

DP C 6.1: Delta Alliance electronic board room session

Chair	Rob Schoonman, Ministry of Housing, Spatial Planning and the Environment, the Netherlands
Organised by:	Deltares, the Netherlands
Presentations	Summary of major delta issues in the Dutch Wing Summary of major delta issues in the San Francisco Wing Summary of major delta issues in the Indonesian Wing Summary of major delta issues in the Vietnamese Wing Interactive 'Electronic Board Room session' by all participants, lead by moderator Wrap-up and discussion lead by the chairman

Welcome (Chair)

Why is the Delta Alliance established?

- Delta's worldwide are facing serious challenges
- Delta's have similar problems (fragmented information)
- Speaking with a united voice (more support)
- International network (share and develop knowledge)

The Alliance network consists: across wings, across disciplines, across sectors.

Announcement of report 'Comparative overview of Delta's' (final published in November). The report gives an overview on delta development, management and governance, combining the DPSIR approach (drivers, pressures, state, impact, responds) with the 3-layer spatial planning model (base, network and occupation layers).

Objective session: (1) exchange knowledge and (2) stimulating collaborative (research) projects.

*Part 1: Brief presentations of draft Delta descriptions
(delta issues, research gaps, needs for knowledge exchange)*

1. Rhine-Meuse (Dutch Wing coordinator Cees vd Guchte)
 - Drivers of change: Stable population, economic activity, technology
Natural drivers: sea level rise, subsidence
 - Approach: Base layer, network layer, occupation layer
 - Pressure (occupation layer): not enough space, vulnerability of flooding, shortage fresh water
 - Government issues: governmental cooperation, public-private partnerships, involving stakeholders, risk-approach
 - **Knowledge gaps:** Spatial planning, efficient water use, use of natural processes, morphological and ecological changes. **From governance perspective:** dealing with uncertainties, cost of water treatment, responsibilities in management, financial arrangements.
2. Ganges-Brahmaputra (Asif Mohammed Zaman)
 - Drivers of change: high population density, sea level rise (east coast already rising)
 - Pressures: land water use (critical flow conditions in rivers), ageing infrastructure, natural resources (erosion, biodiversity, salinity, cyclones and storms).
 - Governance: highly centralized, ppp's increasing, dealing with risks and uncertainties (flood forecasting and cyclone warning)
 - Lessons learned: adverse climate change impact already being experienced, delta people have indigenous coping measures
 - Challenge for Delta management: monitor system, variation in salinity, spatial planning, adapting infrastructure
 - **Gaps:** cheaper methods for portable drink water, research on (soil) salinity, salinity tolerant crops for food production, monitoring system
3. Mekong Delta (Vietnamese Wing coordinator Le Quang Minh)
Population and area similar with NL, but economy grows very fast.

- Drivers of change: Population growth (pressure on food demand and land use), urbanization, industrialization
 - ➔ Upstream development and sea level rise as external pressures on Delta
- Pressures:
 - Base layer: floods (floods do benefit farmers, natural fertility), saline water intrusion, extreme events
 - Network layer: water control projects, changes land-use
 - Occupation layer: increase agriculture activity, de- and reforestation
- Government: lack of regional collaboration, no common strategies and master plans, lack mechanisms from central government to avoid conflicts in policy implementation, lack capacity provinces, weak ppp.
- Challenge: poverty reduction and environmental protection

4. California Bay (California Wing coordinator Peter Wijsman)

Precipitation mainly in the North and fresh water demand in the South (infrastructure solution)

- System vulnerabilities: fishing declines, subsidence (due to agriculture), catastrophic events, climate change. Snow into rainfall needs additional reservoirs.
- New housing has taken place in Delta bay and is not high above sea level
- Leadership role: climate change is taken very seriously (governer)
- Alliance California with NL on climate change and adaption

5. Ciliwung Delta (Indonesian Wing coordinator Jan Sopaheluwakan)

- Drivers of change: population and urbanization, economic growth, climate change (intensity raining season), sea level rise, subsidence (ground water extraction), technological developments (contributes economy)
- Pressures:
 - Occupation layer: out-of-control urbanization, flood vulnerability, fresh water Shortage (requires management)
 - Network layer: ageing and inadequate infrastructure
 - Base layer: water quality (salinization)
- Governance: centralization to decentralization, lack of coordination and cooperation between level and sectors of government, increasing cooperation between government and private sector, apply risk assessment, cooperation civil society at local level.
- **Gaps:** Downscale climate change scenarios (make operational), socio-economic development projections, scenario based risk assessment, ecosystem based planning, data sharing, communication government.

6. Mississippi Delta (Anthony Fontenot)

- Technological development: infrastructure developed after earlier floods, engineering landscape
- Man-made changes: effect on floods and storms, city at risk, natural habitat Alterations increased salt water intrusion, wetlands are disappearing
- How to deal with this?: Projects to transfer water from river to wetlands
 - Delta building dynamics (engineering)
 - Complex system (natural and man-made)
- Economic development: agriculture, port, recreation/tourism, gas and oil industry
 - ➔ Side effect oil industry (making canals is danger for wetlands)
- Drivers of change: Climate change: Sea level rise, hurricanes (rising sea temperature) Subsidence (extraction gas and oil, channelization of the river)
- Governance: coastal wetland planning
- Lessons learned: River is vast natural asset, natural dynamic river
- **Research gap:** Soft infrastructure (flexible, dynamic, adaptive), fresh water diversions and sediment related infrastructure, effects on population and economy, database for future planning.

7. Yangtze Delta (Wenwei Ren)

- Drivers of change: GDP, climate change, subsidence (groundwater extraction)
- Pressure:
 - Occupation layer: pressure on space (urbanization, reclamation), fresh water shortage
 - Network layer: infrastructure
 - Base layer: sediment loss and serious erosion (loss of biodiversity and environmental quality)

- Governance: lack of platform for stakeholders (WWF initiated platform Estuary Partnership)
- Adaptive measures: vulnerability report, natural solution water resource, natural solution biodiversity restoration, natural solution for navigation development, low carbon city
- Lessons learned: (1) knowledge gap between ecologists and engineers
 - environmental awareness of engineers is low, do not have knowledge
 - ecologists want to bring solutions to engineers
- (2) Integrated River Basin Management
 - conscious but not able how to manage

Conclusions

Each Delta has given a good comprehensive overview of the problems and challenges the Delta's are coping with. The presentations were focusing on delta issues, research gaps and knowledge exchange challenges. Each presentation was structured along the approach taken in the study "Comparative Overview of Deltas", combining the DPSIR framework (drivers, pressures, state, impact, and response) with the 3-layer spatial planning model (base, network and occupation layer). Using the same structure for all 7 deltas appeared to be a step forward in jointly exploring and identifying common themes of interest, taking into account the respective national socio-economic and cultural contexts.

Evidently, all deltas are facing similar drivers of change, like demographic developments, ever increasing urbanization, economic activities and envisaged impacts of climate change.

Common themes of concern in all deltas are sea level rise, floods and droughts, salinization, fresh water shortages, subsidence and infrastructure problems, be it with varying magnitudes and accents. But there are also clear differences, like the beneficial flooding for farmers in Vietnam, or concerns for landslides in western USA.

The speakers, and also the subsequent "Electronic Board Room" session, highlighted the need and mutual interest for exchanging knowledge and experiences in adaptive approaches addressing the themes mentioned above. Innovative and surely integrated multi-sector and multi-stakeholder approaches are favored. Lack of capacities, various governance issues and insufficient financing options were regularly indicated as bottlenecks for successful implementation of existing (incl. indigenous) knowledge.

Some of the suggestions made on remaining challenges included:

- taking the leadership role in adaptation processes by local/regional government, like the California State Governor did;
- champions and/or celebrities may be instrumental in reaching out to the public;
- establish long-term adaptation programming adopted through parliaments, as to overcome the short-term life span of many politicians (ref. Dutch Delta programme)
- provide guidance and transparent communications on risk perception, dealing with uncertainties, and stepwise approaches in adaptive water management (not too little, not too much; not too early, not too late) at various levels of scale and time
- link national water management adaptation programming to major global agenda's where the use of water is an important factor, such as Disaster Risk Reduction, Food Security, Energy
- provide local solutions: think globally, act locally

Issues mentioned (much more than summarized above) were prioritized during the electronic board room session, which will be elaborated further during a working session coming Friday, October 1st.

Next to further improve the comparative overview, it is envisaged this joint exercise will provide a common ground for selecting thematic issues to be included in the workprogramme (knowledge exchange, defining joint projects, etc) for the 3rd phase of the Delta Alliance. The outcome may also be instrumental in structuring the web-based Delta Alliance platform.

Part2: First output listing of the EBR session on Delta issues

1. Drivers of change

1. Population growth
2. Economic development
3. Climate change
4. Subsidence
5. Technical development
7. Economic development
8. society's valuation of the importance of habitats
9. rapid urbanisation
10. Urbanisation (2025 75% world pop)
11. Food security / importance of agriculture
12. population growth
13. economic development
14. climate change
15. transboundary / international issues
16. Political trends
17. focus on metropolitan agriculture
18. knowledge development
19. Water demand
20. upstream infrastructure
21. erosion and sedimentation pressures
22. ignorance on delta characteristics
23. sediment trapping behind dams
24. water flow
25. Political trends
26. disasters!!!!
27. UN agenda's like Disaster Risk Reduction
28. technology development
29. coastal processes
30. loss of biodiversity natural systems
31. disasters
32. industrialization
33. land building processes
34. sea level rise
35. environmental mentality
36. deforestation
37. loss of mangrove forest
38. freshwater demand for agriculture
39. events..!
40. maritime issues (BP oil spill)
41. lack of total river basin management
42. Rotterdam 2010 Conference
43. land-use conflicts
44. infrastructure for safety

Research gaps Drivers of change

1. limited data availability
2. Insufficient knowledge on processes
3. Great uncertainty
4. risk assessment and ecosystem valuation
5. Misunderstanding interests other stakeholders

6. nature and extent of subsidence
7. collaboration of the countries along the river
8. ecosystem services
9. Ability to communicate message to population
10. lack of evidence if ecosystem based approaches work
11. ways of dealing with uncertainty (next step from understanding uncertainty itself)
12. downscaling of climate predictions
13. cross boundary cooperation
14. relationship between man-made and natural processes
15. integrated development of responses
16. Lack of felt responsibility
17. adaptation roadmap
18. value of ecosystem services
19. future food security issues
20. socio-economic projections
21. insufficient funding
22. development of tools for assessment of impacts
23. environmental sound and comprehensive plan for delta development
24. value of bio-diverse environments
25. integrating coastal management with land use planning
26. impact of agriculture on spatial planning delta's and possible solutions
27. guidance on how to act
28. Uncertainties about future trends
29. resource accounting
30. links between upstream infrastructure and needs of estuarine ecosystems
31. scenario development
32. drought resistance rice variety
33. urbanisation trends
34. lack of practical knowledge combined engineering and ecological conservation
35. economic incentives to develop with dynamic natural systems
36. pace of re-forestation vs. de-forestation².

Pressures

A. Natural resources (Base layer)

1. Freshwater shortage
2. Salinity intrusion
3. Water pollution
4. Flood hazard
5. Coastal / fluvial erosion
6. Loss of biodiversity and wetlands
7. Sediment supply
8. Mobility of delta distributaries
9. water supply
10. invasive species
11. quantified benefit of natural systems
12. fish stock depletion

- 14. marine water quality
- 15. food chain
- 16. decline in biodiversity
- 18. flood
- 22. land reclamation
- 23. disappearance natural species
- 24. lack of value for biodiversity
- 25. soil and water pollution
- 29. wetland reclamation
- 30. water scarcity
- 31. subsidence
- 32. Open and semi open systems of aquaculture
- 33. ground water extraction
- 34. soil and water pollution
- 35. over harvest

Should be better placed elsewhere:

To Occupation layer:

- 13. poverty
- 17. Urbanization
- 19. flood vulnerability
- 20. opportunistic agri/aquaculture practices
- 26. pressure on space
- 27. rising land prices
- 28. overflow of recreation

To Network layer:

- 21. storm surge barriers

Research gaps Natural resources (Base layer)

- 1. Methods for downscaling
- 2. rate of erosion
- 3. measures for coastline protection
- 4. mangrove protection
- 5. response of coastal processes to climate change
- 6. improving flood forecasting
- 7. improving storm surge prediction
- 8. Decision Support system
- 9. integrated ground water management
- 10. sediment supply
- 11. lack of (mechanistic) knowledge
- 12. data base system
- 13. response of biodiversity to coastal change
- 14. policy conflicting
- 15. bank erosion prediction
- 16. how to restore fish habitat
- 17. relation between upstream infrastructure and sediment supply
- 18. coordinated efforts
- 19. ecosystem based planning
- 20. cyclone forecasting and tracking
- 21. interoperability data base system
- 22. sediment transport processes
- 23. role groundwater
- 24. sufficient funding
- 25. how to move sediment

- 26. methods to restore sedimentary processes
- 27. innovative smart levees
- 28. economic value of wetland
- 29. impact of climate change on storminess and waves
- 30. similarity of interests
- 31. early warning systems for floods, droughts, land slides, ...
- 32. lack of knowledge of ecosystem values
- 33. multi ensemble scenario data
- 34. alternative systems of closed aquaculture and land independent agriculture
- 35. economic values of mangroves
- 36. how to prioritize complex natural systems
- 37. balance resource use and preservation
- 38. fast wetland restoration method
- 39. ways to explain natural; uncertainty to the public
- 40. stepwise approaches, building blocks
- 41. tipping points analyses
- 42. wetland restoration
- 43. spatial planning incorporating climate change
- 44. environmental service valuation
- 45. design and restoration of natural ecosystems
- 46. green adaptation
- 47. integrated approach
- 48. optimising new aquaculture

B. Infrastructure (network layer)

- 1. Flood protection system
- 2. Irrigation and drainage
- 3. Water supply & sanitation
- 4. Roads, railways & ports
- 5. ageing infrastructure
- 7. telecommunication system
- 8. gas and oil extraction
- 9. navigation use
- 10. living infrastructure
- 11. erosion risk management
- 13. inadequate infrastructure
- 14. local management of existing infrastructures
- 15. water supply infrastructure
- 16. port
- 17. flood defense infrastructure
- 18. link delta with upstream infrastructure
- 19. adaptive infrastructure
- 20. flexible infrastructure
- 21. navigation channel
- 23. poor maintenance
- 24. saline intrusion control projects
- 25. infrastructure enhancing natural values
- 27. eco friendly technical water infrastructures

Should be better placed elsewhere:

To Occupation Layer:

6. industrial zones

To governance:

- 12. communication different stakeholders
- 22. public relations

To Drivers:

- 26. climate change impacts

Research gaps Infrastructure (network layer)

1. Conflicts of water- and land uses
2. asset deterioration
3. link delta with upstream infrastructure
4. whole life asset management
5. political debates
6. hydromet monitoring system
7. ecosystem infrastructure planning
8. impact of maintenance regimes on asset performance & life
9. ecosystem based spatial planning
10. climate proofing existing infrastructure
11. improved O&M system
12. defining ecosystem based vs non-ecosystem based infrastructure
13. maximize use of available infrastructure though minimizing impact
14. response of coastal defences to foreshore changes
15. toolbox participative development multi functional infrastructures
16. integrating spatial planning and new constructions
17. financing of infrastructure projects
18. viability of eco-systems approach
19. e-flows requirements for infrastructure
20. designing assets for limited life
21. climate proofing existing infrastructure
22. knowledge on multistakeholder processes
23. multi scenario based risk assessment, environmental and social
24. natural processes around the infrastructure
25. ecosystem sound design, operation and maintenance
26. review of infrastructure design guidelines wrt climate change
27. integrated and interactive spatial planning
28. regional self sufficiency
29. stakeholder communication about dealing with uncertainty
30. effects 'green adaptation' infrastructure in practice
31. innovative financing methods
32. practical solution for integrated River Basin Management
33. long-term approach to eco-planning
34. innovative designs of safety against flooding

35. water robust building

36. beneficiary funding arrangements

C. Land and water use (Occupation layer)

1. Pressure on space
2. Shift in land use / urbanisation
3. Water demand
4. Flood vulnerability
5. population density
6. agriculture vs intertidal habitats
7. population
8. coastal squeeze of habitats against hard defences
9. land reclamation of wetlands
10. pollution
11. No adequate spatial planning
12. contamination
13. conflicting demands
14. struggle over access
15. competing claims
16. food security
17. Reduction of agricultural land for urbanization
18. water supply
20. disconnected management of groundwater and surfacewater
21. traffic
22. blocking natural processes for freshwater storage
23. diversity interests
24. shifts in agricultural landuse
25. fresh water shortage
26. flood vulnerability
27. upstream practices/measures that have down stream impact
28. no enough wetland area as buffer zone for flood
29. room for water
30. water shortage
31. gas and oil extraction
34. shift of rurals to urban centers
35. conflicts of water resource utilization

From elsewhere

- 6. industrial zones

Should be better placed elsewhere:

To Drivers:

- 19. climate change

To Governance:

- 32. changing political views
- 33. localism as a political trend, preventing planning at catchment / delta scale

Research gaps Land and water use (Occupation layer)

1. *knowledge on multistakeholder processes*
2. *governance issues*
3. *rationale for living in a delta*
4. *ecosystem based spatial planning*
5. *public awareness*
6. *youth participation*
7. *up to date database system*
8. *new agriculture in the delta's fitting to urbanisation trend and multifunctional land use*
9. *link upstream developments and consequences for land and water*
10. *communication about risks*
11. *cultural motivations for behaviour of citizens*
12. *monitoring and data collection system*
13. *capacity building for provincial officials*
14. *valuing agriculture against uncertainty re. food security*
15. *water based fiscal system*
16. *integrated approach*
17. *centralization vs de-centralization of authority*
18. *indigenous knowledge*
19. *socio-economic development projections*
20. *evidence that green adaptations measures can reduce pressures*
21. *public awareness*
22. *coordinated data*
23. *process architecture of multi issue/ multi stakeholder processes-*
24. *erosion management*
25. *farmers' adaptation to market needs*
26. *linking to major agenda's and funds, e.g Adaptation, Disaster Risk Reduction, Food, Energy*
27. *effective land reclamation*
28. *awareness raising*
29. *economic value of habitats*
30. *affordable water supply*
31. *integrated spatial planning and flood defense infrastructure*
32. *conflict resolution*
33. *toolbox tackling competing claims in delta's*
34. *good urban planning with combination of landscape, wildlife habitat and economic development*
35. *stakeholder roles and responsibilities*
36. *champions*