From Disaster Risk Reduction (DRR) to Resilience Activities in Thailand after Flood

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The 2011 flood was the worst flood in modern Thai history, inundating

- 9.1% the total land area of the country
- Affecting more than 13million people
- 128 deaths
- Total damage and loss of 46.5 billion
- Paralyzing BMA for 2 months
- 69 provinces damaged



The 2011 Thailand Flood: Causes and Policy Response

- 69 provinces with flood inundation area of 41,381.8 km²
- 19 provinces see most severely inundated.
- Flood began late July 2011, and receded in mid-December 2011.



Facts Relating to the 2011 Thailand Floods

 Given the higher altitudes of the Northern provinces, the surface water flow from North to South to the sea through a few major rivers. (Chao Phraya River, Tha-Chin **River and Pasak River** Basin)



Map of Flood Inundated Areas, 8-9 Nov 2011



Source: The World Bank (2012)

Impact of 2011 Flood: Loss and Damages

- Flood affected 12.8 million people
- Damaged 16,668.55 square km. of agricultural land area
- 66,000 jobs as of 25 November 2011
- Overall, the total damage and loss amounted to 46.5 billion USD.
- Recovery and reconstruction would cost 50 billion USD over 6 months and beyond.

Damages and Losses by Sector (mil USD)

Sub Sector	Disaster Effects			Ownership	
	Damage	Losses	Total	Public	Private
Infrastructure					
Water resources management	284	-	284	284	-
Transport	768	226	995	990	5
Telecommunicati on	42	83	126	52	73
Electricity	104	187	291	176	115
Water supply and sanitation	114	65	179	179	-
Cultural heritage	145	100	245	99	146

Damages and Losses by Sector (mil USD)

Sub Sector	Disaster Effects			Ownership	
	Damage	Losses	Total	Public	Private
Productive					
Agriculture, livestock and fishery	185	1,133	1,318	-	1,318
Manufacturi ng	16,773	16,100	32,874	-	32,874
Tourism	168	2,927	3,095	13	3,081
Finance & banking	-	3,763	3,763	2,418	1,345

Damages and Losses by Sector (mil USD)

Sub Sector	Disaster Effects			Ownership	
	Damage	Losses	Total	Public	Private
Social					
Health	55	70	125	53	71
Social	-	-	-	-	-
Education	426	59	485	346	138
Housing	1,498	1,237	2,735	-	2,735
Cross Cutting	-	-	-	-	-
Environment	12	6	18	7	11
TOTAL	20,575	25,956	46,531	4,618	41,913

Source: The World Bank (2012)

Factors Causing the 2011 Floods: from Mother Nature to Man-made Mistakes

 Factor 1 : The average rainfall of 1,781 mm between January and October 2011 was the highest record, and was 35% higher than the 50-year average.



Average Cumulative Annual Rainfall



Factors 2 : Water runoff from major rivers excluded the capacity of the rivers

- Overflowed the riverbanks, and inundated vast flood plans
- The water levels rose at a slow, steady rate, and flood water persisted in some areas for almost 70 days before receding.



The main cause of the flooding was:

- Low flow capacity of river
- River's capacity decreased downstream which implies that spillage from the river channel gradually occurs in the upstream areas when a large-scale flood occurs.



Factor 3 : Rapid (and unplanned) urbanization and unsuitable land use in the flood plain areas.

- Industrial and housing estates were located in the areas which were supposed to be the flood plains
- Many infrastructural facilities also block the canals and rivers.



FACTOR 3 : No implementation of land use zoning in most provinces

- Several industrial estates and housing developments were allowed to locate in the flood prone areas, because the land prices were the lowest.
- In Bangkok where there has been land use zoning, the zoning law has been changed to serve the interests of business and property developers.

FACTOR 4 : Flood mismanagement

- The weakness of existing operations of major reserves.
- Political intervention in dam operation and irrigation management.
- Ageing structures and defused essential maintenance of the irrigation and flood protection infrastructure.





FACTOR 4 : Flood mismanagement

- Lack of an effective flood fore casing and early warning system
- The emergency mismanagement (the mis-handling) of refugee center of flood victims and flood relief management.



How did Thailand Handle the Flood?

- Flood Management during the Crisis.
 - Established Flood Relief Operation Center (FROC) in October 2011.
 - Serve as the migrant center and shelter for flood victims.
 - Assist the military to repair facilities of irrigation facilities.
 - Evacuated flood victims from flooded area, delivered survivor kits.

Flood Management Master Plan

- To build public confidence and security
- To increase national income
- To manage natural resources on a sustainable basis



The Master Plan in based upon two approaches

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- The structural (or physical infrastructural) measures
 - Flood management measures to "store and divert" water
 - Construction of floodway to divert water (rely upon a JICA study on infrastructural investment and flood management)

The non-structural Royal Initiative

 "room for the river" – increased areas for floods to spread and consists of the large flood retention areas on Monkey Cheek reservoir or Gamling



The Best Mix of Structural and Nonstructural Measures



The water management master plan consists of 8 work plans and implements guidelines as follows

- 1) Work Plan for Restoration and Conservation of Forest and Ecosystem
- 2) Work Plan for Management of Major Water Reservoirs and Formulation of National Annual Water Management Plan



The water management master plan consists of 8 work plans and implements guidelines as follows

- 3) Work Plan for Restoration and Efficiency Improvement of Current and Plan Physical Structures
- 4) Work Plan for Information Warehouse as well as Forecasting and Disaster Warning System.
- 5) Work Plan for Preparedness for Emergency Situations in Specific Areas

The water management master plan consists of 8 work plans and implements guidelines as follows

- 6) Work Plan for Assigning Water Retention Areas and Recovery Measures.
- 7) Work Plan for Improving Water Management Institutions
- 8) Work Plan for Creating Understanding Acceptance and Participation in Large Scale Flood Management from all



Flood Action Plan and Budget

The action plan budget consists of

 An immediate flood compensation budget
 Flood action plans





Assistance, Restoration and Compensation Budget

 Government allocated 3,902 million USD for FY 2011-2012 to provide assistance, restoration and compensation to flood victim



Flood Action Plan

- Action plan for water management for the emergency period
- Action plan for integrated and sustainable flood mitigation in the Chao Phaya River Basin



What is the Weakness of the Master Plan?

- Though, Master Plan consists of
 - Infrastructural investment rehabilitation and maintenance
 - Non-infrastructural management plan



Problems

- No concrete proposal on how to compensate farmers in the flood retention areas
- Too little attention to the issue of drought, given the increasing of extreme weather
- Inadequate attention to the complex long-term issues of fragmented water management



Problems

- Institutional changes in integrated water management to cope with extreme weather conditions
- Appropriate combination of a single command authority and decentralization



CHALLENGE ISSUES

- How to crate effective coordination of more than 40 government agencies with overlapping responsibilities?
- What is the appropriate combination of single command authority and decentralization of power?





CRUCIAL POLICIES

- Policy to facilitate farmers adaptation in the flood retention areas
- Water management institution



RESEARCH NEEDS

- Adaptations to Climate Change
- Water Management Institutions
- Compensation measures
- Enforcement of work plans and consistency in carrying them out



CONCLUSION AND POLICY IMPLICATIONS

- The 2011 flood the biggest and worst flood in Thailand's modern history – resulted in total damage and loss of USD 46.5 billion.
- It was caused by the highest record rainfall, including 5 tropical storms which was concentrated in a short period of 106 days in the mid rainy season.





CONCLUSION AND POLICY IMPLICATIONS

- But man-made mistakes worsened the situation:
- Political pressure has forced the government to allocate USD 11.29 billion for assistance of, and compensation to flood victims, restoration of damaged property and flood management action plans







THANK YOU





