

Third East & Southeast Asia Regional Seminar on Flood Hazard Mapping in Philippines

1. Outline

ICHARM co-hosted the 3rd East & Southeast Asia Regional Seminar on Flood Hazard Mapping on 17-19 February 2009 at Edsa Shangri-la Hotel in Manila, the Philippines, with the Japan International Cooperation Agency (JICA) and the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA).

ICHARM has held this annual event since 2007 to provide an opportunity for those who completed the JICA Flood Hazard Mapping (FHM) training course to get together to report and discuss the current progress and issues on FHM and to promote FHM-related activities in the participating countries. The training course was conducted by ICHARM for the past five consecutive years. 23 people, mainly ex-trainees, participated in the seminar from various Asian countries, including Bangladesh, China, Indonesia, Nepal, Laos, Malaysia, the Philippines, Thailand, Vietnam, and Japan. The diversity of the participants' nationalities and viewpoints made discussions interesting and insightful.

Day 1

The opening ceremony was held in the presence of honorable guests. The participants sang the Filipino national anthem and were greeted by Dr. Prisco D. Nilo, director of the Department of Science and Technology of PAGASA, and Dr. Jayawardena Amithirigala, research and training advisor of ICAHRM. A few other guests, including Mr. Norio Matsuda (manager of JICA Philippine Office), Mr. Hirosato Yoshino (second secretary of the Japanese Embassy), and Hon. Estrella F. Alabastro (secretary of the Department of Science and Technology of



Hon. Estrella F. Alabastro greets the seminar participants.



Ms. Susan R. Espinueva delivers a special lecture on community-based early warning systems.

PAGASA), also made an opening speech at the ceremony. The seminar was televised in a local news program.

The opening ceremony was followed by a special lecture by Ms. Susan R. Espinueva of PAGASA on “Community-Based Early Warning System.” She concluded her lecture by saying, “The success of an early warning system is implicit in the operative capability and the response of the community which operates it.” Her remark was of great importance especially to the ICHARM staff, because the concept was exactly in line with the promotion of “Local Practices,” one of ICHARM’s focus areas. It certainly reminded them of the crucial role of the community in disaster management.

After the lecture, the seminar participants from different countries made 15-minute presentations on progress and issues on FHM in their countries and had discussions based on them. (For more information on the presentations, see the latter part of this report.)

Day 2

In the morning, the participants were divided into four groups and tried “Problem Analysis” to clarify their issues on FHM. Problem Analysis was a part of the “Project Cycle Management” exercise. In the afternoon, the participants visited Kawit City in Cavite Province, located south of Metro Manila, and received a presentation by Ms. Anabelle L. Cayabyab on community-based FHM activities led by JICA. Her presentation revealed that the community was involved in not only hazard mapping itself but also activities to enhance disaster preparedness on a local basis, including the Town Watching exercise as part of the mapping process. The seminar participants also learned that community leaders felt grateful for the FHM activities. It was a pleasant surprise to find out that FHM had made more progress in the



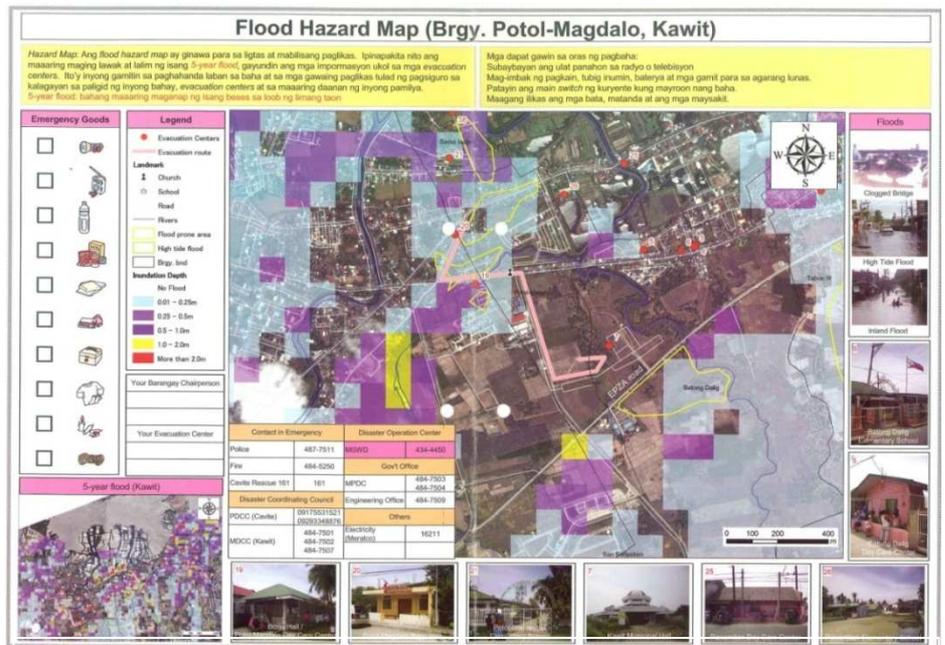
The participants work on Problem Analysis



Ms. Anabelle L. Cayabyab explains Kawit’s community-based FHM activities.

Philippines than expected.

Following the field trip to Kawit City, the director of PAGASA invited the seminar participants to a welcome party at PAGASA. The occasion helped all of the participants including the ICHARM staff to deepen the friendship and partnership.



Kwati's community-based FHM. Residents participated in the production process of this map.

Final Day

The ICHARM staff explained about FHM guidelines on which the institute has been working. Also, the seminar confirmed the current status of FHM and the achievement goal for each country. Finally, five primary issues on FHM were given to the participants for discussions, which helped them learn more about and gain better understanding of FHM. (For more information on the discussions, see the latter part of this report.)



The participants exchanged various views in the general discussion.



ICHARM Research & Training Adviser Jayawardena thanks Ms. Paridah for her great job as a moderator.

The seminar ended with the closing ceremony. Each participant was awarded with a certificate for completing the seminar by Science & Technology Department Director Nilo, ICHARM Research & Training Advisor Jayawardena, and ICHARM Team Leader Shigenobu Tanaka. Dr. Li Na and Ms. Paridah were additionally prized with a special present by ICHARM for their contributions to the seminar as moderators. This year’s seminar was also successfully completed with great support from people and organizations in the Philippines and other countries.

2. Results

ICHARM requested each seminar participant to write a “Progress Report” to understand the current status of FHM in each country and to speak about a part of the report in the seminar. The participants were asked to present FHM-related issues in their countries, such as the current and expected types of flood hazard maps and sample cases of FHM. More information on the report contents can be found in Appendix 1.

2.1 Current and expected types of flood hazard maps in each country

Table 1 was provided for the participants to find out the types of the current and expected flood hazard maps in their countries. The table below shows the types of the current and target flood hazard maps in different countries. For example, Malaysia’s current hazard maps are categorized into type C based on Table 1, but they think that they should improve them to be type F or G.

The table below reveals that all the countries except Bangladesh have developed flood hazard maps of some type. Although most of the countries see the needs of type F, which requires inundation analysis, and type G, which can provide real-time flood information, they also recognize the practical needs of type B (showing contours but no inundation depths), which is simple enough for local residents to produce, and type C, which only shows the maximum inundation depth in the past.

Country	Current	Target
Philippines	B, C, E	C, D, E (combined)
China	D, E, F	(A), G
Thailand	A, B, C, E, F, G	F, G
Bangladesh	G (large scale)	C, E

Malaysia	C	F, G
Lao	F	B
Viet Num	A (communities), G (pilot project) C, E, F	B, D, F
Indonesia	C G (Jakarta)	E, F G (large cities)
Nepal	E F (9 basins)	A, B, C, D, E, F, G

2.2 Current efforts in FHM in each country

The following are excerpts from the participants' reports.

Bangladesh: In Bangladesh, where annually 22%, over 60% in worst cases, of the national land is flooded, little effort has been made in FHM, and no legal framework has been established concerning FHM.

China: China has been active in FHM. In 2004, the country established the Office of State Flood Control and Drought Relief Headquarters (OSFCH) and started FHM as a pilot project. They designated the years 2004-2007 as the first phase and 2008-2010 as the second to produce effective flood hazard maps for various parts of the country. They developed over 300 hazard maps of type E or F in the first phase and also held two FHM seminars by themselves. However, no maps have been made available for public use.

Malaysia: Malaysia has produced flood hazard maps to cover the entire national land based on past inundation records, although the maps for Kota Tinggi Province are the only ones with inundation depths. They have also produced flood hazard maps based on hydrological simulation for the Damansara basin and are currently working on the same kind of maps for other six river basins. They are planning to produce such 30 flood hazard maps by 2010.

Indonesia: Indonesia has been promoting the production of type-G flood hazard maps, having recognized the importance of this type of maps due to the 2007 flood in Jakarta. They have developed flood hazard maps for design floods of different return periods of 1, 2, 5, 10, 25, 50, and

100 years. Like China, however, Indonesia has not made the maps available for public use.

Lao: Lao experiences flood events as other countries do, but they usually cause a fewer number of deaths because the flooding occurs very slowly. However, they have produced flood risk maps for one of the six major river basins and are developing such maps for two others. After the 2007 flood in the Xedone River basin, flood hazard maps were made for that river basin.

Nepal: In Nepal, JICA-led FHM projects started in 1999. Flood hazard maps have so far been produced for nine river basins. Despite this active production of the maps, the country has not made them available for the public and has not highly recognized their effectiveness in disaster management from the outset.

Philippines: In the Philippines, PAGASA (Department of Science and Technology) and MGB (Mines and Geo-sciences Bureau of Department of Environment and Natural Resources) have been taking the initiative in their FHM efforts. They have divided the entire country into 236 zones to produce 1:50,000-scale flood hazard maps, which have already been completed for 165 of the 236 zones. They have also developed 1:10,000-scale flood hazard maps for more than 10 zones in the PAGASA-UNDP READY PROJECT.

Thailand: Thailand has been active in FHM and developed all types of flood hazard maps except type D. They think that at least type-F maps are necessary to issue effective flood warnings. They have also collected sufficient hydrological data to develop flood hazard maps for all river basins in the country and working on DEM data to cover the entire national land. Thailand has already had a good deal of knowledge and technology for FHM, and their next challenge should be to make policies to promote FHM. Like many other countries, Thailand has not yet established a legal framework for FHM and designated a responsible public agency.

2.3 Discussions

On the final day of the seminar, the participants discussed issues under the following five themes. Below are some opinions and comments made by the participants.

Theme 1: What kind of “Flood Hazard Map” do you need?

- Flood hazard maps should be as simple as possible for people to read and interpret them easily. (Philippines)
- Different kinds of flood hazard maps should be made as well. For example, maps showing inundation zones based on different occurrence frequencies or inundation depths in several past flood events. (Philippines)
- Different types of flood hazard maps should be available for different purposes. Also, different organizations should be able to make different types of maps. Simple flood hazard maps, such as type A and C, are necessary. (China)
- Provinces and cities need flood hazard maps produced based on both past flood records and simulation results, but simpler maps are more effective at the local level.
- Flood hazard maps reflect the needs of local residents. Even in the same area, different types of maps will be made if the purposes are different. (Thailand)
- GIS analysis is useful even at the community level.
- In some cases, many flood hazard maps exist for the same area. They should be put together to make a single map.
- Types B and C are good enough for rural areas, where not many people live, but more science-based types G and F is necessary for urban areas. (Lao)
- Type C is simple and useful enough at this moment. Type G is necessary for early forecasting and warning.

Theme 2: Why do you need such FHM?

- In most cases, to lessen flood impacts. To some extent, such flood hazard maps can be used for development/land-use planning. (Philippines)
- FHM and structural measures should be integrated in disaster management. The current design flood is set based on a flood of merely 25-year recurrence frequency, and structural measures based on such design flood have given stakeholders and communities a wrong impression on safety. (Philippines)
- Flood hazard maps are cheap and affordable. They are necessary for policy making, and

donor agencies need them to be informed of local situations to implement projects.
(Nepal)

- Flood control infrastructures are old in Indonesia, and supplementary tools are necessary.
(Indonesia)
- Flood forecasts and warnings that are easy-to-understand and reliable should be provided to people. Flood hazard maps are a part of such a flood management system.
(Thailand).
- Flood hazard maps should be developed for every river basin and flood-prone community, because people need to be informed of possible flood-affected areas. Government agencies also need them to plan development activities. (Vietnam)

Theme 3: How do you use FHM? How do you improve the use of FHM?

- Flood hazard maps are used to identify the locations and types of structures in flood-prone areas. (Philippines)
- Flood hazard maps are used to plan land use. (Lao)
- Flood hazard maps are useful in flood fighting. They are used to identify and monitor high-risk areas in the typhoon season.
- Flood hazard maps are used to identify what population is likely to be the most vulnerable in what area.
- Flood hazard maps are used to promote appropriate land use and arrangement of residential, agricultural, and other purposeful areas.
- Flood hazard maps are used for vulnerability assessment of existing infrastructures for their effective use. Many levees have been constructed in Bangladesh, but they are also very susceptible to river erosion.

Theme 4: What kind of information should be included in a training material?

- Fundamental knowledge like river analysis. Also, how to conduct field investigations, how to read contour maps, basic technical knowledge like HEC-HMS.
- Different types of training should be provided for different population. There should be training specifically targeting communities, developing countries, or countries with sufficient or insufficient data.

- How to collect, improve, or correct data.
- Not only how to make flood hazard maps but also how to distribute the maps effectively.
- Different types of training should be available for different levels of participants.
- People should be informed of negative effects possibly posed when flood hazard maps are made publicly available.

Theme 5: About “Community-based activities”

- When hydrological data is not sufficiently available, the community-based approach works better. However, technical advice from experts is necessary.
- Since we are working for people, we should be well aware of this community-based approach.
- Technically-advanced flood hazard maps take a fair amount of time to complete. Community-based maps should be considered as a cheap, fast alternative in appropriate situations.
- In cases where residents spread throughout the area, it is difficult to develop community-based flood hazard maps.
- Young community members are usually not willing to participate in such activities as FHM. Only the elderly and retired are.
- In China, local people join field investigations for FHM. In particular, elderly people who have had to live with floods throughout their lives can provide precious technical advice to technical experts. We should get communities involved in FHM. Every community has volunteers to warn people in case of emergency. For example, if a typhoon warning is issued, fishermen can play the role of messengers.
- The best way to gain cooperation from local people and other stakeholders is to interview them right after a disaster and collect relevant information. If they are fully aware of risks posed by hazards such as floods, people are willing to support and join such activities as FHM.

2.4 Future challenges

One of the findings from this seminar was that the participating countries have already demonstrated a fairly high FHM capability, although they are not still fully self-sustainable and

need support from overseas organizations such as JICA. The next step should be to promote the effective use of flood hazard maps to mitigate flood damage. In this sense, the Philippine's Kawit City is an excellent pilot case of FHM, which should be introduced as a good example to other countries to disseminate FHM.

3. Conclusion

This year's FHM seminar also ended successfully. The participants joined enthusiastic discussions and produced highly valuable results to bring home. The seminar was also to conclude the five-year project, the Flood Hazard Mapping training course, which came to its end in 2008. Floods are different from country to country. Historical and social backgrounds are also different. Keeping that in mind, we at ICHARM think that the efforts to promote FHM should not be directed to standardize the FHM procedures and use. Rather, the efforts should be focused on the recognition of differences in production and use of flood hazard maps among different countries and the acquisition of insights and implications for future FHM activities in each country.

The FHM training course was held annually for the past five years. In the first three years, the training focus was placed on the technical aspect of FHM, and little time was spent on the effective use of flood hazard maps. The same was true of the previous two FHM follow-up seminars. However, while conducting other training courses such as the Tsunami Disaster Management course, ICHARM gradually deepen its understanding of the crucial role of communities in disaster management. We eventually realized that effective and efficient disaster management depended on not only the technical capability of FHM but also the active involvement of communities in the activity.

In general, FHM requires the following five steps: 1) collection of hydrologic and topographic data, 2) inundation simulation, 3) production of anticipated inundation maps, 4) distribution of the maps to the public, and 5) promoting of public understanding of the maps. When FHM is carried out on a community basis, it is possible to combine and execute all the five steps at the same time. Also, the process is likely to help community members raise their level of disaster preparedness. In fact, we planned activities and a field trip in this year's seminar from that perspective. We hope that the seminar provided a chance for the participants to reflect on the possibility of FHM

in developing countries, especially based on the community-based FHM activities in Kawit City.

In face of emergency such as disasters, people will have to protect themselves. Governments will or can provide almost no help. At the same time, what an individual can do is also very limited. This is why the community-based approach is important in disaster management. ICHARM will continue studying community-based FHM activities and develop FHM guidelines which can be applied to different situations in developing countries.

Finally, ICHARM would like to express deep appreciation to people at PAGASA and JICA, who offered their generous cooperation and made this seminar a great success.



The participants smile for photos at the seminar's opening ceremony.

Contents of “Progress Report”

ICHARM

1. Objectives of this report :

- This “Progress Report” will be prepared by each participant as materials for discussion during the seminar and the research of Flood Hazard Map (FHM) by ICHARM.
- The content of this report consists of two items as follows; please write each item based on not only your own ideas/opinions but also the official standpoint/data at present (*Official Web site is best!*).

Item A: FHM-related situation in your country

A-(1) Current/target situation of FHM in your country

(by using official information/data and your opinions)

(1)-1 Please select current stage of FHM in your country/region/city from the 7 types (Map-A,B,..G) of map shown in Table 1.

(Please refer Table 2 as a selection flow.)

(1)-2 Please describe the outline of current situation of FHM in your country.

(How many FHMs or related projects do you have in your country? Etc.)

(1)-3 (If you have FHMs,) Please write maximum 3 good practices.

(Please make sure Where? Why? When? By Who? To Whom? How?)

(1)-4 Please select target/necessary stage of FHM in your country/ region/city from the 7 types (Map-A,B,..G) of map shown in Table 1, and describe the reason.

(Please refer Table 2 as a selection flow. Which type of FHM do you think is necessary in your country? Which type of FHM is desirable? And why?)

A-(2) For making of FHM

(2)-1 Institutional situation for making FHM

(Is there any FHM-related law? Or governmental system? If yes, which organizations do take responsibilities for making FHM?)

(2)-2 Hydrological/topographical data situation for making FHM

(If the situation is different by a basin and a river, please clarify the data source.)

(2)-3 Problems for making FHM in your country

A-(3) For disseminating/use of FHM

(3)-1 Institutional situation for disseminating/use FHM

(Is there any FHM-related law? Or governmental system? If yes, which organizations do take responsibilities for disseminating FHM?)

(3)-2 Problems for disseminating/use of FHM in your country

(3)-3 Other how to use FHM in your country

(If you have any idea for use of FHM except for types of Table 1, please describe your ideas.)

Item B: For improvement of FHM research by ICHARM

(This item is not included in the presentation)

B-(1) For efficient/effective disaster preventions

(1)-1 Saturation level of TV, Radio, Internet and Newspaper in your country

(by using official information/data)

(1)-2 The flow of information related to evacuation in flood

(Who issues the flood alert and evacuation order in your country? For example in Japan, in flood time the Japan Meteorological Agency (governmental agency) issues forecast of heavy rain and municipalities (city/town) issue evacuation recommendation / order.)

(1)-3 Please describe how high the “awareness level for disaster prevention by residents” in your country is.

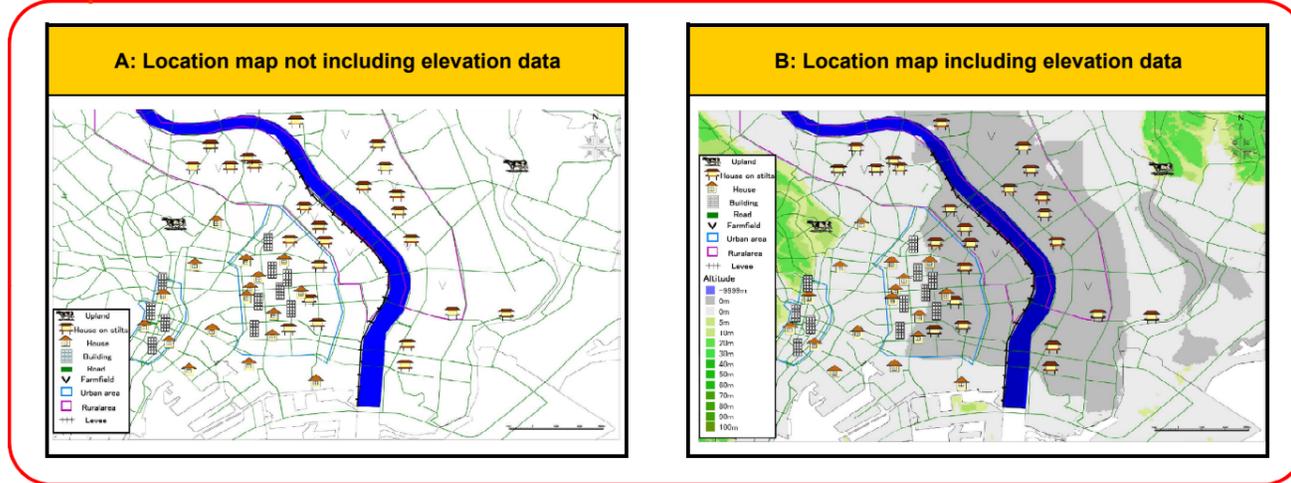
(For example in Japan, some communities organize “Voluntary Disaster Prevention Organization” and act for awareness for disaster such as evacuation drills.)

B-(2) “Flood Hazard Map Manual” made by ICHARM

Please suggest improving the “Flood Hazard Map Manual” to become useful in your country. Is the manual applicable in your country or not?

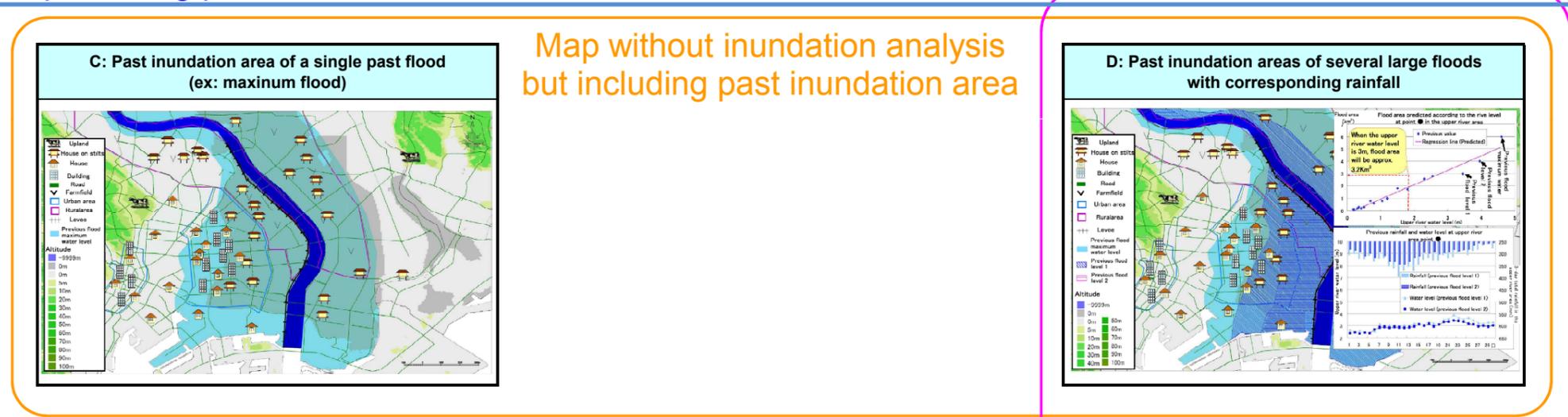
Map without inundation area

Table 1 List of Maps according to the level

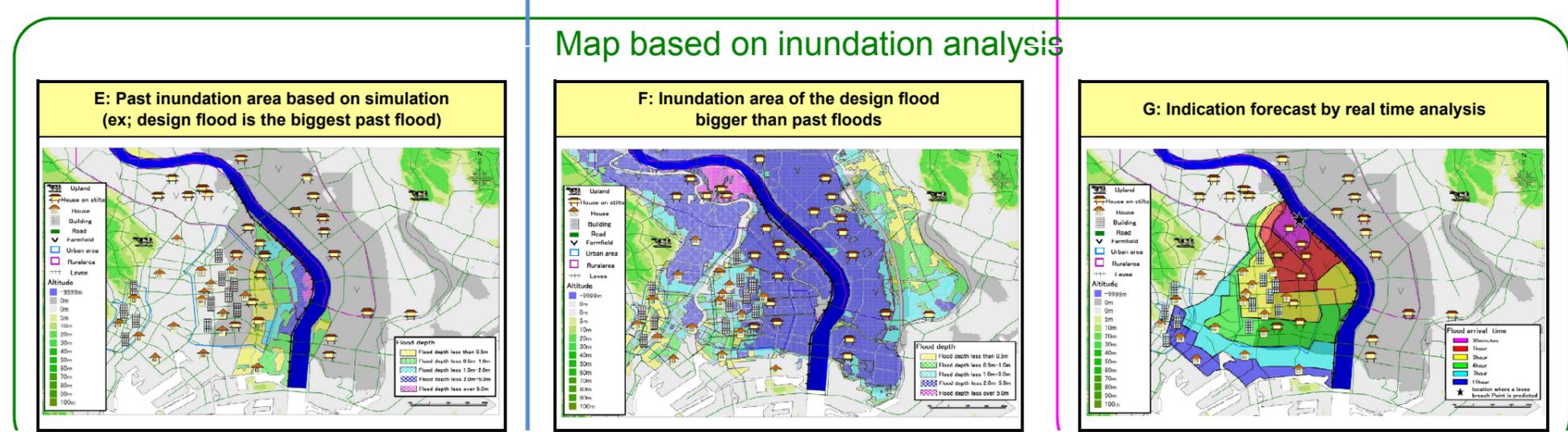


Map showing past inundation areas

Map predictable inundation area



Map without inundation analysis but including past inundation area



Map based on inundation analysis