

'Issues and challenges and actor analysis' (Day 3; Wednesday 23 October)

Day 3 - Bangladesh: Transboundary rivers problems and prospects - Rashidul Kabir

Day 3 - MOTA approach: Introduction and application - Ho Long Phi

BANGLADESH: TRANSBOUNDARY RIVERS PROBLEMS AND PROSPECTS

By

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GENERAL INFORMATION ON BANGLADESH

- ❖ Total area of Bangladesh: 147,570 km²
- ❖ Population: about 146.60 million
- ❖ 80% of the population live in rural areas
- ❖ The Topography of Bangladesh is generally flat. Most of the areas lie within 20m above MSL
- ❖ 80% floodplains, terraces 8% & 12% hills
- ❖ River and inland water bodies: 6.7 %
- ❖ Forest Cover: 17%
- ❖ Bangladesh enjoys a sub-tropical monsoon climate. Out of six seasons in a year, summer, monsoon and winter are predominate.
- ❖ Temperature in winter falls as low as 5° C , during summer the mean is about 30°C and occasionally rises above 40° C.
- ❖ Normal annual rainfall: 1200 mm in the extreme west and as high as 5800 mm in the northeast. About 80% occurs in monsoon (Jun-Oct)

Socio-economic aspects

- ❖ Agriculture support the vast majority of Bangladesh population, accounting for 32% of GDP, 13% of exports, and 60% of employment.
- ❖ Net cultivable area (NCA) is 8.53 Mha
- ❖ Irrigable area is 7.56 Mha.
- ❖ 5.00 Mha is currently irrigated
- ❖ Present cropping intensity is 183%.
- ❖ Of the total NCA, 35% is single cropped, 49% double cropped and 16% triple cropped.

WATER AVAILABILITIES AND DEMANDS

Total water resources in Bangladesh including ground water : about 1297 BCM

Cross border surface water inflow: 1124 BCM

More than 80% occurs during monsoon when Bangladesh does not need so much (Jun-Oct)

Availability during dry season (Jan-Apr) is only 88 BCM while it needs 147 BCM

Being the lowest riparian of the Major Himalayan Rivers, Bangladesh has no control over the huge cross-boundary flows and because of flat topography it also can not store the huge monsoon water

Transboundary Rivers of Bangladesh



Bangladesh is a great delta formed by the three mighty Himalayan Rivers: the Ganges, the Brahmaputra and the Meghna.

There are more than 400 rivers in Bangladesh, most of which are tributaries/distributaries of these three mighty rivers.

Out of 400 rivers, 57 are trans-boundary.

54 enter from India and 3 from Myanmar.

Bangladesh and India, like history and heritage also share the flows of more than fifty rivers which are common to the two countries.

Bangladesh faces floods during the wet season and scarcity of water during dry season.

The Ganges, the Brahmaputra and the Meghna River systems drain a total catchment area of about 1.72 million sq km through Bangladesh into the Bay of Bengal.

Out of this large catchment area, only 7% lies within Bangladesh.

The other co-riparian countries are India, Nepal, Bhutan and China.



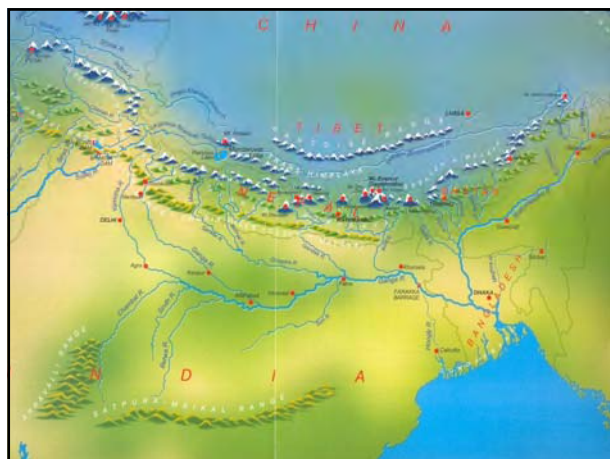
Catchment Areas of Major Rivers

Rivers	Total Catchment Area (Sq. Km.)	Catchment Area (Sq.Km.)				
		India	Nepal	Bhutan	China	Bangladesh
Brahmaputra	552000	195000	-	47000	270900	39100
Ganges	1087300	860000	147480	-	33520	46300
Meghna	82000	47000	-	-	-	35000
	1721300 (100%)	1102000 (64.02%)	147480 (8.57%)	47000 (2.73%)	304420 (17.69%)	120400 (7%)

Main Features of the Major Rivers

	Brahmaputra	Ganges	Meghna
Length of river (km)	2,900	2,500	912
Length within Bangladesh (km)	260	240	452
Highest recorded discharge (cumec)	102,534 at Bahaurabad (1998)	76,000 at Hardinge Bridge (1987)	19,800 At Bhairab Bazar
Lowest recorded discharge (cumec)	2,860 at Bahadurabad (1971)	2675 at Hardinge Bridge (1993)	Tidal

Ganges, Brahmaputra and Meghna Rivers



Ganges River

The Ganges rises from the Gangotri glacier in the Himalayan at an elevation of about 7010 meter near the Indo-China border.

The length of the main river is about 2500 km.

The rivers from Nepal contribute about 71% of the dry season flows and 41% of the total annual flows of the Ganges.

The Ganges Basin has an area of 1087300 sq.km. spread over India (860000 sq.km), Nepal (147480 sq.km.), China (33520 sq.km) and Bangladesh (46300 sq.km).

Treaty on Sharing of The Ganges Waters

12 December, 1996

A Treaty for sharing the Ganges waters at Farakka was signed between Bangladesh and India in December 12, 1996 for a period of 30 years.

Main Features of the Treaty

Treaty is for 30 years covering the period 01 January to 31 May each year with sharing to an agreed formula

Availability at Farakka	Share of India	Share of Bangladesh
70,000 cusecs or less	50%	50%
70,000 - 75,000 cusecs	Balance of flow	35,000 cusecs
75,000 cusecs or more	40,000 cusecs	Balance of flow

Subject to the condition that India and Bangladesh each shall receive guaranteed 35,000 cusecs of water in alternate three 10-day periods during the period March 11 to May 10.

The Treaty has provided an opportunity to Bangladesh for development and management of its land and water resources in the Ganges dependant areas of the country by building a barrage across the Ganges.

Brahmaputra River

Originates in the northern slopes of the Himalayan range.

Catchment lying in China, Bhutan, India and Bangladesh.

Rising in Tibet (China) at an elevation of 5,150 meters.

Total length: 2,900 km

In Bangladesh: 270 km

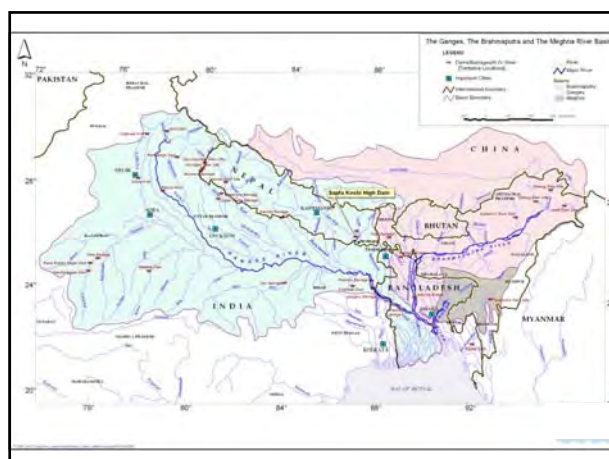
Total catchment area of 552,000 sq. km

China 270,900 sq.km

Bhutan 47,000 sq. km

India 195,000 sq.km

Bangladesh 39,100 sq. km (7.08%)



Meghna/Barak River

The Barak, headstream of the Meghna rises in the hills of Manipur in India. Near the Indo-Bangladesh border, the Barak bifurcates into two: the Surma and the Kushiya.

The Surma and Kushiya again join together near Ajmiriganj in Bangladesh.

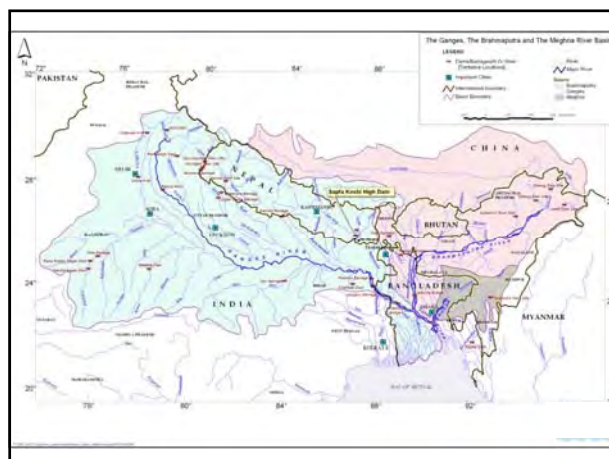
The combined flow takes the name of Meghna at this point and then flows in a south-westerly direction to meet the Padma at Chandpur. It drains the hills of Assam, Meghalaya and Tripura States in India and the north-eastern part of Bangladesh.

The total catchment area of Barak/Meghna is 82,000' sq.km

India: 47,000 sq.km

Bangladesh: 35,000 sq. km

About 43% of this total catchment area lies in Bangladesh.



OPPORTUNITIES OF JOINT COLLABORATION AND BENEFITS SHARING

Hydro-power generation
Augmentation of dry season flows
Flood moderation
River erosion
Fisheries
Forestry
Navigation
Environment

POTENTIALS

Hydropower (flat country, almost no potential)

Flow augmentation during dry season
(no storage, no potential)

Flood management: Two-third (2/3) of the area of Bangladesh would be flood free

Hydropower Potential of Eastern Himalayan Region (Ganges, Brahmaputra, Meghna/Barak)

Nepal	42,000 MW so far identified (theoretical potential 83,000 MW)
Bhutan	23,000 MW
India	76000 MW (Eastern Himalayan Region only)

Nepal's theoretical hydro potential has been assessed as 83,000

Projects of about 43,000 MW have so far been identified

Flow Augmentation

To augment the Ganges flows, the tributaries in Nepal are the most effective sources as their dry season and annual contributions at Farakka are 71 and 41 percent respectively.

Ganges Basin: about 5325 cumec

Brahmaputra Basin: about 4250 cumec (not well quantified)

Way Forward

Bangladesh, India, Nepal and Bhutan- four countries of the Eastern Himalayan Region offer vast opportunities for optimal water resources development and management through collaborative efforts.

The key to prosperity in the region is Integrated Water Resources Management at river basin level.

Establish sharing and long-term transboundary cooperation relying on sound legal and institutional arrangements such as joint basin governing institution.

Undertake joint projects and share benefits

Costs of benefit to be quantified jointly based on authentic data.

THANK YOU

MOTA APPROACH: INTRODUCTION AND APPLICATION

Ho Long Phi, Director

The Center of Water Management and Climate Change
Viet Nam National University – Ho Chi Minh City

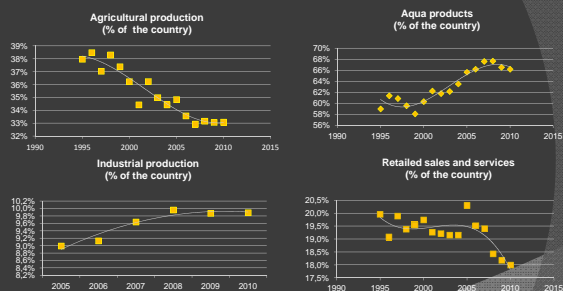
Workshop on Delta Planning and Management
Yangon, 21-25 October 2013

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Delta changes



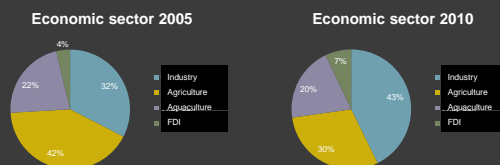
Economical structure



Source: processed by the Author from GSO data

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Economical restructuring

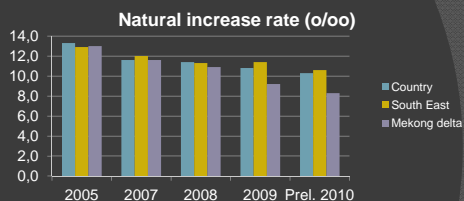


Source: processed by the Author from GSO data

- The role MKD as an agricultural – dominant economic system has been replaced.
- Industrialization followed by Urbanization would be a future trend of the MKD

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Population

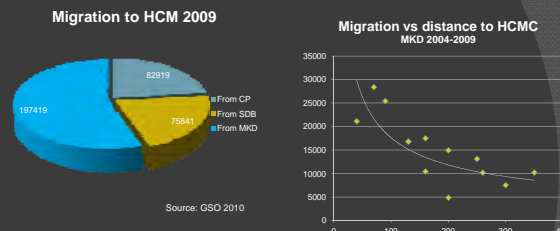


The natural increase rate of the MKD has been reduced for recent years and is just about 80% of the country's. Why?

The population density of the MKD is still as double as the national average.

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Migration



Source: GSO 2010

Source: processed by the Author from GSO data 2010

During the year 2004-2009, there have been about 370,000 migrants from the MKD to HCMC and other provinces, in which almost 200,000 found their new home in HCMC.

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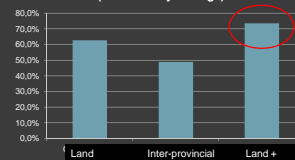
Current bottlenecks & Conflicts



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Transport

Road length/1000 people
(% of country average)



Source: processed by the Author from GSO data

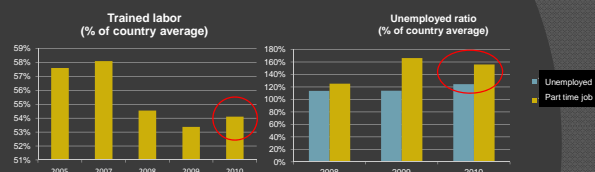
- Road densities, both land- and water- is very low compared with the country average, especially the inter-provincial road.

- The fact implies a bottle neck of the MKD.



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Labor

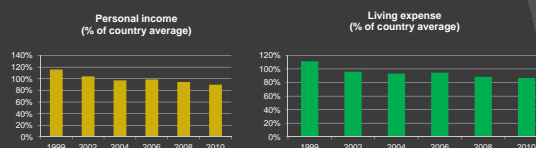


Source: processed by the Author from GSO data

- Low profiled labor force and high unemployed ratio compare with the national-wide average imply high risks for the MKD development.

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Income and Expense

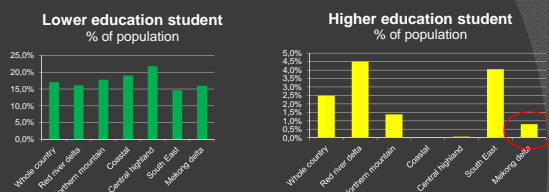


Source: processed by the Author from GSO data

- Personal income and living expense has been decreased since decades. The favorable natural conditions could not made the delta prosperous.

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Education



Source: processed by the Author from GSO data

- Higher education student ratio is just 20% of the country average.

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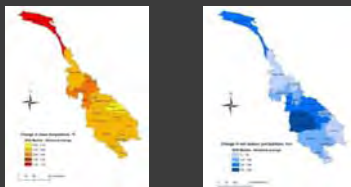
Conflicts

- Land use:
 - Rice vs non-rice
 - Agriculture vs Industry/urbanization
- Environment vs livelihood
 - Mangrove vs shrimp
- Policy vs market
 - Food security vs Economic flexibility
- Value chain
 - 70% farmers get 30% profit
- Upstream vs downstream
 - Dike vs water rise
 - hydropower vs sedimentation/fishery

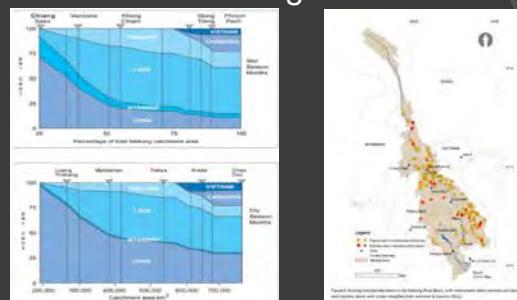
The Mekong delta conflicts are basically stakeholders' conflicts.

The internal conflicts resolve in context of external changes would shape the future Mekong delta.

Future challenges



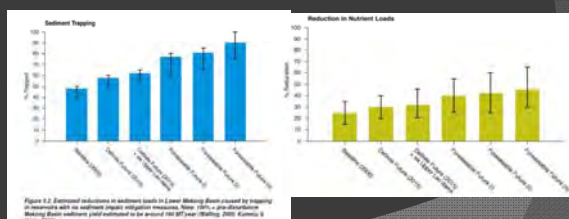
Water resources of the Mekong basin



As Viet Nam part contributes only 10% of the water resources, the MKD will be heavily impacted by future developments and climate change in the whole upstream catchment.

Sedimentation

- Extensive development of reservoirs for hydropower and irrigation in MKB will create sediment traps. MKD problems: nutrient, land subsidence.

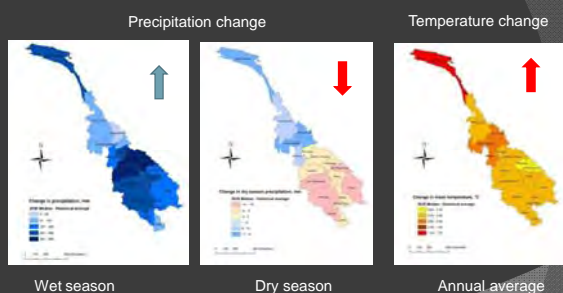


Source: Colin Thorne et al. Mar 2011: MRC report

Fishery

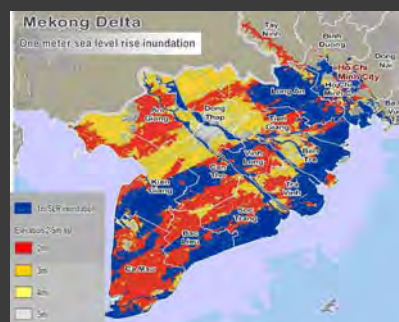
- Inland fishery, both fishing and farming, still rely on **natural fish fry and fingerling**.
- Dam cascades will **deconstruct fish migration cycle** and, therefore, heavily damage the fishery and, hence, the livelihood of the lower MKB.

Climate change issues



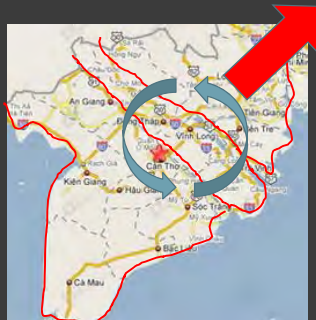
Climate changes in the catchment would imply **more floods and also more droughts**, which may create serious transboundary water issues.

Sea level rise



Sea level rise may trigger anthropogenic over-reactions, most of them are irreversible.

Possible responses



Protection?

Adaptation?

Migration?

A most realistic future may be a **balanced combination** of possible responses

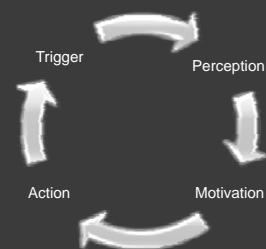
Remarks

- The deltas future will be impacted strongly by External triggers, **both upstream and downstream**. None of them can be controlled nor predicted.
- Many **uncertainties** may make long term plan extremely risky.
- To resolve **Internal stakeholder conflicts** should be the key issues for planning.
- The **livelihood-centered planning** would be the most effective and sustainable approach in context of Uncertainty.

Plan for change

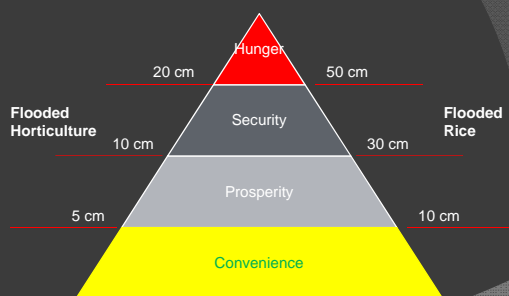


Change cycle



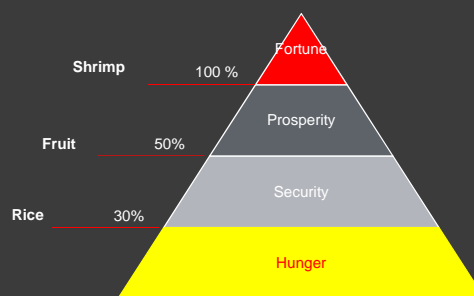
- A change cycle can **start from any stage** of the process.
- Between any two stages, there would be **thresholds/resistances** to be overcome before a transition can start.
- The fact implies the implicit role of **Ability** in the change process.

From Threat to Perception



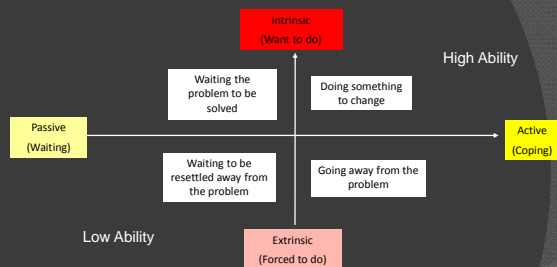
- Different stakeholder, different Perception threshold;
- The higher threat, the stronger Perception.

From Oppotunity to Perception



- Opportunity is not equal for all stakeholder;
- The difference in Opportunity makes perception.

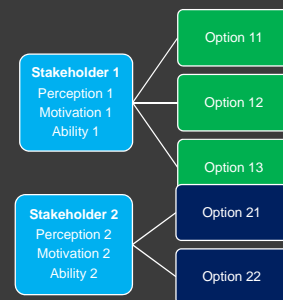
From Perception to Motivation



- Motivation has roots in physiological, behavioral, cognitive, and social impacts.
- Different Perceptions may lead to a large range of Motivation.
- Motivation can be also affected by Abilities.

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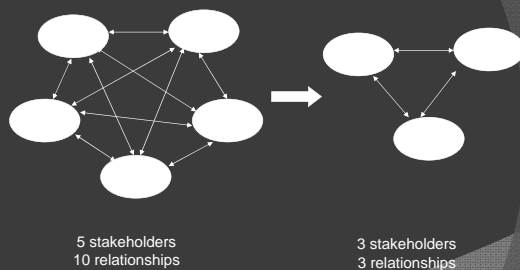
From Motivation to Action



- No Action until a certain level of Motivation reached;
- Different Motivations → Various possible actions
- Different Motivation levels → unsynchronized Actions
- Different Abilities → different measures and Implementation Options

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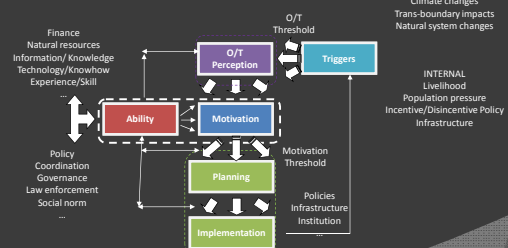
Participation complexity



- Multi-stakeholder participation is basically not a desirable process due to its complexity.
- Stakeholders exclusion is usually unavoidable choice.

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Change complexity



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Then, why participatory process?

- Conflicts may occur as minority (or weakers) has to sacrifice for the majority (or strongers);
- The relentless counter-activities from the "weakens result in gaps between planned outcomes and reality.
- Participatory planning for a better consent;
- A compromising between Top-down and Bottom-up

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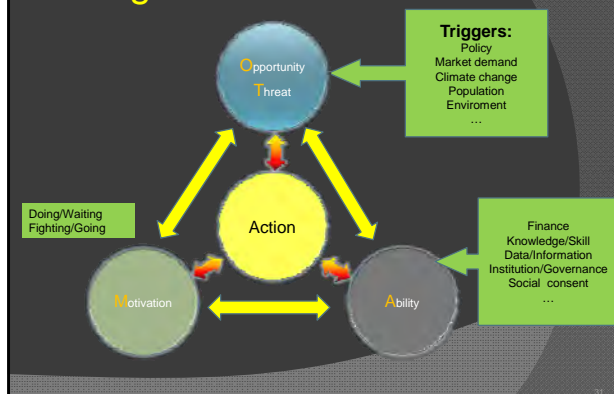
Multi-stakeholder involvement, how?

- To understand stakeholders' **Motivation and Ability**;
- To identify **Resistances**
- To identify **Conflicts**
- To improve **Consensus**

MOTA approach is designed to explore Stakeholder's Motivation and Ability

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Change we can?



Perception Index



Description	Perception index	Your evaluation
Not significant	0	0.9
Low impact	0.25	
Medium impact	0.5	
High impact	0.75	
Very high impact	1	

Stakeholder's perception could vary from one to another, depending on logical and emotional reasons.

Motivation Index

Description	Motivation index	Your evaluation
Strong Objection	-1	-0.5
Objection	-0.5	
Neutral	0	
Support	0.5	
Strong support	1	

Motivation is strongly situation –dependent and varies from one to another, depending on concurrent considerations of Perception and Ability.

Ability Index



Description	Ability index
Very low or not relevant	0
Low	0.25
Medium	0.5
High	0.75
Very high	1

Ability Index reflects your ability of contribution for a specific action.

Weighted factor for Ability index

Rate	Description
0	Very low
0.25	Low
0.5	Average
0.75	High
1	Very high

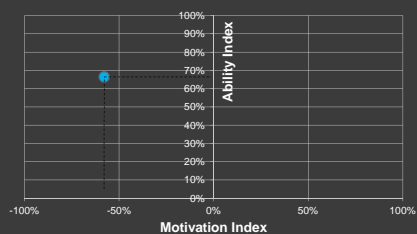
Requirement	Hazard control	Exposure control	Vulnerability control	Mitigation
	Impact factor			
Finance	0.50	0.30		
Skill/Experience				
Knowledge	0.30	0.10		
Data/Information				
Governance	0.10	0.20		
Social support	0.10	0.40		
	S=1	S=1	S=1	S=1

Abilities Index

Ability Factors	Actions			
	Hazard control	Resettlement	Flood proof	Flood regulation
Financial Ability Required budget availability	0 x WF	0.2 x WF	0.4 x WF	0 x WF
Technical Ability Availability of relevant data/information/ knowledge /tools)	0 x WF	0.3 x WF	0.6 x WF	0 x WF
Institutional Ability Availability and effectiveness of relevant Institutional mechanism/governance/ coordination/policy)	0 x WF	0 x WF	0 x WF	0 x WF
Social Ability Community participation	0.2	0.1 x WF	0.3 x WF	0 x WF

Ability Index reflects your ability of contribution to a specific action.

MOTA point & MOTA score

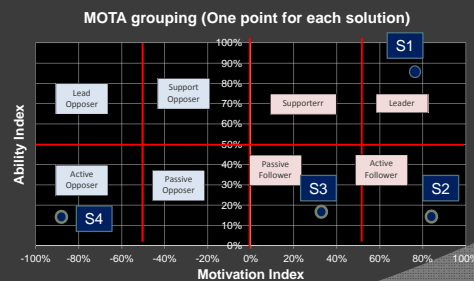


MOTA point is a point with:
X –coordinate = Motivation Index
Y-coordination = Ability Index

MOTA score = Motivation Index x Ability Index

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MOTA grouping



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MOTA groups



MOTA group	Solution 1	Solution 2	Solution 3	Solution 4
Leader				
Active follower				
Passive Follower				
Supporter				
Lead Opposer				
Active Opposer				
Support Opposer				
Passive Opposer				

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Leader groups and MOTA score



Solution No	Leader Group	MOTA score
1		
2		
3		
4		

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MOTA score improvement

- Make deal(s) with Opposer(s) to reduce their Negative Motivation.
- Make deal(s) with Supporter to increase their Motivation.
- Suggest measures to Improve Ability of Follower(s) and also Opposer(s)
- Make deal(s) between two Leaders
- Include more stakeholders who has high Motivation and/or Ability

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MOTA score improvement

Leader Name:..... Solution No:

Solution No	MOTA Group	Contents of Deal(s)	Motivation Index
		•	
		•	
		•	
		•	
		•	
		•	
		•	

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Final MOTA score

Plan No	Leader Group	Final MOTA score
1		
2		
3		
4		



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Potential resistance & Conflict

- Potential resistances may come from Ability inadequacy of some stakeholders. On the MOTA graph, the resistances may come from Follower groups, especially the Passive Follower.
- Potential conflicts may be emerged from the Opposers, especially the Lead group.



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Stakeholder involvement

•Stakeholder missing

If there is no Leader for a solution, there could be some stakeholder missed.

•Capacity building

Capacity building can be applied for all stakeholder with low Ability. Capacity building for the Opposer(s) could be also has influence in their Perception, resulting, eventually, change in Motivation.

•Motivation improvement

Motivation improvement can be conducted through Stakeholder's Perception of Opportunity and Threat.

•Consensus index

Consensus index is calculated by $\frac{\text{Number of Positive Motivation Stakeholders}}{\text{Number of Stakeholder}}$

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Thank you

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'Solution strategies' (Day 4; Thursday 24 October)

Day 4 - MOTA debriefing - Leon Hermans

Day 4 - Nutrient Export by Rivers to the Bay of Bengal in 1970-2050 and Management Strategies - Abdus Sattar

Day 4 - Mekong river delta: Resilient livelihoods Dikes or floods or both or what else? - Nguyen Van Kien

Day 4 - Water management in Vietnam - Mai Van Cong

Day 4 - Tidal River Management Concept & Its Application in Southwestern Delta - Engr. Md. Waji Ullah

MOTA debriefing

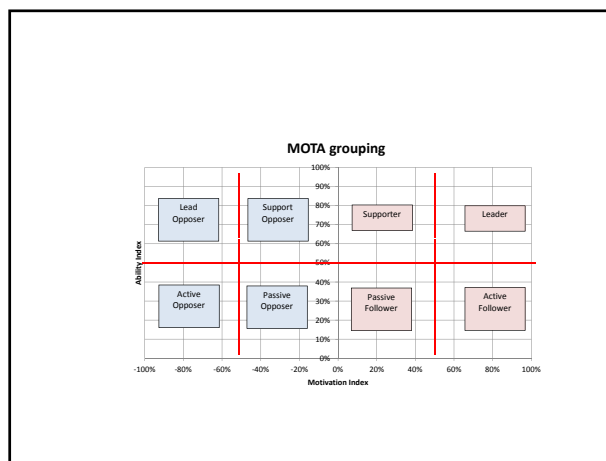
Leon Hermans,
24 October 2013

Scorecard Expert judgment

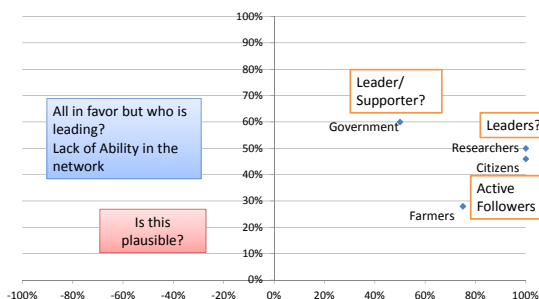
	Solutions	Group 1	Group 2	Group 3	Group 4
1	Hazard control	-6	-4	-6	-1
2	Exposure control	-8	-4	-1	-2
3	Vulnerability control	+7	+7	+5	+6
4	Mitigation	+4	-5	+5	+2
5	Do nothing	-5	-4	-9	+2

Scoring and ranking of each group, based on expert judgement, no stakeholder roles

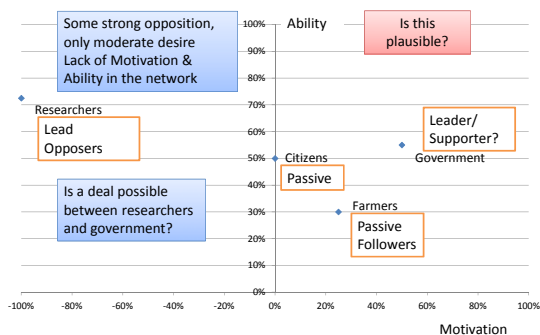
Solutions	Group 1	Group 2	Group 3	Group 4	Motivation
1 Hazard control	-6	-4	-6	-1	
2 Exposure control	-8	-4	-1	-2	
3 Vulnerability control	+7	+7	+5	+6	
4 Mitigation	+4	-5	+5	+2	
5 Do nothing	-5	-4	-9	+2	
	Farmers	Citizens	Government	Experts	
Hazard control	0,21	0,46	0,30	0,50	
Exposure control	-0,22	-0,25	0,23	0,00	
Vulnerability control	0,08	0,00	0,28	-0,73	
Mitigation	0,15	0,38	0,60	0,41	



Hazard control (dikes, dam, reservoir)



Vulnerability Control MOTA Grouping



Motivation Index Individuals and groups

Individuals	Farmer	Citizen	Government	Research	Average	STDEV
Hazard control	0,25	0,33	0	0,43	0,25	0,19
Exposure control	-0,33	-0,04	0,31	-0,15	-0,05	0,27
Vulnerability control	0,40	0,53	0,6	0,54	0,51	0,08
Mitigation	0,33	0,40	0,55	0,38	0,41	0,09
Do nothing	-0,67	-0,42	-1	-0,83	-0,73	0,25

Group Work	Farmer	Citizen	Government	Research	Average	STDEV
Hazard control	0,75	1	0,5	1	0,81	0,24
Exposure control	-0,5	-0,5	0,5	0	-0,13	0,48
Vulnerability control	0,25	0	0,5	-1	-0,06	0,66
Mitigation	0,5	1	1	0,5	0,75	0,29
Do nothing	?	?	?	?	?	?

Note that average alone does not convey useful information, but it does in combination with standard deviation. STDEV provides indicator for potential disagreement

What did you think?

- How did you feel about the session, the presentation and the groupwork?
- Do you understand MOTA?
- Is MOTA useful for integrated planning?
- Do you think you can apply MOTA?
 - What is biggest challenge?
 - What would be the most interesting?

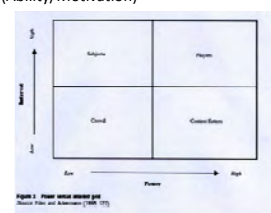
What did I think?

- I hope you are now well aware of the importance of stakeholders
- I hope you will from now on remember the importance of Motivation & Ability to understand stakeholder (in)actions
- Still too much filling of forms
 - Different per group
- Information about the case: too much (3 pages newspaper clippings) and too little ("who am I?")
 - But how would a decision-maker feel about the delta plan report? Too much paper and no answers to (all) my questions... (?)

Final, final words

- MOTA is in development – as is the exercise
- Promising, with unique elements, but not the first or only method for analyzing stakeholders

Stakeholder analysis: Power/Interest Grids (Ability/Motivation)



MEKONG RIVER DELTA:

RESILIENT LIVELIHOODS

DIKES OR FLOODS OR BOTH OR WHAT ELSE?

ROOMS FOR FLOODS?

Dr. Nguyen Van Kien

Acting Director, Research Centre for Rural Development
An Giang University, Vietnam

Yanong, 21-25 October 2013

AN GIANG UNIVERSITAS <http://www.agu.edu.vn>

Outline of the presentation

AN GIANG UNIVERSITAS <http://www.agu.edu.vn>

What is resilience?

The Oxford English Dictionaries define resilience	(i) the ability of a substance or object to spring back into "shape" and (ii) "elasticity" (Oxford University Press 2012).
Ecological resilience	•the ability of a system to absorb change of state variables, driving variables and parameters and still persist" (Holling 1973: 17).
Natural hazard researchers define resilience as	•the ability of the system to recover from floods (Brujin 2004: 199); •Capacity to overcome damage caused by natural hazards (Gaillard 2007: 522)
Sociologists define resilience as	•A process linking a set of adaptive capacities to a positive trajectory of functioning and adaptation after a disturbance (Norris et al. 2008: 130). •Disturbance can be either <i>abiotic</i> or <i>biotic</i> (Colding et al. 2003: 163). • <i>Abiotic</i> disturbances are those caused by non-biotic agents such as droughts or flooding.

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What is resilience?

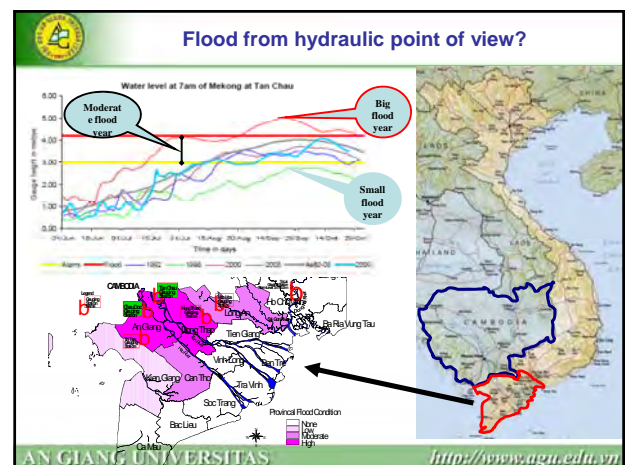
Social resilience is defined as	the ability of communities to absorb external changes and stress while maintaining the sustainability of their livelihoods" (Adger et al. 2002: 358).
Ecological-social resilience is defined as	the capacity for renewal, re-organization and development (Folke 2006: 253); creativity (Adger 2000; Maguire and Hagan 2007); and transformation (Walker et al. 2004) in a social-ecological system.

That is resilience!

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What is a flood?

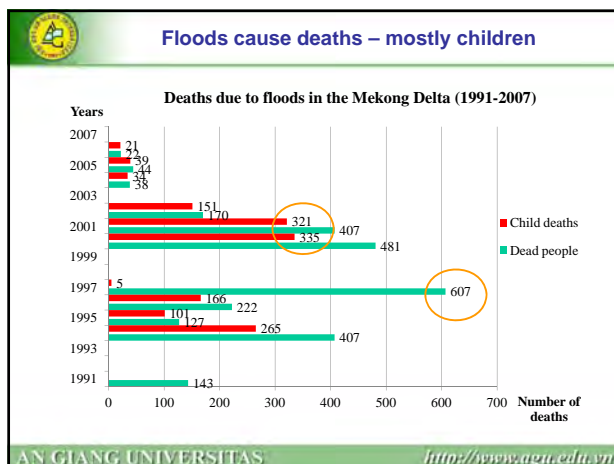
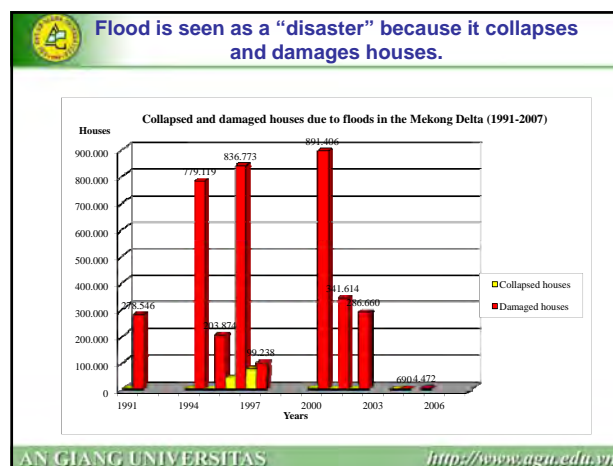
AN GIANG UNIVERSITAS <http://www.agu.edu.vn>



What do Vietnamese lay people talk about the flood in the MRD? – flood means “public bad”

- Several terms were used to describe the “water event” in the MRD
- The term “flood” or “lũ lụt” was mostly seen in the governmental documents, scientific reports and newspapers.
- Flood means “disasters” and it was often used in the “extreme flood years”.

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Floods can be also seen as “public good” or opportunities for livelihood development

- When people refer “flood” as “public good” for livelihoods, the term “flood” was used in different ways “waiting for the water season for searching livelihoods”

AN GIANG UNIVE. <http://www.agu.edu.vn>

A difficult question? How to live with floods while minimizing costs and maximizing benefits?

11

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Sustainable livelihood is the key strategy for resilience to floods.

Option 1: complete dike – rice intensification

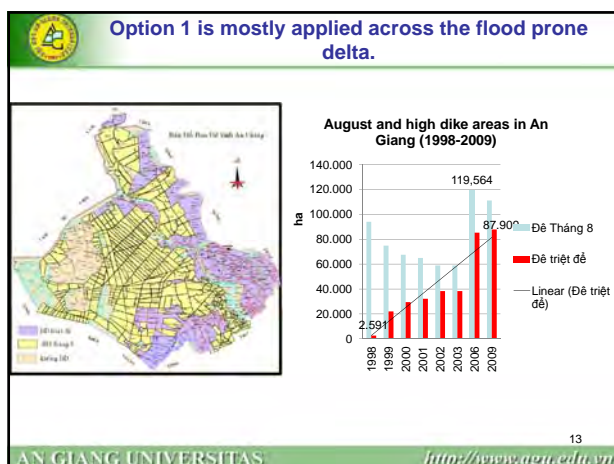
Option 2: semi dike – on-farm diversification

Option 3: off or non-farm diversification

Mix of farm – off-farm and non-farm

12

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Dikes/polders create opportunities for farming diversity, but challenging for sustainability

Benefits:

- Rural transportation is more convenient
- Rural market is accessible
- Water and sanitation is improved

Costs:

- Soil fertility declines
- Opportunities costs such as losing fertile sediments, fish, and fresh water resources
- Increasing chemical inputs such as pesticides and fertilizers, water pollution
- Increasing flood risk of dike breach
- Conflicts in land use planning

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A critical research question for living with floods:

Does the net return from a third rice crop with high dike/embankment outweigh the environmental and social costs from negative externalities from dikes and polders?

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Re thinking about rapid development of dikes and polders

Dose room for floods policy provide environmental, social and economic desirability?

Backing to farming systems of the Mekong Delta during 1970s

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Rooms for floods
Resilient livelihoods to floods and climate change

Apr May Sep Nov-Dec Jan Feb Mar

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Conclusion

- Vietnamese people have lived well with floods traditionally in the Mekong Delta
- However,
 - The pressure of livelihood development and population growth;
 - People have to manipulate the delta;
 - Dikes and polders are become a plausible option;
 - Because they focus livelihood much on farm; less investment in off-farm and non-farm policies;
 - Again, dikes/polders have both costs and benefits
 - Does benefit overweight costs?

Re-thinking about "rooms for floods linking to traditional farming system" – a resilient way of living with floods why maintaining the sustainability of livelihoods

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Regional Training Workshop Delta Planning and Management

Water management in Vietnam

Dr. Mai Van Cong

Water Resources University of Vietnam

Vice head, coastal engineering division

Email: MaiVanCong@WRU.VN



W R U

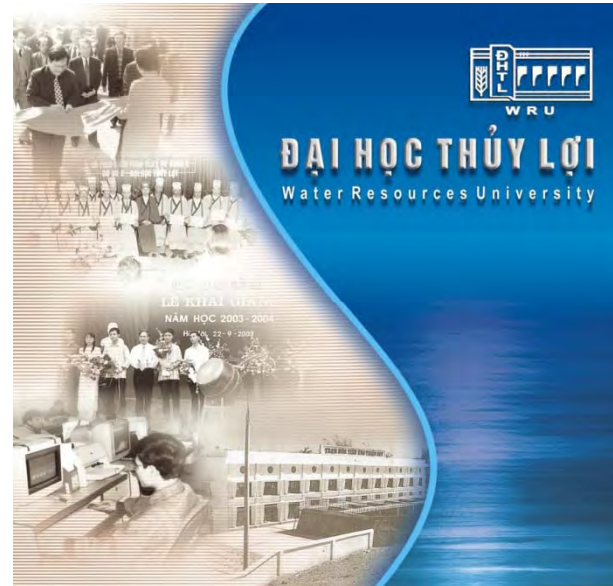
WRU: basic fact and figures



Main campus in
Hanoi

Third Campus
in Ninh Thuan

2nd Campus in HCM City



Established in 1959

- Student population: 18,000 BSc; 1000 MSc & 100 PhD.
- Annual enrollment: 4.500 studs.
- Fact.: Hydrology; Water management; Hydraulic Eng; Marine & Coastal Eng; Energy development; Engineering economics
- 04 Master program in English

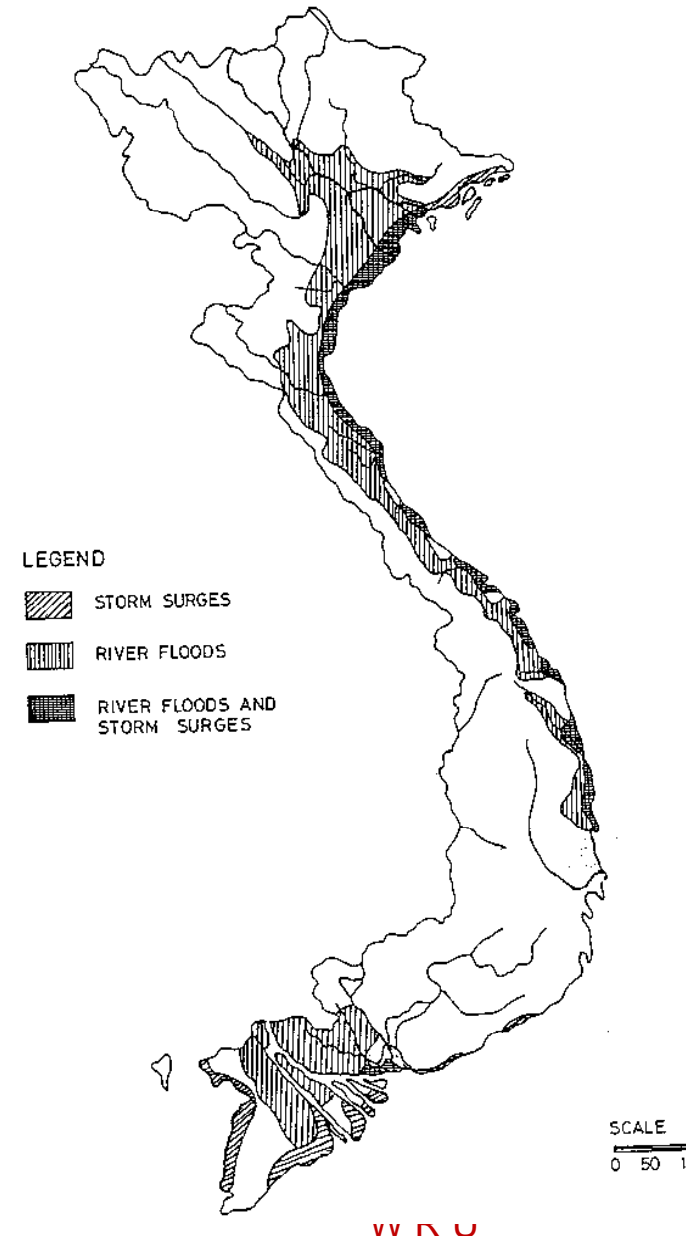
Outline

- Overview of water defences in Vietnam
- Existing water management strategy
- Preliminary solutions per region
- Brief on Mekong Delta Plan
- Cooperation triangle



Water defences in Vietnam

- Tropical monsoon area, typhoons: 6-10 times/year
- Extensive river networks
- Large proportion of population lives in the flood prone area (~70%)
- Extensive defence system: 6000 km national river dikes and 2000 km of sea dikes
- Dike department, Ministry of Agriculture & Rural Development (MARD), is responsible for management of the dikes system



Water defences in Vietnam

Current strategy

In the North: Red river system-flood defences with dikes

In the Mekong: low dikes, yearly flood accepted – living with water

In the Central: combination; integrated water managements



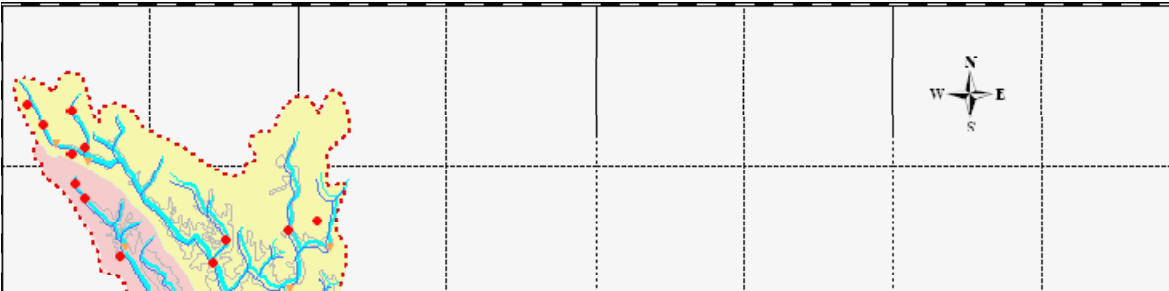
WRU

Water defences in Vietnam

existing situation:

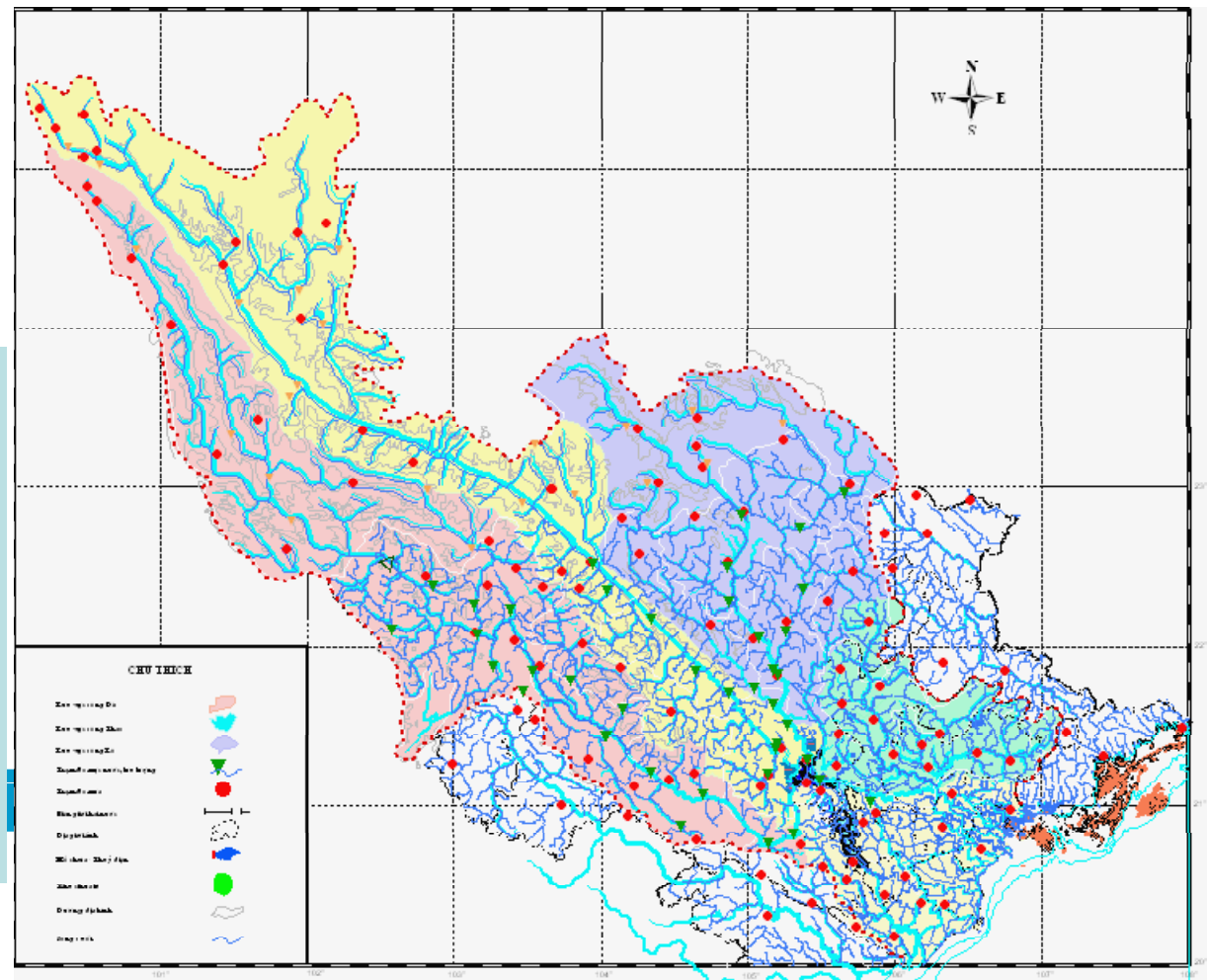
- Relatively low safety levels
- Water defense system of Viet Nam fails regularly
- Since 1953, numbers of flood disasters which caused loss of more than 20,000 lives and ~ \$US 10 billion.
- Last recent floods: 1999,2008 (central); 2005 (north, sea) 2011 (Mekong)
- Most recent floods in the Central: 4 provinces; affected to 2.5 millions;
- Annual economic damages due to typhoon and flood
~1.5% of Vietnam GDP (experiences from last 15 years)

Solution to the situation in the North

- Continue from what has been existing (1000 years dike system)
 - Use of the “dike ring” concept along rivers
 - In combination of optimal operation of flood control reservoirs in upstream
 - Maintaining yearly
 - Relatively safe, but costly
- 
- The map displays the Yangtze River Delta region, including Shanghai and surrounding areas. A network of blue lines represents the river system. A yellow-shaded area, outlined by a red dotted line, indicates the 'dike ring' concept, which is a flood control system designed to protect the urban and industrial areas within the ring. A compass rose in the top right corner shows the cardinal directions: North (N), South (S), East (E), and West (W).

The dikes are divided in two main categories, with four grade (I-IV)

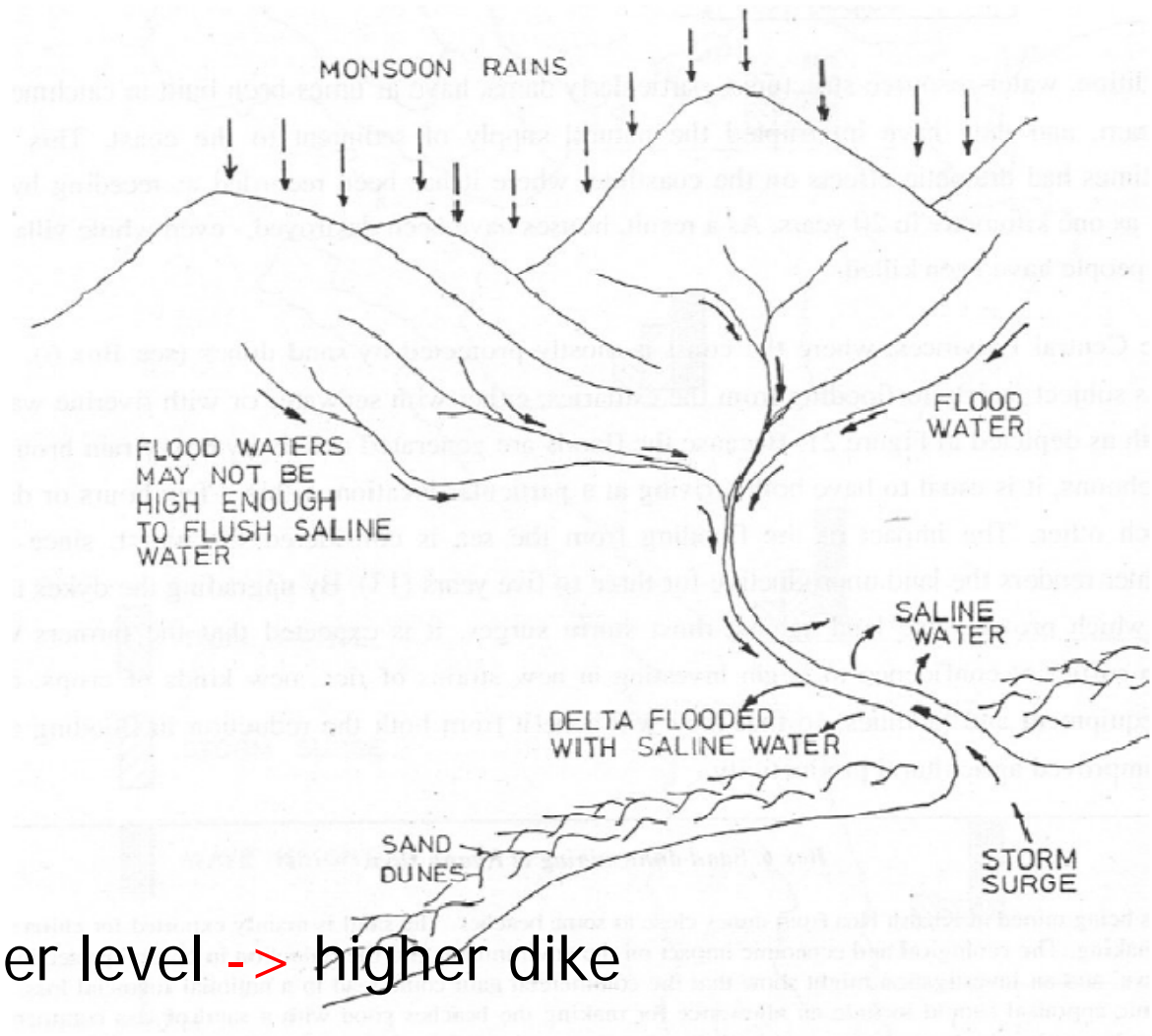
- River dikes: 1/250 to 1/100 year;
- Sea dikes: 1/20-1/50 year (mainly in the North)
- Hanoi is protected by 1/500 year flood



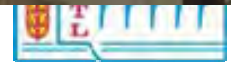
Situation in the Central

Wet and Dry seasons

- Flood locally
 - Flood large scale
 - Water shortage
 - Salt intrusion
- Using dikes:
 - Circular problem:
 - dike -> higher water level -> higher dike



Dam operations impact flooding situation



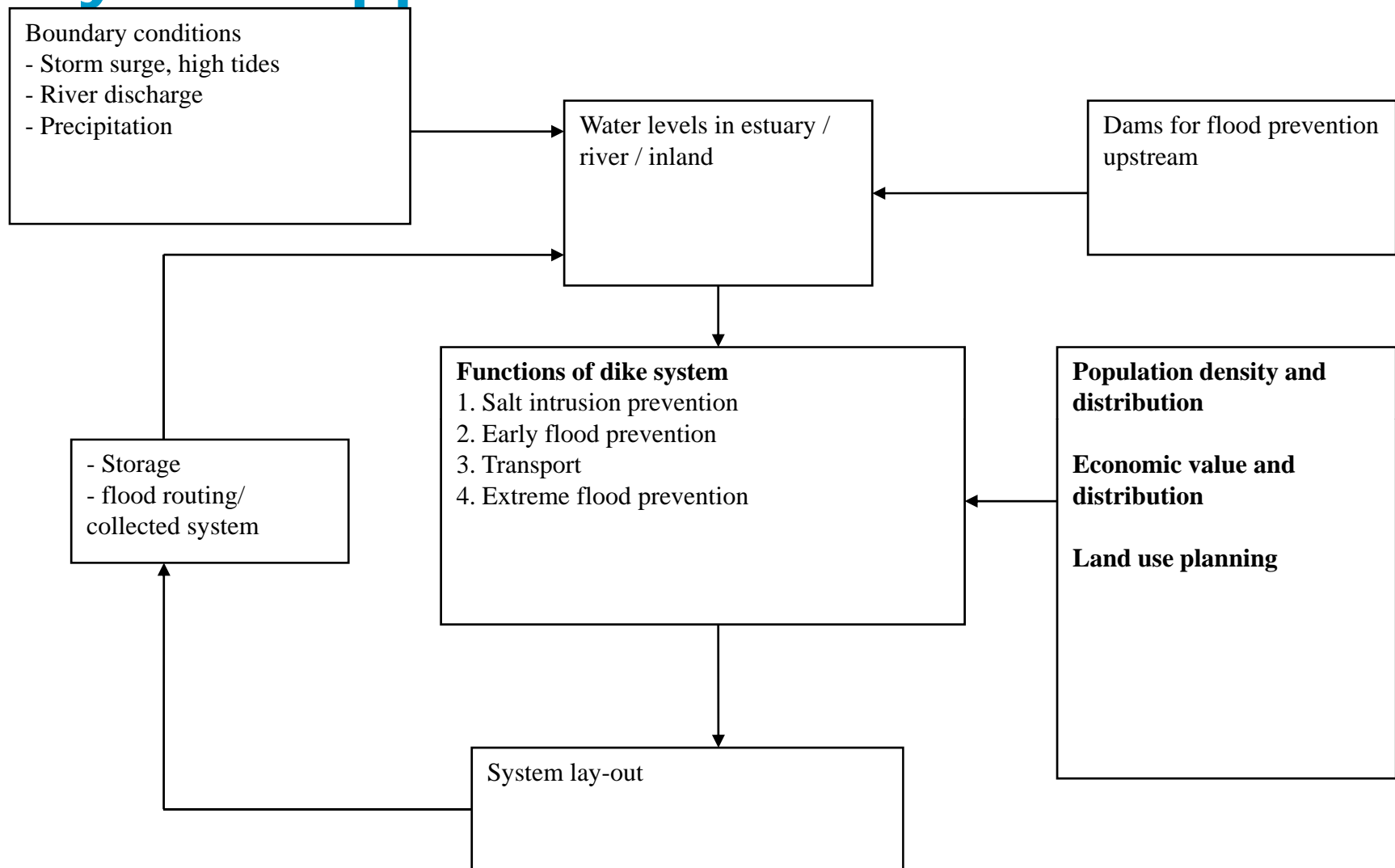
WRU

System approach for integrated water management in the Central

formulating the aims

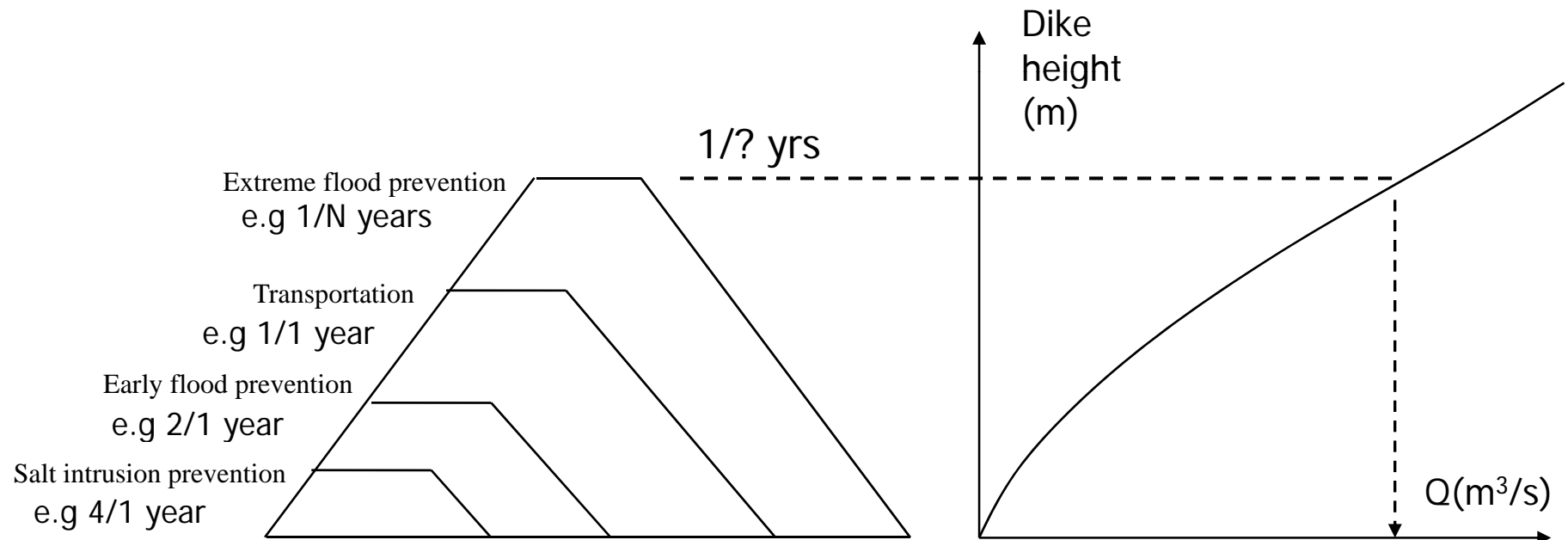
- Flood safety
- Fresh water (limit salt intrusion) for agriculture
- Salt water for fish farming
- Facilitate shipping
- Facilitate recreation
- Nature conservation

System approach scheme



System approach scheme

Circular problem: dike -> water level -> higher dike



Single estuarine system

Precipitation

River flood (peak reduced by reservoir)

Storm surge

City on dry ground

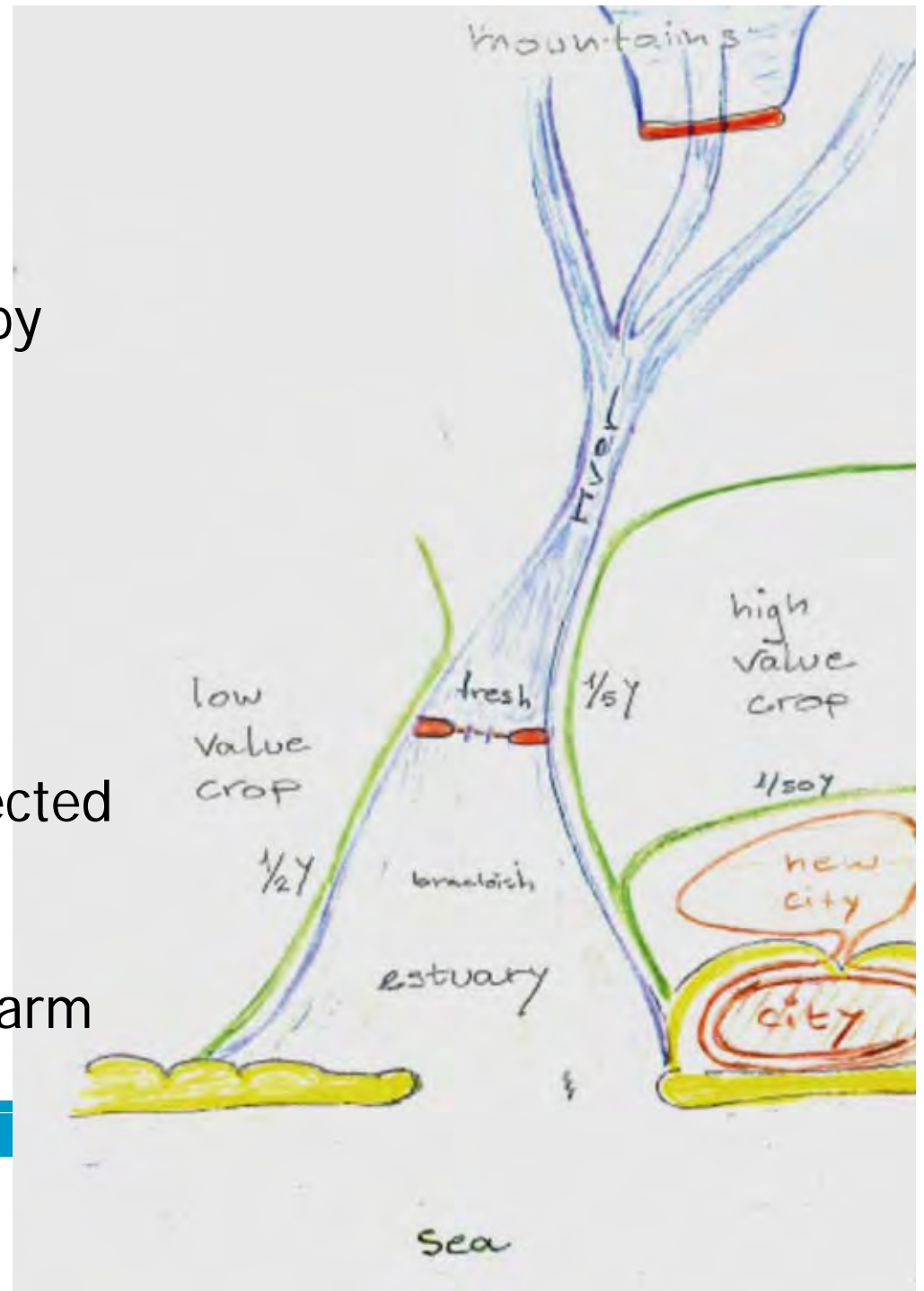
New town/city protected

High value crop protected

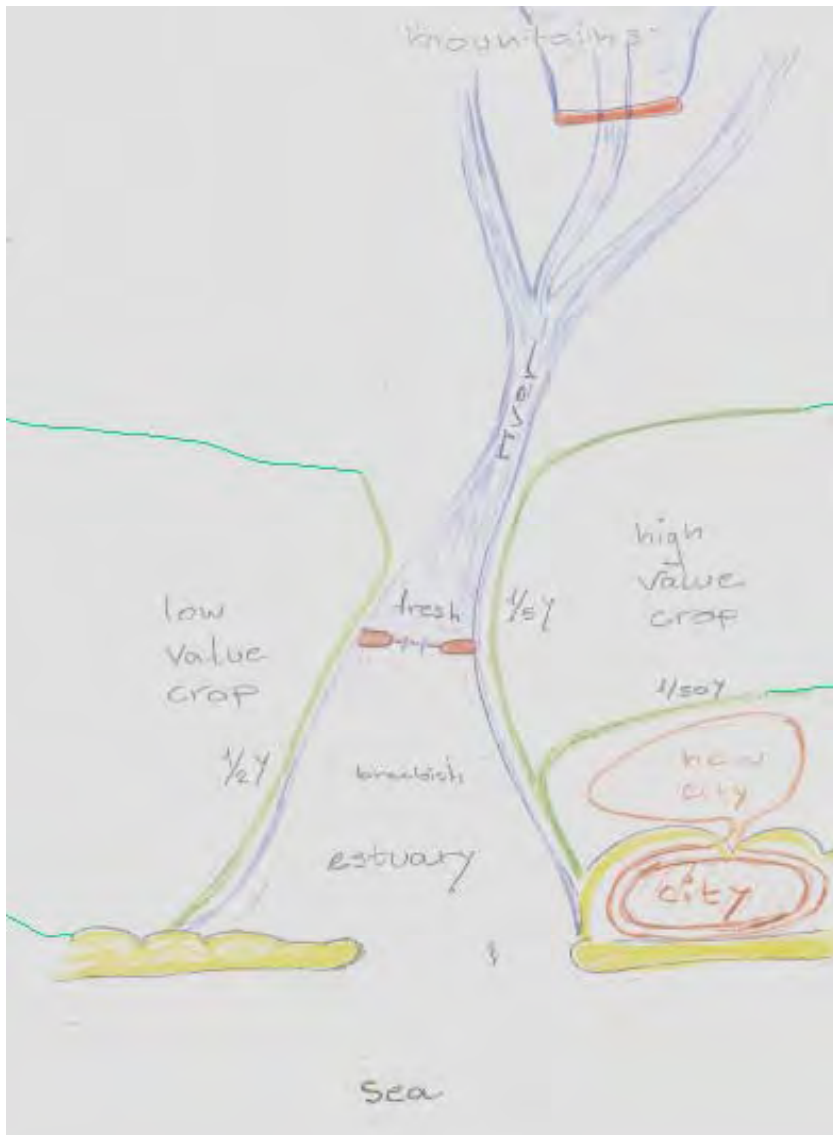
Low value crop partly protected

Fresh water for agriculture

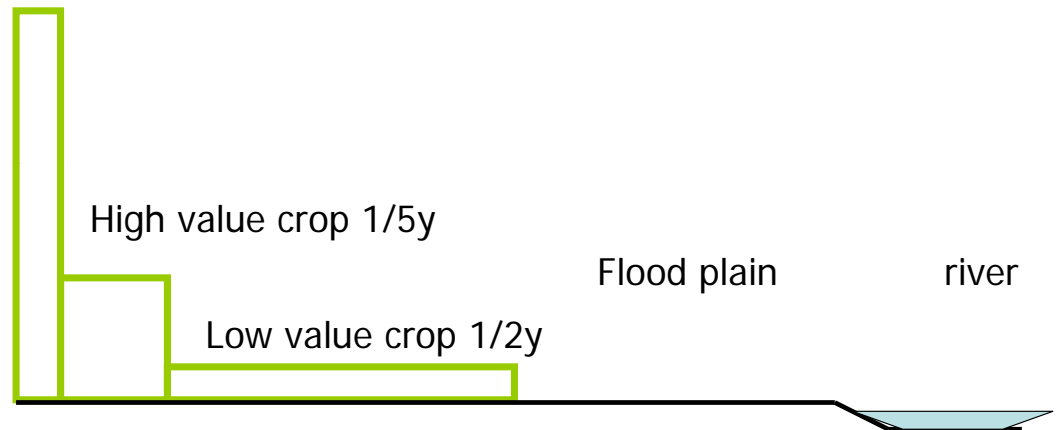
Brackish water for shrimp farm



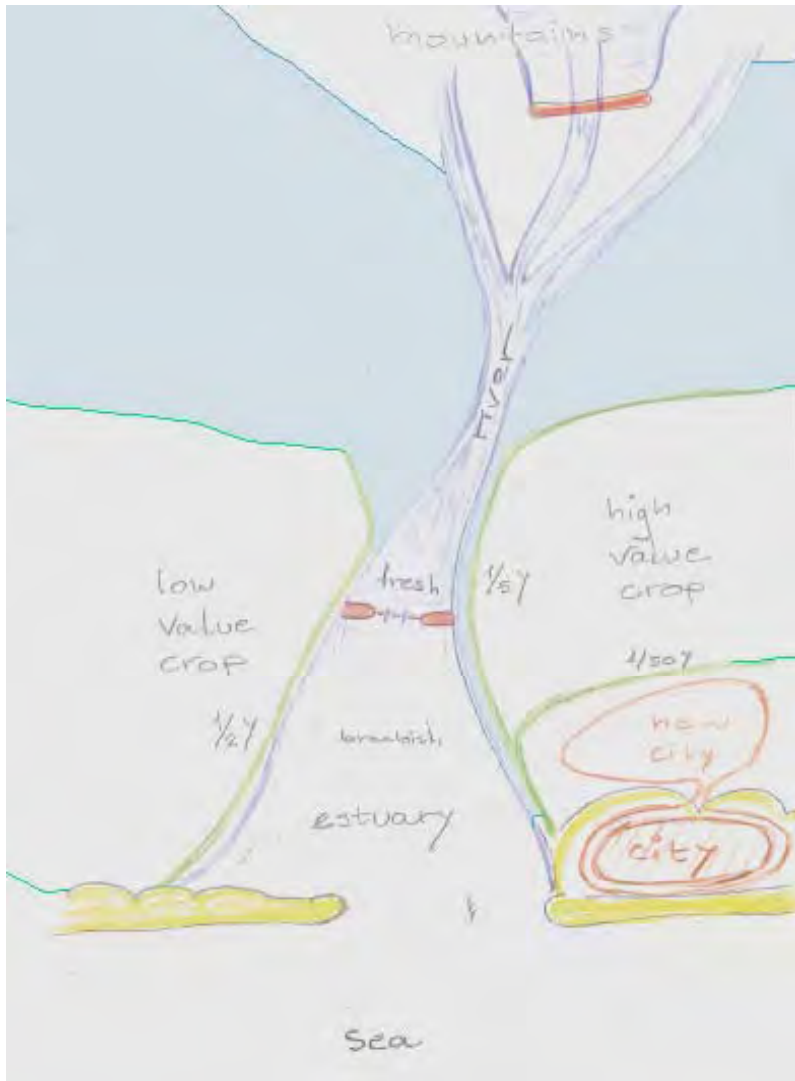
Concept simulation- Normal situation



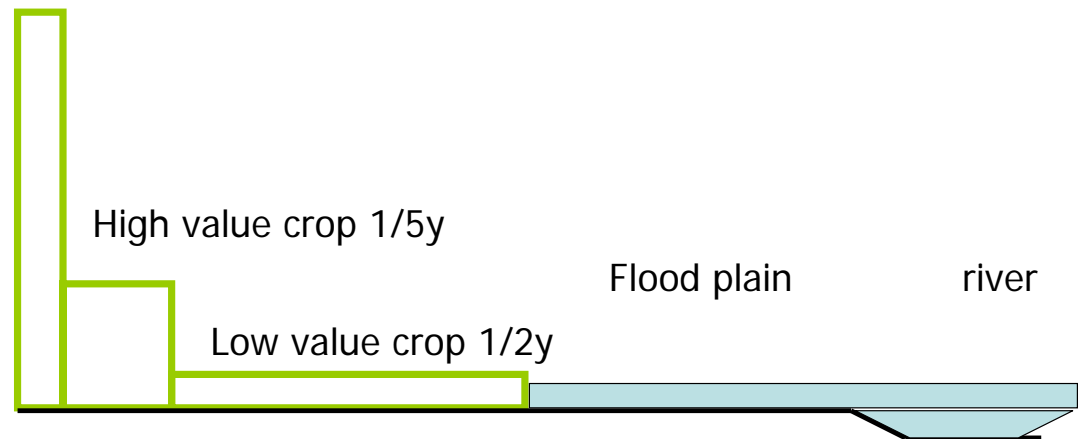
New city 1/50y



Yearly flood



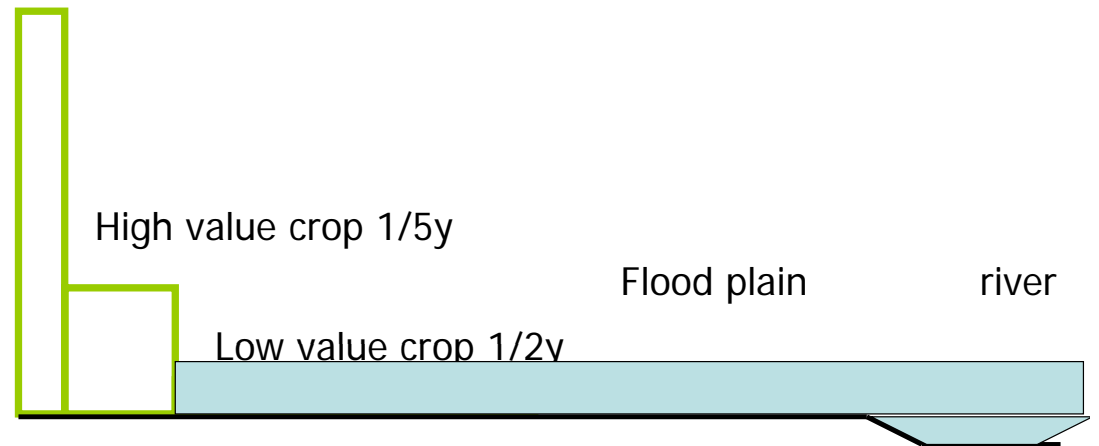
New city 1/50y



1/3 year flood



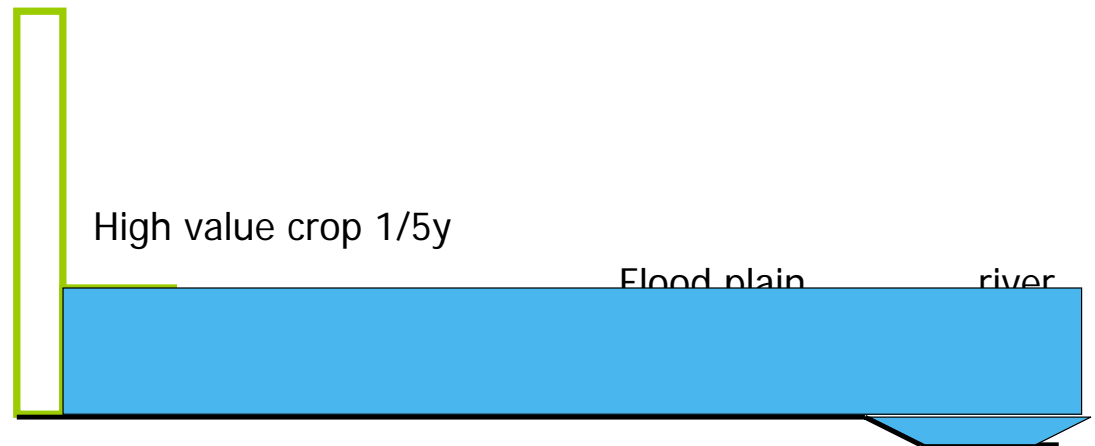
New city 1/50y



1/ 6 year flood



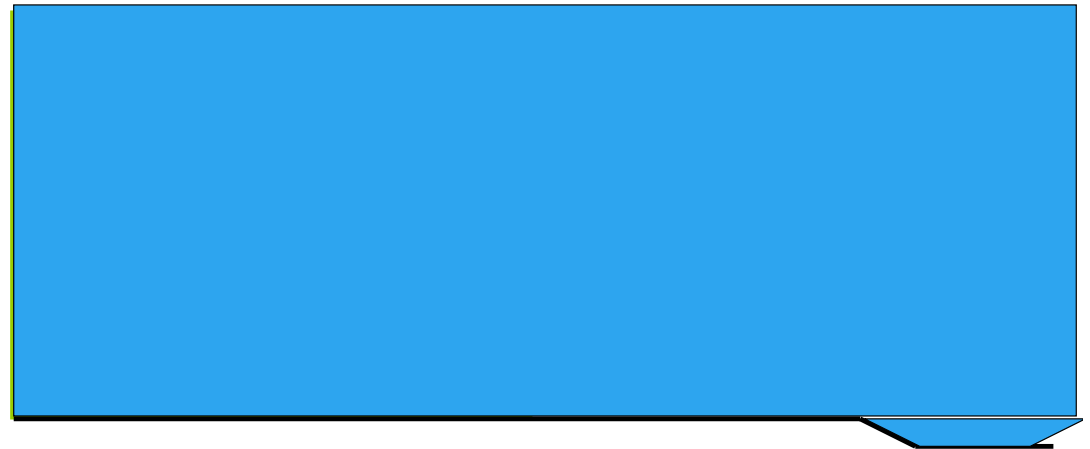
New city 1/50y



1/51 year flood

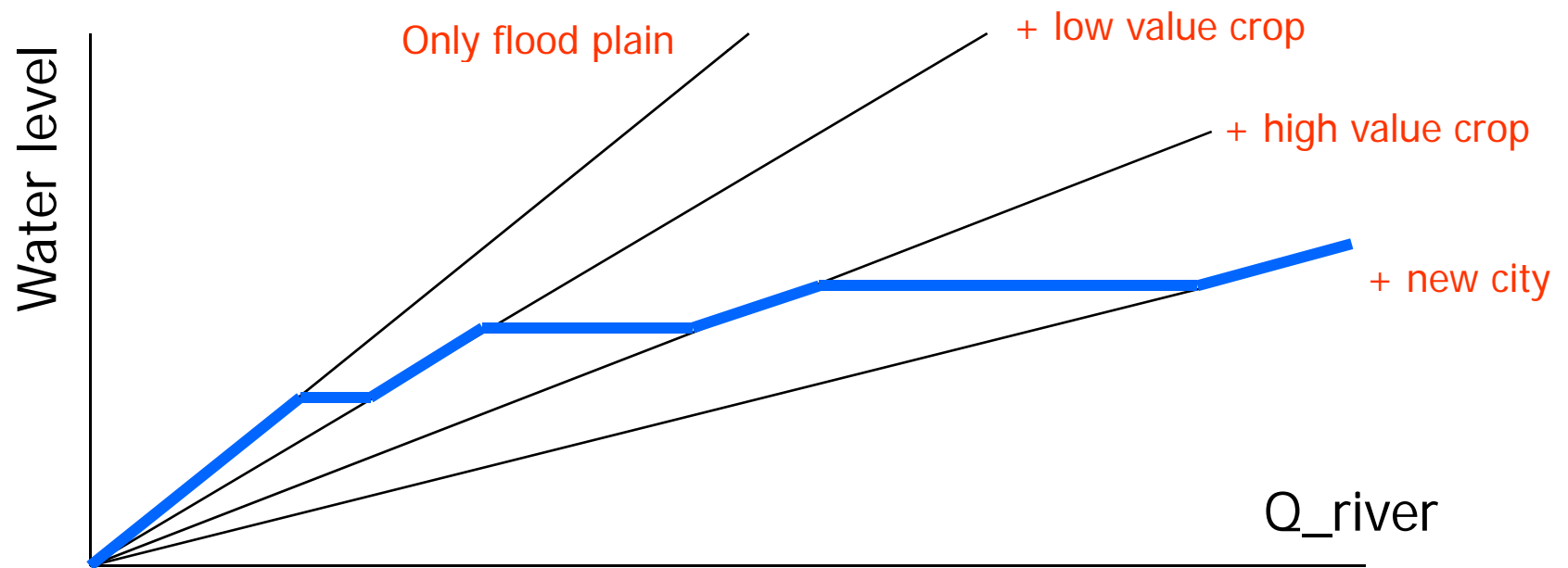


New city 1/50y



Rating curves

- In case no breaching and flood plain is filled by rain/river:



Situation and Solution in the Mekong

Social condition:

- 17 million people: jobless, poverty

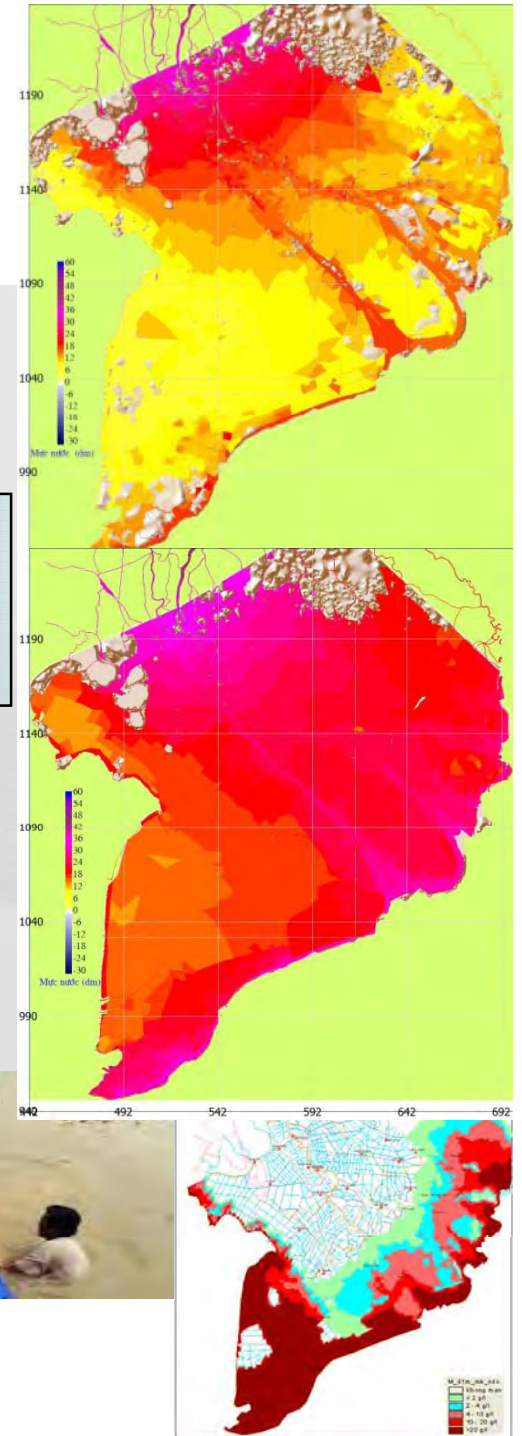
Natural conditions:

- Low elevation
- Seasonal flooding
- Drought and salinization

Impacts of upstream developments

- Dry season flow
- Sediment influx, fish migration

Climate change



Reality of living in the Mekong Delta



During
flood
season...



What we
call dike in
the Mekong



And
after..



Strategic aims

- Ensure flood safety (daily convenience)
- Secure fresh water (limit salt intrusion) for agriculture
- Ensure salt water for fish farming
- Facilitate shipping and transportation
- Facilitate food processing industry
- Facilitate job creation and increase income
- Nature conservancy

Process of Mekong Delta Plan

Joint project (2011-2013) under:
**The Vietnam – Netherlands
Strategic Partnership Arrangement (SPA) on
Climate Change Adaptation & Water
Management**

Supervision by VN - NL Intergovernmental Steering
Committee, chaired by Prime Ministers of VN and NL

Principle: NL advise, VN ownership



MEKONG DELTA PLAN

Long-term vision on a safe, prosperous and sustainable delta

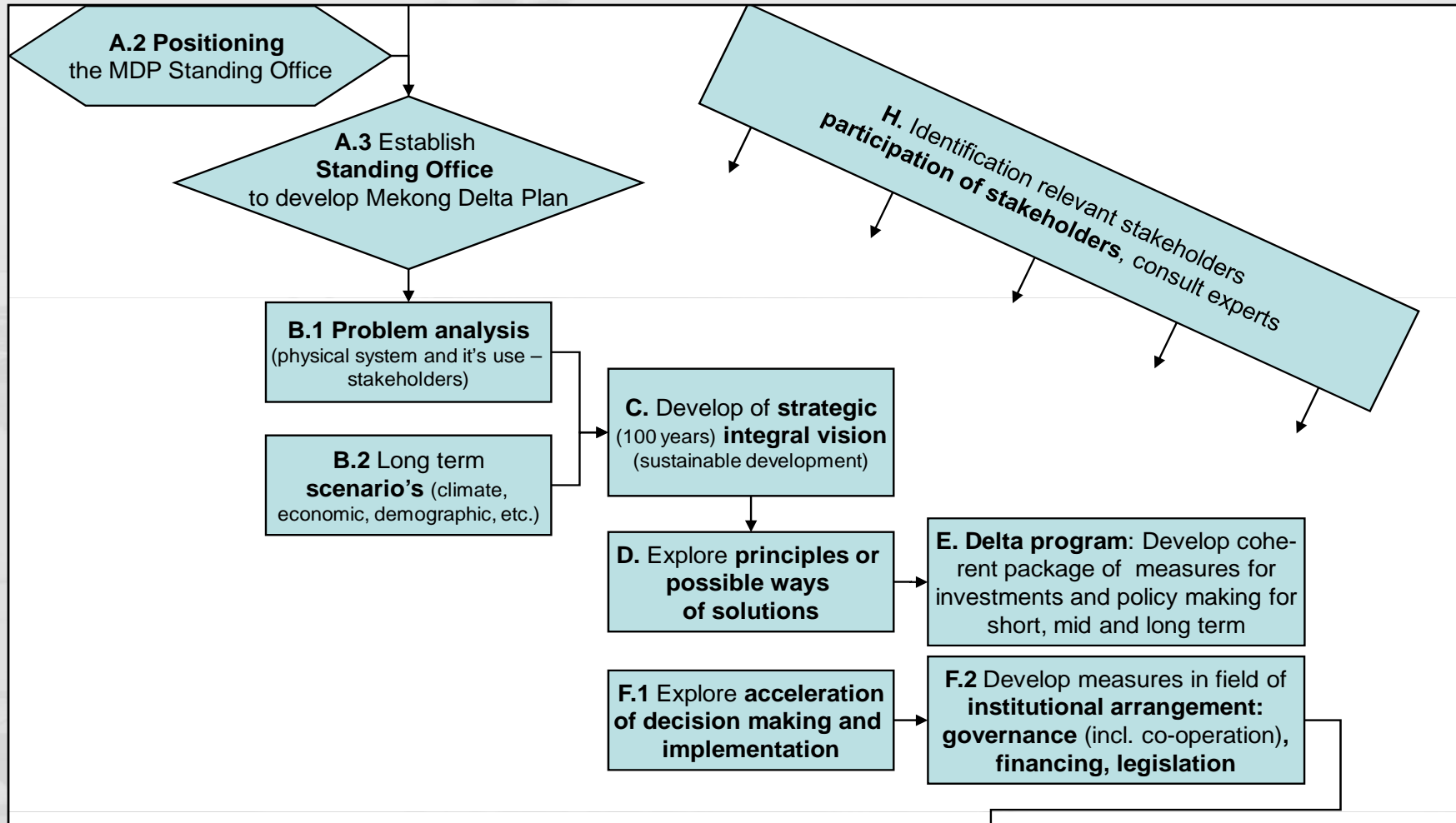


Version 1.1
1 August 2013

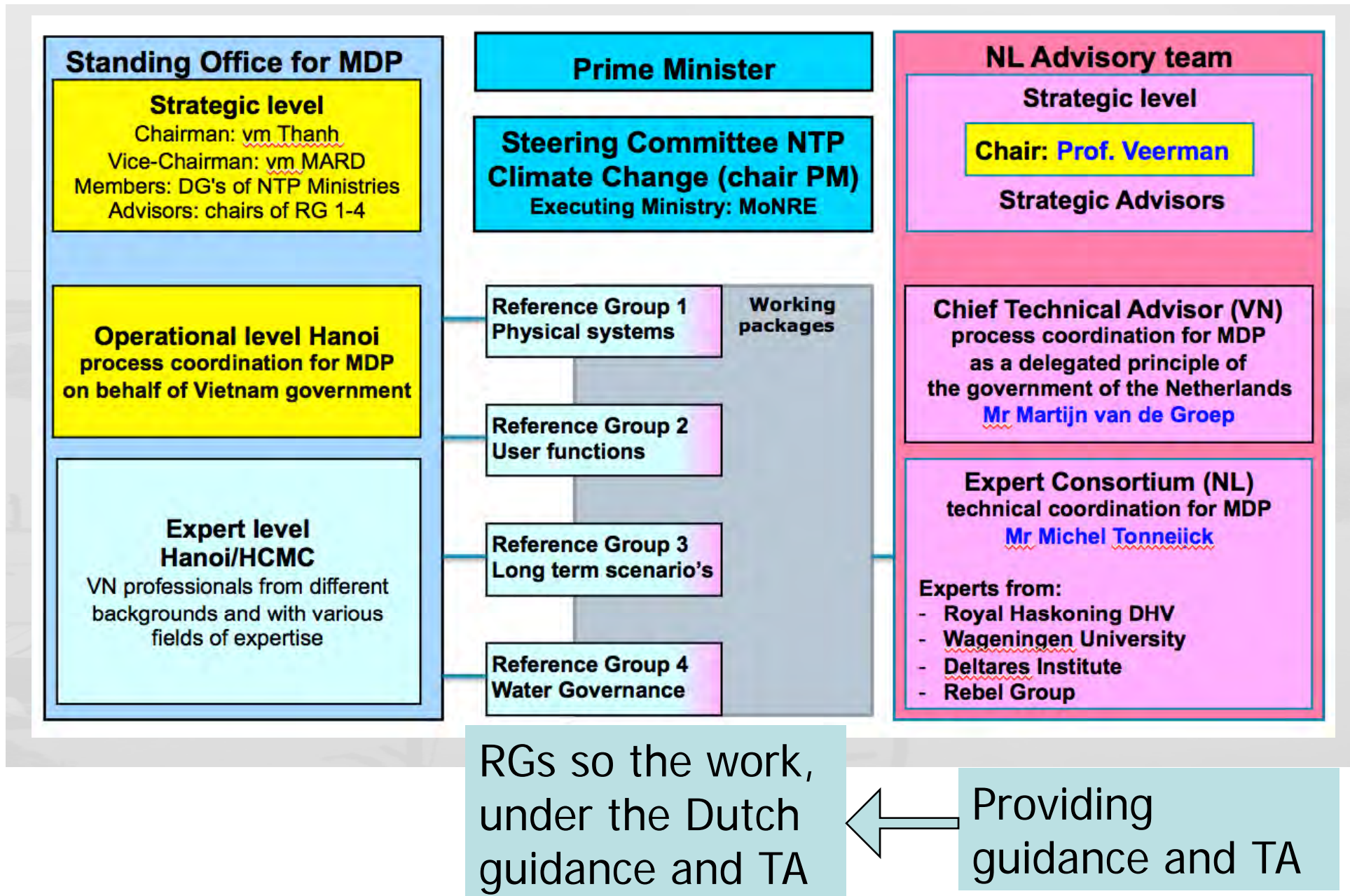


W R U

Working Process for developing the Mekong Delta Plan



Organisational structure for developing the Mekong Delta Plan

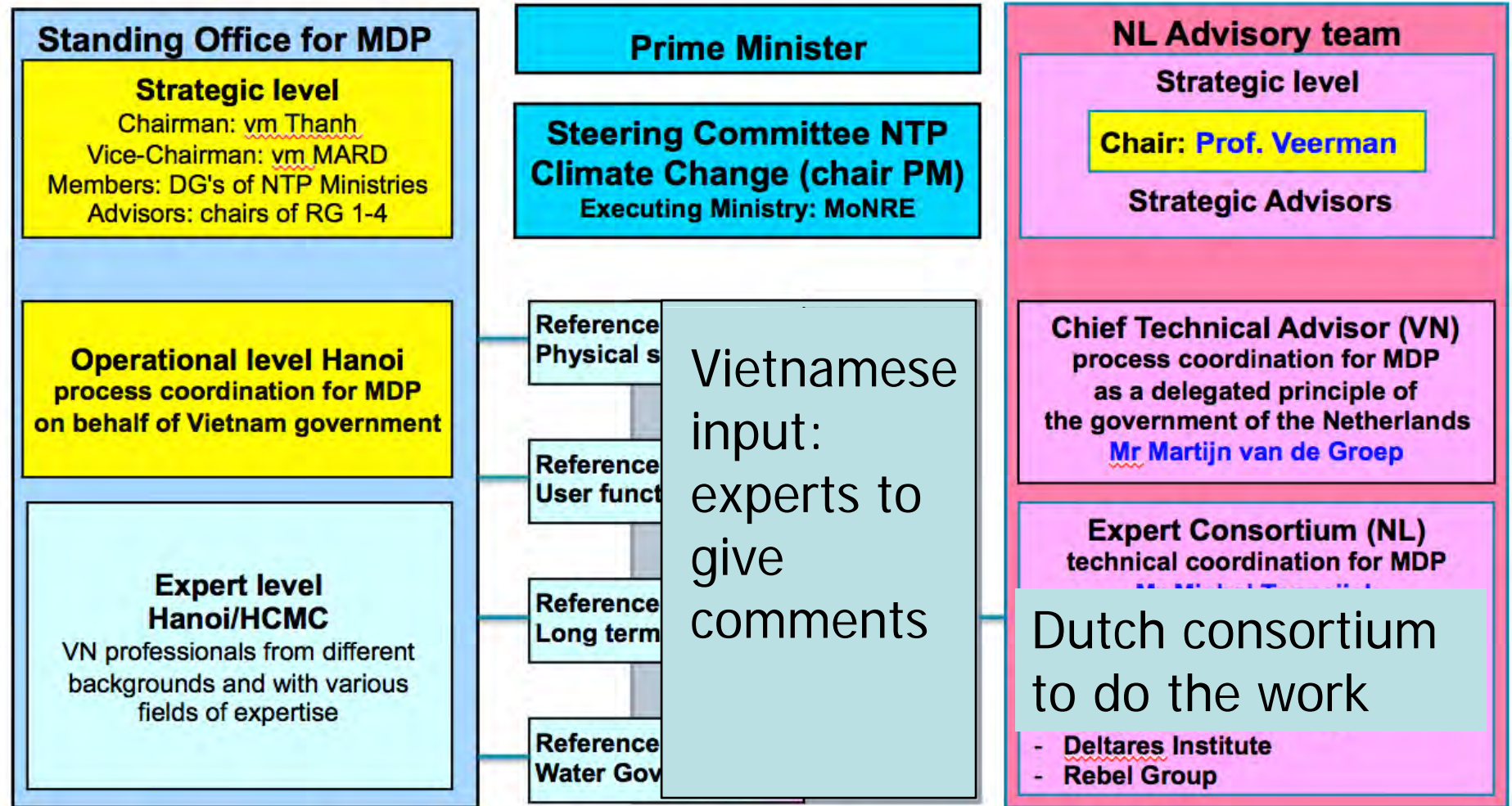


Exploring principles and possible solutions



- Adaptive delta management
- Explore 'no-regret' and priority measures
- Identify 'tipping points'
- Avoid overinvestment

... in reality



Economic Diversification / Land Use

Corridor
Industrialization



3

Dual node
Industrialization



4

Spatially
Evolving

Spatially
Coordinated



1



2

Food security

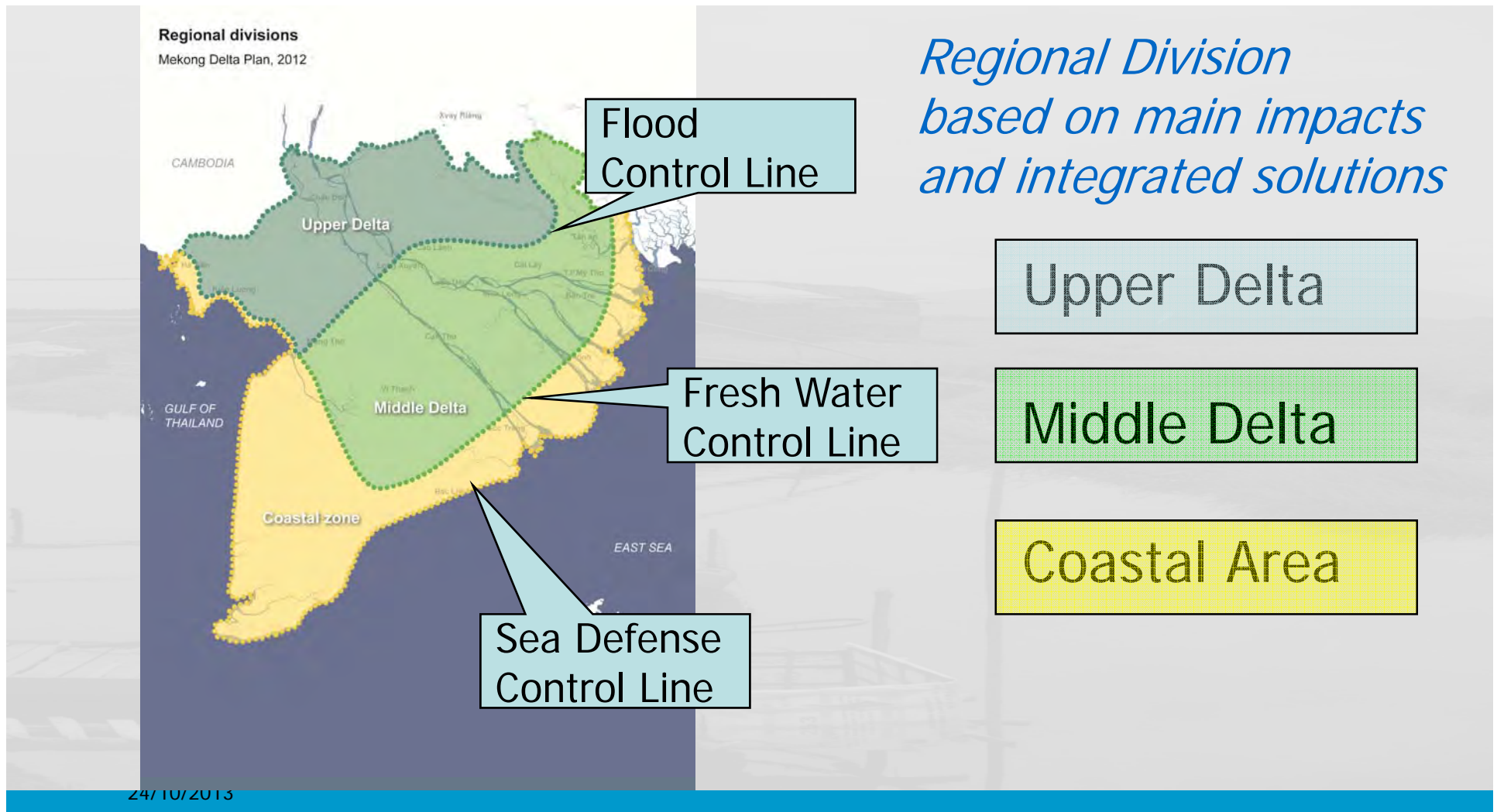
Agro-business

Agro-based Economy / Land Use



WRIU

Recommendations for an Adaptive Approach



Upper Delta

Seasonal Flooding

Controlled Flooding

Reduce downstream flooding risk



Now – 2050

Reinstate retention areas

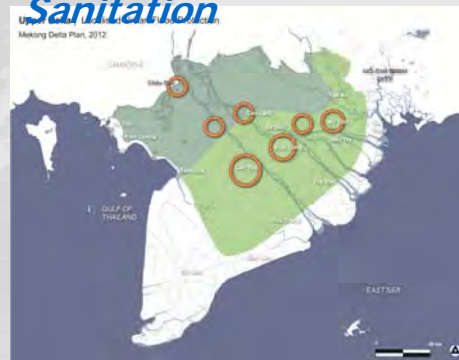
Reconsider triple rice growing

Land use planning

Diversification of crops/fish

Urban Flood Protection

Increase Safety and Sanitation



Now - 2050

Flood & Inundation

protection

Ring dikes

2050 -

Urban Polders

2100
Pumped drainage

Diversion Canals

Limit downstream investments



Now

Research and Planning

Space reservation

2050 - 2100

Construction

Additional discharge capacity

24/10/2013

Middle Delta

Fresh water in dry season

Water Management

Fresh Water Supply



Now - 2050
Upgrade existing
systems

2050 - 2100
Polders
Pumped drainage

Bassac Link Canal

Assure fresh water West Delta



Now
Monitor
Research and planning

2050 - 2100
Secure flow division
Bassac-Mekong;
Construction of Link Canal

Closing River Branches

Assure fresh water East Delta



Now
Research and planning

2050 - 2100
Construction of Tidal Barriers

Dual Zone Management Water Management

Coastal Defense

Go for Brackish Economy



Now - 2050

From shrimp farming to sustainable aquaculture including mangrove restoration

30% - 80% production loss

Alternative fresh water supply



Now - 2050

Mitigate groundwater usage
Local rain harvesting and storage
Surface water supply

2050 – 2100

Fresh water shortage
Saline agriculture

Better Protection



Now - 2050

Upgrade existing sea dikes
Restore mangroves
Unlink road and dike system

2050 – 2100

Closed Sea Defense, except Bassac

24/10/2013

Effects of Climate Change, Upstream Developments

→ *Uncertainty requires a flexible approach*

- Climate change minor or major impact?
(floods, droughts/fresh water shortage, salt)

→ *All economic and climate scenarios require*

- better land use planning;
- change of agro- and aquaculture systems
- structural measures for flood protection and fresh water supply

→ *International coordination required*

- Mitigate effects from upstream dam construction and address extreme climate change

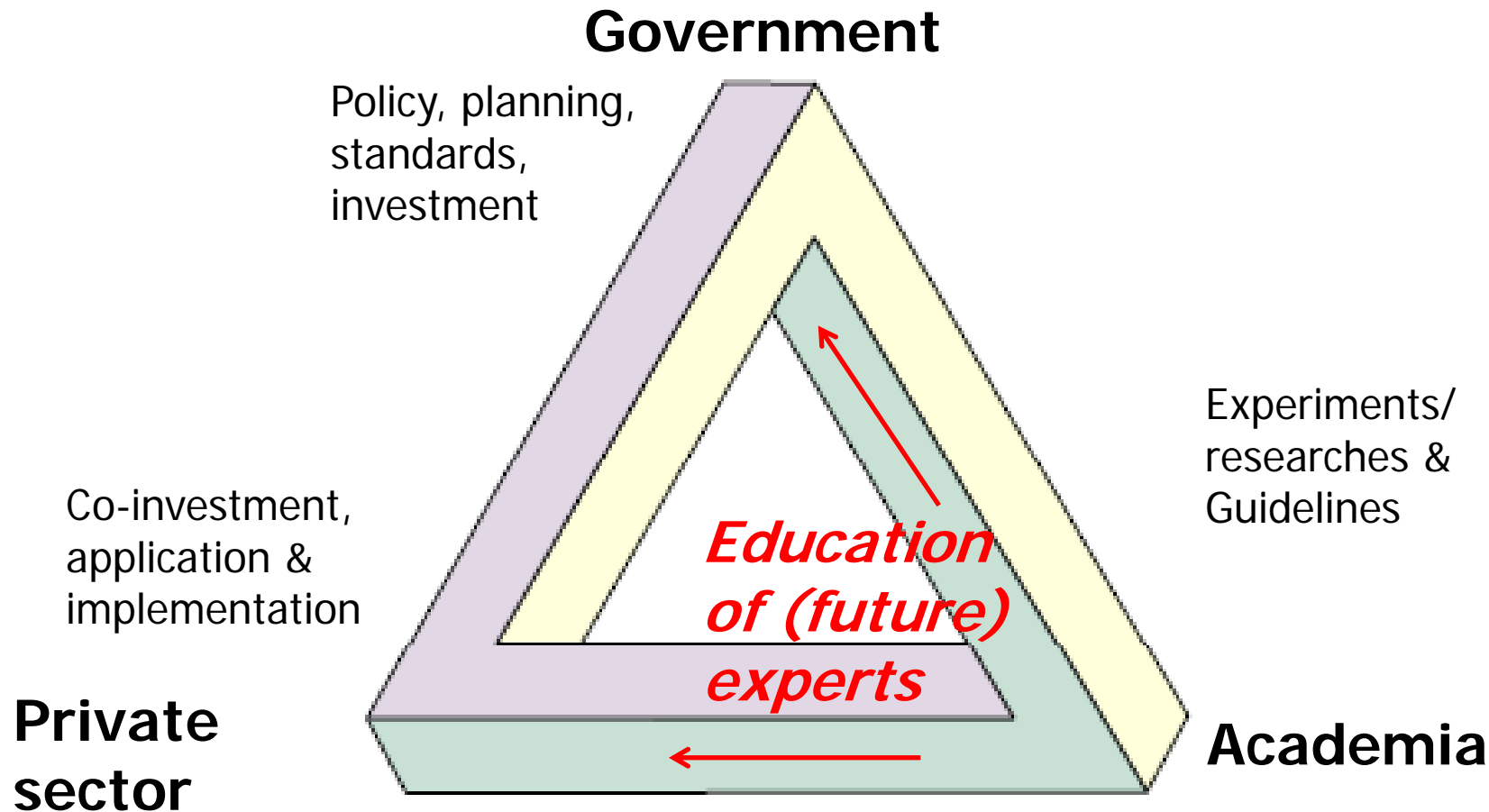


Extreme climate scenario threatens the very existence of the Delta

Some remarks

- Flood defences should be considered under an integrated water management, it requires multi-disciplinary inputs, i.e:
 - Spatial planning: where to plan what
 - Transportation planning: road network layout / scale
 - Flood risk management
 - Hydraulic engineering & Water management
 - Dike engineering
- Always start from system level
- cost-benefit framework: both system design and dike design
- Interactions of GOV-Institutes-Contractors/Private Secs

Cooperation in water management



W R U

'Delta learning and sharing' (Day 4; Thursday 24 October)

Day 5 -

Delta Planning and Implementation

Leon Hermans

Delta Training Workshop, Myanmar, 25 October 2013

Outline of presentation

1. Implementation & delta planning
2. Three things you need to know about implementation
3. Implications for delta planners

IMPLEMENTATION AND DELTA PLANNING

Two perspectives on planning: Systems and Actors

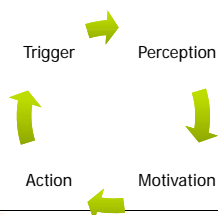


No actor support,
No implementation

Delta planners' (apparent) consensus on implementation

Implementation is a problem

Funds + Laws + Organization = Implementation



??

Financing & Institutions = Implementation?

- World Bank Evaluation Water Strategy 2002:
 - "Water strategy in part not very successful, because it proved difficult to implement"
- Netherlands water quality policy, non-point source pollution
 - "Everyone agrees on importance, yet not implemented" (? - for 20 years!)



Inconvenient truth:
Things you need to know, but don't want to know.

THREE THINGS YOU NEED TO KNOW ABOUT IMPLEMENTATION



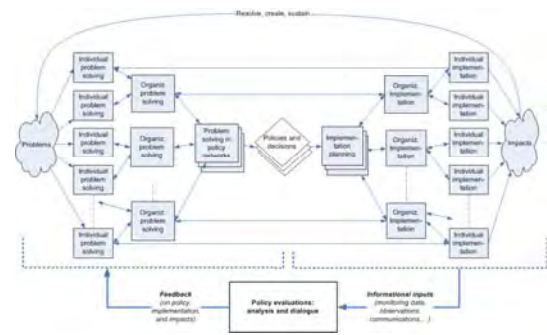
This is not All Gore

1. Your plans will not be implemented (at least, not as planned)
2. You will rarely ever get to know exactly what happened and why
3. More information is not going to help

1. Whatever happens during implementation, it is not what you planned...

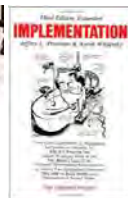
PLANS ARE NOT IMPLEMENTED

Multi-actor complexity



Literal implementation is impossible

- If it were possible, machines could do the job.
- All do what they think "needs to be done". Other parts neglected, or, at best, "have to be done".
- Complexity of joint action



Decision Point	Participants Involved	Complexity of Decision
24. Decision to implement, involving assessment and agreement to apply (February 1980)	EDA Washington (Policy-Sector), Port of Oakland	81
25. Selection of committees for construction of terminal (December 1980)	Port of Oakland, EDA Oakland, EDA Washington	84
26. Vote of port's request that one term limit design and contract (February 1980)	EDA Washington	87
27. Decision to go ahead with design project, but at reduced cost and with strict design guidelines (February 1980)	EDA Washington (Policy-Sector)	86
28. Selection of alternate architect for design (April 1970)	Port of Oakland	87
29. Approval of preliminary plan, and approval for design (June 1970)	EDA Washington	88
30. Launching of contracts for construction of bridge (June 1971)	Port of Oakland, EDA Washington	70

Table 8.0: Program Completion Enabled Unless Level of Agreement Among Participants Is Truly High

Probability of Agreement at Each Decision Point (in percent)	Probability of Success after 20 Decisions	Probability of Success after 30 Decisions
80	0.0000125	4
90	0.00044	7
95	0.0085	14
99	480	65

We conclude that the probability of agreement by every participant on each decision point must be exceedingly high for there to be any chance at all that a program will be brought to completion. On the assumption that the probability is 80 percent (see Table 8), the chances of completion are a little over one in a million after twenty agreements have been reached, and fall below the half-way mark after just four. By increasing the probability of agreement to a healthy 90 percent, we increase the ultimate likelihood of approval to something over six in ten thousand and allow seven agreements

TABLE 8: Program Completion Doubtful Unless Level of Agreement Among Participants Is Terribly High

Probability of Agreement on Each Clearance Point (in percent)	Probability of Success After 70 Clearances	No. of Agreements that Reduce Probability Below 50 Percent
80	.000000125	4
90	.000644	7
95	.00395	14
99	.489	68



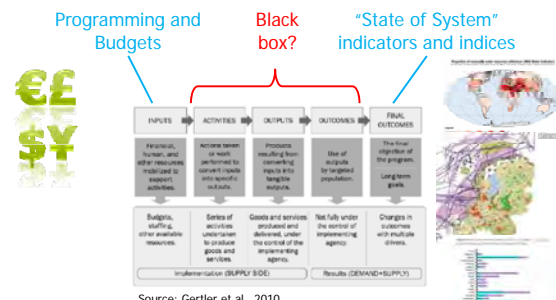
Strategic and opportunistic actors

Implementation games

- diversion of resources,
- deflection of goals,
- resistance to control,
- dissipation of energies,
- ...
- (Black-box: As these games are not officially 'sanctioned', monitoring these processes is not likely to be done voluntarily)

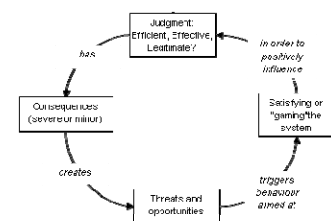
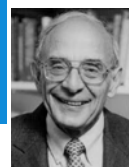
2. You will not know what happened and why THE BLACK-BOX OF IMPLEMENTATION

The black box of implementation



Of course, there are different shades of grey

- If a dam or reservoir is constructed, is quite easy to observe
 - but how the final design was decided perhaps not?
 - Operating rules and their implementation?
- Groundwater pumping restrictions?
- Setting up user committees?
- Pollution guidelines?
- Early warning systems?
- Allowance for building construction in flood prone areas?
- Etc...



We fear blaming and shaming. Defensive routines result in withholding information or 'positive' bias in communications.

'Theory-in-use': Bypassing threats and covering up the bypass
Repeated over and over again – routines & skilled incompetence



1. Politicians and decision makers look ahead, rather than back. They like to start new things, not dwell on 'water under the bridge'
2. Implementing agents face increasing administrative burdens and 'paperwork' – all needed as paper trail for implementation activities. They are not enthusiastic about filling these forms, that take time away from primary tasks
3. Monitoring is associated with control, and lack of trust. Most people do not like to be, or feel, controlled by others

3. More information is not going to help
**“MORE INFORMATION” ?
GET REAL !**



Designed blindness (Friedman) combined with emphasis on unmeasurable outcomes (Radin)

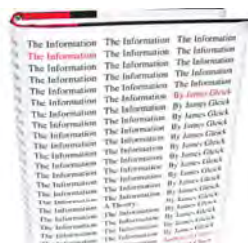
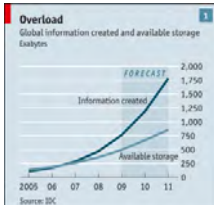
- We can not monitor the surprises, only the 'planned' events
- There are no 'boxes' or categories for certain monitoring information
 - e.g. what if officially overtime is not allowed (because we are not going to pay for it)? Or registration of ethnic characteristics (because we are not discriminating)?
- What if there is confusion over what is meant by categories on monitoring forms?



Even if we want to monitor and/or record our activities, we lack daily routine and discipline required to do so

- we record too late, making data unreliable, or
- we record only what we think is important (see previous; 'emergent' blindness?)

Economist, Feb 2010



1. What is the use of adding even more data to the heap?
Explosion of data availability over past years. More than we can use, and still not 'right'?
2. More information does not lead to better decisions. Information overload

IN CONCLUSION

Today's "news" – bad and good

- We cannot expect implementation
- We cannot ignore implementation complexity
- We cannot expect full understanding
- We cannot expect guaranteed fixes
- **If we engage the people 'on the ground' more constructively in our policy processes, they may be:**
 - More inclined to engage in monitoring activities to inform policy learning
 - More capacitated to make implementation decisions in line with spirit of the plan
- This engagements does not stop once a plan is made, but is part of ongoing dialogue in society – 'probing' and 'plausibility' rather than 'truths'.



- Three things you didn't want to know, and a framework to plan for more appropriate engagement



Thank you for your attention!

Leon Hermans
L.M.Hermans@tudelft.nl

Annex 5. Outcomes working sessions

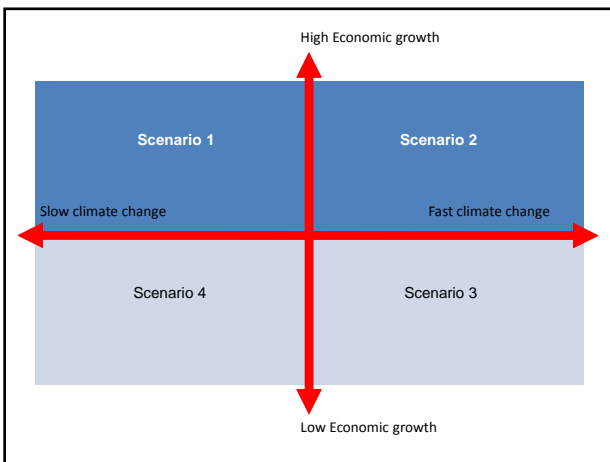
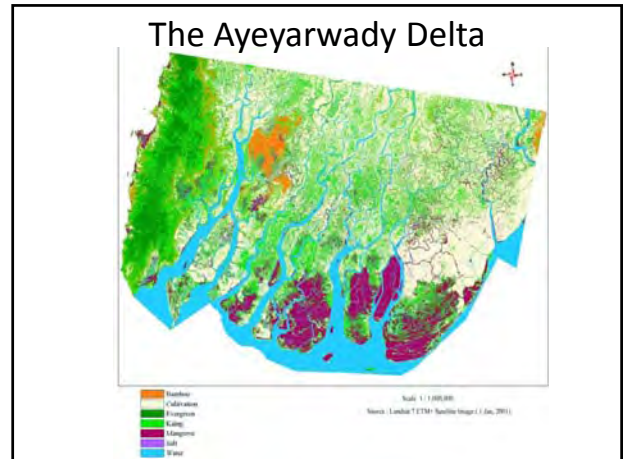
'Scenarios' (Day 2; Tuesday 22 October)

Group work results - Scenarios The Ayeyarwady Delta

Group work results - Scenarios The Mekong Delta

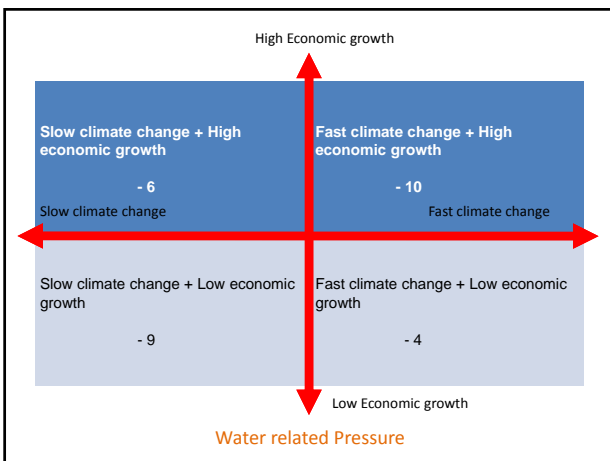
Group work results - Scenarios Indonesia Ciliwung

Group work results - Scenarios Bangladesh



	1 Slow CC High EG	2 FastCC High EG	3 FastCC Low EG	4 Slow CC Low EG
Drivers:				
Population	---	---	+	---
GDP	+++	++	---	---
Employment	++	+++	---	---
Education	+++	++	---	---
Agriculture	---	---	++	+++
Sea level change	0	+	+	0
Technology	++	+++	0	0
Fertility	---	++	---	+++
Urbanization	++	+++	0	---
Entrepreneur	---	---	0	+
Food security	++	+	---	+
Industry	++	+	---	---
Water demand	---	---	---	0
Energy demand	---	---	---	0
Pressures:				
Flood	---	---	---	0
Drought	0	0	---	---
Salinity	0	---	---	---
Water quantity	---	---	---	0
Water quality	---	---	---	0

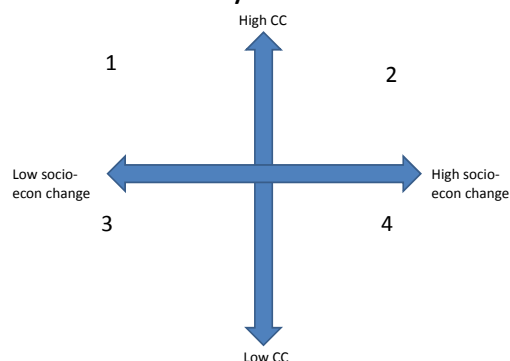
Legend: --- (0), ++, +++



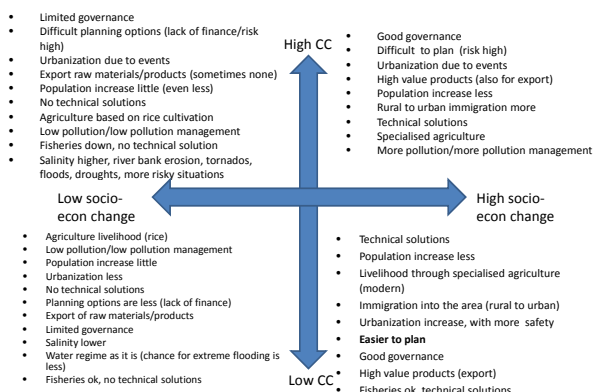
Group 2: Mekong Delta (Vietnam)

Khin Kyu Kyu
Phyo Myint
Waji Ullah
Ky Quang Vinh
Leon Hermans
Michiel Slotema
Catharien Terwisscha van Scheltinga

Story lines



Story lines: Vietnam Mekong Delta



Story lines: Vietnam Mekong Delta

1. Low econ-growth – High CC

- Limited governance
- Difficult planning options (lack of finance/risk high)
- Urbanization due to events
- Export raw materials/products (sometimes none)
- Population increase little (even less)
- No technical solutions
- Agriculture based on rice cultivation
- Low pollution/low pollution management
- Fisheries down, no technical solution
- Salinity higher, river bank erosion, tornados, floods, droughts, more risky situations

2. High econ.growth – high CC

- Good governance
- Difficult to plan (risk high)
- Urbanization due to events
- High value products (also for export)
- Population increase less
- Rural to urban immigration more
- Technical solutions
- Specialised agriculture
- More pollution/more pollution management

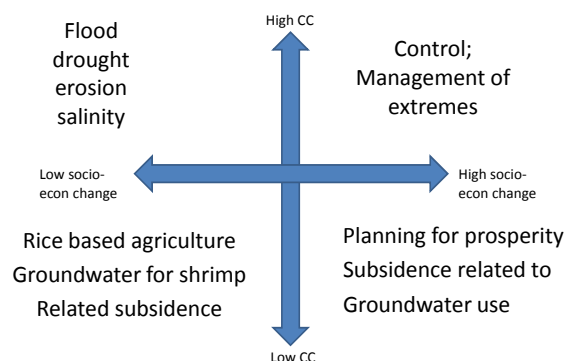
3. Low econ.growth- low CC

- Agriculture livelihood (rice)
- Low pollution/low pollution management
- Population increase little
- Urbanization less
- No technical solutions
- Planning options are less (lack of finance)
- Export of raw materials/products
- Limited governance
- Salinity lower
- Water regime as it is (chance for extreme flooding is less)
- Fisheries ok, no technical solutions

4. High socio-econ growth – low CC

- Technical solutions
- Population increase less
- Livelihood through specialised agriculture (modern)
- Immigration into the area (rural to urban)
- Urbanization increase, with more safety
- **Easier to plan**
- Good governance
- High value products (export)
- Fisheries ok, technical solutions

Vietnam Mekong Delta – water issues



Discussion

Alternative scenarios

- 1. Build the dike around the delta (scenario 2)
- 2. Don't do anything (scenario 3)
- 3. Go away (migration)

Why? To address immediate concerns

Selection of the axes

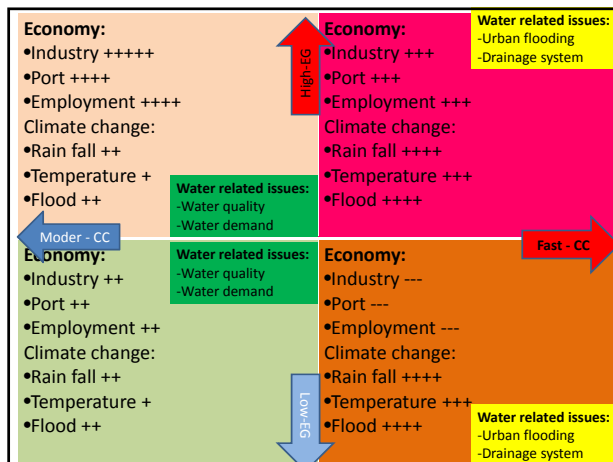
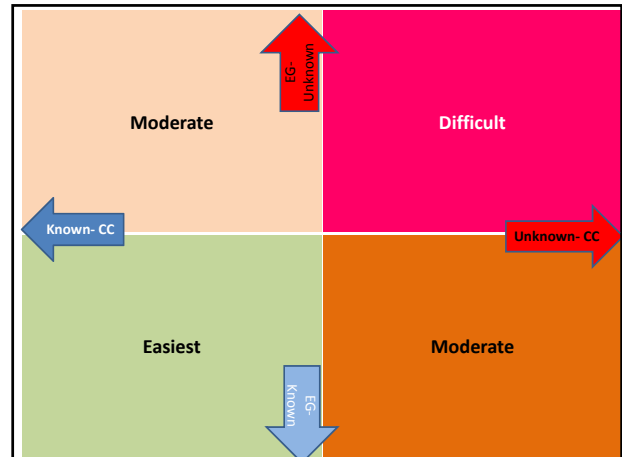
- Based on trend analysis (we did not do that)
- Selection of
 - Uncertain elements
 - Cannot influence
 - With most impact

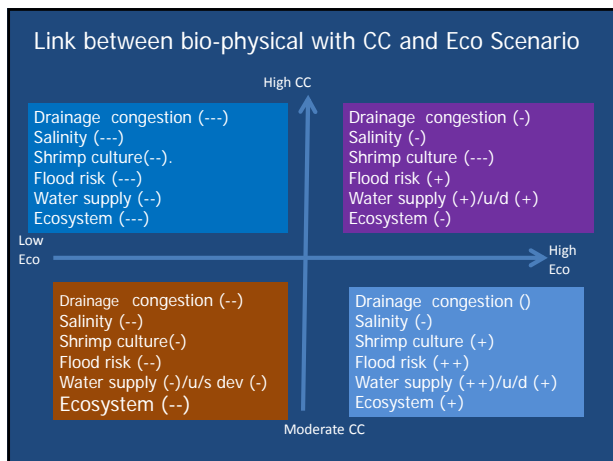
Learnings

- Facilitation important
- Listening to all
- Getting to a same level of understanding
- Ownership will develop, through involvement in the process
- Need for various types of stakeholders
- Earlier experience
- Base line description is needed
- Limitations: only two axes, while reality is more complex
- Dealing with assumptions required (we need to make them explicit)
- Thinking outside the box necessary
- It takes time!
- We still did not quantify the indicators

Group 3: Jakarta baseline condition - 2013

- GDP Growth: 6%
- Temperature: 25-30 °C





Points of Discussion

1. Different time horizon (25, 50, 100).
2. Spatially different scenarios (per regions)/province)
3. Neutral way of increase/decrease
4. Monitor the planning and review the scenarios

'Solution strategies' (Day 4; Thursday 24 October)

Group work results - Strategies The Ayeyarwady Delta

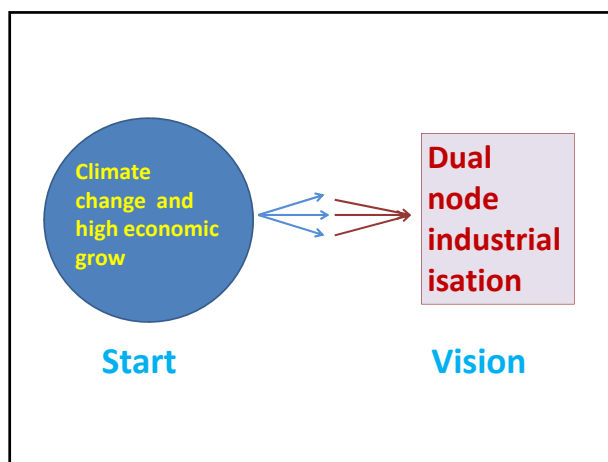
Group work results - Strategies The Mekong Delta

Group work results - Strategies Indonesia Ciliwung

Group work results - Strategies Bangladesh

Strategy 1 (Hard measures)	Strategy 2 (Soft measures)	Strategy 3 (Combine)
1. Construction of river embankment 2. Seawall 3. River dredging 4. Construction of dam for fresh water supply 5. ETP (Effluent Treatment Plan) 6. Infrastructures such as drainage channel	1. Flood retarding basins 2. Afforestation 3. Land zoning 4. Flood early warning 5. Spatial planning 6. Rules and regulations 7. Awareness building	1. Seawall 2. River dredging 3. ETP 4. Afforestation 5. Flood early warning 6. Spatial planning

Criteria	Strategy 1	Strategy 2	Strategy 3
Effectiveness	+++	+	+++
Economic effect	+	++	++
Side effects	- - -		-
Flexibility	- -	++	+
Acceptance	+	++	+++
Overall scores	Average	Moderate	Very good



WATER ISSUES

1. Water supply (increase demand, lowering groundwater levels, land subsidence)
2. Urban drainage (urban flooding)
3. Water pollution (bad in environmental management)

SOLUTIONS for Supply & groundwater

1. Law and policy for optimal using groundwater
2. Regulation & improved infrastructure for better urban water supply and distribution (reducing losses)
3. Decentralized Water reservoirs / in-stream storage capacity (new)
4. Rehabilitation of existing canal system for storage and groundwater recharge
5. Urban planning and improved cross-sectoral coordination

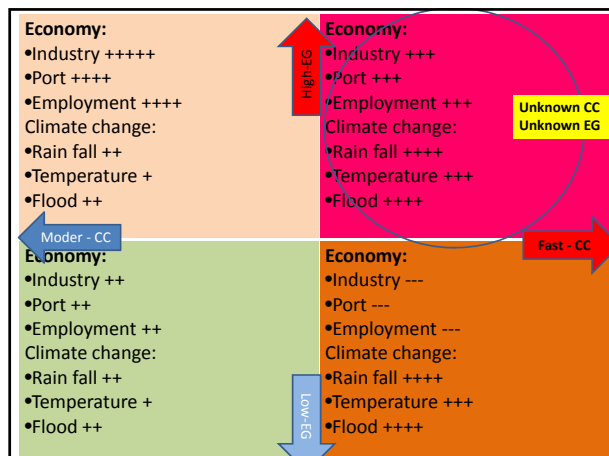
	Effectiveness	Flexibility	Economic (costs)	Side-effects	Acceptance	SUM SCORE
Low optimal GW use	5	3	5	4	3	20
Improved WS & distribution	5	2	3	3	4	17
Decentralized reservoirs	5	4	3	3	3	18
Rehab canal system	5	4	4	4	5	22
Urban planning	5	3	5	4	4	21

Strategy: All solutions, consumptive use of groundwater and surface water, starting with rehabilitation existing canals for quick wins & all depending on funds and timely availability of those funds

Reflections

- How to rank and weighting of score-card
- Issues that did not fit in the focal solution were not included in score-card but came up again and again (purification and treatment)
- Process helps to change your ideas and beliefs

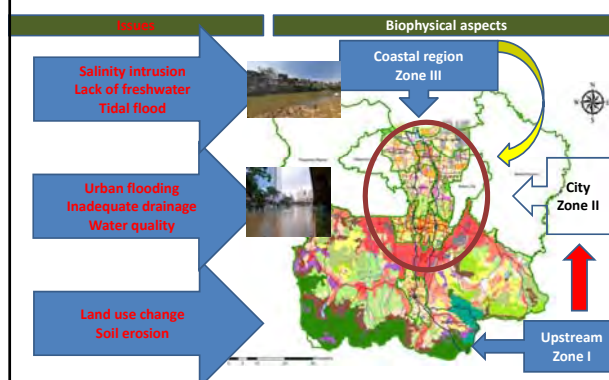
Jakarta scenarios



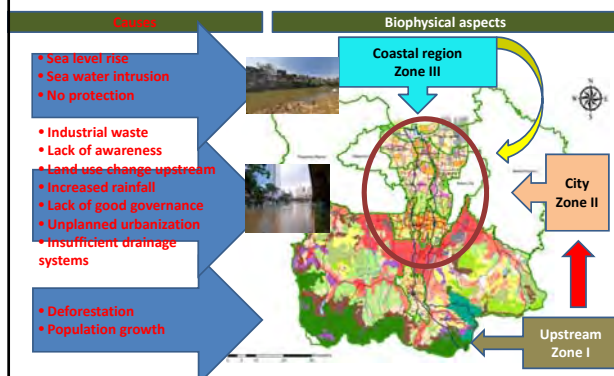
Participatory planning



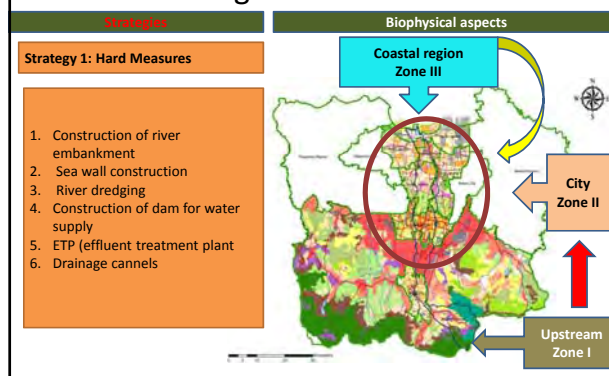
First step: identifying issues in the selected delta



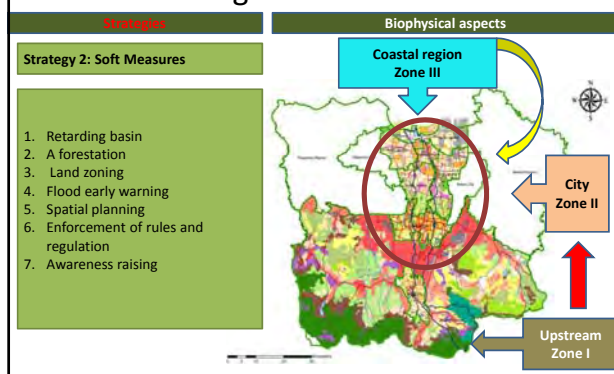
Second step: identifying root causes of the problems



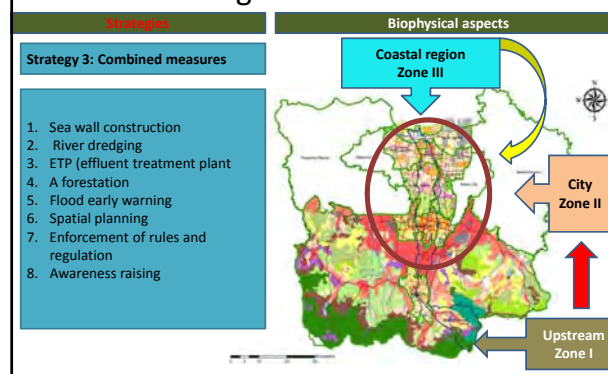
Third step: identifying strategies to target root causes



Third step: identifying strategies to target root causes



Third step: identifying strategies to target root causes

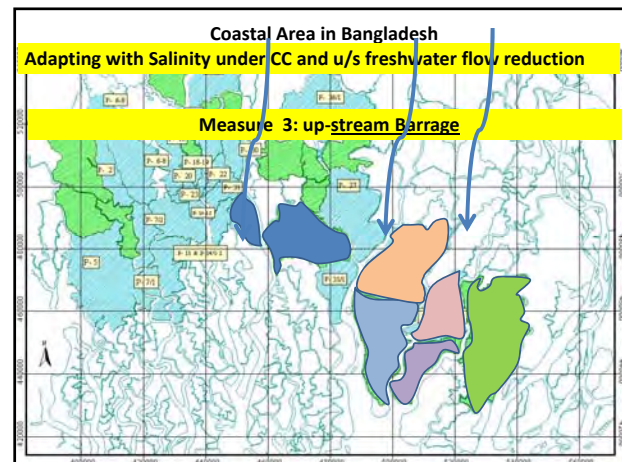


Final step: Evaluating Criteria

Criteria	Strategy 1	Strategy 2	Strategy 3
Effectiveness	+++	+	+++
Economic effect	+	++	++
Side effects	- - -		-
Flexibility	- -	++	+
Acceptance	+	++	+++

Thanks

23 October 2013



Area: Coastal Area

Scenario: Sea level rise /High Climate change and Moderate economic development

Issues: Salinity, Flood, Water Supply

Vision: Protection of Sunderban, maximum agriculture and minimum environmental risks

Issues	Measures	Assessment criteria				
		Effectiveness	Economic	Side effect	Flexibility	Acceptance
Salinity	Multi-layer (low polder embankment and structures), flexible & stepwise infr,	Individual polders can be adjusted with demand	Investment can be made in stepwise, therefore less pressure	Sediment deposition in channels, drainage problems in the polders, long duration flooding during surge	Individual area can be managed with much flexibility, embankment can be destroyed if long duration flooding occurs, both rice and shrimp can be cultivated	It is acceptable as present practice needs to be strengthened considering cc.
	Large scale measure (estuarial barrages at d/s))	Effective for larger area to serve	large numbers (10) of gates(1 km each)	Sedimentation in the channels	Individual area can hardly be managed in an independent manner	Consensus of all the stakeholders would be difficult. opportunities are minimum
	Increase of dry season fresh water flows (Barrages at u/s)	It will partially reduce the ingress of salinity, therefore effective for incremental areas	It is multipurpose , therefore economically viable	Environmental impact of the up/s freshwater supply is always positive	There is a flexibility of distributing water to a number of rivers/channels depending on its requirements	It is widely accepted as it has multiple opportunities

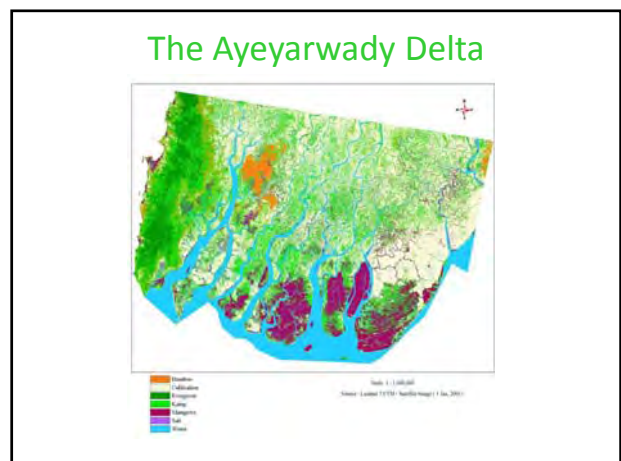
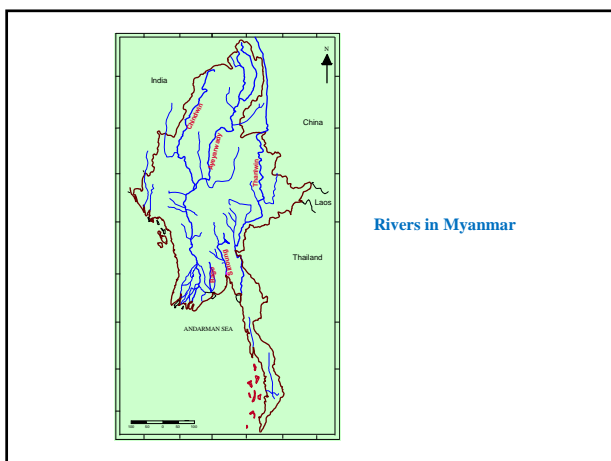
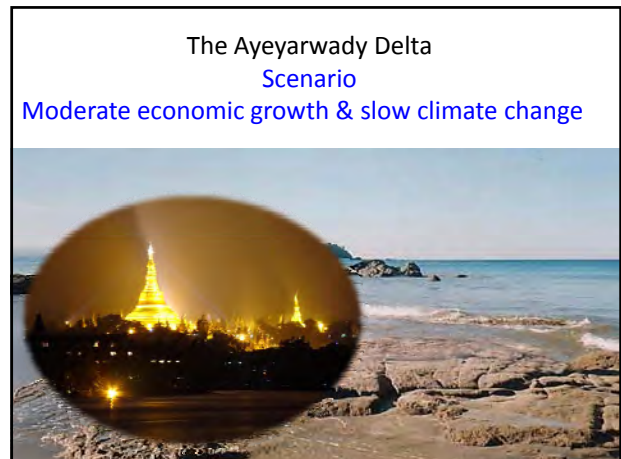
'Road map' (Day 5; Friday 25 October)

Group work results - Road map The Ayeyarwady Delta

Group work results - Road map The Mekong Delta

Group work results - Road map Indonesia Ciliwung

Group work results - Road map Bangladesh



Issues

1. Flood (flood and tidal)
2. Water quality
3. Fresh water availability

1. Causes of Flood

- 1a. Higher rainfall intensity (July - September)
- 1b. Upstream deforestation (over exploitation shifting cultivation, 2.6 million people practising SC, approximately 142, 000 ha)
- 1c. High tide + storm surge

2. Causes of water quality deterioration (December-April)

- 2a. Not enough water
- 2b. fertilizer and pesticides
- 2c. Salinity intrusion
- 2d. Grounded water abstraction
- 2e. Mining (upstream) activities

3. Causes of Fresh Water Availability

- 3a. Limited rain in the dry season
- 3b. Upstream reservoirs (more than 300)

Flood as the most serious issue

Strategies to solve the flood

Address to higher rainfall intensity

- 1. Improve Drainage System
(Infrastructure, dredging, ponds, gates, by-pass, flood retention ponds, wetland conservation, flood control structure)
- 2. Early warning system
- 3. Spatial Distribution of flood water

Address to Upstream Deforestation

- 1. Agroforestry, permanent farmings
- 2. Land use management/plan/zoning
- 3. Provide income generation opportunity for the people o upstream
- 4. Provision of compensation/subsidy
- 5. Develop new business like Eco-tourism

Address to High Tide and Storm Surge

- 1. Early warning
- 2. Cyclone Shelter
- 3. Bio-shield (Mangrove plantation along all rivers, 2m, 5m or 10 m strips)
- 4. Embankment (Protection for Valuable places)
- 5. Training to the local people
- 6. Comprehensive Disaster Management

Main Items for Strategy

- 1. Environmental Management
- 2. Institutional Development
- 3. Capacity Building
- 4. Economic Analysis

Challenges

1. Money
2. Capacity
3. Motivation
4. Cooperation/Collaboration/Coordination



Vision

Happy, Healthy, Safe people,
prosperous, human quality, diversity

Project Period of the Planning

Short-term 3 years
Mid-term 10 years
Long-term 50 years

Roadmap of the Ayeyarwady Delta Plan

1. Structural Measures

Components	Short-term	Mid-term	Long-term	All-terms
Dikes	X	X		
Drainage System	X	X		
Cyclone-shelter	X	X		
Embankment		X	X	
Warning	X	X	X	
Disaster Mgt	X	X	X	

2. Non-structural Measures

Component s	Short-term	Mid-term	Long-term	All-terms
Zoning Mgt	X		X	
Awareness	X	X	X	
Capacity Building	X	X	X	
Education				X
Monitoring				X

Who should be involved in the developing roadmap?

1. Central, Regional and Local Government
2. Representatives
 - 2a. Civil Society Organization CSO
 - 2b. Researchers
 - 2c. INGOs, and NGOs
 - 2d. Other Stakeholder (Farmers, Fishermen and so on)
3. Development partners

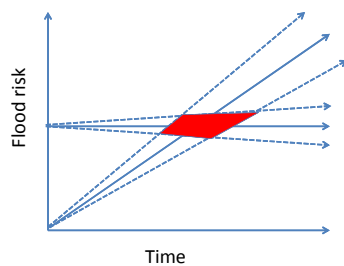
How!

1. Dialogue
2. Survey
3.

How to monitor and evaluate?

1. Develop indicators and criteria
2. Periodic Assessment
3. Revision
4.

Tipping Area



Mekong Delta Urban Water Supply Project



Mekong Delta Planning Process

- Scenario: High economy, high climate change: Dual node industrialization
- Issues:
 - Urban Water Supply & Groundwater
 - Urban flooding
 - Water quality & pollution
- Score card ranked strategies

Timeline

Measures	10 yrs	50 yrs	> 50 yrs
Rehab canal system			
Urban planning			
Low optimal GW use			
Decentralized reservoirs			
Improved Water supply & distribution			
Updating the plan			

Starting with no-regret measures (rehab canal system, urban planning), while starting up other options (e.g. securing funding, policy and guidelines)

Rehabilitate existing canals

Who?

- Leader: **Urban Management division of city government.**
- Involve district regional government, community
- Private sector / PPP for operation of water supply system later, to attract more funding
- Involving stakeholders as and when required (Community Based Organizations)

What?

- Conduct Environmental Impact Assessment (where to take the waste?) (government)
- Implement the project: clean up canals (private contractor)
- Improve the waste management & awareness raising (community delegates)

Monitoring (for canals):

- Waste & water hyacinth / plant cover
- Water flows
- Expenditures
- Sedimentation
- Water quality & quantity

Coordinated urban planning

Develop a Spatial Plan

- Vision development
- Baseline status development
- Data collection planning and design to inform coordinated planning

Who?

- **Leader: Urban planning department**, but involve water department and others
- Based on community, staff and scientists will develop planning, people committee then issues it
- Implementation of plan: operation & maintenance - enforcement and compliance (land use developments, building areas etc)

Start monitoring:

- Indicators for improved urban planning for water perspective:
 - Approved plans and measures take into account water considerations:
 - Access to water
 - Flooding
 - Groundwater fluctuation
 - Industrialization – pollution, water demand
 - Costs, efficiency
- First years: can only monitor plans if they take into account above. After 10 years, can expect to see results in the measured indicators on the ground.

Agencies for implementation

Actors	Rehab canal system	Urban planning
Relevant line agencies	Irrigation Department (DARD)	Department of Construction
Planning organization	DPI – Department of Planning & Investment	DPI – Department of Planning & Investment
Planning consultant	CTU (Can Tho University), ...	
Coordination	Urban Management div of City government	Urban Management div of City government
District regional gov		
Community		
Private Sector	Constructor/Developer	
Public Finance (for rehab)	DPI – Department of Planning & Investment	

DELTA _PLAN
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Road Map for Adaptive Salinity Management in the Coastal zone of Bangladesh

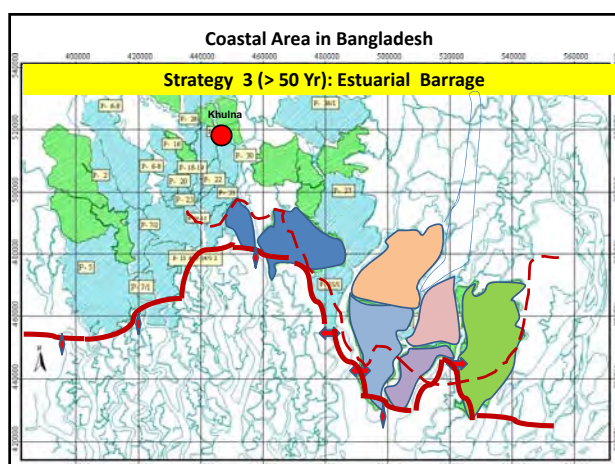
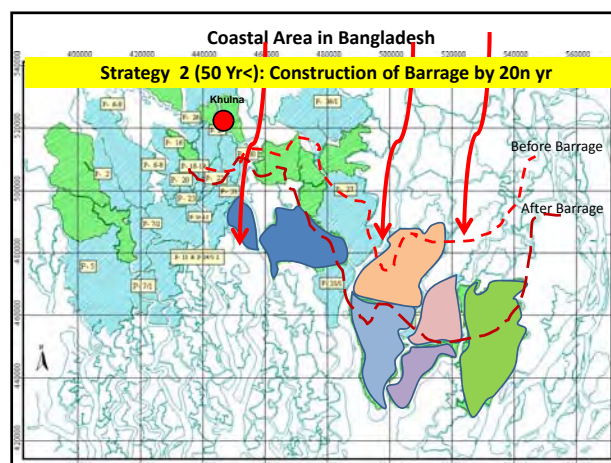
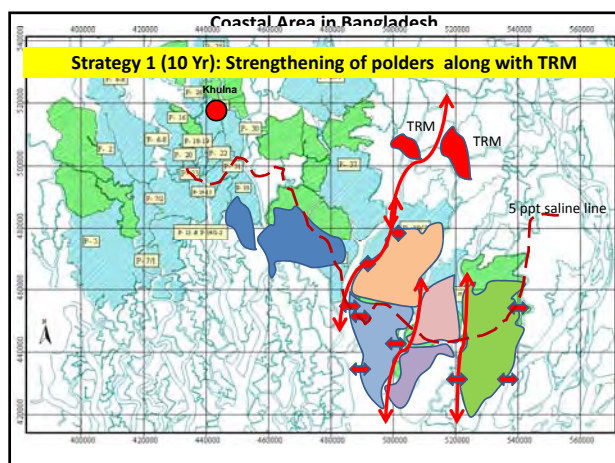
25 October 2013

Scenario: High Socio-Economic Growth and moderate Climate change Salinity

Opportunities of Dev

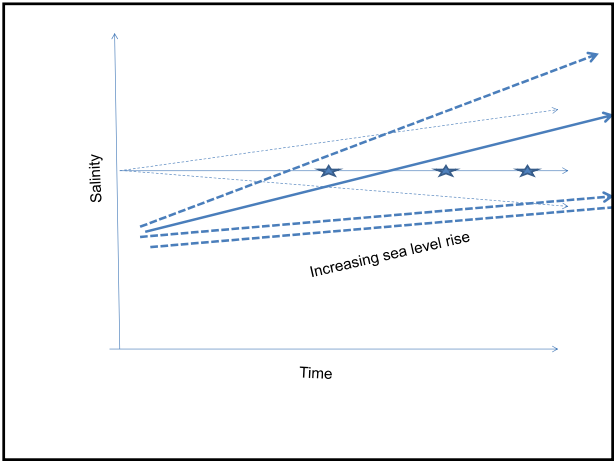
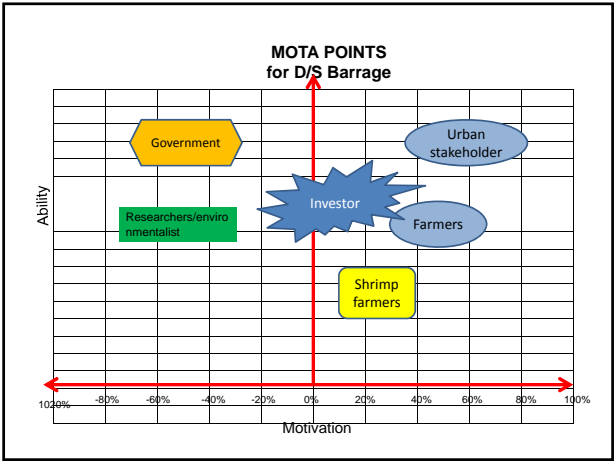
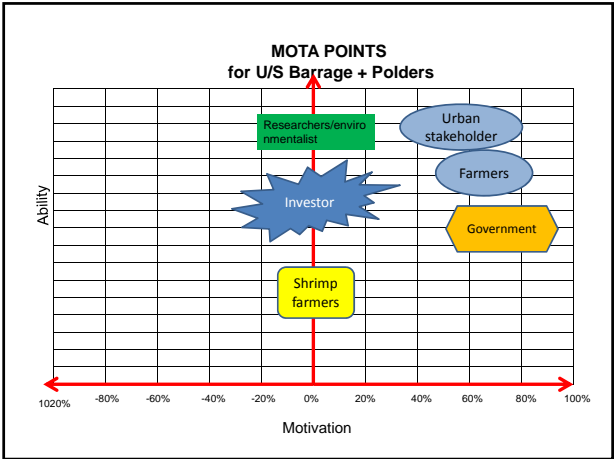
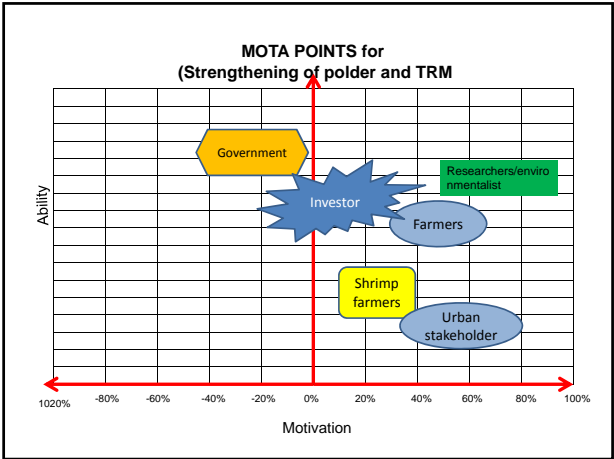
- fisheries & shrimp
- marine fisheries
- agriculture
- forest
- ports & EPZs
- on shore & off shore gas
- tourism

- Sea level rise, more extreme storm surges
- Changing rainfall patterns
- Changed geo-hydrodynamics;
- Impact on Coastal zone of Bangladesh:
- Fresh water supply availability
- Food production: agricultural + aquaculture/fisheries
- Ecosystems



Broad Stakeholder consultation ?





Annex 6. Daily recapitulation

Recap Day 1 by Kien
Recap Day 2 by Kabir
Recap Day 3 by Fikri
Recap Day 4 by Vinh

Recapitulation Day 2

By
T. M. Rashidul Kabir
Bangladesh

Day Facilitated by Mr. Malik Fida

- The day started with the recapitulation of the day 1 by Mr. Kien

Presentation of Mr. Sattar

- He presented his MSc thesis on Coastal Eutrophication taking into account the study area, the Bay of Bengal.
- His study objective was to analyse current and future nutrient input trend for both dissolved and particulate nitrogen, phosphorous and carbon and to explore environmental management strategy for the future nutrients input.
- The study was a macro level study and with regional scale
- The study revealed that coastal eutrophication is increasing with increased nitrogen and phosphorous loading and decreased carbon migration.
- Agricultural sector has the larger contribution to
- Fertilizer and Energy management can reduce nutrient export upto 50%

The presentation followed by joint presentation of Ms. Catharine and Mr. Saiful Alam

- Salinity in Coastal Delta
- Case of Khula city drinking water supply a challenge to get fresh drinking water source.
- Put emphasis on salinity management in the Asian Delta
- Then comes to GBM delta by Mr. Alam
- Coastal Zone setting (Vulnerable, Fragile and opportunity)
- ICZM in Bangladesh
- 3 SLR scenarios
- Economic growth and GDP growth for 2021.

The presentation followed by joint presentation of Ms. Catharine and Mr. Saiful Alam

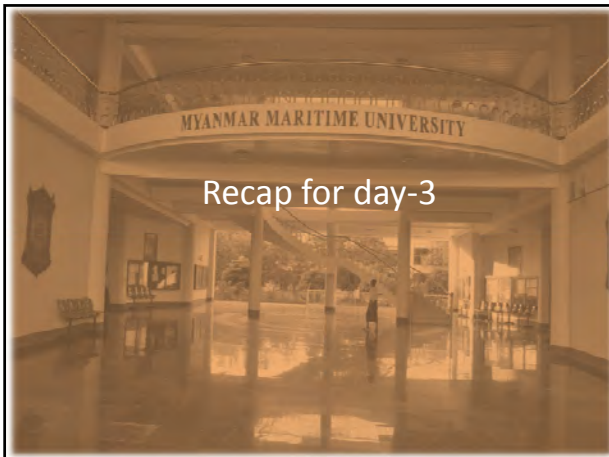
- Discuss the upstream economic growth in regional scale
- Sectoral share of GDP
- Discuss current land use change
- GW and SW use in food security
- Basin wide water resources availability
- Climate change impact on peak discharge of the GBM
- BDP clusters and NWMP clusters
- Institutional Arrangement (NWRC)
- Weaknesses

Presentation Ayeyarwady Delta

- Salient Features, Seasons, Rivers and River station in Myanmar
- Cropping pattern, Transportation in the Delta
- River bank protection and challenges
- Economic potentials
- Degradation of Mangrove Ecosystem
- Policy and Strategy in Coastal Delta Management like protected area system, reserve forest and community plantation
- Recent Activities to Coastal Management: Institutional Legal and Management aspect

Presentation of Henk

- What are the water water related issues in Delta too much too little or dirty
- Scenarios (CC and Bio-physical) and key features and uncertainties in
- Modelling framework for Bangladesh Delta
- Sea level rise
- Interaction between CC and Bio-physical scenarios
- Economic Diversification
- Exercise on Scenario development with key water related issues.



Morning session

- Continue for the group work on Delta Planning
 - Presentation of each groups
 - Presentation by Mr. Malik Fida: Comparison of 3 Important Deltas: The Rhine-Meuse, The GBM, The Mekong.
- Discussion:
- The transboundary issues in the delta plan
 - The plan should emphasize on the livelihood of the people.
- Lunch

Afternoon session

- Presentation by Mr. Rashidul Kabir: The water transboundary issues in Bangladesh
- Discussion:
- The upstream countries should involve in the delta plan.
- Introduction of the group work by Mr. Leon: Pre MOTA Session
 - Group work : Introduction of the case study: Vuc Mau reservoir flood
 - Presentation by Mr. Phi: MOTA Score card
 - Group work on the MOTA Score card

Re cap of day 4

9:00 24/10/2013

Mr. Ky Quang Vinh

CCCCO Can Tho

Leon Hermans: MOTA debriefing

- Present findings from MOTA exercise on day 3 –
- The most significant difference between scorecard and MOTA is vulnerability control index. For example, **scorecard gives positive results** while **MOTA approach shows negative feedback**.
- Index hazard control from group is greater than individuals;
- vulnerability for individuals is positive while it is negative for group decision.

It is not the first or only method for analyzing stakeholders.

Dr. Mai Van Cong: Water management in Vietnam

Water defenses in Vietnam - Current strategy

- In the North: Red river system-flood defenses with dikes
- In the Mekong: low dikes, yearly flood accepted – living with water
- In the Central: combination; integrated water managements

Some remarks

- Always start from system level
- Cost-benefit framework: both system design and dike design
- Interactions of GOV-Institutes-Contractors/Private Secs

**Dr. Nguyen Van Kien: MEKONG RIVER DELTA: RESILIENT LIVELIHOODS
DIKES OR FLOODS OR BOTH OR WHAT ELSE? ROOMS FOR FLOODS?**

- **Define resilience from different perspectives – ecology-sociology; but linked ecology and social resilience is most important**
- **Livelihood options for living with floods (1) dike/farm; (2) off-farm; (3) non-farm;**
- **Addressing the first option is plausible**
- **Pay attention costs/benefits of option 1**
- **Suggest traditional farming systems – rooms for floods**

Dr Waji Ullah: Tidal River Management Concepts and its Practical Experiences

- Environment friendly river management and removing water logging
- Concerning about sediment moving backward from the sea to inland
- Participatory management and sustainable water management practices
- Innovative and indigenous management practice and cost effective

Annex 7. Workshop evaluation

Challenges and Approaches in Delta Planning and Management: Sharing experiences from SE Asian Deltas and the Rhine-Meuse Delta

2013 Edition of the Regional Training Workshop for professionals working / interested in Asian Deltas

Host and venue: Myanmar Maritime University (MMU), Thanlyin (close to Yangon), Myanmar. Period: 21-25 October 2013

Objectives

- To expose participants to the latest thinking of delta planning with specific focus on environmental and social aspects and placed in a development context;
- To familiarise participants with the multi-level and multi-sectoral dimension of the topic - also by sharing the experiences of the participants from different backgrounds - with specific focus on rural/coastal and urban case studies.
- To familiarise participants with approaches how to address these multiple dimensions - also considering uncertainty - and (institutional) conditions for implementing such approaches.
- To present, practice and discuss examples of approaches and methods of delta planning by means of European and Asian case studies; and
- To provide a Forum / Community of Practice for knowledge networking between participants, and between participants and resources persons of the institutes involved.

Note: Please tick appropriate box.

Please do not fill in an answer if you don't know or don't have an opinion!

1. THE COURSE IN GENERAL

	Results (1 Strongly disagree; 5 Strongly agree)
Q1: Do you think the training workshop enabled you to achieve learning objectives as stated above	4.57 / 21
Q2: The total available time is reasonable for the amount of material to be studied	3.71 / 21
Q3: The balance between theory and practice (exercises/assignments) is right	3.67 / 21
Q4: The training workshop is well supported by teaching tools, facilities & materials, such as lecture notes, handouts, etc.	3.67 / 21
Q5: The material covered in the training workshop was mostly new for me	3.90 / 21
Q6: The training workshop provided a useful contribution to the specific requirements of my job	4.14 / 21
Q7: The training workshop provided a useful contribution to my professional development	4.48 / 21

Comments on the course in general:

- Good and excellent.
- Nice combination of participants and facilitators.
- The course has been useful despite its short duration.
- The course was knowledgeable and motivating and I have developed a strong desire to start working in the deltas with the help of Dutch institutions.
- I would like to join the workshops which will be held in the future.
- The training workshop gave me much knowledge and experiences for delta planning
- The training workshop is a very comprehensive way of providing knowledge and sharing experiences from each other and from delta to delta.
- Among delta planning and management, there are some specific situations required to be adapted to my delta such as the three parts upper, middle and lower parts of deltas and as MOTa.
- This is without doubt a good attempt.
- A lot of new ideas and knowledge generation is presented in the course and programme.
- This is a good platform of knowledge sharing.
- Suggest to condense to a 3 day workshop, and 2 days fieldtrip.
- Suggest to use the flip charts instead of group power points.
- I think it is really a useful course with regard to sharing experiences between deltas and of course it would be an input for own delta planning.
- Very interactive and I need more time to get the process.
- Most are very interesting and very useful for my future work plan.
- Two days indoor and one day fieldtrip would cover well the workshop content.
- Provide participants list in advance.
- More stakeholders / participants from related ministries (even though not directly related) should be informed (e.g. fisheries).
- Some of the listening could be replaced by reading / seeing.
- Some presentations are very long and not very informative.
- Some presenters do not totally follow the citation rule. The academic ethics should be considered. Generally, the presentation raise issues / challenges, but the delta plan relies much on water perspective rather than on integrated/multidisciplinary approach.
- If we use the delta plan from a water perspective then the focus will be water. However, the delta plan comprises both socio-economic and livelihoods ,therefore the design team should multidisciplinary.
- I can see that the delta plan in Mekong Delta and Bangladesh has been done by technical water team, therefore less involvement of social - economic experts.

Working relations	Results (1 Difficult; 5 Stimulating)
Q8: The working relations with the trainers has been:	4.67 / 21
Q9: The working relations between participants has been:	4.38 / 21

Comments on working relations:

- Good relation, friendly.
- It is quite OK.
- Suggest trainers to review individual ppt to make presentations more focused towards learning objectives.
- All the trainers are likely to help each other to be understandable for each other.
- The working relations are cooperative between trainers and participants.
- All the trainers and participants from different countries were very cooperative and supporting.
- Relations with trainers has been excellent.
- I like working in the group. It is useful to get other ideas.
- In the discussion add more horizon / contribution to the materials.
- I am a new participant, so do not know too much.
- Very good workshop.

2 Additional Questions**A. What did you like the most about this training?**

- I like tidal river management.
- I like the tidal irrigation presentation.
- The topic fits my expectation.
- Group work and discussions.
- Discussions, group work and assignments.
- Learning from each other.
- Experiences from different deltas and their conditions.
- I like mostly the different opinions out of the box.
- The presentations made by the countries on their own deltas was very interesting and fascinating.
- Delta plan thinking.
- I like most the preparation for each presentation which was intended to give in a comprehensive way knowledge and experience.
- The training is quite participatory, friendly and generates new ideas.
- Bus trips to talk individually with participants.
- Learning from others experiences.
- Object of training was achieved. I have a chance to visit Yangon in Myanmar which I expected to visit for a long time.
- The best thing is that the organizer held this conference in a remote, isolated area/university.
- The presentation is flexible and divers for different deltas.
- Food is excellent.
- Group output.
- Non formal discussion and good demonstrations.
- Mekong delta experience.
- New concepts and methods.
- Integrated way of making a plan for a region.
- Participants from many countries, so there is a chance to learn from each other.
- Experiences from Mekong delta.
- Dutch commission with the 5 D's are useful ideas for planning.
- MOTA as well as if it can be practised in reality.
- The total environment: all participants and organizers are friendly, open and nice to work with.

B. What did you like the least about this training

- Some presenters do not follow the time rule thus overuse of time.
- There could be some preparatory materials, giving for example some overview and / or a report on the previous workshop.
- Presentation including a wider perspective, not a concrete one.
- A bit too long.
- Meeting room.
- No cultural evening.
- Heavy on power points.
- Could not always follow trend of workshop (random presentations).
- The per diem was not attractive.
- Long presentations.
- The location is too far and I would like to enjoy the country also.
- Theory of delta planning and delta management.

C. What did you find most difficult?

- Salinity intrusion problem.
- Language of different participants.
- Why planning does not work in many cases.
- Time preserving.
- Uncertainty and flexibility.
- MOTA.
- Go for a long distance every day.
- To spell out the planning process.
- Drawing road map should take more time.
- The presentation on back casting.

D. Was there anything you found missing in this training which you believe should have been included?

- I feel that we missed decision makers from different country who are involved in designing delta plans. If we hear the perspectives from decision makers, we may see the complexity of delta planning. We really missed the role of decision makers in this conference.
- I hope, next time in Bangladesh, the organizer should arrange a fieldtrip to see the reality in the delta. This makes participants relax and have more understanding about the new region.
- A visit to the Delta in Myanmar for this course would have been good.
- Visit Some special places as alternatives for delta development plans.
- A free day in between the training period.
- Limited scope of participant's field of expertise.
- Lessons learned from a successful plan: starting point – planning – implementation – results.
- Regional cooperation between riparian countries.
- Should include at least one day field trip to visit the delta.
- Maybe a video or two.
- Guest lectures.
- For each session need more clearly on what KAP are being developed.
- A field exercise with real stakeholders to get to know the ground situation of water management in Myanmar.
- Some resource persons related to the delta plan of Myanmar could be invited to the course.
- Participation of political / administrative people would be good.
- Linkage between the themes.
- More knowledge sharing from other delta in the world.

E. Any other comments or suggestions to improve the training.

- I hope, next time in Bangladesh, the organizer will arrange a fieldtrip to see the reality in the delta. This makes participants relax and provides more understanding about the new region.
- More field trips need to be included to the training; especially a visit to the Delta in Myanmar for this course was expected.
- More site-seeing tours.
- More experiences from other country plans.
- More exercises and examples of deltas.
- Stakeholders from other disciplines could be useful.
- Would like to be connected to water institute in the Netherlands and develop further cooperation.
- I would like to learn more.
- It is very perfect to learn so much in a few days.
- Animation film of socio-physical and water management processes may improve the quality of the training.
- Instead of group work followed by ppp, find other innovative ways of presenting findings.
- More energizers.
- Find ways to get those who are quiet, to participate.
- Provide tea and coffee in the room.
- Suggest pre reading before workshop as well as more interaction with participants prior to workshop.
- To add cultural evening.
- More exercises concerning delta management.
- More exercises, particular individual exercises.
- Seminar should be compressed into 3 – 3.5 days.
- Field trip to delta area.
- Observations on the real situation in the field.
- Posters replacing some talks.

2. Overall Assessment

	Results (1 Very bad; 5 Very good)
Q10: Please mark your overall assessment of the quality of this training	4.48 / 21

3. Logistics

	Results (1 Bad; 5 Excellent)
Q11: The internal organization and logistical support has been:	4.38 / 21
Q12: The accommodation has been:	4.24 / 21

Comments

- Nice to be there, meet all of you and be with all of you together.
- This kind of workshop should be organized regularly among Asian Deltas and Netherland Deltas to share our challenges, opportunities and solutions. We missed the decision makers who actually are involved in delta planning in the country.
- Other deltas in Malaysia, Cambodia, Thailand should be involved in the next workshop.
- A number of logistics should be improved, e.g. programme announcement, distributing workshop materials in advance.
- Limited information about workshop in advance, limited timing.
- Next time organize the workshop in Indonesia for transportation reasons.
- This is a very nice, innovative lesson learning workshop, the process should be continued.
- The overall performance of logistics, support and hospitality of the organizers is really excellent.
- Thanks for everything.
- The training programme, experts, hotel accommodation, food and hospitality was excellent. I would like to thank you for all.
- Very nicely organised workshop.

The course in general				5	4	3	2	1	Total number			Average
				<i>Strongly agree</i>	<i>Agree</i>	<i>Neutral</i>	<i>Disagree</i>	<i>Strongly disagree</i>				
		Q1	Do you think the training workshop enabled you to achieve learning objectives as stated above	12	9	0	0	0		21		4,57
		Q2	The total available time is reasonable for the amount of material to be studied	2	13	4	2	0		21		3,71
		Q3	The balance between theory and practice (exercises/assignments) is right	1	13	6	1	0		21		3,67
		Q4	The training workshop is well supported by teaching tools, facilities & materials, such as lecture notes, handouts, etc.	6	6	5	4	0		21		3,67
		Q5	The material covered in the training workshop was mostly new for me	6	8	6	1	0		21		3,90
		Q6	The training workshop provided a useful contribution to the specific requirements of my job	7	10	4	0	0		21		4,14
		Q7	The training workshop provided a useful contribution to my professional development	10	11	0	0	0		21		4,48
Working relations				<i>Stimulating</i>	<i>Cooperative</i>	<i>Neutral</i>	<i>Distant</i>	<i>Difficult</i>	Total number			Average
		Q8	The working relations with the trainers has been:	14	7	0	0	0		21		4,67
		Q9	The working relations between participants has been:	8	13	0	0	0		21		4,38
Overall assessment				<i>Very good</i>	<i>Good</i>	<i>Neutral</i>	<i>Not good</i>	<i>Very bad</i>	Total number			Average
		Q10	Please mark your overall assessment of the quality of this training	10	11	0	0	0		21		4,48
Logistics				<i>Excellent</i>	<i>Good</i>	<i>Reasonable</i>	<i>Poor</i>	<i>Bad</i>	Total number			Average
		Q11	The internal organization and logistical support has been:	13	3	5	0	0		21		4,38
		Q12	The accommodation has been:	10	6	5	0	0		21		4,24