

Vietnam
Ministry of Agriculture and Rural Development
Da Nang City
Binh Dinh Province

COLLABORATION PROGRAM WITH THE
PRIVATE SECTOR FOR
DISSEMINATING JAPANESE TECHNOLOGY
FOR
SUSTAINABLE DISASTER-PREVENTION
WITH ICT
Project Completion Report (Summary)

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Japan International Cooperation Agency

Hitachi, Ltd.

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1 Purpose

Vietnam has been damaged by storms and floods every year. There are average 300~400 people died from 2000. Moreover, the damages are about 1 ~ 1.5 % of GDP. The enhancement of disaster-prevention capabilities is an urgent issue.

Japan has experienced many damages caused by storms, earthquakes and TSUNAMI. Therefore, there are many accumulated know-how and technologies of disaster-prevention. The information system has been developing.

The most important purpose in this project is that to help disaster-prevention in Vietnam through Japanese disaster-prevention experience. We focus on “Collecting and Delivering disaster information” and “Decision Making”. The target areas are Da Nang City and Binh Dinh Province which have experienced flood disaster in 2013. The goals are shown as below:

- ① Promoting the people in charge of disaster-prevention to understand disaster-prevention technology and operation in Japan.
- ② Validating the adaptability of Japanese technologies and systems in Vietnam
- ③ Considering the future plan of implementing the disaster-prevention information system in Vietnam.

2 Outline

In this project, we implement a visit to Japan and verify the systems in Vietnam. We consider the implementation plan of disaster-prevention system in Vietnam from the results.

1. Outline of a visit to Japan

We introduced the disaster-prevention systems in central governments (Cabinet Office ‘Integrated Disaster Management System’) and local governments in Japan. Moreover, we held the seminars by the experts of disaster-prevention to help the Vietnam government inspectorate to understand the know-how and technologies in Japan. This visit would be served as a useful reference of considering further disaster-prevention plans in Vietnam.

2. Outline of verifying the systems

We implemented Flood Simulation System, Information Collecting Mapping Delivery System. We verified that whether the systems are helpful to disaster-prevention in Vietnam and whether the people in charge of disaster-prevention utilize the systems autonomously.

In addition, we consider the future plan of disaster-prevention system in Vietnam and future policy.

This project implemented from 06/2014 to 01/2015. The implementation structure is shown as below.

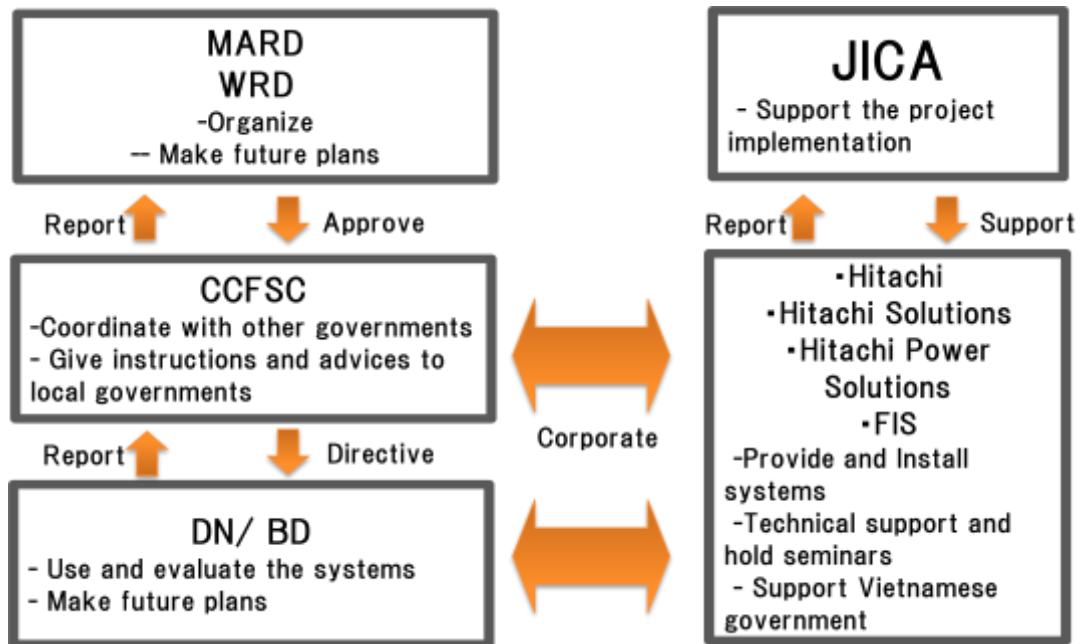


Figure 1 the Implementation Structure

3 Conclusion

1. A Visit to Japan

The visit and the seminars support the Vietnam inspectorate to improve better understandings of the relevant laws about disaster-prevention, the technologies and operations in Japan. The visit also helps the Vietnam inspectorate to utilize for development of laws about disaster-prevention; system construction plans In Vietnam in the future.

The Vietnam inspectorate is composed of 6 people from MARD-WRD, Da Nang City and Binh Dinh Province.

Table 1 the Schedule of A Visit to Japan

Destination	Content
1) JICA	Introduction of ODA and JICA's Assistance on Disaster risk reduction & Management and Projects in Vietnam
	Introduction of Natural Disaster in Vietnam by MARD
2) Lectures by professors	Information Sharing, Circulation and Evacuation at Over-Level Hazard
	Monitoring about natural disaster and climatic change in Vietnam
3) Cabinet Office, Government of Japan, Director-General for Policy Planning in charge of disaster-prevention Counselor in charge of disaster, emergency response	Introduction of the role of Cabinet Office and the inspection of the Integrated Disaster-management Information System
4) Ministry of Land, Infrastructure, Transport and Tourism(MLTI)	Water inundation and hazard map
	Observation of floodgate and prediction of water disaster
	Introduction of Natural Disaster in Vietnam by MARD
5) Department of Crisis Management and Disaster Prevention, Nagaoka City, Niigata	Introduction of the role of Department of Crisis Management and Disaster Prevention and the system
	Introduction of the experiences with disasters and reconstruction effort
	Visit of Fire Headquarters in Nagaoka City

Results

The Vietnam inspectorate answered the questionnaire survey on that how this visit helpful to disaster-prevention in Vietnam

In the results of the answers, we found that the Vietnam inspectorate is most interested in the Database and the way of information sharing of Cabinet Office 'Integrated Disaster Management System'. Through the seminars and the presentation by MLTI, they found that hazard maps, disaster-prevention education and training is necessary. Moreover, they commented that the disaster-prevention system of Nagaoka City is very useful to decision making.

We found that Vietnamese government wants to strength "Collecting and Delivering disaster information" and "Decision Making". They also focus on the enhancement of disaster-prevention abilities in communities.

2) Implementation of systems

① Configuration Diagram

The system is composed of Flood Simulation System, Information Collecting Mapping Delivery System and a server, PCs and smart phones.

We installed a server and implemented Information Collecting Mapping Delivery System and the Database at MARD.

We installed PCs and smart phones at Da Nang City and Binh Dinh Province. The staff can use Information Collecting Mapping Delivery System by these IT devices.

In addition, we implemented Flood Simulation System in the PC. Therefore, it is unnecessary to access the server to use the system.

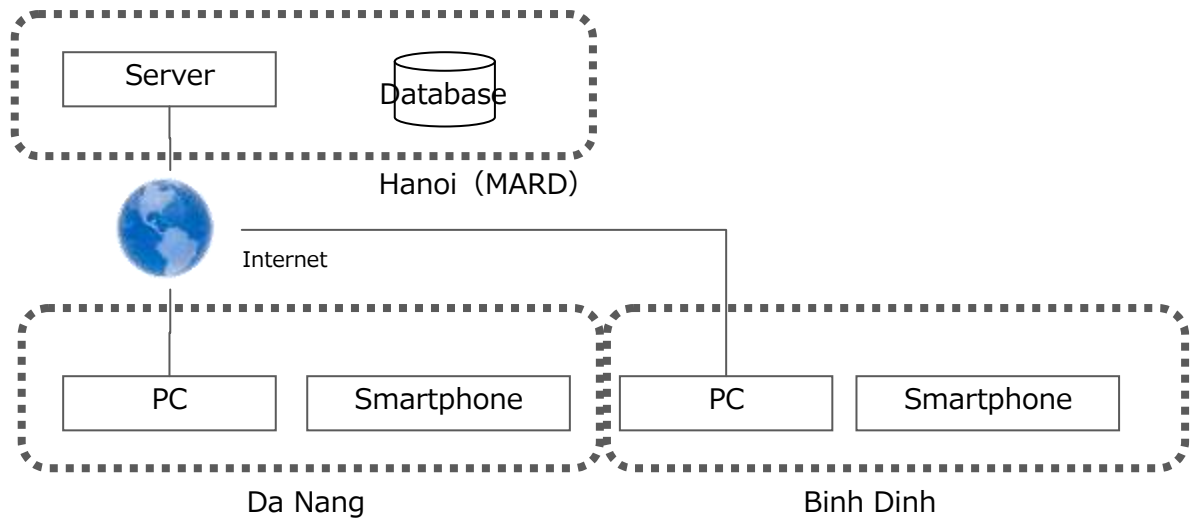


Figure 2 the Configuration Diagram of Hard Ware

② Outline of Flood Simulation System

In this project, we register topography data and enter rainfall and river flow quantities to the system to simulate floods.

Users setup conditions on the system and simulate. The results show on the map. We can use the system on a visceral level and master it easily.

Simulation results are applicable to flood hazard map. It can be useful to airing the flood risk to the citizens. It can be used as reference for city planning.

If there are high accuracy topography data and enough rainfall and rainfall predictive, river flow quantities, the system can simulate food emerges hours later in real time.

③ Outline of Information Collecting Mapping Delivery System

The system collects weather, river and disaster site information by smart phones or other systems, display the information on the map and deliver evacuation advisory and alarm information to citizens.

The system also displays evacuation centers information and hazard maps which made by Flood simulation System. It is useful to evacuation instruction.

3) Disaster Drill with Systems

① Flood Simulation System

The goal of disaster drill is that the people in charge of disaster-prevention are able to make hazard maps by themselves. To archive the goal, the software must be simple to use and the data are availability. If the system is simple to use, the people in charge are able to use the system voluntary. If the data are availability, people can do flood simulate of the area.

Therefore, in this activity, we verified these 2 points according to the evaluation items shown in Table 2. We offer people in charge of disaster-prevention at Da Nang and Binh Dinh to answer questionnaire surveys.

Table 2 the Evaluation Items of the Activity

No.	Validation Items	Evaluation Items
1	The usability of the software	<ul style="list-style-type: none"> • The people in charge of disaster-prevention can make the simulation scenario. • The people in charge of disaster-prevention can implement the simulation. • The people in charge of disaster-prevention can identify the hazardous area.
2	The availability of data	<ul style="list-style-type: none"> • The necessary data are availability • The data are availability although the system develops to real time simulate in the future.

First, the people in charge of disaster-prevention provided map data and imported the data to the system. (Step 1) Secondly, we instructed the people in charge how to use the system. (Step 2) We asked the people in charge and the intellectuals to collect the documents such as hydraulic data for the simulation conditions. Then the people in charge imported the simulation conditions to the system and make the hazard map. (Step 3) We chose 4 spots which are flooded in the hazard map. At last, we compared the flood trace in the field with the depth shown in the hazard map in the system. (Step 4)

We implemented this drill for 3 days each in October and November.

We instructed the people in charge how to use the system on the first day. The people could do the flood simulation by themselves.

On the second day, the people in charge referred to the hydraulic data and imported the appropriate conditions to the system. Moreover, they do the flood simulation, printed the simulation result over the map and read out to Information Collecting Mapping Delivery System. The actions were all by themselves.

We did the field study on the third day. The people in charge referred to the simulation result and found the result were basically corresponding to the flood trace in the field by themselves.

We offered people in charge to answer questionnaire surveys. We found 4 clarified points shown as below.

i) The operability and effectively of the system get 4 score out of 5. Therefore, the people show positive appreciation to the usability of the software.

ii) According to the question “Did you used enough data for the drill or not ”, it gets 3.5 score of 5. It shows that we need to improve and expand the data to simulate.

iii) According to the continued of Flood Simulation System, it gets 4.9 score of 5. It clarified the people in charge of disaster-prevention hope to continued use.

iv) The people in charge of disaster-prevention hope to simulate other than flood, such as washing out and outfall of reservoir simulation, sea level rise and storm surge simulation, TSUNAMI simulation, dike effects evaluation simulation and so on. Therefore, they hope continued technological support.

It is necessary to establish a sustainable framework of software maintenance and operation. We need to improve data and keep them up to date. Moreover, they require continuous training for doing full-scale simulations.

②Information Collecting Mapping Delivery System

The goal of disaster drill is to validate 3 items shown as below:

- i) The people in charge of disaster-prevention at Da nang and Binh Dinh collect and grasp the disaster information in the area.
- ii) The people in charge deliver evacuation instructions by the system.
- iii) The people in charge of disaster-prevention at Da nang and Binh Dinh are able to implement these operations by themselves.

We implement disaster drills using Information Collecting Mapping Delivery System for the people in charge of disaster-prevention at Da Nang and Binh Dinh to train decision making based on drill scenario. The scenario contents show as below:

Table 3 Drill Scenario

Drill Scenario	Drill Contents	
Drill Scenario 1	Basic Operation Drill	GIS Basic operation
Drill Scenario 2		Display previous disaster-prevention data
Drill Scenario 3		Cooperative and display data in real time
Drill Scenario 4		Report the damage from the field
Drill Scenario 5		Inform evacuation instructions
Drill Scenario 6	Drill for typhoon landfall	The crisis meeting before typhoon landfall
Drill Scenario 7		The crisis meeting after typhoon landfall

The drill was implemented for 2 days in November.

We implemented basic operation drill for the people in charge at first day. The people in charge could use system without difficulty.

At second day, we simulate a typhoon landfall and create a taskforce. We predict and check the damage situation, inform citizen evacuation instruction. This drill was also implemented without difficulty.

The people in charge in Vietnam accomplished to implement this drill according to the plan by themselves. The 3 goals of this drill we set are achieved.

We also offered people in charge to answer questionnaire surveys. We classified the surveys in to 4 categories. "The adaptabilities of Information Collecting Mapping Delivery System", "The function effectual to disaster-prevention in Vietnam", "The understanding of importance of ICT systems to disaster-prevention", "Requests for Information Collecting Mapping Delivery System after the drill."

From the questionnaire results, we reaped results of the goals of this collaboration program.

Goal① : Promoting the people in charge of disaster-prevention to understand disaster-prevention technology and operation in Japan.

Result : According to “The understanding of importance of ICT systems to disaster-prevention”, it gets 4.4 score out of 5.

Goal② : Validating the adaptability of Japanese technologies and systems in Vietnam

Result : According to “The adaptabilities of Information Collecting Mapping Delivery System”, it gets 4 score out of 5 in 11 questions of 12 .

Goal③ : Considering the future plan of implementing the disaster-prevention information system in Vietnam.

Result : We obtain all kinds of needs from “The function effectual to disaster-prevention in Vietnam” free description.

4 Results

In this project, we obtained the results shown as below. We achieved the goals of this project.

Result 1 . We helped the people in charge of disaster-prevention in Vietnam to understand disaster-prevention technologies and maintenances in Japan through a visit to Japan and disaster drills.

Result 2 . The people in charge of disaster-prevention in Vietnam use the systems smoothly. Therefore, the disaster-prevention technologies and systems are adaptable to Vietnam.

Result 3 . We expanded the system and confirmed the future needs.

Fig. 3 shows the future needs of disaster-prevention system.

The core of this system is disaster information database. It helps information sharing between relevant organizations when disasters happen. In addition, it also helps quick and accurate decision making and provide timely information to citizens.

This database collects weather information, disaster-affected information and countermeasure situation information quickly and shares the information with relevant organizations. Moreover, we can confirm previous disaster-prevention data and flood simulation results. For citizens, it offers information by many kind measures of information delivering such as smart phones or speakers.

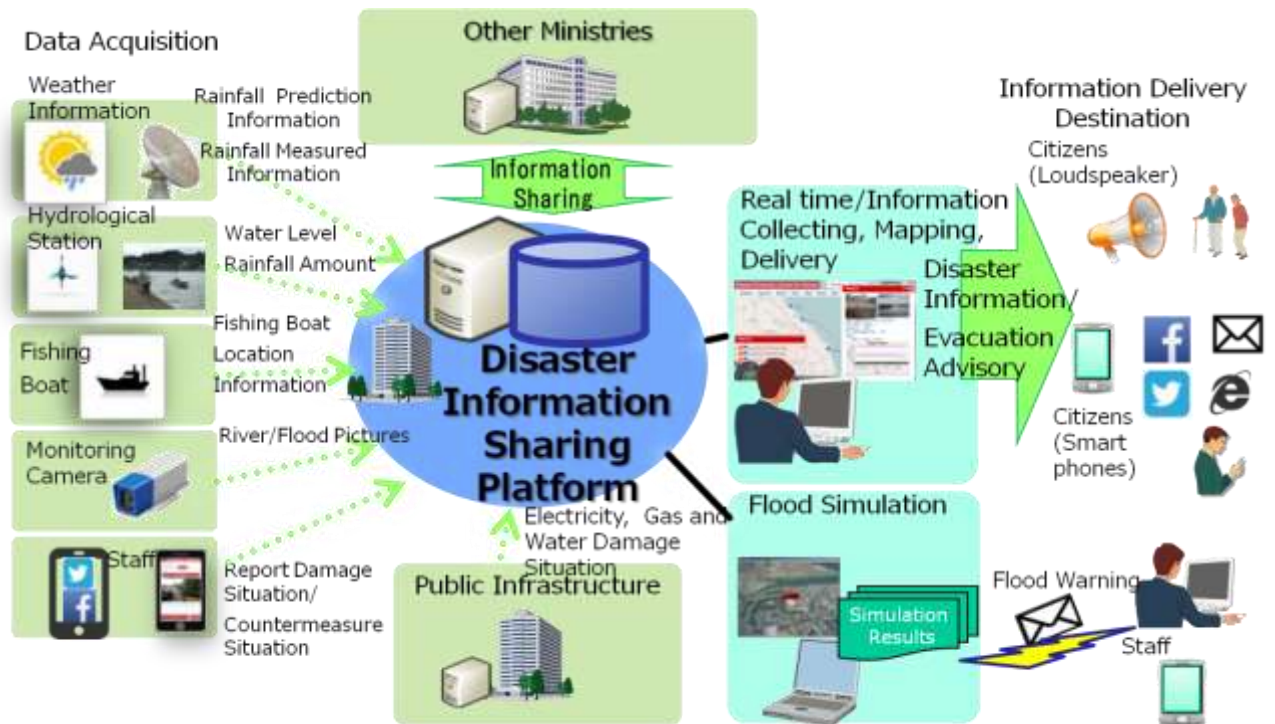


Figure 3 our purpose of the future disaster-prevention system in Vietnam

5 Future Development

The last event of this project is a result presentation to MARD. We made a presentation of the accomplishments of this project and the future plan of disaster-prevention system in Vietnam.

The result of the result presentation is that MARD agree with considering our proposal. We proposed the All Japan project to create Disaster Information Sharing Platform (DISP) which integrates disaster-prevention system and Data Base, related facilities implement, related construction and capacity building of the people in charge.

The concept of DISP matches Vietnamese Disaster Prevention Law and local needs. Moreover, MARD started to consider the implementation. It thought to be implemented in Vietnam in the future.

On the other hand, World Bank and GIZ also make similar propose to MARD. We have to overcome them to diffuse Japanese disaster-prevention system.

In addition, to implement our proposal, we need to MARD set this project in higher priorities than other projects of rural development and irrigation.

Our proposal of DISP earned high evaluation from MARD. MARD asked us to propose detailed function of DISP, detailed implementation process, segregation of duties between MARD and Japan and the fund.

We continue to make proposals to MARD. The next step is to implement a short term project. Moreover, we need Japanese governments' strong support to overcome other countries and set this project in higher priorities in MARD. We continue to act in an effort to implement this project by All

Japan regime in the future.



Figure 4 the Result Presentation