

Preface

The characteristics of natural disasters in modern mega-cities have been complicated and diversified since the end of 20th century and originated not only from geo-physical and global changes of natural hazards, such as earthquakes, tsunami, floods, storms, landslides, and drought, but also from the recent structural changes of our post-industrial societies. In fact, the Japanese urban area has become more and more vulnerable to newly emerging risks of low probability but high consequence type (LPHC type), which have been induced technologically and socially in modern society. For example, the estimated damage exposed by the floods has increased five times during the past 20 years in terms of unit-exposed space (inundated area in the case of flooding). This is due to the high concentration of both population and social infrastructures in residential districts, in spite of the success in decreasing the total number of human casualties of flood disasters, thanks to the tremendous amount of investment in constructing such physical structural facilities as dams, dikes, banks, etc.

In return, we unfortunately face the soaring marginal cost of reducing disaster risk up to an acceptable level. In addition, we have such a new type of multi-disasters in modern mega-cities that a single small-scale hazard episode in an urban area might trigger a series of “catastrophic disasters” in a cascading manner under current interwoven and complicated urban water systems, such as from a small-scale river channel up to a large-scale river embankment. There seems to be many cases in which “natural disasters with totally different characteristics may happen before people forget about the previous disasters”, in contrast with the famous expression “natural disasters occur when people are not thinking about them”.

Until very recently, people used to take precautionary steps against storms and/or inundation disasters at their homes in accordance with the amount of rainfall or the rise of water in adjacent rivers, and would listen to radio or TV news reports that predicted the routes of typhoons, and would standby at their homes or work places. Nowadays, such self-help practices to reduce possible damage of disasters have waned, reflecting a public reliance on the remarkable improvements in basic social infrastructure to prevent disasters.

Our country seems to have been transformed into a “hands-off society of leaving the management responsibility to regulatory authorities” in which people wait until they receive warning information or evacuation orders from the local government who are specialized in disaster prevention. However, when we face unexpected or surprise conditions, ordinary citizens become unable to understand the nature of risks, partly due to the complex processes of the regulatory management systems specialized in current disaster prevention schemes. They stop making their own choices regarding proactive responses to the emerging risks that have been so-called socio-technologically or socio-culturally constructed in our post-industrial society.

In fact, newcomers who have migrated and settled in newly developed lowland areas that used to be flood plains tend to be unable to inherit past disaster experiences. They tend to claim more and more “safety measures of intensified structural facilities” as well as an expansion of the “disaster relief measures” in cases where local residents become victims. But they prefer to leave management judgment regarding distinction between “safety and danger” to governmental institutions, as indicated in our recent case studies on a series of catastrophic flood disasters, such as the 2000 Tokai Floods in Nagoya and the 2004 Niigata-Fukui Floods. This also leads to another management issue of the increase in social costs to deal with the unexpected nature of risks, even by taking a proper combination of both structural and non-structural measures depending on which level of risks the community and residents may accept in long-term. Moreover, we are concerned about this kind of emerging disaster risks growing larger and continuing to increase, as suggested by the recent IPCC reports of global and regional climate changes.

Here appears an integrated risk management approach to deal with natural disasters as social risk phenomena in terms of enhancing a variety of proactive or participatory ways that governmental institutions, communities, and residents could jointly carry out proper risk management against newly emerging disaster risks. To make our modern societies sustainable in terms of our lives, socio-cultural assets, and environmental resources in this risk society, it is vital to create a kind of societal governance system resilient to unexpected or surprise disasters not only by promoting a proper understanding of the nature of “risks” in their community but also by strengthening their preparedness to “risks” in the whole cycle of disaster prevention, from the normal, emergency, and recovery phases .

Japan’s National Research Institute for Earth Science and Disaster Prevention (NIED) has launched a five-year research project (2001–2005) with

the aim of making modern societies resilient, not only to a traditional flood but also to possible catastrophic disasters of low probability but high consequence (LPHC). The approach that NIED has tried to explore is necessarily a new type of integrated risk management that should be tailored to the emerging disaster risks of the LPHC type. This includes (1) shifting the management strategy from “disaster prevention with zero risk” to “disaster reduction with an acceptable risk”, (2) integrating both structure and non-structure measures (hard and soft measures), and (3) creating a social platform to call for a wide range of stakeholders (governments, communities, residents, corporations, local groups, and NPOs) in planning, designing and implementing an integrated risk management plan resilient to LPHC disasters in both short- and long-term perspectives.

In order to tackle these urgent tasks, a new team was formed on the basis of social and human sciences by adding fellows and guest researchers, unlike the conventional team of disaster scientists at the NIED. Then, the team began operations through close cooperation with outside research institutions such as the Disaster Prevention Research Institute of Kyoto University. Our research group has been developing such a participatory platform of disaster risk communication, called the Participatory Flood Risk Communication Support System (Pafrics), that can facilitate community-based participation in planning, designing and implementing processes for a better integrated flood risk management. Pafrics has been particularly developed by taking a number of research outcomes based on the social scientific studies concerning local people’s flood risk perception and disaster prevention activities in their community through questionnaire surveys conducted by NIED. Currently, we believe that Pafrics has been developed to such a sufficient level as to be released on the Web, but it is still being repeatedly modified through trials and experiences with new aspects and episodes in new areas.

This book intends to provide outcomes of those studies in three parts. The first part expresses some of the important conceptual and methodological issues associated with the “integrated approach of disaster risk management” toward resilient society to emerging disaster risks in mega-cities in Japan. Four types of “integration” are taken into consideration in most of the papers. They are (1) integration of hard (structural control facilities) and soft (institutions and information) measures for shifting the concept of “zero risk” to “an acceptable level of risk”, (2) integration of precaution and emergency relief measures, (3) integration of governmental and local community activities toward residents’ informed choice of disaster risks, and (4) integration

of individual risk management programs towards handling multiple sources of hazards. All papers focus on both the natural and socio-cultural factors of integrated risk management and their uncertainties involved in our modern society, reflecting the recent inter disciplinary development in “risk analysis”, “disaster sciences”, “resource economics”, and “public policy analysis”.

In the second part, all contributed papers are more or less associated with outcomes of case studies or the social surveys which NIED conducted since the start of the project. Those involved include the 2000 Tokai flood disaster, 2004 Fukui, Niigata Typhoon 23 disasters in Japan, as well as the 2005 Hurricane Catrena in the USA. Many important research topics are addressed in terms of public understanding or perception of disaster risks, public preparedness for reducing risks, attitude of local government officers engaging in disaster prevention, the role of volunteers in disaster prevention or relief activities, based on social scientific disciplines in relation to social psychology, disaster sociology, and disaster insurance and economics, etc. Those contributions are particularly important for the NIED project to look forward to making modern societies resilient to disasters of LPHC type by facilitating residents’ participation to risk governance in local communities towards the informed choice of disaster risks.

The final part presents a set of papers which illustrate the development of “Pafrics”, and some of the lessons we learned from several trials of using Pafrics in workshops, meetings, and lectures. In order to disseminate our model of “Pafrics”, several internet-accessible versions are already open on the Web (<http://www.pafrics.org>), which is in Japanese for local residents, but a short English version is also available at the same Web site.

Finally, we should stress again that all contributions in this book are, more or less, the outcome of joint efforts conducted by all members of the project. However, final responsibility of the views expressed in these chapters lies with the individual authors themselves. We are very grateful for a number of invaluable comments and suggestions provided by the members of advisory body to our project; Dr. Sachio Kubo (Pasco Corporation), Mr. Nobuyuki Kurita (NPO: Rescue Stock Yard), Dr. Kimio Meguro (Tokyo University), Mr. Yukiji Nishida (NPO: Rescue Stock Yard), Dr. Norio Okada (Kyoto University), Dr. Yugo Ono (Hokkaido University), Dr. Isao Takagi (Keio University), and Dr. Kentaro Yoshida (Tsukuba University). We also express our deep gratitude for Ms. Reiko Shibakami, Ms. Reiko Kawamura, and other assistants for their sincere and endless effort to support our studies and preparation of these manuscripts during period of the project.

We should be very pleased if this book could make a valuable contribution towards a new perspective of “integrated disaster risk management” and “disaster risk governance” in the future.

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