Building a water management knowledge infrastructure for Myanmar – Ayeyarwady Delta
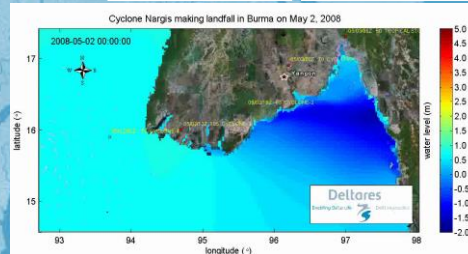
Tjitte Nauta

Deltares

Deltas in times of climate change II, Rotterdam (26 September 2014) – delta session on Myanmar

Content

- Stepwise approach
- The Ayeyarwady Delta
- Developing decision support tools
- Towards decision-making
- Conclusions and Recommendations

Stepwise approach

1. Various identification missions (a.o. Ministry of Infrastructure and Environment; Blue Moon Fund);
2. IWRM Data Inventory study to Support the Development of an Integrated Water Resources Management Strategy for Myanmar (Ministry of Infrastructure and Environment);
3. Ribasim development for major river basins in Myanmar as input into the strategic WRM study (Ministry of Infrastructure and Environment);
4. Comparative Assessment of the Vulnerability and Resilience (Delta Alliance / MmWP – GWP and FAO);
5. Sobek training (Nuffic);
6. Many valuable student contributions (4 students from the Technical University of Delft and 2 from Wageningen University).

Dutch partners: TU Delft (1,2,5 and 6); RHDHV (1,6); WUR (6) and Alterra (4)

Deltares
Enabling Delta Life

The Ayeyarwady Delta

DRIVERS	Main indicators	Values/comments
Demographic trends	Growth rate of the delta population	Estimated at1.52%
Economic developments	GDP/capita GDP av. Growth	$1,700 (2013) 6.8 %(2013)
Technological developments	Research and development Knowledge-intensive industry	Low Low
Climate change	Increase mean temperature change in 2050 Increase mean precipitation change in 2050 Increase in river peak discharge Sea level rise in 2050 Extreme events	+ 1.4 ℃. + 250 mm Unknown Approx. + 0.30m More cyclones, strong winds, flooding, drought.
Subsidence	Tectonic subsidence Human induced subsidence	No data available

The Ayeyarwady Delta

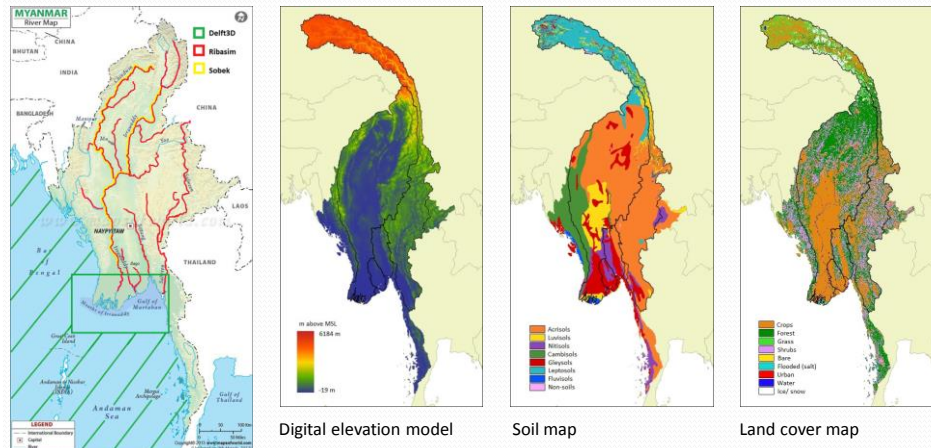| PRESSURES/ PROBLEMS	Main indicators	
Land and water use (occupation layer)	Population density Urbanization Fresh water demands Flood vulnerability	230 inhabitants/km^2 Increasing in and around Yangon High High
Network / infrastructure (network layer)	Flood protection standards Irrigation and Drainage Water supply and sanitation Road, railways and ports	Rivers: moderate. Coast: low Moderate condition Low Low
Natural resources (base layer)	Storm surges/cyclones Coastal/fluvial erosion Ecosystems health Biodiversity loss Water quality Freshwater shortage/salinity intrusion	Up to > 6m (Nargis) High Moderate Moderate (mangroves loss) Moderate Problem in lower delta

The Ayeyarwady Delta

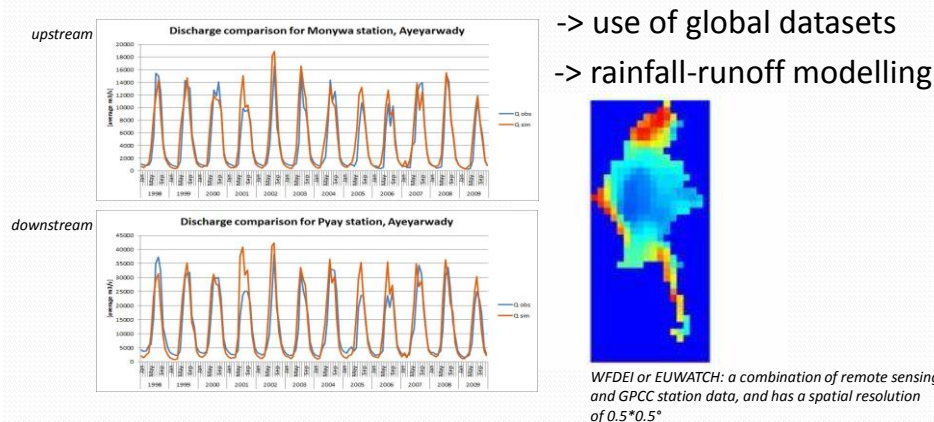| GOVERNANCE	Main indicators	
Multi-level and multi-sectorial cooperation	Existence of integrated plans Existence of multi sectorial/multilevel committees	No integrated plans. IWRM strategy in development NWRC (National Water Resources Committee)
Public-private partnerships	Number of PPPs Scale of PPPs (geographically/financially)	Low No information
Involvement of stakeholders and citizens	Existence of legal instruments for participation Number of NGOs involved	No information NGOs present, no information on their role
Approaches for dealing with risks and uncertainties	Existence of adaptive management (strategies) Existence of risk management and emergency systems	No Yes

NWRC
DWIR
ID
Rijkswaterstaat
Ministry of Infrastructure and the Environment

Developing decision support tools

- IWRM data collection study and RIBASIM modelling

Digital elevation model · Soil map · Land cover map

ID
Rijkswaterstaat
Ministry of Infrastructure and the Environment

Developing decision support tools

- Lack of reliable and area covering hydrometeorological data

-> use of global datasets
-> rainfall-runoff modelling

upstream

downstream

*WFDEI or EUWATCH: a combination of remote sensing and GPCC station data, and has a spatial resolution of 0.5*0.5°*

Developing decision support tools

Joint inventory and analysis of all (hydropower) dams and irrigation areas and assessment of current water demand (domestic, industrial, agricultural).
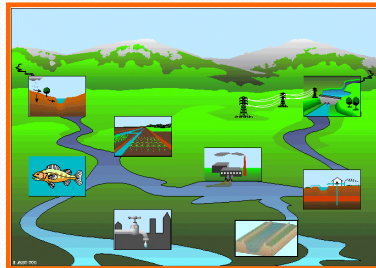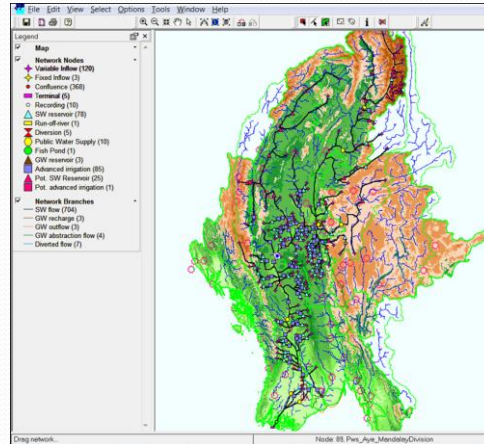

Infrastructure:
- 120 Sub-catchments
- 103 Dams: 78 existing and 25 under-construction
- 1 Run-of-river hydro-power stations
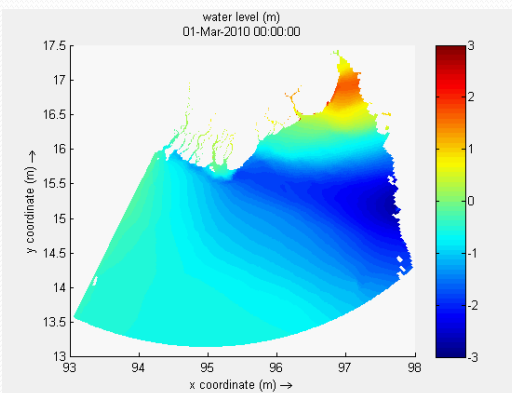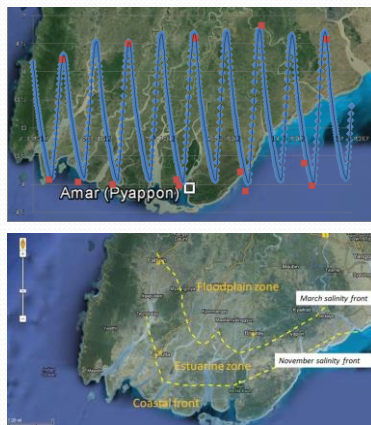- 10 Recording stations
- 3 Aquifers

Users and losses:
- 86 Irrigation areas: 85 existing and 1 potential
- 10 large Domestic, Municipal and Industrial water uses
- 3 aquaculture (fish ponds)

Developing decision support tools

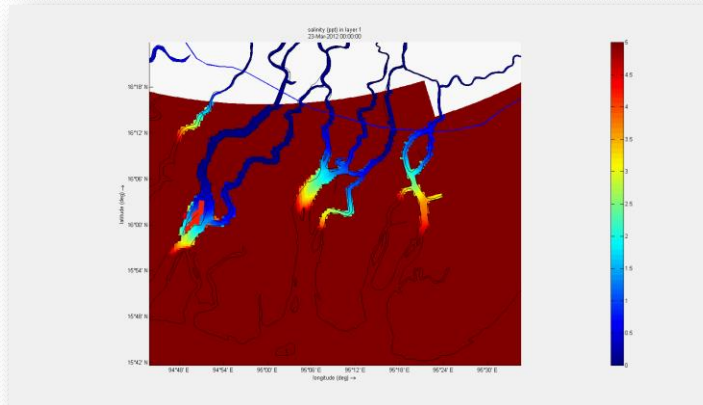Using scarce field data (tidal data, bathymetry, river discharges, salinity intrusion, etc.)

Developing decision support tools

Using scarce field data (tidal data, bathymetry, river discharges, salinity intrusion, etc.)

*Salinity intrusion*

Towards decision-making

Key issues in the delta:

- Salinity intrusion
- Lack of infrastructure and asset management
- Mangroves and delta degradation
- Adverse water quality / environmental degradation
- Public health problems
- Flooding / lack of drainage
- Livelihood limitations
- Lack of knowledge and innovation

Nay Pyi Taw, June 2014

Towards decision-making

Stakeholders analysis through a.o. pairwise comparison method

Towards decision-making
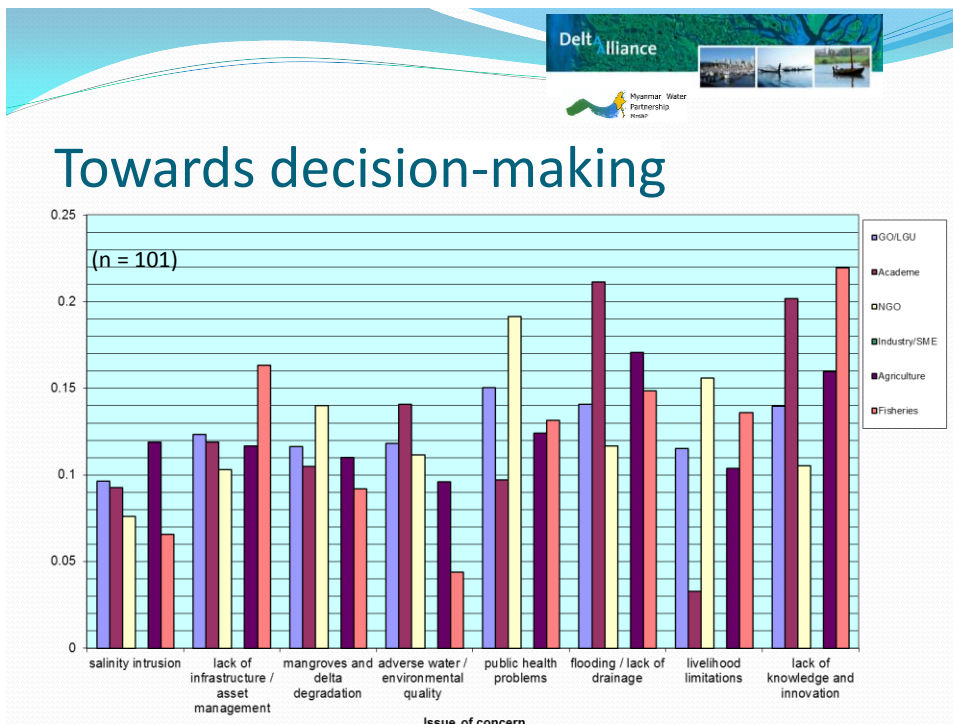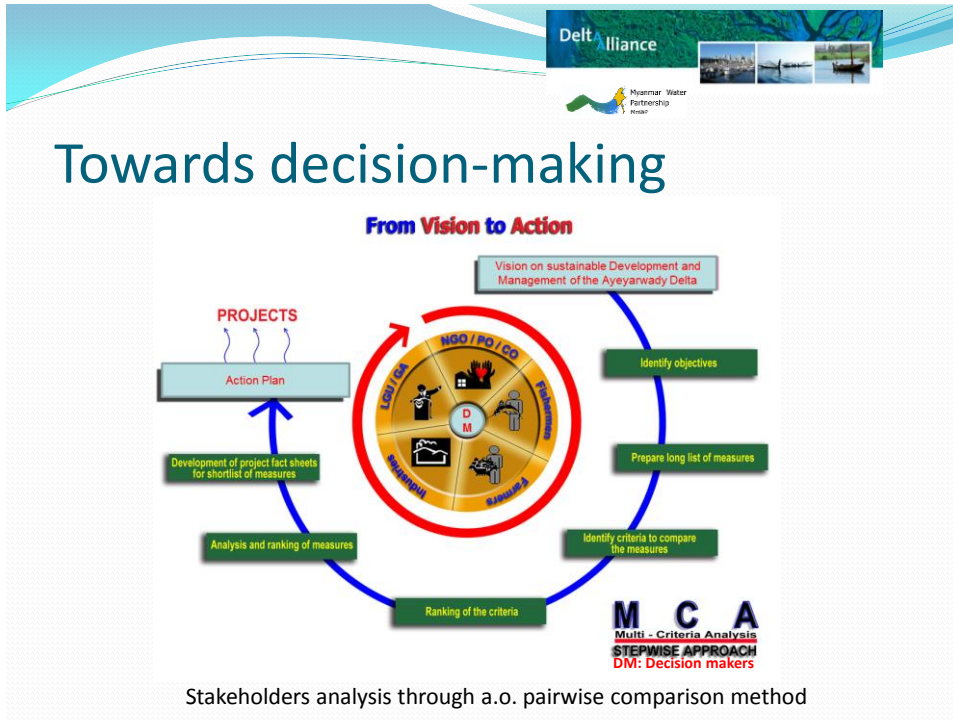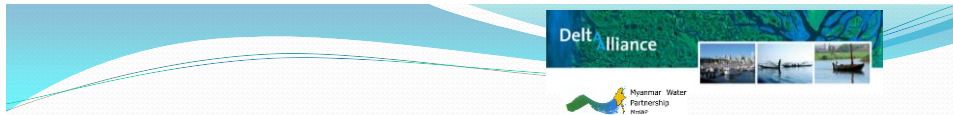
Towards decision-making

- Measures proposed need to address the issues, the costs, the side-effects, the implementability and need to be integrated and optimized (strategy development).
- Adaptive planning (dealing with future uncertainties such as climate change, SLR, demographics, socio-economics) is very important for the Ayeyarwady Delta.
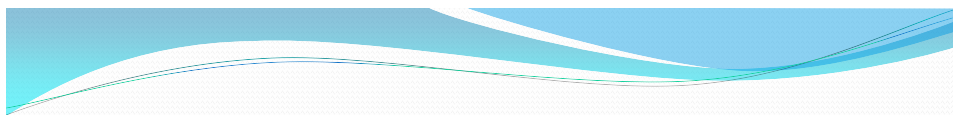
Conclusions and recommendations

- Leapfrogging to latest technology is the way to go.
- Tool development is quite promising and very helpful in better understanding the water system and its uses, and in addressing the effect of measures, strategies and scenarios.
- Good monitoring programmes need to be set up asap and data should be shared.
- The participatory approach (and stakeholders involvements) is much appreciated and very supportive to the identification and future ownership of projects.
- Capacity building is crucial and needs urgent attention.

Thank you for your attention