Proposal Report

on

Flood Hazard Mapping Project

in LiNan Polder

Prepared By

Liao Hongzhi

Changjiang Water Resources Commission

China

FLOOD HAZARD MAPPING TRAINING COURSE

JFY 2008

1. Background of the proposal

Flooding has caused enormous damage through its history on Changjiang River in China. After 1998, China government made great efforts to implement the project to prevent floods. The flood control systems in Changjiang River are composed of structural and non-structural measures. Combined two measures, the main goal of flood management are prevention of casualties and reduction of economic losses to the least. Flood Hazard Map (FHM) is one of the very important non-structural countermeasures.

FHM is referred to a map that is prepared primarily to prevent human damage by providing residents with inundation related information, such as levee braches and flood occurrences and evacuation information in an easy to understand way. The FHM aim is to minimize the damage in case of foods by giving information to the residents in advance.

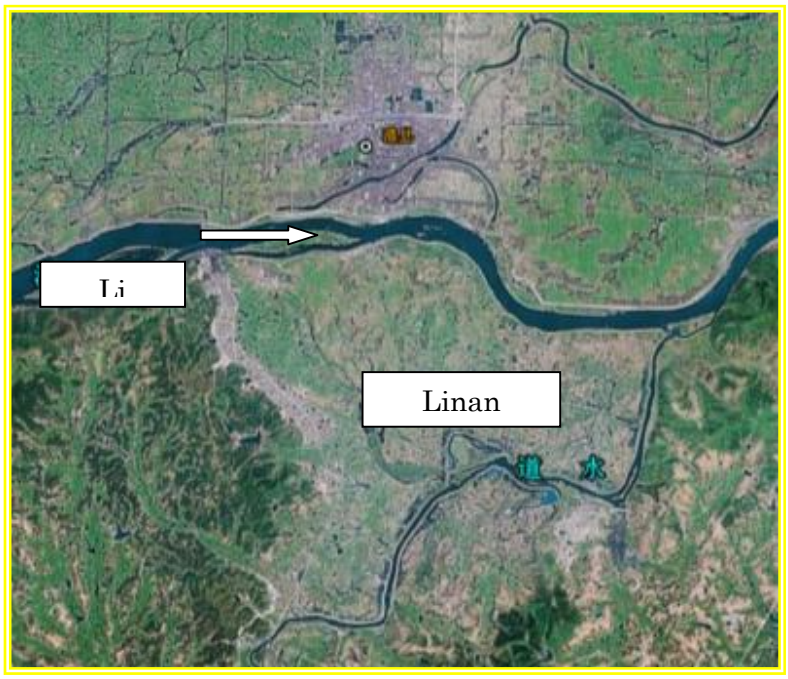
In order to promote the execution of FHM, Guidelines for flood hazard mapping were issued by the Office of State Flood Control and Drought Relief Headquarters in May, 2005. Then， 36 pilot studies in seven major river basins have been arranged, including some detention areas, cities, dike protected areas and dam failure events. 6 areas which are chosen to make a FHM in Changjiang river basin. In 2008, the FHM in 6 areas are compiled. Through the pilot study, we get some conclusions for feature stage:

- ✓ The criterion for FHM should to be established immediately;
- ✓ The basic information and date should to be collected more comprehensive, specially the social and economic data should to be included;
- ✓ The FHM compiled should to be published and disseminated to residents.

Therefore, based on the pilot study of FHM and applying the knowledge and ideas acquired and discussed in the Flood Hazard Map Training Course, the target area (LiNan Polder) is chosen to compile the FHM. Not only to compile the FHM, but also to disseminate it to residents to make them aware of the danger caused by foods and be prepared for them.

2. Outline of the LiNan Polder

Li River is among 4 rivers of DongTing Lake water system. LiNan polder is located at the lower reaches of Li River. LiNan Polder has 34.3 km² in area and 24.2 km in dike length. About 77% of the land area is plantation. In 2006 the estimated population of LiNan Polder was 28326. 22 companies, 5 schools, 2 cliniques and 150 convenient stores are located on the polder.



LiNan polder is among 24 flood detention areas in Hunan Province. It is charged with the flood diversion role for excess flood discharge of Li River. When the water level of the Li River reaches the flood diversion water level, if the upriver discharge will increase according to the forecast and the lower reach of the Li River need to mitigate the flood influence, the diversion gate will be opened, and the flood water will flow into the polder. Before flood flow in the polder, the residents will be evacuated to the evacuation center. After the flood flow out from the polder, the government will evaluate the damage and give residents compensating caused by flood diversion.

LiNan polder has open landform and complanate hypsography. The upriver of Li River is the famous storm zone, and the lower reaches of Li River influenced by the jacking of DongTing Lake flood. The flood disaster occurs frequently and threatens the local people severely. LiNan polder belong monsoon climate and locate on the subtropical zone. The rainfall quantity is abundant in this area. The mean annual precipitation is 1254.2 mm, the mean annual evaporation is 1242.9 mm and the mean annual rainy day is 142 days.

The average annual discharge of Li River near the LiNan polder is 478 m^3/s. The maximum flood peak discharge is 15900 m^3/s. The design flood discharge of 20-years

floods is 15000 m^3/s on Jingshi hydrometric station when the Jiangya Reservoir regulate flood. The average annual water level of Li River near the LiNan polder is 31.48 m; the maximum observation water level is 42.85 m.

1998，flood have been overtopping the dike of LiNan polder. The water lever of Liujiahe water gauge station is 44.825 m. The width of the dike breach on LiNan polder is as following: BaiZhiPeng 296 m; WangJiaZhou 228 m; LiuJiaCiTang 188 m. The maximum overtopping discharge is 9800 m^3/s, the maximum storage level is 45.8 m, the total storage capacity is 2 hundred million m^3, the inundated area is 36 km^2, the flooded infield area is 26.4 km^2. 28.3 thousand people are influenced by this flood disaster. The flooding duration is 45 days. The water depth of characteristics position is 8.5 m. The flood damage is 3 hundred million Yuan.

2003, flood have been overtopping the dike of LiNan polder again. The water lever of Liujiahe water gauge station is 47.1m. The width of the dike breach on LiNan polder is as following: SongJiaDu 308m. The maximum overtopping discharge is 7500 m^3/s, the maximum storage level is 43.745m, the total storage capacity is 2 hundred million m^3, the inundated area is 36 km^2, the flooded infield area is 26.4 km^2. 28.3 thousand people are influenced by this flood disaster. The flooding duration is 29 days. The water depth of characteristics position is 8.5 m. The flood damage is 40 million Yuan.

LiNan polder has three evacuation centers with total area is 255 million m^2. These three evacuation centers can allocation 28.3 thousand people. The information about them is as follows:

The total area of QiaoJiaHe evacuation center is 150 million m^2. It can allocation 21072 people. The altitude of QiaoJiaHe is 47.95m.

The total area of ZhangJiaTan evacuation center is 90 million m^2. It can allocation 5664 people. The altitude of ZhangJiaTan is 50.95m.

The total area of YiaoPo candidate evacuation center is 15 million m^2. It can allocation 1590 people. The altitude of QiaoJiaHe is 51.95m.

The diversion gate is controlled by the flood control and drought relief headquarters of HuNan province. LiNan polder flood control and drought relief headquarters take charge of the organization of residents evacuate to the evacuation center.

3. Schedule of implementation

According to the process for the execution FHM and the situation of the LiNan Polder, the implementation schedule for the LiNan Polder is making as follows:

- **Data collection and analysis (6 months)**

Some basic information should be collected in this stage:

- ✓ History flood records and inundation area;
- ✓ Base map;
- ✓ Social and economic data;
- ✓ Hydrological and meteorological data;
- ✓ Flood damage data;
- ✓ Flood control project information;
- ✓ Evacuation site and route information;
- ✓ Land use information;
- ✓ Flood dispatching plan (river, reservoir, detention area and sluice).

- **Inundation area analysis (2 months)**

Through hydrological and hydraulic calculation and simulation, analysis the inundation areas, such as extent of inundation, water depth, flow rate, arrival timing and the inundation duration etc.

- **Flood hazard mapping (2 months)**

- ✓ Investigation all stakeholders' suggestion or opinion (resident, central government, province administration and community);
- ✓ Calculation the population required to evacuate, accommodation provided by shelters;
- ✓ Formulation the evacuation plan;
- ✓ Compilation the flood hazard map.

- **Dissemination FHM (1 month)**

- ✓ Dissemination the FHM to each level administration;
- ✓ Dissemination the FHM to each household in inundation area.

❖ **Flood hazard drill and exercise (1 month)**

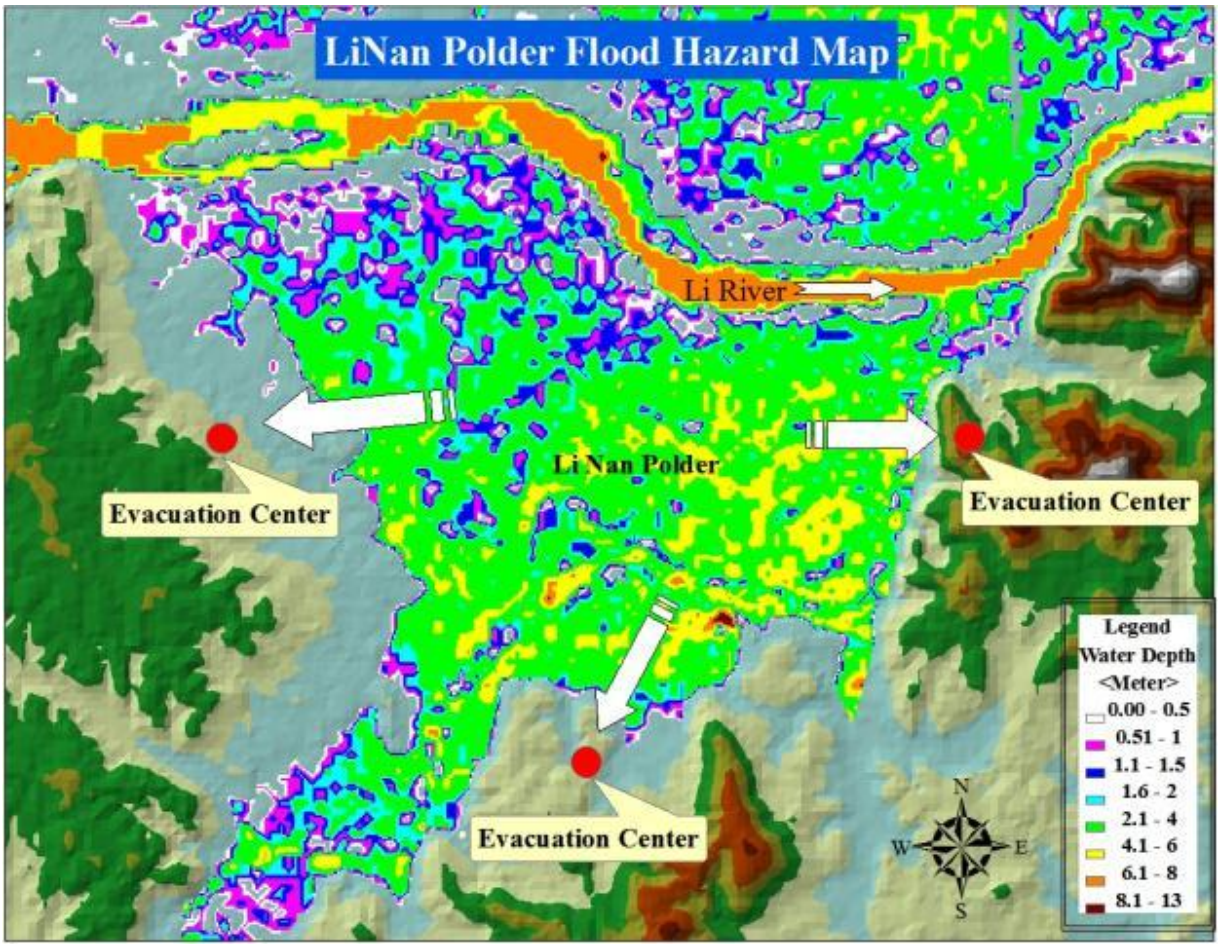
✓ Flood hazard education course;
✓ Flood hazard drill and exercise.

4. Estimated budget

	Item	Cost (RMB)
1	Data collection and analysis	500,000
2	Inundation area analysis	150,000
3	Flood hazard mapping	150,000
4	Dissemination FHM	100,000
5	Flood hazard drill and exercise	100,000
Sum		1,000,000

5. Expected effectiveness

LiNan Polder flood detention area is an extremely important part of DongTing Lake flood control system which taking on the duty of cutting flood peak and storing floodwater. From 1998, LiNan Polder flood detention area was utilized to storage floodwater four times. It is very important for the residents living in the detention areas to evacuate fast when the detention area is utilized. When we finish the LiNan Polder FHM, it will be published by the government. After that, all the residents, companies and communities will get the FHM. At same time, they will be required to participate in the flood hazard drill and exercise which will help them understand the risk caused by flood and how to evacuate to the safety area in time.



LiNan Polder Flood Hazard Map