements in Chi-Chi's economic and industrial recovery.

An event of personal significance occurred on October 1, 1999, ten days after the earthquake. My colleagues and I visited Chi-Chi to conduct a damage survey. It was my first field survey outside Japan and the town was littered with collapsed buildings (Fig. 12.5). Everywhere we looked, people were responding to emergencies. Because of its close proximity to the epicenter of the earthquake, the town had been devastated.

This time in Chi-Chi was relatively brief, but deeply affecting. It was a wonder how this town could ever recover. Just prior to this visit, I had finalized my doctoral

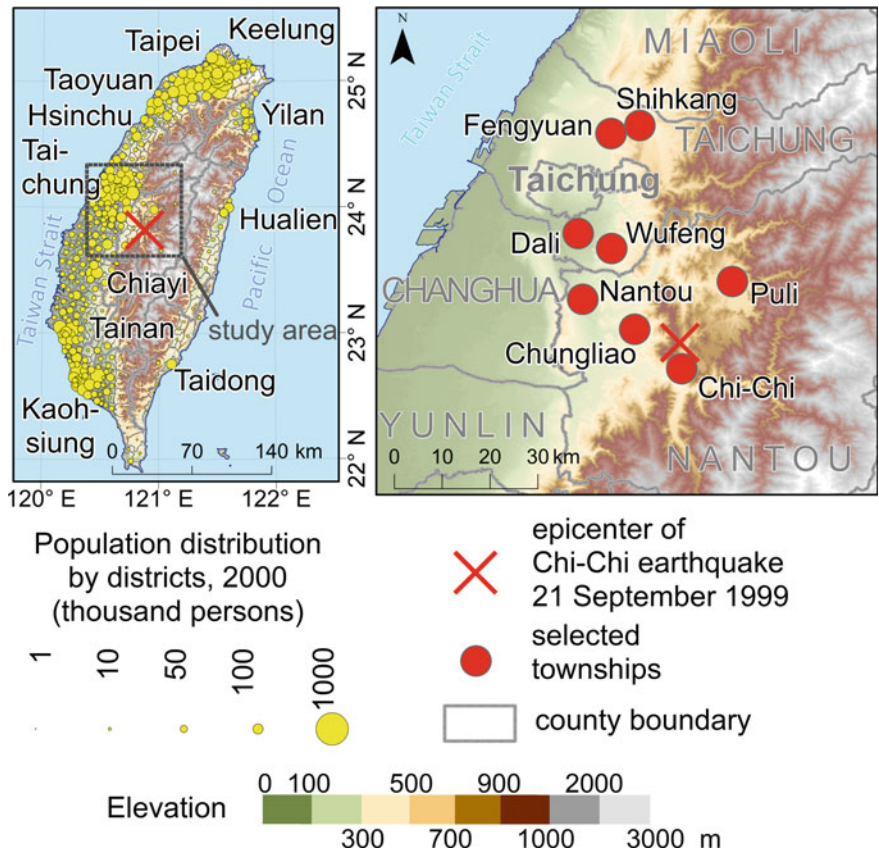


Fig. 12.4 Location of Chi-Chi and the epicenter of 1999 Taiwan earthquake (Authors Murao, Karacsonyi, cartography by Karacsonyi, population distribution based on census data)



Fig. 12.5 Collapsed buildings (L) and Wuchang temple (R) in Chi-Chi, Taiwan, due to the 1999 Chi-Chi Earthquake (Murao 1999)

thesis, “Study on Building Damage Estimation based on the Actual Damage Data due to the 1995 Hyogoken Nanbu Earthquake,” and was looking for the next research topic. As a researcher with a background in architecture and city planning, I became immediately interested in the post-earthquake recovery of Chi-Chi. This experience turned out to be the trigger for later post-disaster recovery research.

12.3.2 Continuous Surveys in Chi-Chi and Building Ties

At the beginning of 2000, the Research Committee on Urban Planning and Community Development for Disaster Reduction (the Committee) was established within the City Planning Institute of Japan (CPIJ). As member of the Committee, I met many young like-minded Japanese researchers and a Taiwanese student, Hsueh-Wen Wang, who were motivated to understand the process of urban recovery in Taiwan. The importance of on-site field surveys was advocated by this group who successfully gained CPIJ’s support.

As a delegate member of the Committee, I visited Chi-Chi again in April 2000, approximately six months after the earthquake and set about investigating recovery conditions in the township, as well as other affected areas in Nantou County and Taichung County. On this visit, we gathered materials and information on damage (walk through surveys, photo recording, interviews, and collecting data on housing stock) that would help in better understanding the recovery situation and the urban recovery strategies that were being developed and implemented.

Numerous stakeholders and specialists affected by the tragedy or involved in the recovery were engaged in the course of conducting the survey. The stakeholders included faculty members of the National Taiwan University and Feng-Chia University, government officials, NPO members in charge of rebuilding communities in the affected districts, architects, planners, and local residents. Among our many interactions, meetings with Prof. Liang-Chun Chen of the National Taiwan University were perhaps the most significant. They enabled us to maintain continuous contact with the Taiwanese recovery situation over a number of years. These important meetings were arranged by Ms. Wang, who played a critical role helping our study survey.

In April 2001, the Committee received a three-year research grant entitled *A Comparative Study on Disaster Management and Reconstruction Strategy among Earthquake Disasters of Hanshin (Japan), Kocaeli (Turkey), and Chi-Chi (Taiwan)*, from the Japan Society for the Promotion of Science (JSPS). The 1999 Kocaeli Earthquake, also known as the 1999 Izmit Earthquake, occurred in Turkey on August 17 1999, approximately one month before the 1999 Chi-Chi Earthquake. Our intention was to compare the Kocaeli and Chi-Chi urban recovery processes to the 1995 Great Kobe (Hanshin) Earthquake recovery.

Supported by the grant, frequent visits were made to affected areas in Turkey, Taiwan, and Japan for surveys with particular research concerns and continued to collect related materials and information through to March 2004. The research



Fig. 12.6 Permanent housings (L) and childcare activities (R) in Kocaeli, Turkey (Murao 2001)

covered a wide range of topics that included urban recovery planning, temporary housing, permanent housing (Fig. 12.6, left), construction methods, economic recovery, debris management, community building, childcare activities (Fig. 12.6, right), and more. Given that the field of post-disaster urban recovery research in at this time was still in its infancy, the interviews and discussions with local government officials and recovery specialists in Turkey and Taiwan were found to be extremely helpful in shaping our thoughts regarding what is needed to conduct an insightful comparative study of post-disaster urban recovery.

During this time, I visited Chi-Chi several more times meeting two key persons who would be instrumental in advancing my research. An Internet search for an interpreter who could translate from Chinese to English led us to Ms. Yayoi Mitsuda (Yoyo), a multilingual Japanese student who was studying cultural anthropology at National Tsing Hua University. It was my great fortune, for Yoyo became an indispensable partner in conducting surveys.

Random good fortune also led us to a restaurant owner in Chi-Chi referred here to as David. While out conducting field surveys, we stopped at David's restaurant for dinner. It was a small, unassuming restaurant of the type we would often see along the streets of Taiwan. We quickly discovered that the restaurant operated as a community hub. It turned out that David was a community leader in Chi-Chi, with close relationships with the current and former mayors and other local people of influence. Since that first night, David's restaurant became my base for conducting surveys in Chi-Chi. My time there yielded an exceptional amount of information on the recovery process, local history, key persons, politics, culture, human relationships, and much more.

Soon after the project ended in April 2004, I managed another JSPS grant to pursue research in Chi-Chi entitled *Architecture of Reconstruction Process of Chi-Chi Area (Taiwan) and Archives Related to Urban Reconstruction in the World*. This meant that the research ideas, which had been forming since my first days in Chi-Chi, would continue to develop and mature.

12.3.3 Research on Post-earthquake Recovery in Chi-Chi

My research activity in Chi-Chi went on until 2008. It allowed for continuous surveys and research activities over an extended ten year period, mostly in a trial-and-error fashion. This work is published in several academic journals (e.g., Murao 2006a, b, Murao et al. 2007) and international conference proceedings. Some of the research findings are described below.

Through the field surveys, I was able to monitor and record the urban recovery conditions of Chi-Chi, which were in a continuous state of change. In order to clearly understand Chi-Chi's transition, a proper town map was necessary. In 2000–2001 however, such a map was difficult if not impossible to obtain. Consequently, I decided to create my own digital base map. Walking around and surveying the town with lab students using IKONOS (satellite) imagery, I continued to digitize the research area until a suitable GIS base map was completed. The map functioned to chronologically record the building demolition and reconstruction conditions that I had been monitoring since the earthquake struck. The recovery processes of Chi-Chi could be representable visually, as illustrated by the maps in Fig. 12.7.

Through the study of the Hanshin (Japan), Kocaeli (Turkey), and Chi-Chi (Taiwan) earthquake disasters and recoveries, I compared post-disaster urban recovery processes in cities with such different social backgrounds with my collaborators in Taiwan, Turkey, and Japan. Based on this cooperation experience, I recognized the need to develop a quantitative evaluation method but was yet to determine how to assess the recovery process quantitatively. This became an important research question during my time in Chi-Chi.

The question continued to taunt me, until one day, in a research meeting at the National Taiwan University, I was struck with the idea to represent the progress of the recovery by creating “recovery curves” based on building construction data. This process is essentially counting the number of building completions of various types over time. Later, with the support of Yoyo our translator and several officials, I was able to obtain statistical data on post-earthquake construction from the Nanto Government. From this data, I was able to create recovery curves for the various building types (temporary houses, rebuilt buildings, and new buildings) that are shown in Fig. 12.8.

The recovery curves show the reconstruction of buildings in Chi-Chi began approximately six months after the earthquake and continued for a further three years. The construction of new buildings began only after a delay of 1.5 years. This component of my research was challenging, but the method for constructing recovery curves would later be applied to good effect to my other research cases in Sri Lanka, Thailand, Indonesia, and the Japanese coastal areas affected by the 2011 Great East Japan Earthquake. The approach helped to conveniently compare recovery processes in areas affected by disasters in the four countries under study.

Having the opportunity to monitor the reconstruction process over an extended period and applying the idea of recovery curves contributed greatly to the research outcomes in Chi-Chi. It should be noted that while the research was carried out to

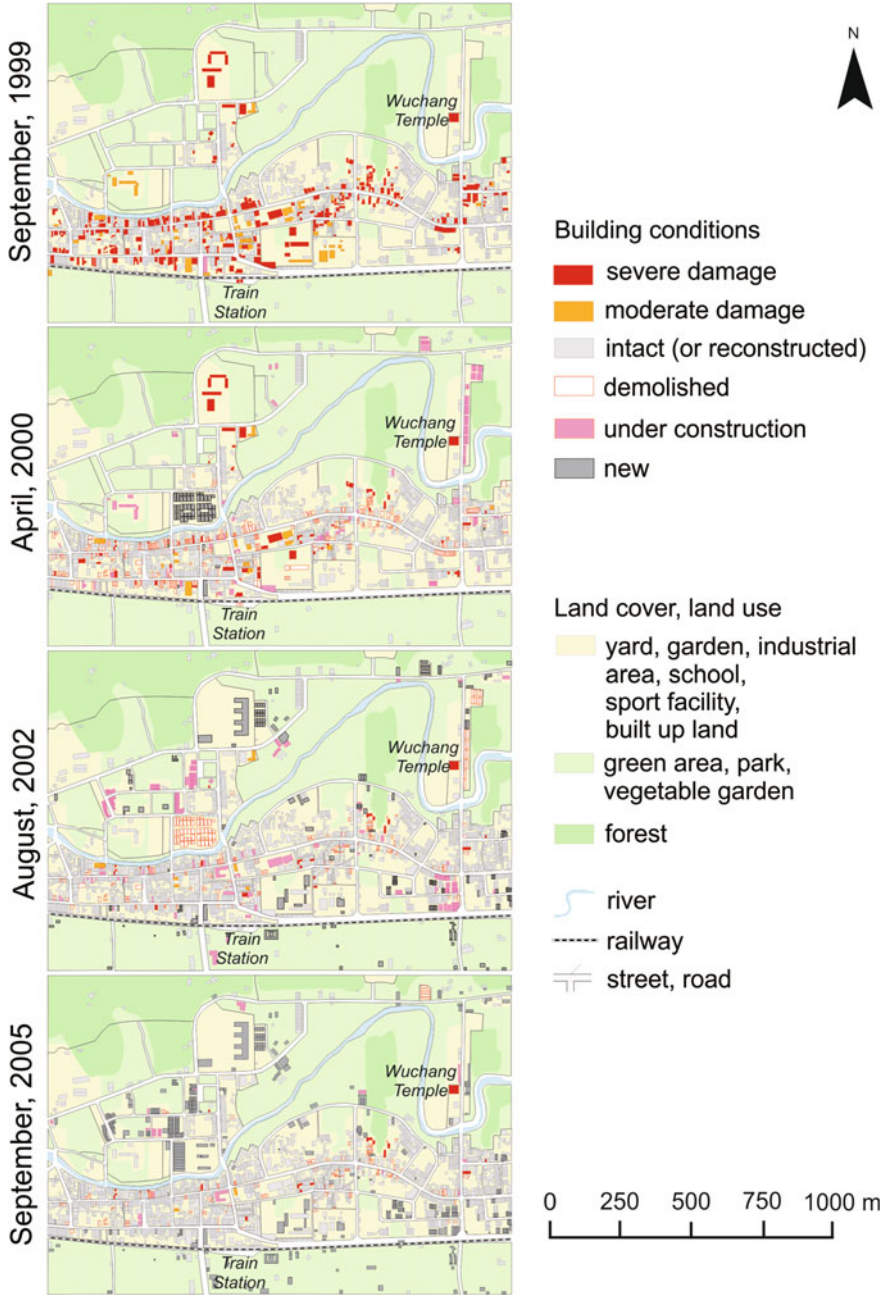


Fig. 12.7 Change of post-earthquake recovery conditions of Chi-Chi (Murao 2006a, cartography by Murao and Karácsonyi)

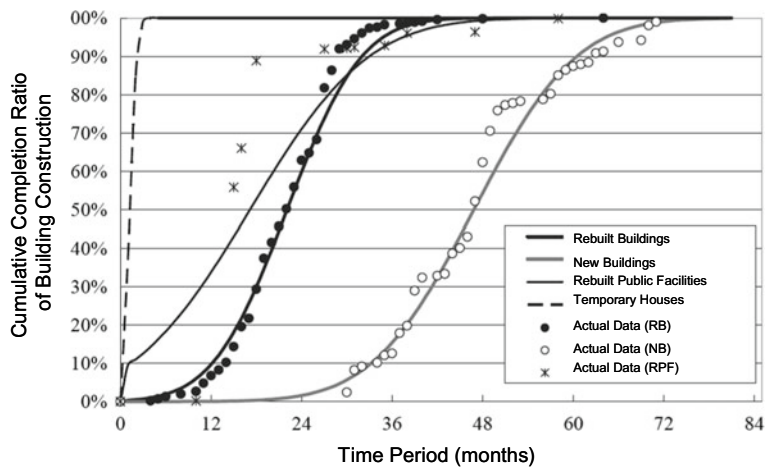


Fig. 12.8 Recovery curves in terms of building types (Murao et al. 2007)

understand Chi-Chi’s recovery process, in terms of changes in the area’s physical environment such as building reconstruction and the restoration of housing, we also recognized that the observable recovery was the product of human activity. Accordingly, I often sought out and interviewed key persons in the recovery effort. They included mayors, local government officials, shop owners, and victims. They were interviewed about Chi-Chi’s history and cultural background, the behavior of individuals from the initial emergency response stage to the reconstruction stage, and the various recovery strategies that were being employed. Based on the opinions and concerns expressed by residents in these interviews, I modeled the post-earthquake recovery process by using the simplified model shown in Fig. 12.9. This systematic model indicates the sequential process of recovery from the viewpoint of the victims, from the early catastrophic moments until the time of resettlement in permanent housing.

By 2006, I had monitored the ever-changing status of Chi-Chi Township and spoken extensively with local residents for several years. I began to consider the importance of producing a permanent record of Chi-Chi’s urban disaster recovery processes. By this time, I had already gathered a great number of pictures, movies, and considerable other data. From this, I conceived the idea of creating a digital model of Chi-Chi Township to preserve at least a segment of the recovery process. To this end, together with my laboratory students, I took pictures of every building elevation in the area and ultimately completed the model called *Digital Chi-Chi City* on the Google Earth platform. With information on the recovery conditions of important facilities in the township, Fig. 12.10 illustrates the product of our efforts.

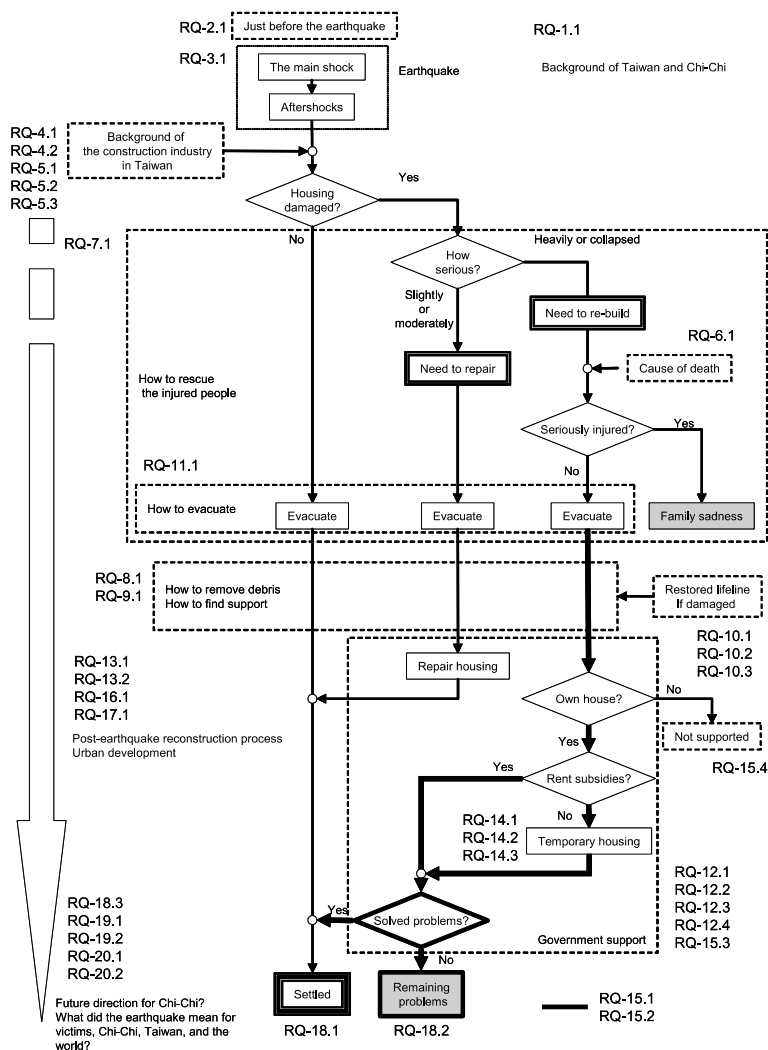


Fig. 12.9 Structure of post-earthquake recovery process (Murao 2006b)

12.3.4 Lessons from Post-earthquake Recovery in Chi-Chi

The Chi-Chi experience provided a number of important lessons regarding long-term post-disaster research in foreign countries. From the first visit to Chi-Chi in 1999, it was clear that the support of others was needed to conduct effective surveys and reach useful research outcomes. The support of Prof. Liang-Chun Chen, David, and Yoyo was crucial. The following describes their contributions as a way of underlining



Fig. 12.10 Digital Chi-Chi City on Google Earth as recovery digital archives (Murao 2007)

the importance of finding reliable local collaborators when conducting international disaster research.

I. *Seek out collaborative relationships with local specialists/researchers*

I first met Prof. Lian-Chun Chen (2001) at the National Taiwan University during the course of developing my survey for the *Comparative Study on Disaster Management and Reconstruction Strategy among Earthquake Disasters of Hanshin (Japan), Kocaeli (Turkey), and Chi-Chi (Taiwan)*. Prof. Chen graduated from Waseda University in Japan, which made it easy for us to communicate about the survey's purpose and subsequent information requests. Following our first meeting, we had many more opportunities to exchange information and ideas on the recovery in Taiwan. Prof. Chen generously provided all requested information.

Under the 2004 JSPS grant *Architecture of Reconstruction Process of Chi-Chi Area (Taiwan) and Archives Related to Urban Reconstruction in the World* and with the support of Prof. Chen, I spent three months in Taiwan (primarily in Chi-Chi) during the summer of 2005 as a visiting researcher at the Graduate Institute of Building and Planning, National Taiwan University. Throughout this time, Prof. Chen was available to answer questions about the cities, building structures, or disaster management systems of Taiwan. He would introduce helpful faculty members and suggest suitable paths for this research.

His invaluable assistance made me realize that when traveling to affected areas after a disaster, and especially in the field of urban recovery, it is difficult for foreigners to successfully conduct field surveys using suitable research questions without solid knowledge of the social context. Thus, it is extremely important to have a specialist or local researcher in the same research field who can provide critical support.

II. *Be a friend and build good relationships with the local community*

Whenever I returned to Chi-Chi, David's restaurant was always the first place I visited. There I would have dinner and get the latest information on Chi-Chi Township, the recovery situation, politics, the new mayor, new restaurants, business conditions, visitors to Chi-Chi, and the current circumstances of individual residents. Because of his numerous connections, I was able to conduct interviews with many of the local people, which would eventually lead to my structural model of the post-earthquake recovery process (Murao 2006b). His contacts opened the door to much of the data and materials needed in this research.

As noted earlier, meeting David was by sheer accident, yet he became precious to my research. It was important to continue to visit David's restaurant, particularly in the early stages of my long-term work in Chi-Chi. With each visit, exchanging stories about our families and ourselves, drinking together, or singing loudly brought our relationship closer. The rapport that we built led David to introduce me to many of Chi-Chi's stakeholders and played a key role in my ability to finalize my research there.

When a disaster occurs, the temptation for disaster recovery researchers is to immediately survey those affected by the tragedy. However, essential information

for comprehensive recovery research, including knowledge of the social context, cannot be acquired without taking the time to establish a strong rapport with the local people.

III. *Find the best partner possible*

Yoyo was a doctoral student at the Institute of Anthropology, Tsing Hua University, who was conducting research on the survival strategies of the Thao people living near Sun Moon Lake in Nantou County, Taiwan. She became critical to my research in Chi-Chi. I have an engineering background with a focus on architecture and city planning. However, post-disaster urban recovery activities are, in a sense, comprehensive phenomena of society as a whole. Given this conception, I intended to take an interdisciplinary approach to my research in Chi-Chi—an approach that included sociology and anthropology. Yoyo fully understood my intention and advised me on the most appropriate ways to conduct my local surveys.

In her capacity as interpreter, noting that I cannot speak or understand Chinese, Yoyo would often pose more questions to the interviewee than I had requested in order to gather the kind of information that she knew I needed. This ability arose from her sense of anthropology and intimate knowledge of society in central Taiwan, as well as her deep understanding of my long-term research goals. As a young anthropologist whose doctoral thesis focused on the indigenous people of Taiwan, Yoyo's complementary knowledge and instincts were indispensable to my work. I met her in 2002 quite by accident, but the successful outcomes of my research could not have been produced without her advice and support.

I can easily say, no one could replace her. Good research in overseas fields can sometimes come down to one happy chance encounter. Such continuous surveys are basic activities to obtain proper datasets for the demography of disasters.

12.4 Summary and Conclusions

This chapter describes the Sendai Framework for Disaster Risk Reduction, introduced the ISDML within IRIDeS at the Tohoku University, and highlighted their international collaborative activities. It discussed some of the research activities overseen by the author and took a personal lense through this experience. The importance of international collaboration and harnessing opportunities for effective partnerships has been stressed throughout. The author's extensive recovery research in Chi-Chi, Taiwan, was presented in some detail as an example of international collaborative activities.

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