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GREEN WATER DEFENSE

A Perspective on Water Security at Deltas (International Water Week)

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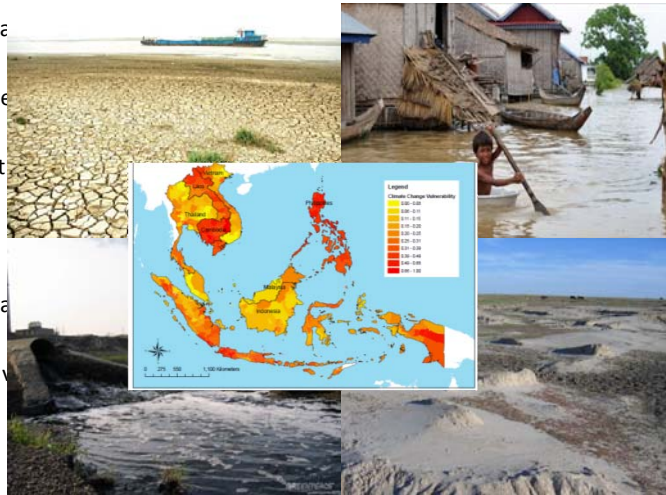
Overview

- ☐ **Why GREEN Water Defense?**
- ☐ **GREEN Water Defense Defined**
- ☐ **GWD Architecture & Spatial Model**
- ☐ **GWD Conceptual Framework**
- ☐ **Examples of GWD in Action**
- ☐ **Key Lessons Learnt**
- ☐ **Main Conclusions**

Why Green Water Defense?

- an endeavor to find a 'green' approach to water management

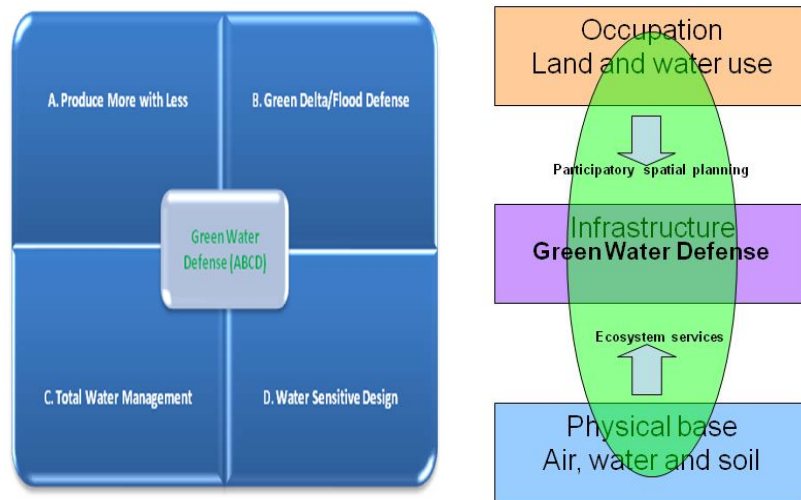
- Water availability & quality
- Overdraft & competition
- Flood and drought
- Water pollution
- Ecosystem degradation
- Climate change & variability
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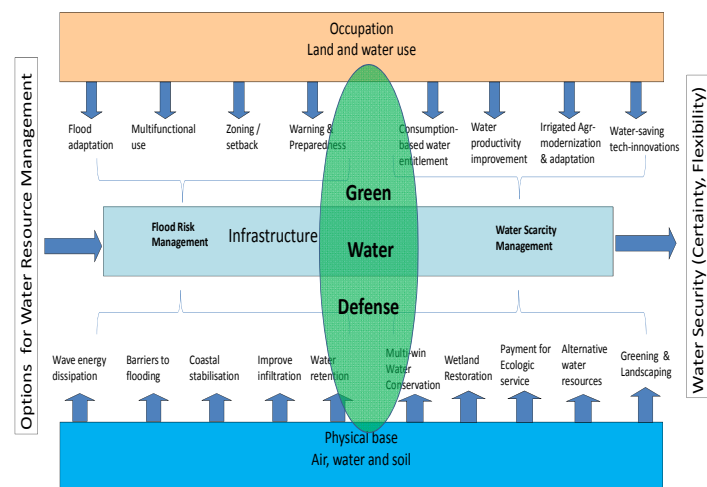
GREEN Water Defense Defined

- ❖ GREEN Water Defense is an adaptive management philosophy and approach which seek to **spatially integrate** natural forces and human interventions, and to balance incentive-based and supply-driven measures, with minimum footprint and externality in **sustainably providing water services and managing related climate risks**.
- ❖ It builds on some existing and emerging concepts & approaches:
 - ✓ Integrated water resources & environment management (IWREM)
 - ✓ Productivity-based agricultural water management
 - ✓ Green Adaptation and Low impact development (LID)
 - ✓ Live with Nature and Build with Nature
 - ✓ Water-sensitive design and Ecodynamic design

GWD Architecture & Spatial Model



GWD Concept Framework



GWD in Action (1)

BP1. Green Water Defense makes Dutch flood defense millions of Euros cheaper

A recent inventory for the Dutch Delta Program revealed that flood defenses could lead to substantial savings in the order of tens of millions of Euros. Natural solutions use 'soft' materials like soil, sand, clay and vegetation to reduce the load on the defense system. Furthermore, with the areas under consideration, the main issue is the deployment of foreshore elements such as (salt) marshes, sand flats, sand bars and tidal areas. An important aspect of these natural solutions is the use of natural processes and sedimentation, as well as the development of vegetation. These are deployed when and where possible in various project phases – construction, management and maintenance. There are clear advantages of this "building with nature" concept. Moreover, natural sea defenses are better able to cope with changes in the system, such as rising sea levels.

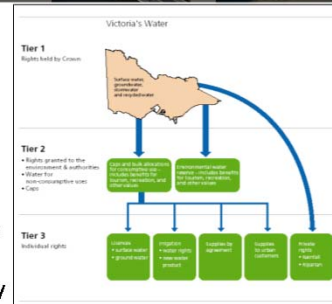


GWD in Action (2)

BP2. Water Scarcity Management - Australia

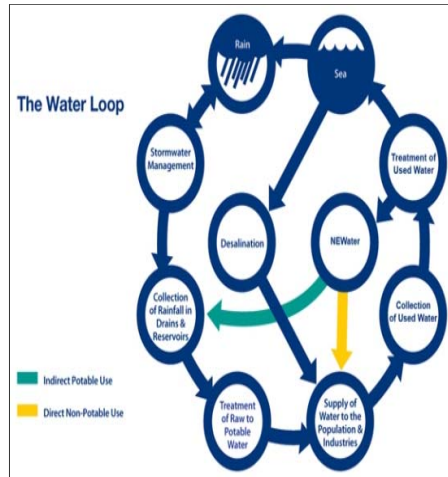
Overall approaches/measures for GWD

- Integrated River Basin Management
 - a. Policy/institutional reform favoring sustainable development
 - b. Establishing an effective water entitlement and water right trading system
- Productivity-based Demand Management
 - a. Modernization of irrigation system
 - b. Improving on-farm water use efficiency
 - c. Managing the impact of irrigation



GWD in Action(3)

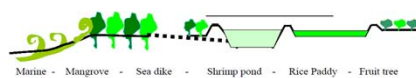
BP3. Total Water Management in Singapore



GWD in Action (4)

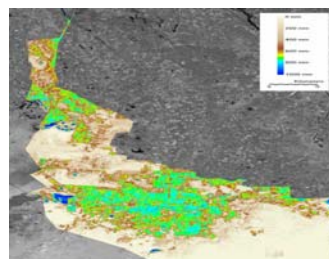
BP4. GREEN Water Defense in the Mekong Delta

- ✓Live with Floods
- ✓Mangrove Restoration
- ✓'Green' Dikes with vetiver grass
- ✓Combined shrimp-rice-fruit farming
- ✓Melaleuca forest for soil improvement
- ✓ Multiple-functional Canal System



GWD in Action (5)

- Stringent Water Management & W-E Society
- **ET/Consumptive water use mgt approach**
- Water Allocation & Use Right
- **Multiple-win agr. water conservation**
- Institutional reform (WSC/WUA)
- Gov. Regulation and Market mechanisms



Key Lessons Learnt

- It is possible to achieve water & food security and environmental sustainability at the same time through GWD;
- Sustainable water management benefits enormously from a water-sensitive culture and efficient society;
- GWD calls for a spatial approach in tackling inter-connected development issues (e.g. water and food security, climate risk management and environmental sustainability), and it is a cost-effective approach owing to its multiple-win focus and multiple benefit results;
- A participatory approach to WRM through multi-stakeholder governance mechanism is indispensable ;
- Successful GWD requires a portfolio of measures: shared knowledge, clear and strategy, a strong legal framework and institutional mechanisms, incentive policies & instruments, technological innovations, and targeted investment programs;
- ‘Living with nature’ and adaptation are the fundamental principles for flood risk management
- Consumption (ET)-based water productivity improvement is at the core of adaptive water management, especially in physically water-stressed areas;
- Effective water management calls for establishment of a clearly defined and transparent water allocation and entitlement/rights system. Water right trading is very effective in reallocating water to high value use and thus in increasing water productivity;
- Agricultural water use has a large potential in water consumption reduction through a comprehensive package of water-saving measures. Multi-win agricultural water conservation practices giving priority to farmer incentives can increase farm incomes and reduce water consumption;
- Through addressing the water usage-energy efficiency linkage, water service providers can minimize environmental impact and reduce running costs;
- Virtual water trade cross countries or regions, as demonstrated by the Spanish case, can be an effective strategy for physically water-scarce regions in reducing agricultural water consumption and addressing water shortage issue at the country or local levels;
- Effective water management requires both demand- and supply side management measures.

Main Conclusions

- GWD approach is **adaptive, balanced, cost effective and sustainable**, and requires a **major paradigm shift**; it is a **promising solution** to 'green growth' issues in the water sector;
- Adaptive water management requires '**living and building with nature**' and **maximizing water productivity**;
- GWD approach calls for a **climate-resilient and water-efficient society**; **balanced demand side & supply-driven, structural & non-structural interventions**;
- GWD endorses **multi-stakeholder engagement**, and **integrated spatial planning and management**;
- Water must be **managed in its totality** as a multi-functional resource, a service and a risk factor;
- GWD favours **right-based and productivity focused** water management toward **multi-functions and multiple win results**; and
- **Well-conceived incentive policies and locally-tailored market mechanisms** are essential to behaviour change in water use and management.

Further Reading

