Achieving Natural Disaster Business Success by Developing Clients and Community: Lessons from Local Leading Companies in Nagaoka City, Niigata, Japan

- Japanese flood monitoring experiences for the Philippines –

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1. Introduction

1. 1 Back ground and Research questions

This paper aims to investigate the possible disaster related business for flood monitoring system. The role of the private sector is increasing in the field of ODA. And JICA is planning to expand the participation of the private sector to the social development as well. After the East Japan Great Disaster (EJGD) in 2011, the level of natural disaster risk perception is rising among the people, however it is still widely agreed that not many people actually take proper disaster preparations. And the monitoring systems to detect the risks of tsunami ware not yet perfect to understand the threats.

In addition to EJGD, we have observed many historical floods all over the world including Thailand, Philippines, and Vietnam, recently. This is partly because of the rapid urbanization, industrialization, deforestation and climate change.

The traditional idea for the flood prevention was to understand the possibilities of the floods by monitoring the condition of the river flow including water level, water velocity and quantity. However, not much is known about the factors that drive people to take natural disaster preparation before the actual disaster strikes. The technological improvements cannot be always practical.

We found a <u>completely deferent idea</u> to prevent the potential flood risks by introducing simple web camera system. We have been conducting the field survey in Nagaoka city, Nigata prefecture and Yokohama city, Kanagawa prefecture since October 2012.

At the same time, we started our joint project for Lake Laguna basin management project with The University of the Philippines Los Baños (UPLB). In the Philippines, we saw many flood disasters, even they had introduced some monitoring stations and early warning systems. In August 2013, there was a historical floods in the Philippines. More than 200 evacuation centers were opened in Manila and surrounding provinces, filled with tens of thousands of people. More than 600,000 people have been affected by the floods. In many coastal towns along swollen Lake Laguna, near Manila, and in food-growing riverside provinces, residents were trapped on rooftops, waded through the streets or drifted on makeshift rafts.

After the survey in Nagaoka, we have convinced that the private sector can play an important role in disaster prevention, mitigation and preparedness by investing more in disaster risk reduction, both

for their own business strategy, and in the local communities where their workforce resides. For multinational companies with global reach, corporate social responsibility initiatives should seize upon disaster risk reduction as an increasingly important development and humanitarian issue. (UNISDR 2008) We had a series of big natural disasters in 2011 including EJGD and huge floods in Thailand. Japan's most profitable companies built up factories in developing country such as Philippines, Thailand and Vietnam, so Japan faces the biggest impact from the floods. We learned safety operations of factory ware essential to preserve production linkages worldwide.

Our research question is to investigate the advantage and challenges of the private sector initiative in the field of the flood management and propose some practical and simple floods preparation plans in the developing country to the Philippines. We have proposed a JICA partnership project in the Philippines and JICA has accepted us recently. This paper tried to investigate the new challenges to introduce the new idea to the flood management in the Philippines. We analyzed the merits of the simple floods warning system to improve the economic resilience of the local community and at the same time, found the new challenges and limitations of the private sector.

Disaster risk management refers to the systematic management of administrative decisions, organization, operational skills and abilities to implement policies, strategies and coping capacities of the society or individuals to lessen the impacts of natural and related environmental and technological hazards (United Nations Development Program, 2004).

1.2 Significance of the Study

Before 11 March 2011, Japan had already developed sophisticated high-tech tsunami-warning systems including hundreds of real-time monitoring stations. But on 11 March 2011, the peoples' response was not enough to save their lives. Many sociologists, economists and psychologists have concerned about the practical solutions to save their lives. (Unagami 2012) In the Philippines, some of river basins where flood control works have been implemented is increasing year by year. However, they had serious damages caused by flood disasters every year, especially in rural areas. In this paper, we have examined the effectiveness of the simple web camera monitoring system developed by a small company in Nagaoka, Japan. New innovations mainly come from the private sector, since they can easily understand the practical value of the system comparing to the public sector or academia. This is our research hypothesis. The traditional monitoring system is trying to predict the precise coming floods as possible as they can. And they were usually equipped with highly sophisticated measuring devices. Accordingly, it takes much costs and time. But the simple web camera system can be easily introduced. The objective of the project is to mitigate flood damage in the selected core areas in Lake Laguna basin in the Philippines by implementing simple web camera warning system and human development program against flood, thereby contributing to the sustainable and stable economic development in the target areas.

1.3 Methodology

A case study has been used in this research in order to meet the purpose. We conducted our study by looking at available secondary data, and have ensured the credibility of our study by evaluating various sources regarding the information required in order to answer our research questions.

2. Literature review

2.1   Lessons learned from the EJGD

There are some differences between Tsunami and Floods, but we have learned the most important factor to activate the people's response to the warnings. The warning system was mostly perfect. It includes web based information, mobile e-mail notification, warning siren and loud speaker systems. However, more than half of the people at the risk area recognized the warning via TV news.

2.3   Floods in Nagaoka City, Nigata JAPAN

Nagaoka is located in the center of Niigata prefecture. Nagaoka city has wide-spread hill-side areas and the Japanese largest river, The Shinano River, as well as the coastal line of Sea of Japan. The river flows through it from south to north and industrial development area is on both banks of the river. Niigata-Fukushima Heavy Rain on 13 July 2004, killed 4 residents and destroyed 3,996 houses. Based on the valuable experiences, Nagaoka city is recognized as a model city in Japan in terms of DRR (Disaster Risk Reduction) activities. For examples, VDMG (Voluntary Disaster Management Groups) based on Community Based Organizations has increased dramatically since the 2004. Currently VDMGs are organized in 88% of the city while the national average is 73%. In addition, 50 experts of disaster management are certified through the Chuetsu Citizen's College for Disaster Management and Safety that was initiated after the Chuetsu Earthquake in 2004, and they are actively mobilizing citizens as the leaders of regional disaster management. Nagaoka city hopes to establish as a model city for disaster risk reduction activities. The simple web camera based flood observation system was introduced to tackle these continuous flood risks. And by using these experiences, Nagaoka city government has decided to transfer their knowledge to the Philippines.
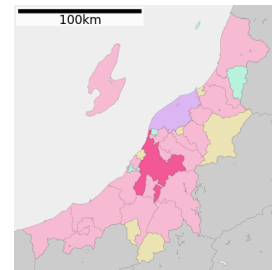
2.4 Floods around Manila and Lake Laguna basin

2.4.1 Overview of the target area

The Philippines is one of the most natural disaster prone countries in the world. Lake Laguna basin is important areas for food supply and economic development in the Philippines as they hold large grain-growing areas, industrial growth corridor,

economic zones and residential area for Metro Manila. However, frequent flood damage and weakness to floods are hampering the economic activities. The flood management works in these areas are important for sustainable economic development of the Philippines. Iloilo City hosts the first Philippine International River Summit on 30 May to 1 June 2012. The summit provides a venue for discussing common concerns of cities located along rivers, including disaster risk reduction and ecotourism. (JICA 2012)

2.4.2 Flood Disaster Related Project by Major Donors

We recognized various flood projects in the Philippines since they had continuous flood disasters. Those project can be classified by the Donors as Tbale-1. Bilateral donors including JICA, US, Spanish, Australia, UK and Canada are commonly to improve the monitoring and furcating systems for the floods. Multilateral donors including World Bank, ADB and UNDP are working together with some bilateral donors and providing necessary funds to the government agencies in the Philippines.

Table-1 Flood related projects in the Philippines

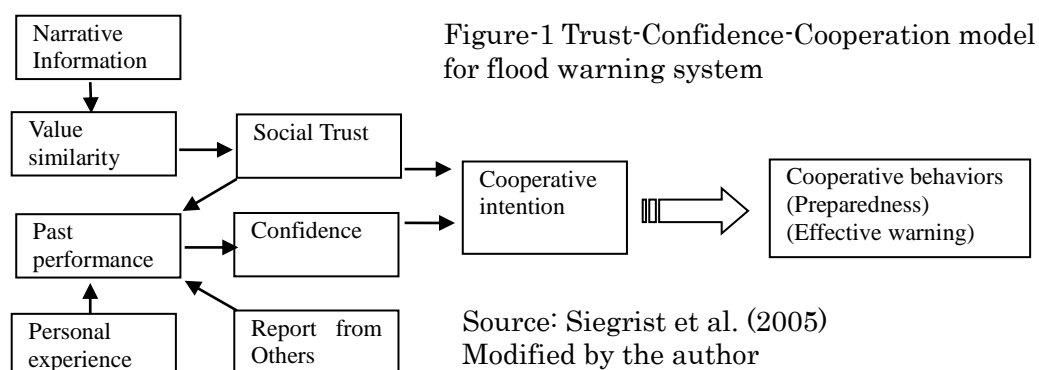| Project name and related organization in the Philippines	Donor
Disaster Risk Reduction and Management (DRRM) Capacity Enhancement, Office of Civil Defense (OCD). (2012-2015)	JICA
A Simple and Community Friendly Independent Floods Observation System for the Laguna Lake district and National Capital Region, The University of the Philippines Los Baños (UPLB), Laguna Lake Development Authority (LLDA) (2013-2016)	JICA
ASEAN – US Cooperation on Disaster Management, ICS(Incident Command System) Phase 2 (2009-2012)	US State Department, USAID
Program for Enhancement of Emergency Response (PEER) Phase 3	USAID, Office of U.S. Foreign Disaster Assistance (OFDA)
Establishment of Reconstruction Monitoring and Evaluation System (RMES)	World Bank, US State Department, USAID
Climate Change Adaptation Project Study to establish impact of climate change in the agriculture sector in two pilot areas (Bicol Region and Region 2), Department of Environment and Natural Resources (DENR)	Spanish Government, World Bank
Integrated Disaster Risk Management Framework – Disaster Risk Profiling and Development of Risk Models	ADB
Hazards Mapping and Assessment for Effective Community-based Disaster Management (READY), DENR, Department of Science and Technology (DOST)	UNDP, AusAID,
Greater Metro Manila Area Risk Analysis Project	AusAid, UNDP
Building Community Resilience and Strengthening Local Government Capacities for Recovery and Disaster Risk Management	UNDP, CIDA
Flood Early Warning System in Metro Manila, Philippines, Center for Disaster Preparedness, University of Philippines (2012-)	Christian Aid UK Government

(Source: Kiyoto KUROKAWA from the various website information.)

In the PAGASA Rainfall Warning System, Yellow, Orange, Red was used based on the color coding scheme of the Community-Based Flood Early Warning System under the UNDP project.

These colors are generally associated with awareness, preparedness and emergency respectively. JICA has also started our new project, "A Simple and Community Friendly Independent Floods Observation System for the Laguna Lake district and National Capital Region in the Republic of Philippines." The uniqueness of this simple system for flood observation. All the projects are providing training program since the importance of risk perception in shaping people's behavior is essential. (Slovic 1987) emphasized the role of risk perception by indicating that the public relies on risk perception to evaluate hazard situation. Perception could be viewed as a process of transforming inputs (e.g. flood warning) to output (e.g. public mitigation response). People who perceive that they are vulnerable are more likely to respond to warnings and undertake protective measures. Thus, understandings of the people's risk perception will influence the effectiveness of the flood management strategy.

2.5 The trust-confidence-cooperation (TCC) model for the flood warning

The value of the flood warning system will be evaluated by using TCC model. People's reaction by the flood warning system is one of the most important factor to increase the effectiveness of the system. The TCC model, developed by Siegrist et al. in 2005 can be used to increase the effectiveness of the flood warning system. Residents' trust in the flood warning system depends on how similar to their own values. This judgment depends on related information provided by the community leaders and other residents. Their trust in the warning system depends on their assessment of the quality of information provided by the system in the past. Past performance of the warning system including false warning will affect their confidence strongly. Social trust, especially from the community leader, and confidence in the system jointly determine the level of cooperation that the resident intends to have with the warning. This intention can produce a variety of cooperative behaviors, such as protecting the warning system by themselves, accepting advice about risk levels from the system and acting on the basis of that advice.

Figure-1 Trust-Confidence-Cooperation model for flood warning system

Source: Siegrist et al. (2005)
Modified by the author

3. Flood Survey in the Philippines

We have developed our project proposal by combining our previous surveys in Japan and the

Philippines. UPLB, our main partner, has been working for the flood control researches, especially in the field of the agriculture.

3.1 Target area

Manila is the largest city in the Philippines and one of the country's most industrialized area. The target area has a tropical monsoon climate with two seasons: a typhoon and wet season lasting from September through March and a dry season lasting from April through August. The Lake Laguna is the biggest lake in the Philippines. We have selected two different communities to examine the effectiveness of the proposed simple web camera flood observation system. Victoria village, one of our target area, is a typical agricultural rural village. The population is about 35,000. The other target is Town of Los Banos, 101,000 population. The town is under the typical rapid urbanization and industrialization. These two are under the flood risk.

3.2 Participatory Mapping

Nowadays, all the donors and government agencies have introduced this mapping operations with the collaborations of the local community. Basic data for flood disaster risk management are sometimes limited, unobtainable, incomplete, inaccurate, outdated, contradictory, or expensive. Disaster risk managers, especially those in local governments, therefore face many barriers to accessing and utilizing up-to-date and accurate hazard and risk data. (Chapman 2013) In Nagaoka city, we have recognized similar activities and they have developed it on the web site.

4. Conclusions and Remaining Issues

The flood warning systems were able to reduce economic damages and loss of life by providing lead time for people to take protective measures. But it is not perfect still needs some improvement to activate people's response to the warnings. All the donors are trying to introduce new sophisticated technologies to improve these system, especially early warning system. Using warning systems to trigger community response is the key to flood disaster management. Nowadays, the speed of the floods are increasing because of the rapid urbanization. No matter how advanced technology becomes, the guiding principle is that people should take the initiative to understand the potential risks of the flood on their own. Warning information has the limitations of the forecasting technology. Inaccurate or inappropriate warning information could mislead or delay evacuation and increase the loss of lives. Disaster risk communication must be practiced regularly, so that people are able to better understand the flood warning system. From this preliminary survey, we found out some useful findings such as the cultural aspects to understand the preparedness of the flood risk. This implies that flood warnings should be tailored to the characteristics of the target people. Introduction of Nagaoka's simple web camera based flood warning system to the Philippines is a new challenge toward the effective flood risk management.