

**ASEM LLL HUB CONFERENCE:  
LIFELONG LEARNING AND RESILIENCE IN DISASTER MANAGEMENT  
ASIAN AND EUROPEAN PERSPECTIVES  
8-10 NOVEMBER 2016, HO CHI MINH CITY, VIETNAM**



**Restoring Heritage  
Developing Disaster Risk Management Plan to Conserve  
the Outstanding Universal Value of  
the Historic City of Ayutthaya, Thailand**

Hatthaya Siriphatthanakun

# Outline

The background of the slide is a detailed map of the Historic City of Ayutthaya, Thailand. The map shows the city's layout, including its walled perimeter, internal streets, and various structures. The city is situated on an island in the Chao Phraya River. The map is rendered in a light, faded style, allowing the text to be clearly visible. At the bottom of the map, the text 'PLAN DE LA VILLE D' is visible.

**I. Historic City of Ayutthaya and the 2011 flood**

**II. Developing disaster risk management for cultural heritage**

**III. Engaging partners, stakeholders and local communities through capacity building activities in order to advance the understanding in disaster risk management for cultural heritage.**

**VI. Lesson learnt**

# I. Introduction



**Historic City of  
Ayutthaya,  
Thailand**



**Thailand**

**Southeast Asia**

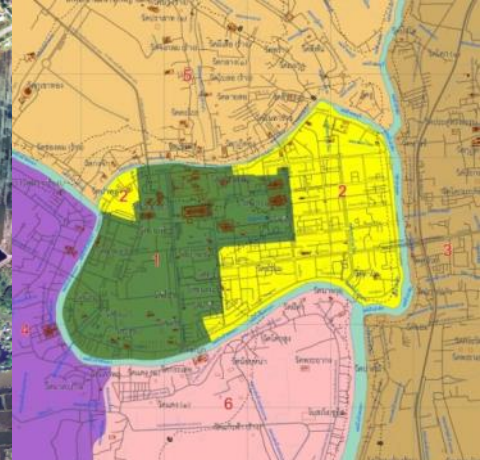
**Where**



Greater Ayutthaya

Greater Ayutthaya

Greater Ayutthaya



Ayutthaya Island

**P**resent  
Aerial  
view



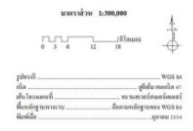
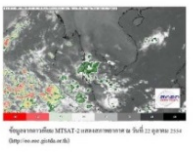
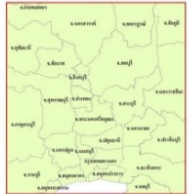
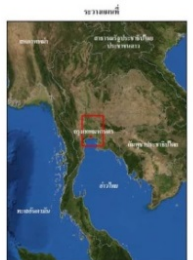
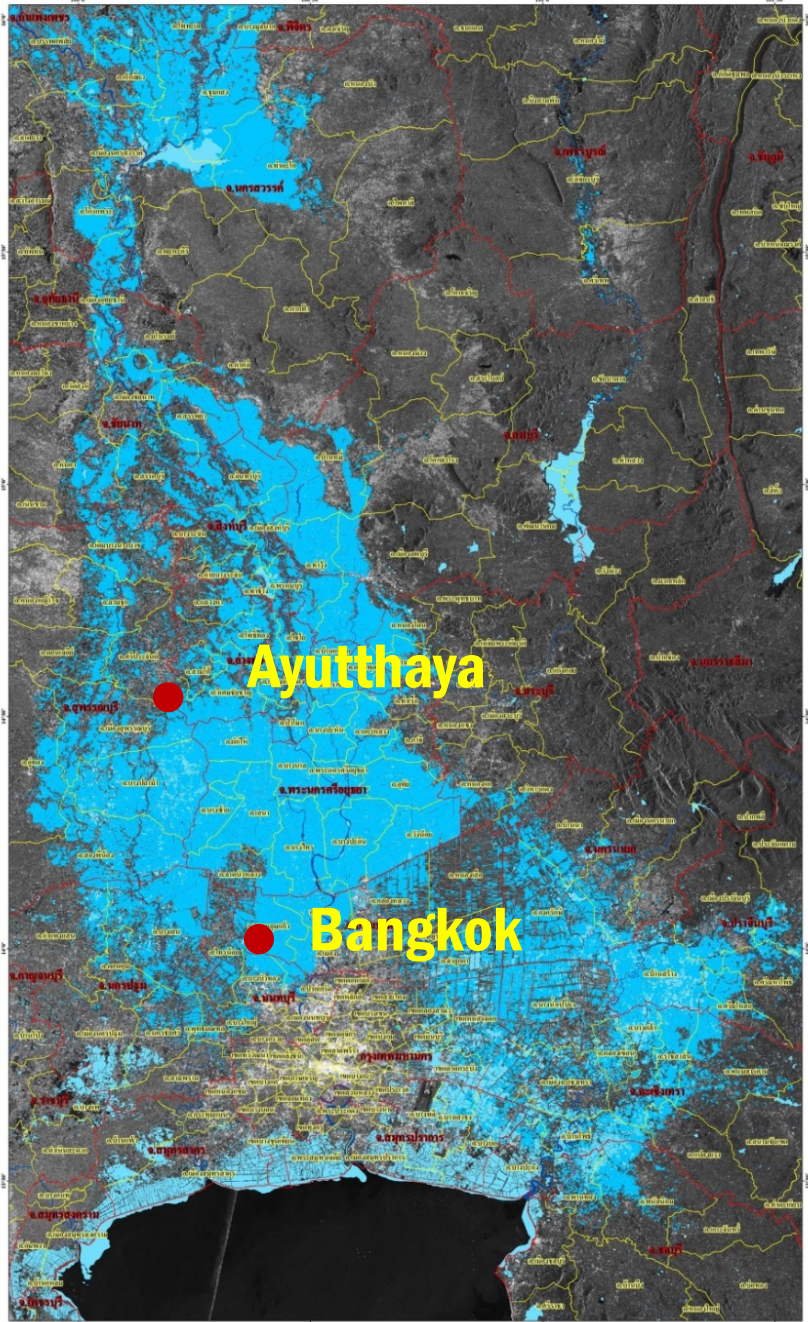








**ข้อมูลจากดาวเทียม RADARSAT - บันทึกข้อมูลเมื่อวันที่ 22 ตุลาคม 2554 เวลา 06.09 น.**  
 แสดงพื้นที่ที่ท่วม บริเวณบางส่วนของจังหวัดกรุงเทพมหานคร ฉะเชิงเทรา ชลบุรี ชัยนาท ตาก นครนายก นครปฐม นครสวรรค์ นครพนม  
 ปทุมธานี ปราจีนบุรี พระนครศรีอยุธยา สตูล สุพรรณบุรี สระบุรี สิงห์บุรี สุพรรณบุรี อ่างทอง และอุทัยธานี



สงวนลิขสิทธิ์ในข้อมูลดาวเทียม RADARSAT โดย Canadian Space Agency  
 ข้อมูลดาวเทียม RADARSAT เป็นข้อมูลลิขสิทธิ์ของ Canadian Space Agency  
 ข้อมูลดาวเทียม RADARSAT เป็นข้อมูลลิขสิทธิ์ของ Canadian Space Agency  
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 ข้อมูลดาวเทียม RADARSAT เป็นข้อมูลลิขสิทธิ์ของ Canadian Space Agency

**October 2011**









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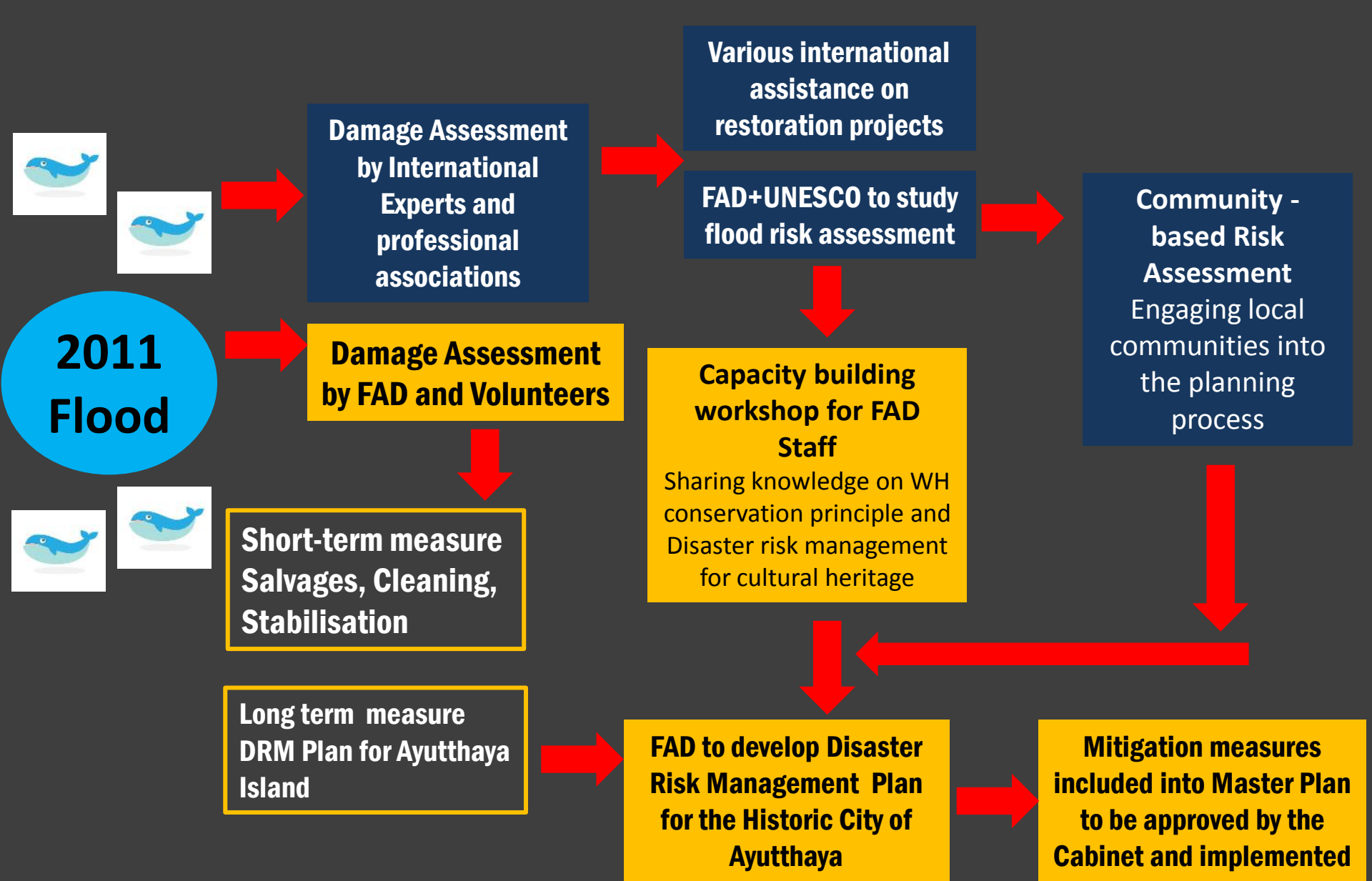




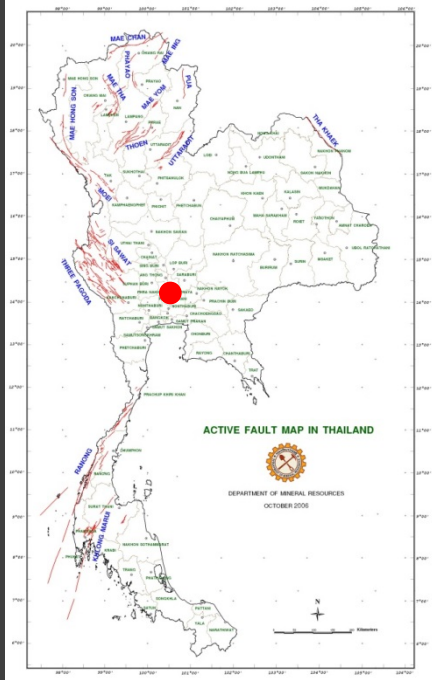




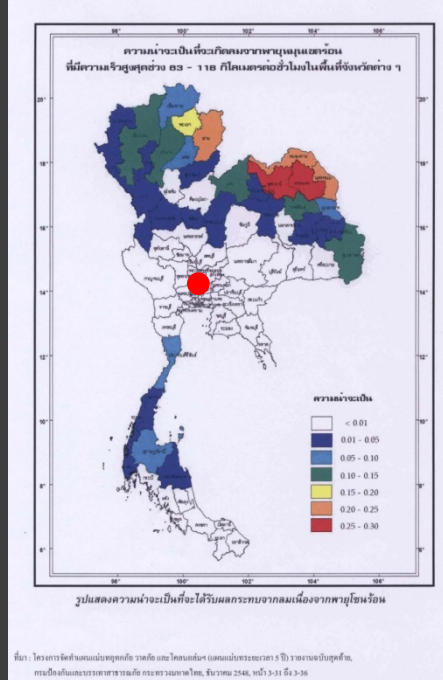
## **II. Disaster Risk Management Plan**



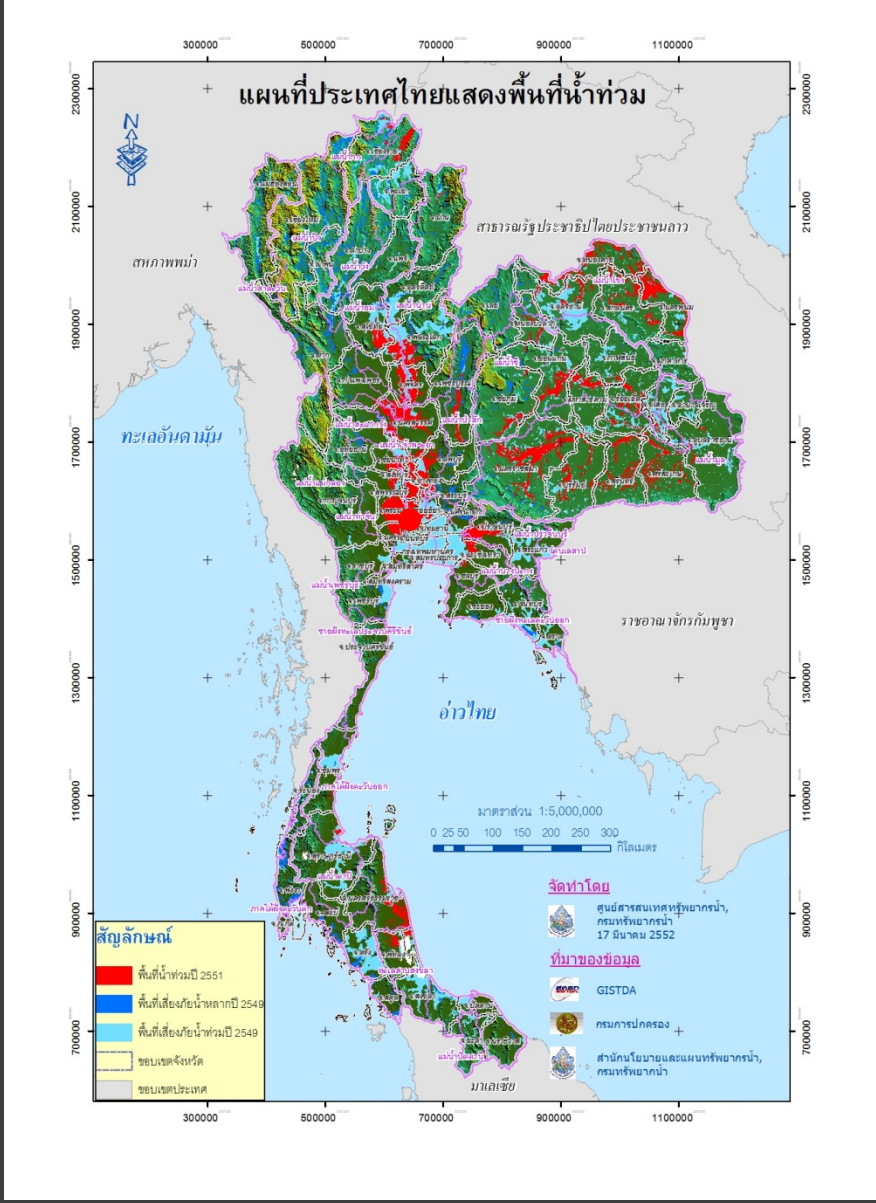
# Overview of Developing DRM Plan



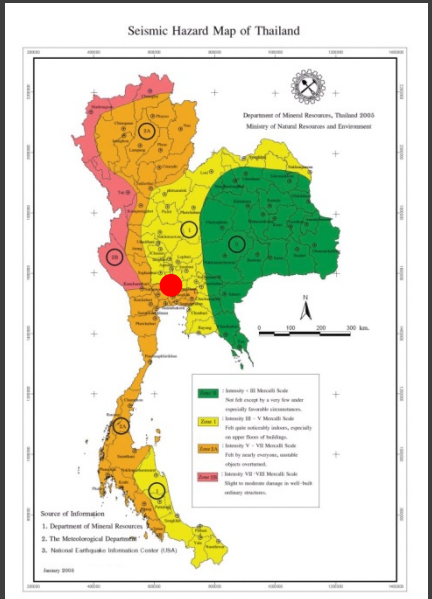
**Active Faults**



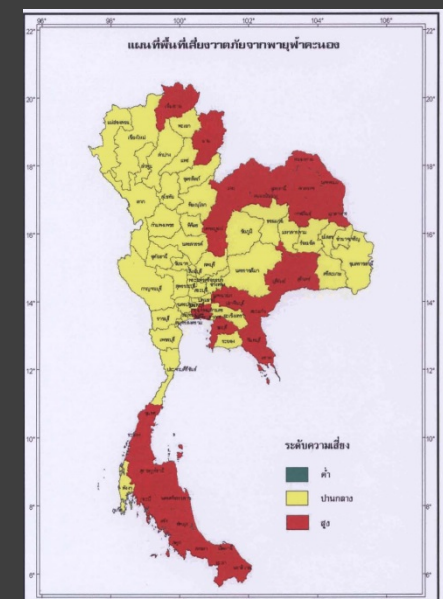
**Tropical spiral storm**



**Flood risk map**



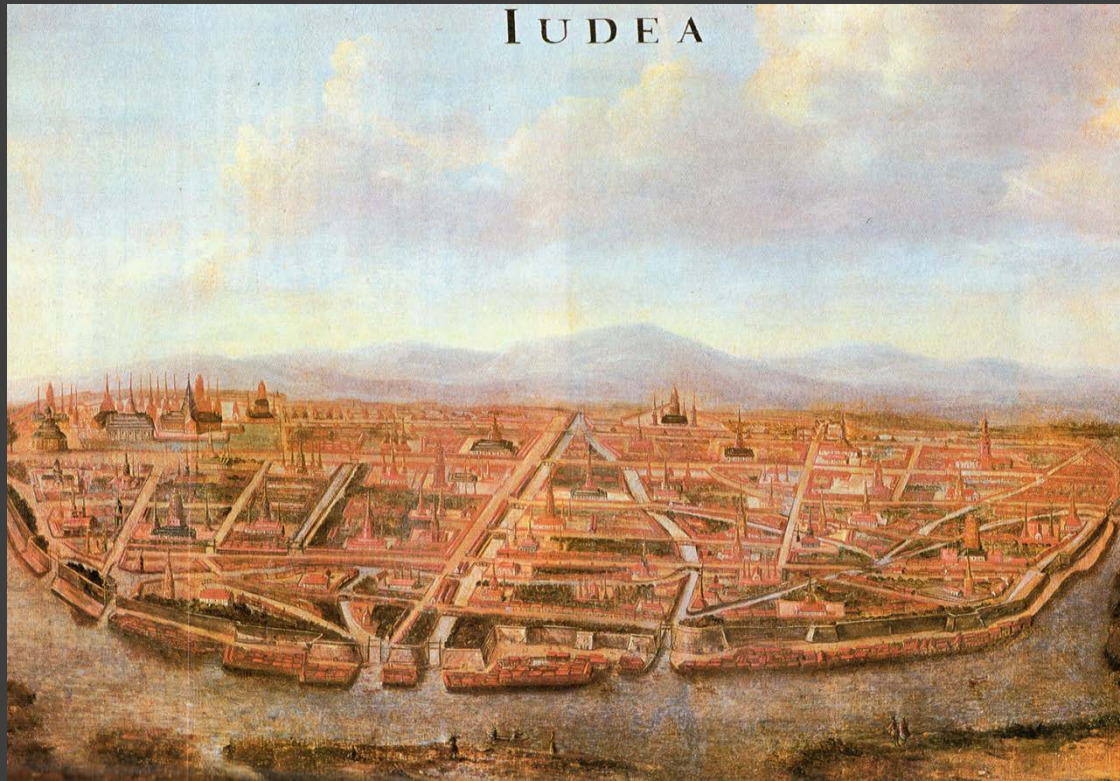
**Seismic hazard**



**Summer storm**

# Hazard Maps

# What to be conserved ?



Well-known from contemporary sources and maps, Ayutthaya was laid out according to a **systematic and rigid city planning grid, consisting of roads, canals, and moats around all the principal structures**. The scheme took maximum advantage of the city's position in the midst of three rivers and had a **hydraulic system for water management which was technologically extremely advanced and unique in the world**.

**S**tatement of Outstanding Universal Value

# Values assessment

Significance	Attributes	Contribution of Attribute to Significance of Property
<p>The world's largest and most cosmopolitan urban areas and a center of global diplomacy and commerce</p>	<ol style="list-style-type: none"> <li>1. Location-an island surrounded by 3 rivers connecting the city to the sea</li> <li>2. Extensive archaeological site the remains of tall <i>prang</i> and Buddhist monasteries</li> </ol>	<ol style="list-style-type: none"> <li>1.Very high (Urban Heritage)</li> <li>2.Very high (Archaeology Heritage)</li> </ol>
<p>Water management which was technologically extremely advanced and unique in the world.</p>	<ol style="list-style-type: none"> <li>1.Systematic and rigid city planning grid, consisting of roads, canals, and moats around all the principal structures</li> </ol>	<ol style="list-style-type: none"> <li>1.Very high (Urban Heritage)</li> </ol>
<p>Ingenuity and the creativity of the Ayutthaya civilization as well as its ability to assimilate a multitude of foreign influences</p>	<ol style="list-style-type: none"> <li>1.The surviving art in the architectural ruins.</li> <li>2.The large palaces and the Buddhist monasteries</li> </ol>	<ol style="list-style-type: none"> <li>1.Very high (Architecture/Intangible Heritage)</li> <li>2.Very high (Architecture /Intangible Heritage)</li> </ol>
<p>Emulation the perfection of the mythical city of Ayodhya</p>	<ol style="list-style-type: none"> <li>1.Pattern of urban replication is in keeping with the urban planning concept (Bangkok)</li> </ol>	<ol style="list-style-type: none"> <li>1.Very high (Urban Heritage)</li> </ol>



## Vulnerabilities

- Monsoon
- Depression
- Climate change
- Location

- Urbanisation
- Construction
- Water management
- Past intervention
- Unprepared management
- Lack of corporation
- Change of architecture and building technique

## Hazards

### Primary

## Flood

Landslide/  
erosion

Land sunken

Electricity  
leakage

Theft

### Secondary

## Impacts

Remains, water  
system

Museum Antiques  
objects

Historic building  
Urban structure  
deteriorated,  
failed

Cultural assets/  
economic  
damages

Loss of traditional  
knowledge

Loss of  
lives/safety of  
staff, visitors

Loss of original bricks, lime mortar of the ancient ruins, the river/canal bank can collapse

Antiques and artefacts kept in the museums can be stolen or broken during the emergency time

Moist and rising damp can make the earlier deteriorated to the ruins, old temples and museum objects.

Cultural buildings and tourism asset coming from the heritage attributes can be affected

Old local artisans carrying the knowledge of living with water and handicraft can not transmit their knowledge

Staff of heritage sites and visitors are insecure during the time

# Risk analysis

## Vulnerabilities

Monsoon  
Depression  
Climate change  
Location

Past intervention/  
conservation treatment

Change of architectural  
style and building  
technique

Urbanisation in the  
historic city and  
Industrialisation around  
/less flood plains and  
water flow channel

Construction of higher  
embankment and  
retaining wall along the  
river/ Increase water  
amount to lower area

Water management of the  
dams relating the area

Unprepared management  
for disasters

Lack of integrated  
corporation when disaster  
happened

## Mitigation measures

### Policy and Guidelines at Site and Buffer Levels

1. Local building code should be addressed the flood protection architectural design
2. Study the areas impacted by flood within the Historic City of Ayutthaya and proposed polder system with various alternatives of the polders
3. Regulate architectural design guideline that meets the flooding area condition
4. Control flood protection barriers or structures
5. Identify areas controlled for canal encroachment and flood detention area
6. Review the urban planning to identify the retention areas around Ayutthaya Island.
7. Strengthen law enforcement
8. Strengthen collaboration among government agencies.

### Planning measures at Site and Buffer Levels

1. Review Land use
2. Transportation improvement
3. Infrastructure and services improvement i.e. sewage, drainage

## Flood

# Mitigation measures

## Vulnerabilities

Monsoon  
Depression  
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for disasters

Lack of integrated  
corporation when disaster  
happened

## Mitigation measures

Technical  
Measures within  
Site (at area or  
attribute level)

1. Scientific research / compilation/evaluation on appropriate techniques i.e. Intensive archaeological survey and scientific study for the ancient canal system
2. Conduct water system restoration and retention areas within the Island
3. Put in place temporary water barrier around the island
4. Enhance landscape for flood protection
5. Improve river embankment
6. Consolidation of ancient monuments
7. Ayutthaya city wall restoration to be part of water barrier
8. Adapt temple wall to protect local flood
9. Regular capacity building for staff

Maintenance and  
Monitoring  
Procedures at  
Sites, Area and  
Attribute levels

1. Always cleaning the drainage system
2. Flushing the canal system
3. Depending on condition-3m
4. Monitoring and checking monuments
5. Maintenance flood protection system/temporary flood barriers/equipment/pumping machines(กรมศิลปากร)+station (เทศบาล)



# Flood



# Mitigation measures

# III. Capacity-building activities

## Background

Long term measure to protect this WH property

Conservation model for other heritage sites

5-day workshop at Ayutthaya World Heritage property

## Target

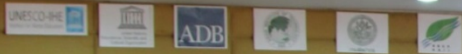
Bangkok office - Conservation architects/engineers  
- inventory's staff

World Heritage Sites (4 historical parks and Ban  
Chiang National Museum) - managers  
- Archaeologists  
- Technicians

## Expected Outcome

DRM to be implemented at other heritage sites

**C**apacity-building workshop



การประชุมปรึกษาหารือ  
โครงการลดภาวะโลกร้อนและปรับปรุงคุณภาพ  
ชีวิตในเขตเทศบาลนครศรีนครินทร์  
วันที่ ๒๗ มิถุนายน ๒๕๕๗  
โรงแรม มิวส์ ซิตี้ นครศรีธรรมราช



Man in dark suit speaking at a podium.

Audience members seated at tables with green tablecloths, water bottles, and papers.



# Participatory Flood Risk Assessment: activities

1. Meetings with partners:
  - UNESCO
  - Fine Arts Department
  - Department of Public Works and Town and Country Planning
  - Ayutthaya municipality (Social Welfare Division)
2. Two workshops with 5-7 representatives from 30 of 33 communities/ Group mapping and group interviews with communities' representatives
3. Individual questionnaires

Source : UNESCO-IHE and UNESCO Bangkok (2015). Flood Risk Assessment Study for the Historic City of Ayutthaya, Thailand

**C**ommunity-based risk assessment



# Stakeholders identification



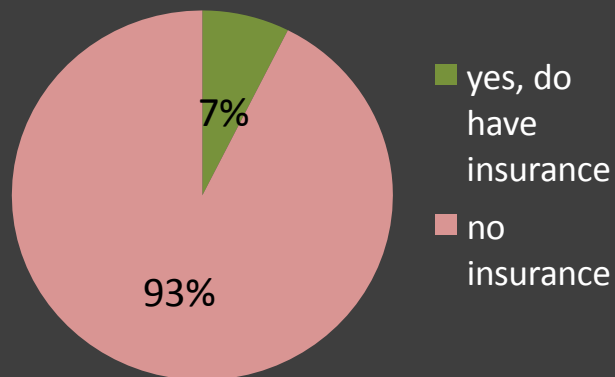
Source : HIRUNSALEE, S (2015). Presentation on community-based risk assessment for the Historic City of Ayutthaya, Thailand



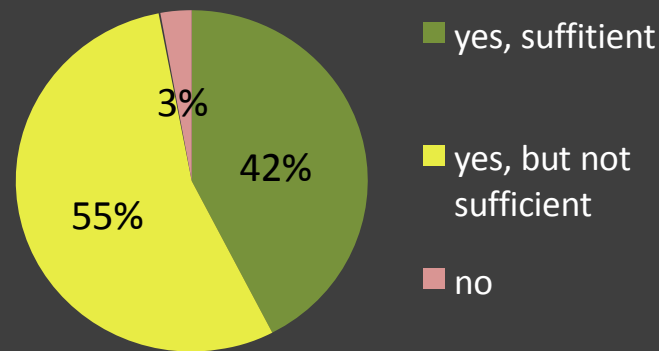
Source : HIRUNSALEE, S (2015). Presentation on community-based risk assessment for the Historic City of Ayutthaya, Thailand

# Vulnerability: social dimension

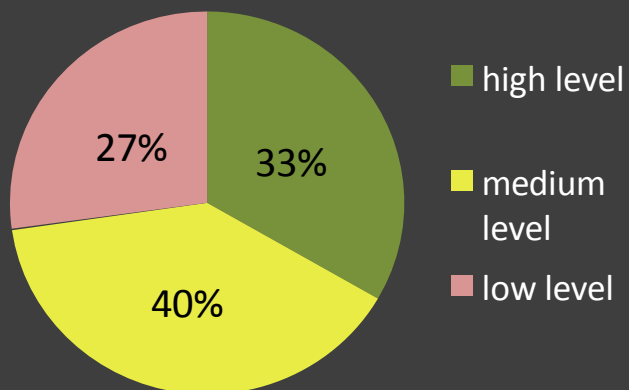
## Property insurance



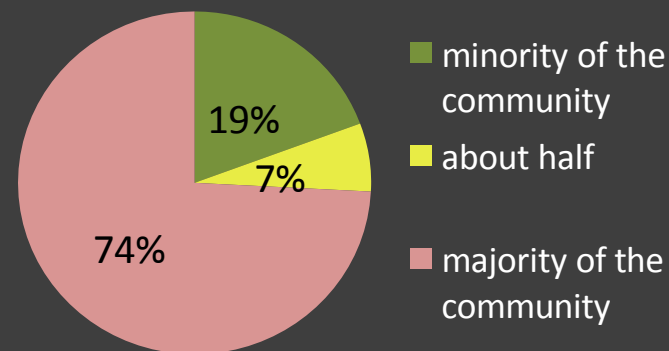
## Support from authorities



## Flood awareness

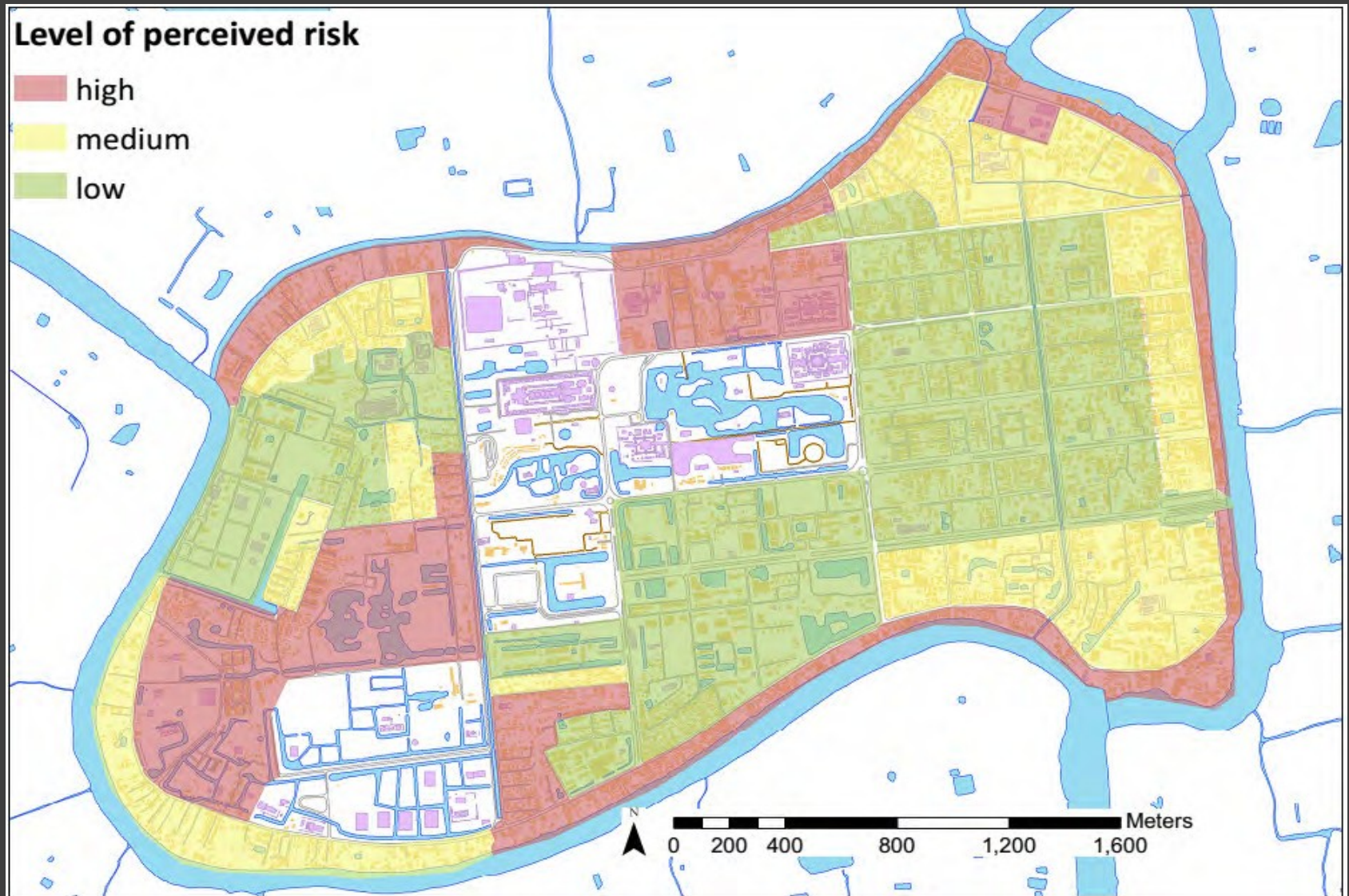


## Loss of income sources



Source : HIRUNSALEE, S (2015). Presentation on community-based risk assessment for the Historic City of Ayutthaya, Thailand

# Risk perception



Source : HIRUNSALEE, S (2015). Presentation on community-based risk assessment for the Historic City of Ayutthaya, Thailand

## **IV. Lessons learnt**

# Culture –Disaster Management : Human lives come



Heritage to be protected while it can also help i.e. shelters, knowledge



# Local communities play a major role when dealing with their areas





# CULTURE URBAN FUTURE

SUMMARY

GLOBAL REPORT  
on CULTURE  
for SUSTAINABLE  
URBAN  
DEVELOPMENT

Making heritage city sustainable and resilient is a new dimension for conservation to response Global agenda

# Capacity building/ learning activities are strongly needed



**SEAMEO-SPAFA Consultative Meeting on  
Developing Capacity-Building  
Disaster Risk Management for Southeast Asian  
Cultural Heritage**

**Thank you for your attention**

**KHOB KHUN KHA**