Context Setting of Strategy Paper on Water Sector – an economic sector by 2040

Transformation for 12th Malaysia Plan: Aligning to the Global Context

Salmah Zakaria, FASc
Akademi Sains Malaysia

Sounding the Alarm

World Economic Forum, Davos, Switzerland - Evolving Risks Landscape 2007-2019

Top 5 Global Risks in Terms of Likelihood

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1st	Breakdown of critical information infrastructure	Asset price collapse	Asset price collapse	Asset price collapse	Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity	Interstate conflict with regional consequences	Large-scale involuntary migration	Extreme weather events	Extreme weather events	Extreme weather events
2nd	Chronic disease in developed countries	Middle East instability	Slowing Chinese economy (<6%)	Slowing Chinese economy (<6%)	Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events	Extreme weather events	Extreme weather events	Large-scale involuntary migration	Natural disasters	Failure of climate-change mitigation and adaptation
3rd	Oil price shock	Failed and failing states	Chronic disease	Chronic disease	Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment	Failure of national governance	Failure of climate-change mitigation and adaptation	Major natural disasters	Cyber-attacks	Natural disasters
4th	China economic hard landing	Oil and gas price spike	Global governance gaps	Fiscal crises	Biodiversity loss	Cyber-attacks	Water supply crises	Climate change	State collapse or crisis	Interstate conflict with regional consequences	Large-scale terrorist attacks	Data fraud or theft	Data fraud or theft
5th	Asset price collapse	Chronic disease, developed world	Retrenchment from globalization	Global governance gaps	Climate change	Water supply crises	Mismanagement of population	Cyber-attacks	High structural unemployment or underemployment	Major natural catastrophes	Massive incident of data fraud/theft	Failure of climate-change mitigation and adaptation	Cyber-attacks

Top 5 Global Risks in Terms of Impact

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1st	Asset price collapse	Asset price collapse	Asset price collapse	Asset price collapse	Fiscal crises	Major systemic financial failure	Major systemic financial failure	Fiscal crises	Water crises	Failure of climate-change mitigation and adaptation	Weapons of mass destruction	Weapons of mass destruction	Weapons of mass destruction
2nd	Retrenchment from globalization	Retrenchment from globalization (developed)	Retrenchment from globalization (developed)	Retrenchment from globalization (developed)	Climate change	Water supply crises	Water supply crises	Climate change	Rapid and massive spread of infectious diseases	Weapons of mass destruction	Extreme weather events	Extreme weather events	Failure of climate-change mitigation and adaptation
3rd	Interstate and civil wars	Slowing Chinese economy (<6%)	Oil and gas price spike	Oil price spikes	Geopolitical conflict	Food shortage crises	Chronic fiscal imbalances	Water crises	Weapons of mass destruction	Water crises	Water crises	Natural disasters	Extreme weather events
4th	Pandemics	Oil and gas price spike	Chronic disease	Chronic disease	Asset price collapse	Chronic fiscal imbalances	Diffusion of weapons of mass destruction	Unemployment and underemployment	Interstate conflict with regional consequences	Large-scale involuntary migration	Major natural disasters	Failure of climate-change mitigation and adaptation	Water crises
5th	Oil price shock	Pandemics	Fiscal crises	Fiscal crises	Extreme energy price volatility	Extreme volatility in energy and agriculture prices	Failure of climate-change mitigation and adaptation	Critical information infrastructure breakdown	Failure of climate-change mitigation and adaptation	Severe energy price shock	Failure of climate-change mitigation and adaptation	Water crises	Natural disasters

Economic Environmental Geopolitical Societal Technological

Source: World Economic Forum 2009–2019, Global Risks Reports.

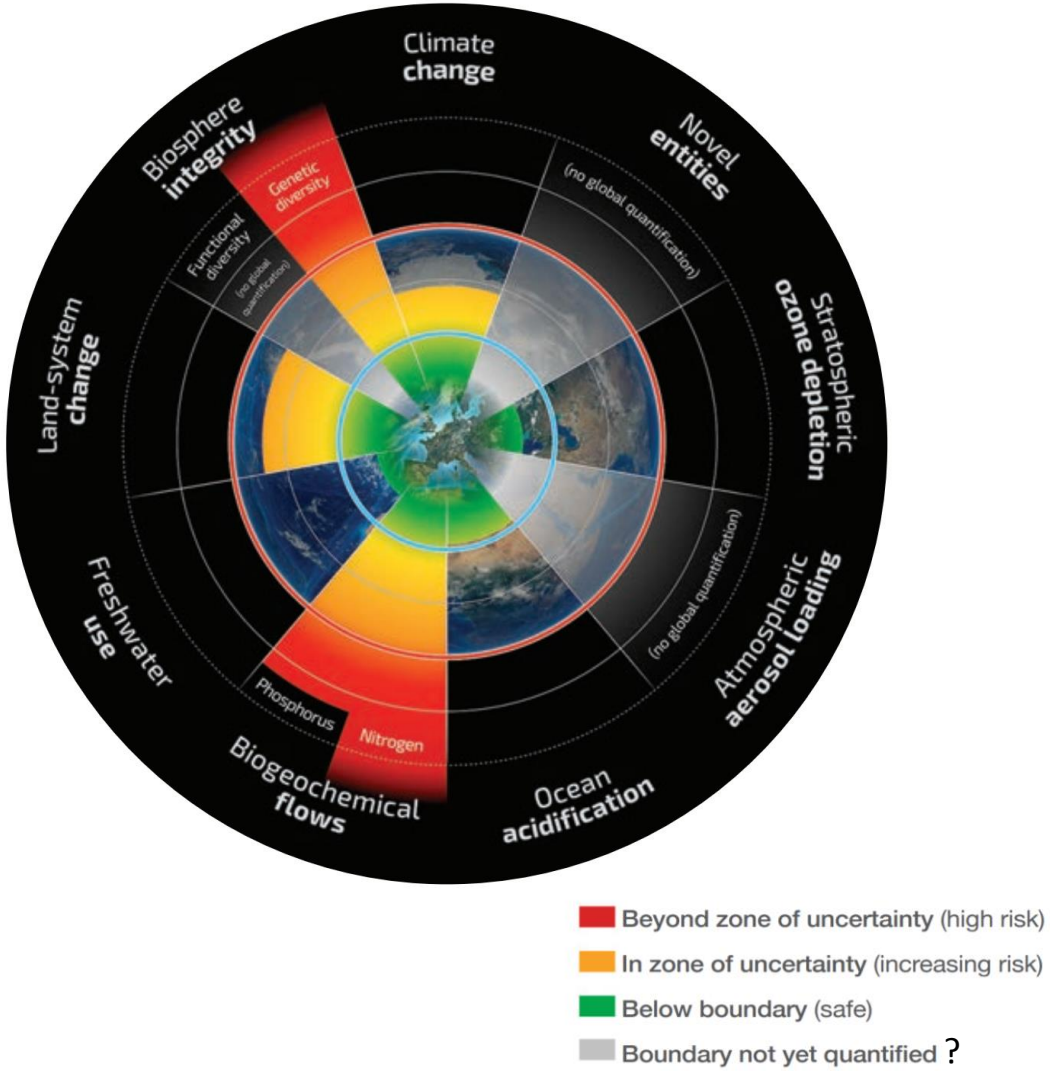
Note: Global risks may not be strictly comparable across years, as definitions and the set of global risks have evolved with new issues emerging on the 10-year horizon. For example, cyberattacks, income disparity and unemployment entered the s of global risks in 2012. Some global risks were reclassified: water crises and rising income disparity were re-categorized first as societal risks and then as a trend in the 2015 and 2016 *Global Risks Reports*, respectively.

Report 2019

8

file:///F:/WEF-Global%20Risk%20Reports/WEF_GRR19.pdf &http://www3.weforum.org/docs/WEF_Global_Risks_2015_Report15.pdf

Nine Planetary Boundaries



Adapted from: Steffen et al. 2015

1. Stratospheric ozone depletion (Safe)
2. Chemical pollution and the release of novel entities (?)
3. Climate Change (IR)
4. Loss of biosphere integrity (biodiversity loss and extinctions (HR/?)
5. Land system change (IR)
6. Freshwater consumption and the global hydrological cycle (Safe)
7. Nitrogen and phosphorus flows to the biosphere and oceans (HR)
8. Ocean acidification (Safe)
9. Atmospheric aerosol loading (?)

https://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html

Planetary Boundaries (PB)

PBs Key takeaways

- Transgression of the core boundaries at the same time drives more rapid deterioration and destabilisation of the Earth System
- PBs are interconnected; understanding the interactions between the PBs is important, particularly the core boundaries, climate change and biosphere integrity
- The two core PBs interact with all other seven PBs and can thus act as an overall integrator as well as a limiting factor for other PBs
- Action should be prioritised with an initial focus on the core boundaries
- Regenerative approaches offer solutions across the PBs

Business implications

- Transgressing the PBs will create business disruptions, including cost increases, resource scarcity and supply chain insecurity
- The PB framework offers an approach for companies to assess their impacts on the Earth System
- The PBs need to be made accessible for companies to use them practically at the scales within which they operate

https://www.cisl.cam.ac.uk/resources/publication-pdfs/linking-planetary-boundaries.pdf

From the Netherlands

Prof Pavel Kabat

Studied studied climate change for almost 20 years

Started in early 1990s

To understand the climate system you have to look at the land and land use too

- Initially climate change, focus on weather, atmosphere and the oceans
- Kabat and team conduct research both on basic aspects of the climate system – how the atmosphere functions and the interaction between land and land use – and on technologies to adapt to climate change
- Land and land use are essential to understanding how the climate system works.
- "….carbon is to a large extent captured on land; tropical forests, for example, play an important role in this.
- …… carbon emissions are also mostly produced on land.

Rethinking Environmental Management

- IWRM – not moving fast enough?
- Green Economy – South Korea
- Water Security
- Water-Food-Energy Nexus – Europe
- Circular Economy
- Zero Waste Management
- More and continuous …. ???

Tracing IWRM Development

Tracing IWRM Development – Global to Malaysia

- 1977 - UN Conference on Water, Mar del Plata
  - first internationally coordinated approach to IWRM
- 1992 - International Conference on Water and Environment, Dubl
  - meeting of experts - 4 principles
- 1992 - UNCED Rio de Janeiro -*Chapter eighteen of Agenda 21*
- ***2001 – EPU - Malaysia Plan Policy, 2001-05 – Para 1.09 (details in 1.43-1.45)***
  - ***...integrated and holistic approach in addressing environmental and resource issues ..***
- ***2003 – MSAN Approval for River Basin Master Plans in all our river basins***
- 2012 - United Nations Conference on Sustainable Development, Rio+20
  - The Future We Want
- 2015 - UNGA, New York
  - 17 SDGs, Water and Sanitation – SDG 6
- ***2016 - ASM -Transforming the water sector: National IWRM Plan***
  - ***Strategies and Road Map***
- ***2019 -Proposed: MEA -Transforming the water sector in Malaysia in 4 MPs – 2021-2040***

UNCED 1992: Agenda 21 – Chap 18, Para 18.6

- The holistic management of freshwater as a ***finite and vulnerable resource***, and the ***integration of sectoral water plans and programmes within the framework of national economic and social policy***, are of paramount ***importance*** for action in the 1990s and beyond.
- The ***fragmentation of responsibilities for water resources*** development among sectoral agencies is proving, however, to be ***an even greater impediment to promoting integrated water management*** than had been anticipated.
- ***Effective implementation and coordination*** mechanisms ***are required***.

8th Malaysia Plan 2001-05 – Achieving Sustainable Development

- 1.43 ….. ***addressing environmental and resource issues in an integrated and holistic manner. … ensure that development is sustainable and resilient***. …. adopt early preventive measures and will apply the precautionary principle to address environment and natural resource management issues. ….put in place the enabling conditions for effective policy change….
- 1.44 ….. ***strengthen the database for environmental decision making*** by introducing the use of sustainable development indicators. …. Efforts to address air pollution, particularly from mobile sources…. A ***National Water Policy will be formulated*** ….. ***… a comprehensive waste management policy to address issues of waste reduction, reuse and recycling***, will be introduced.
- 1.45 ***Land use planning will be strengthened*** …. The overall management of marine affairs will be reviewed to address multiple-use conflicts in marine areas…..

UN CSD 2012: The Future We Want – Para 119-134

- 119. …..that ***water is at the core of sustainable development*** as it is closely linked to a number of key global challenges. ……. the importance ***of integrating water in sustainable development*** ….
- 120. …….commit to the progressive realization of ***access to safe and affordable drinking water and basic sanitation for all***, …… commitments to support these efforts in particular in developing countries through the mobilization of resources from all sources, capacity building and technology transfer.
- 121. …..the ***human right to safe drinking water and sanitation***, ….
- 122. ……the ***key role that ecosystems play in maintaining water quantity and quality*** …..
- 123. ….. adopt measures to address floods, droughts, and water scarcity, addressing the ***balance between water supply and demand*** including where appropriate non-conventional water resources, and to mobilize financial resources and 22 investment in infrastructure for water and sanitation services, in accordance with national priorities.
- 124. ……adopt measures to ***significantly reduce water pollution and increase water quality***, significantly ***improve wastewater treatment***, and ***water efficiency and reduce water losses***…..

UNGA, Sept 2015: 17 Sustainable Development Goals

SDG 6 – Clean Water & Sanitation

- Ensure availability and sustainable management of water and sanitation for all
  - ***6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all***
  - **6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all** and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
  - **6.3** By 2030, improve water quality by ***reducing pollution***, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
  - **6.4** By 2030, substantially ***increase water-use efficiency across all sectors*** and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
  - 6.5 By 2030, ***implement integrated water resources management*** at all levels, including through transboundary cooperation as appropriate
  - **6.6** By 2020?, ***protect and restore water-related ecosystems***, including mountains, forests, wetlands, rivers, aquifers and lakes
  - **6.a** By 2030, expand international cooperation and ***capacity-building*** support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies
  - **6.b** Support and strengthen the ***participation of local communities*** in improving water and sanitation management

2016 - ASM NIWRMP 25 recommendations

https://issuu.com/asmpub/docs/web_vol1_gf

1. ***Overarching - 2***
2. ***Enabling Environment - 10***
3. ***Institutional Framework - 5***
4. ***Management Instruments - 5***
5. ***Investments in Water Infrastructure - 1***
6. ***NIWRM Plan implementation Management Structure - 1***
7. ***Champions – 1***

Summary Recommendations

OVERALL RECOMMENDATIONS

Adoption and implementation of **NIWRMP** together with the Component Plans nationwide by the key ministries and respective state administrations.

ENABLING ENVIRONMENT

Addressing policies, legislation, regulations and finance among which is the need for an over-arching Integrated Natural Resources Policy; a contemporary National Water Resources Act to be expedited; and the need for funding arrangements and protocols especially pertaining to environment rehabilitation works.

INSTITUTIONAL FRAMEWORK

Focuses on the review and strengthening of governance through institution of oversight and implementation of management structures at national, state, river basin and local hierarchical levels, and calls for greater intra-ministerial integration.

MANAGEMENT INSTRUMENTS

Stresses on the establishment of a central IWRM database built around river basin platforms; the use of economic, financial and technical instruments for greater water use efficiency and accountability and to curb abuse; implementing a national agenda for integrated water research; mechanisms for promotion of green growth; and the pooling of resources to establish one-stop capacity building centres to improve skills and raise competency at all levels

Summary Recommendations

INVESTMENTS IN WATER INFRASTRUCTURE

Central recommendation for urgent Investments in Water Infrastructure to cater for the national water sector needs and to spur the transformation of the water sector. **15 major programmes** with corresponding **95 EPPs** were identified broken down into 3 sub-programmes, namely 5 Cross-cutting programmes involving 14 EPPs, 5 programmes related to "Water as a Resource" involving 48 EPPs, and 5 programmes related to "Water for Livelihood" involving a further 33 EPPs.

PLAN IMPLEMENTATION MANAGEMENT STRUCTURE

Recommends for the Plan be to managed nationally at the highest political level by the National Water Resources Council (*MSAN*), and at the state level by the State Water Resources Council (*MSANg*) with the support of a National Steering Committee (NSC) to oversee the implementation and assisted by a National Technical Committee (NTC) to resolve technical issues. Formation of a dedicated IWRM Implementation Unit (IWRM-IU) reporting to the NSC to ensure the timely and coordinated implementation of the Plan.

CHAMPIONING THE NATIONAL IWRM AGENDA

The need for "**champion(s)**" to actively pursue "NIWRMP" initiative and the transformation process.

Tracing IWRM Development – Global to Malaysia

- 1977 - UN Conference on Water, Mar del Plata
  - first internationally coordinated approach to IWRM
- 1992 - International Conference on Water and Environment, Dubl
  - meeting of experts - 4 principles
- 1992 - UNCED Rio de Janeiro -*Chapter eighteen of Agenda 21*
- ***2001 – EPU - Malaysia Plan Policy, 2001-05 – Para 1.09 (details in 1.43-1.45)***
  - ***…integrated and holistic approach in addressing environmental and resource issues ..***
- ***2003 – MSAN Approval for River Basin Master Plans in all our river basins***
- 2012 - United Nations Conference on Sustainable Development, Rio+20
  - The Future We Want
- 2015 - UNGA, New York
  - 17 SDGs, Water and Sanitation – SDG 6
- ***2016 - ASM -Transforming the water sector: National IWRM Plan***
  - ***Strategies and Road Map***
- ***2019 -Proposed: MEA -Transforming the water sector in Malaysia in 4 MPs – 2021-2040***

What is IWRM

INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) Paradigm

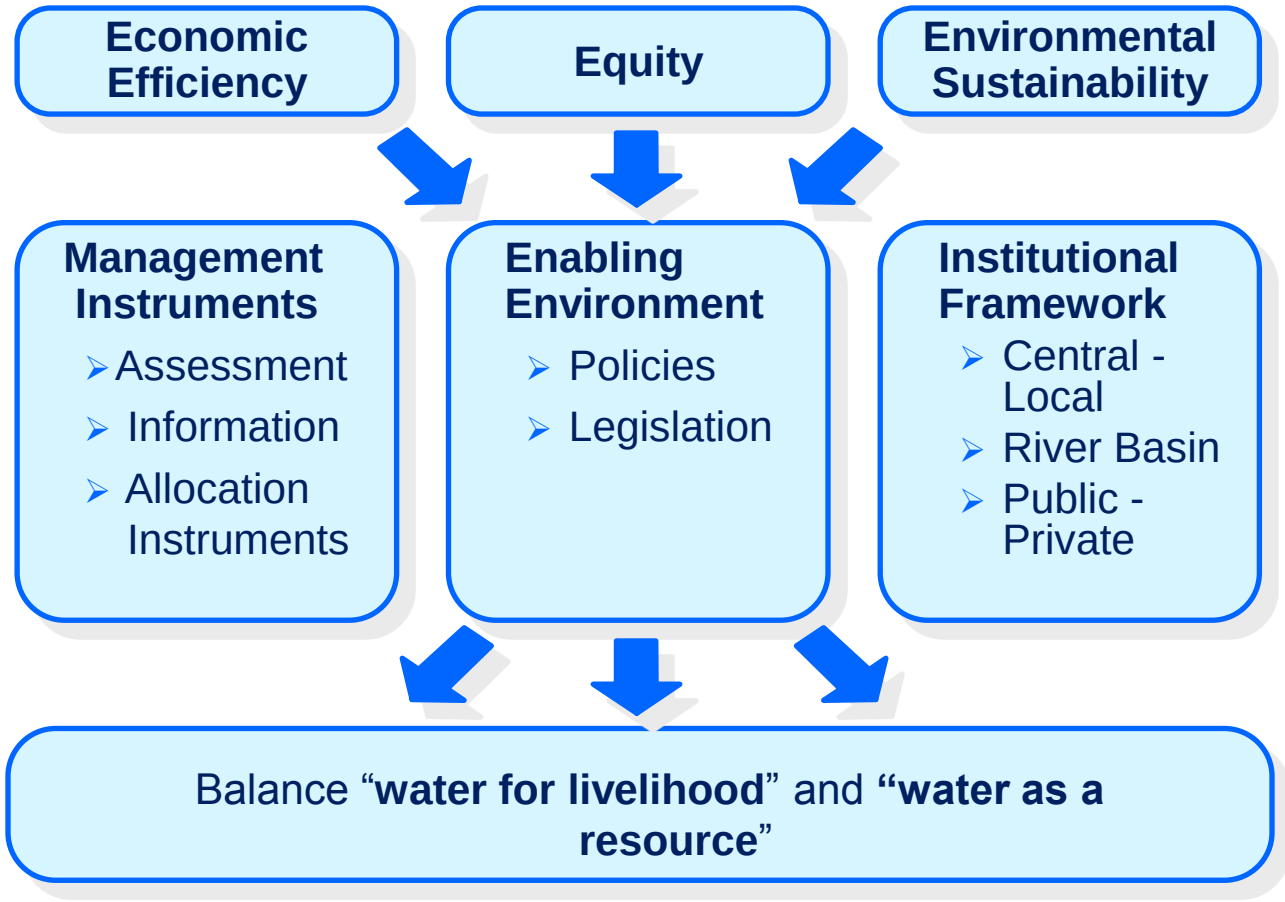
*"A process which promotes the **coordinated development and management of water, land and related resources**, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems" – GWP*

Guided by the Dublin Principles of 1992

Dublin Principles - 1992

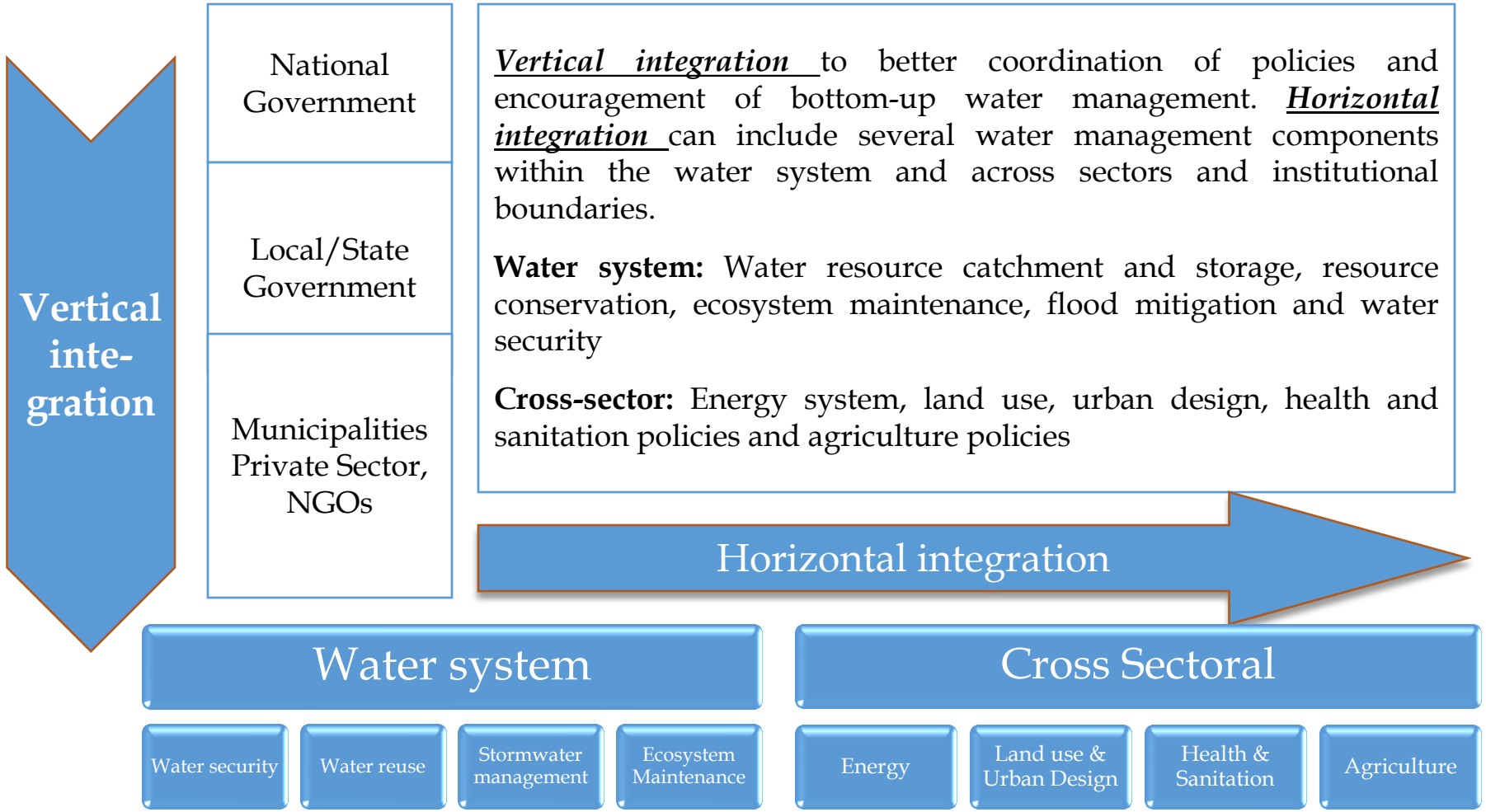
- **Principle No. 1 - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment**
  - *Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.*
- **Principle No. 2 - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels**
  - *The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.*
- **Principle No. 3 - Women play a central part in the provision, management and safeguarding of water**
  - *This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.*
- **Principle No. 4 - Water has an economic value in all its competing uses and should be recognized as an economic good**
  - *Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.*

IWRM addresses the “three E’s”



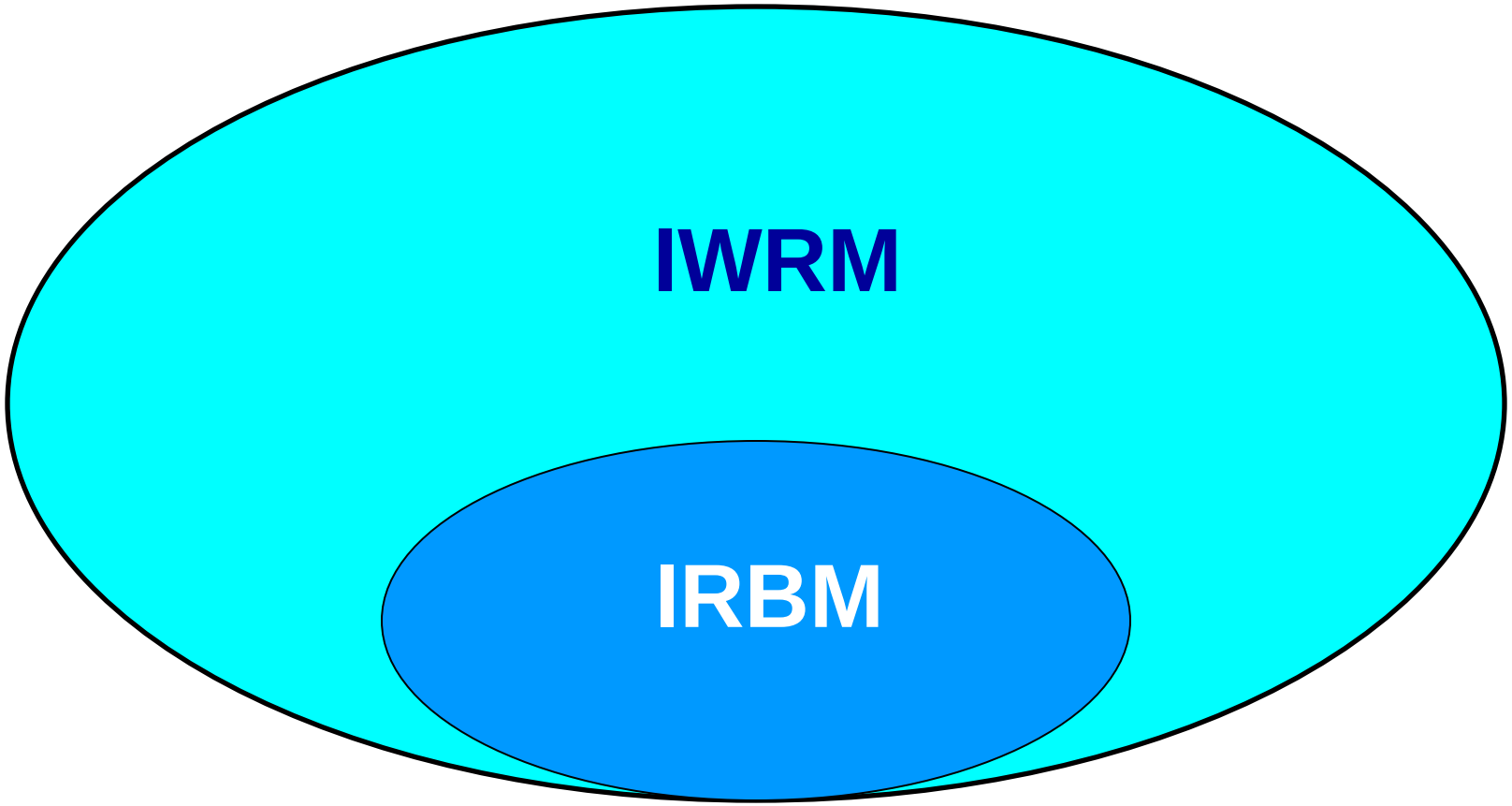
- the three “pillars” of IWRM

Integration in IWRM



Source: Low Carbon Green Growth Roadmap for Asia and the Pacific, UNESCAP 2012

…..builds on river basin management

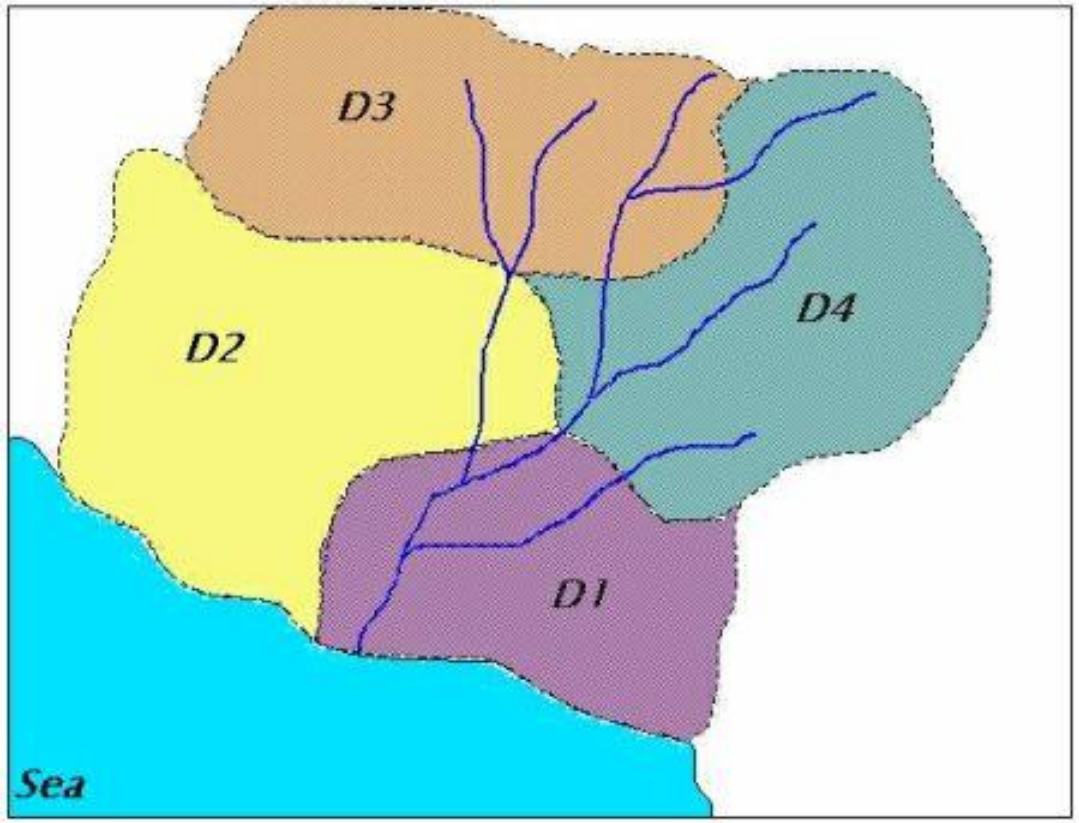


- from both water quantity *and* water quality perspective

Integrated River Basin Management (IRBM)

- IRBM manages these human activities in the river basin on an integrated basis such as
  - Provide overarching guidelines and legislations accompanied by required institutions, monitoring and enforcement capabilities to enable
    - Floods be mitigated and
    - The environment to remain pristine
  - identifies the optimum carrying capacity of the rivers
    - discharge volume
    - pollutant loadings
  - looks at appropriate location of housing areas, business centers, industries and recreational areas,
  - looks at methods and pattern of waste disposals
  - looks at the need for river riparian areas to sustain bio-diversity

River Basin A and 4 Districts



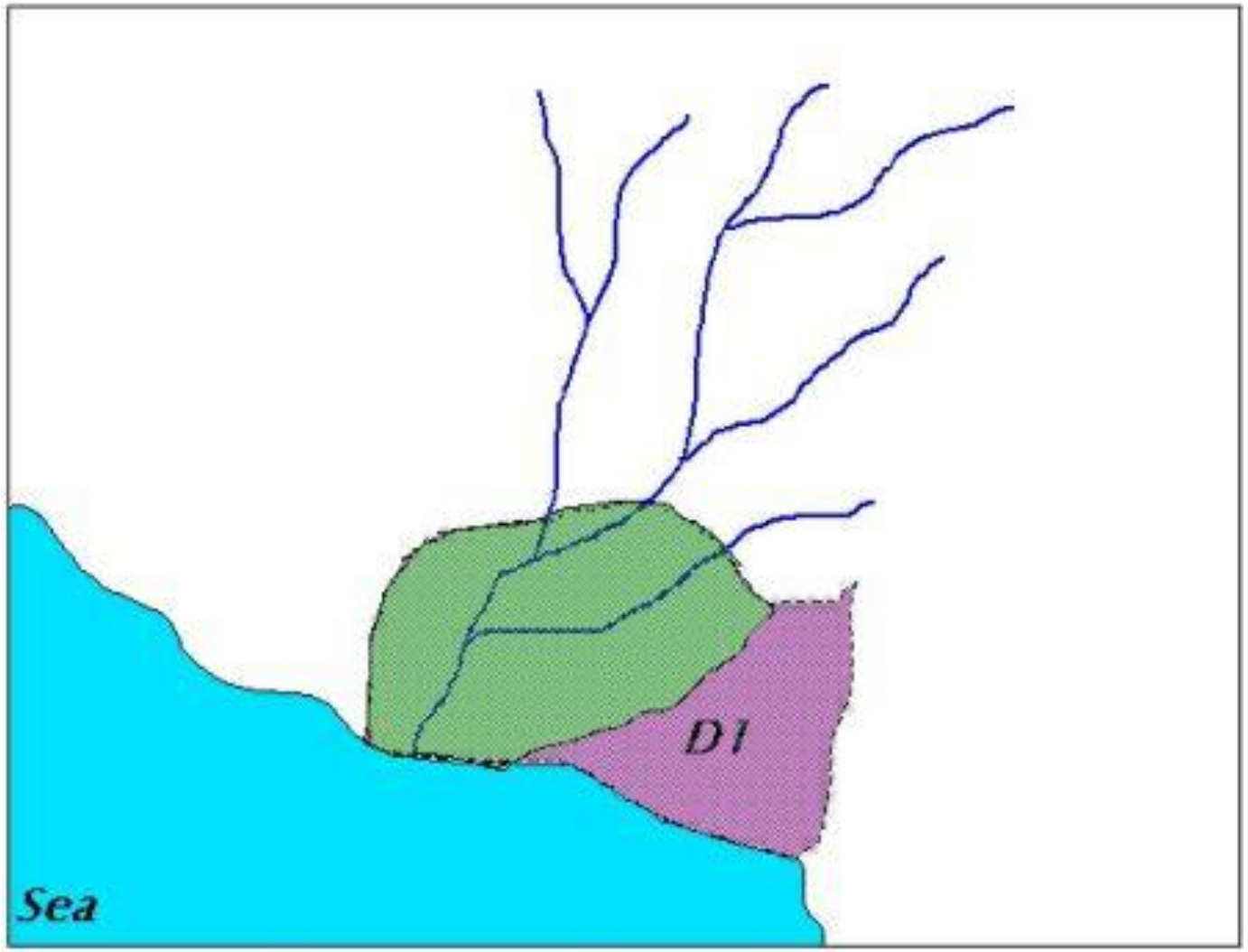
LEMBANGAN SUNGAI KELANG

1,288 km^2

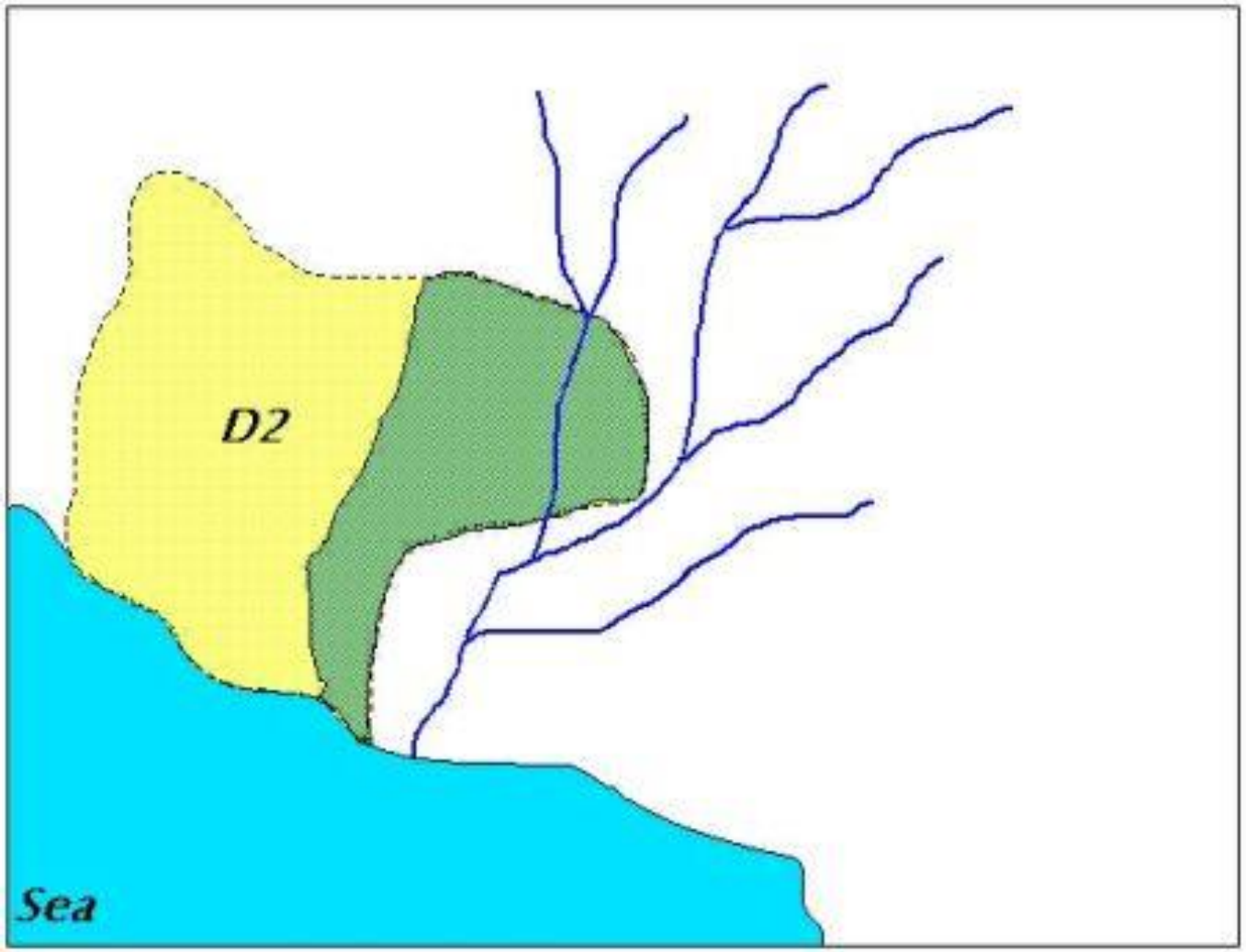
8 PBT, 2 Negeri

1. Ampang Jaya
2. Ulu Langat
3. Gombak
4. Wilayah Persekutuan Kuala Lumpur
5. Petaling Jaya
6. Subang Jaya
7. Shah Alam
8. Kelang

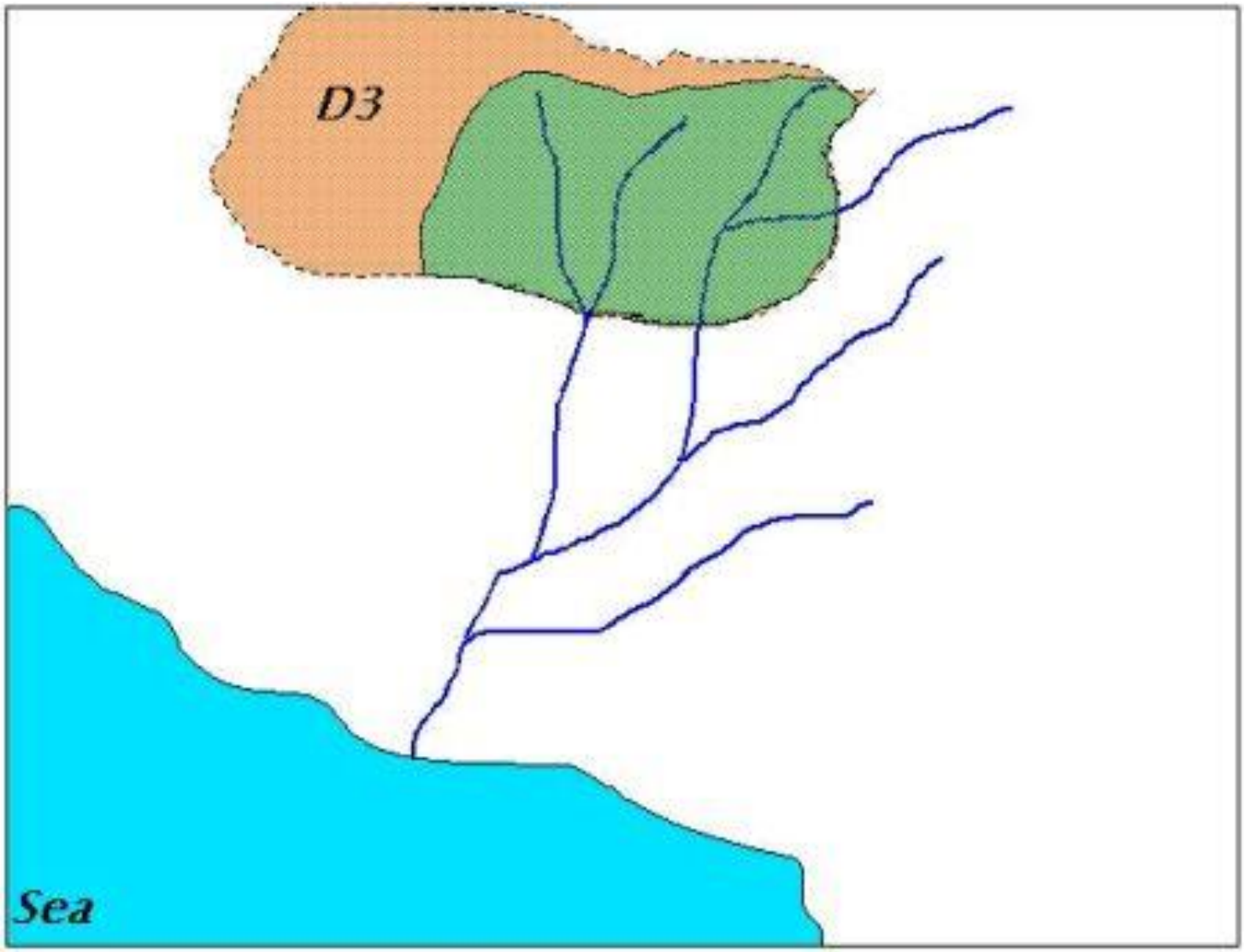
Part of District D1 within River Basin A



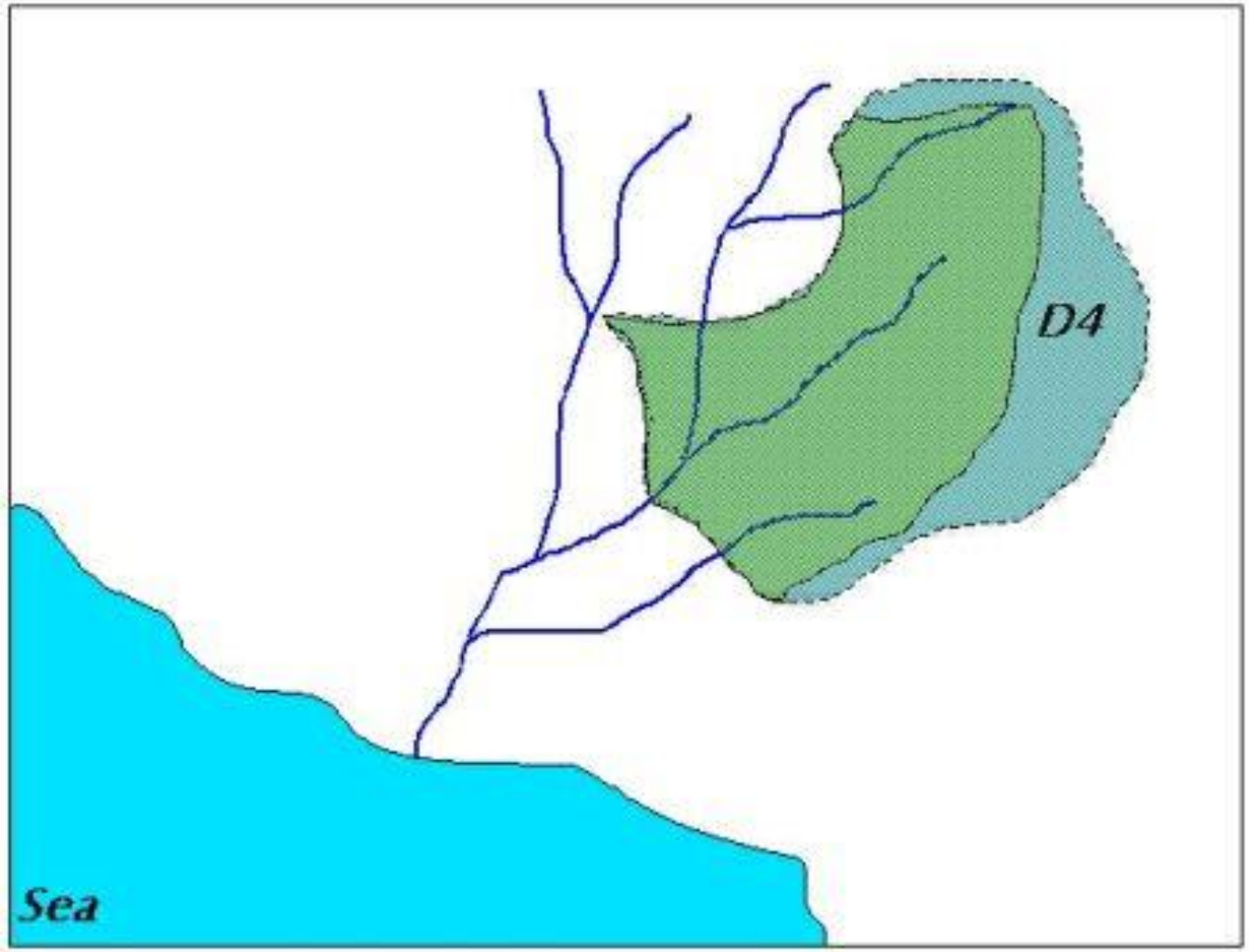
Part of District D2 within River Basin A



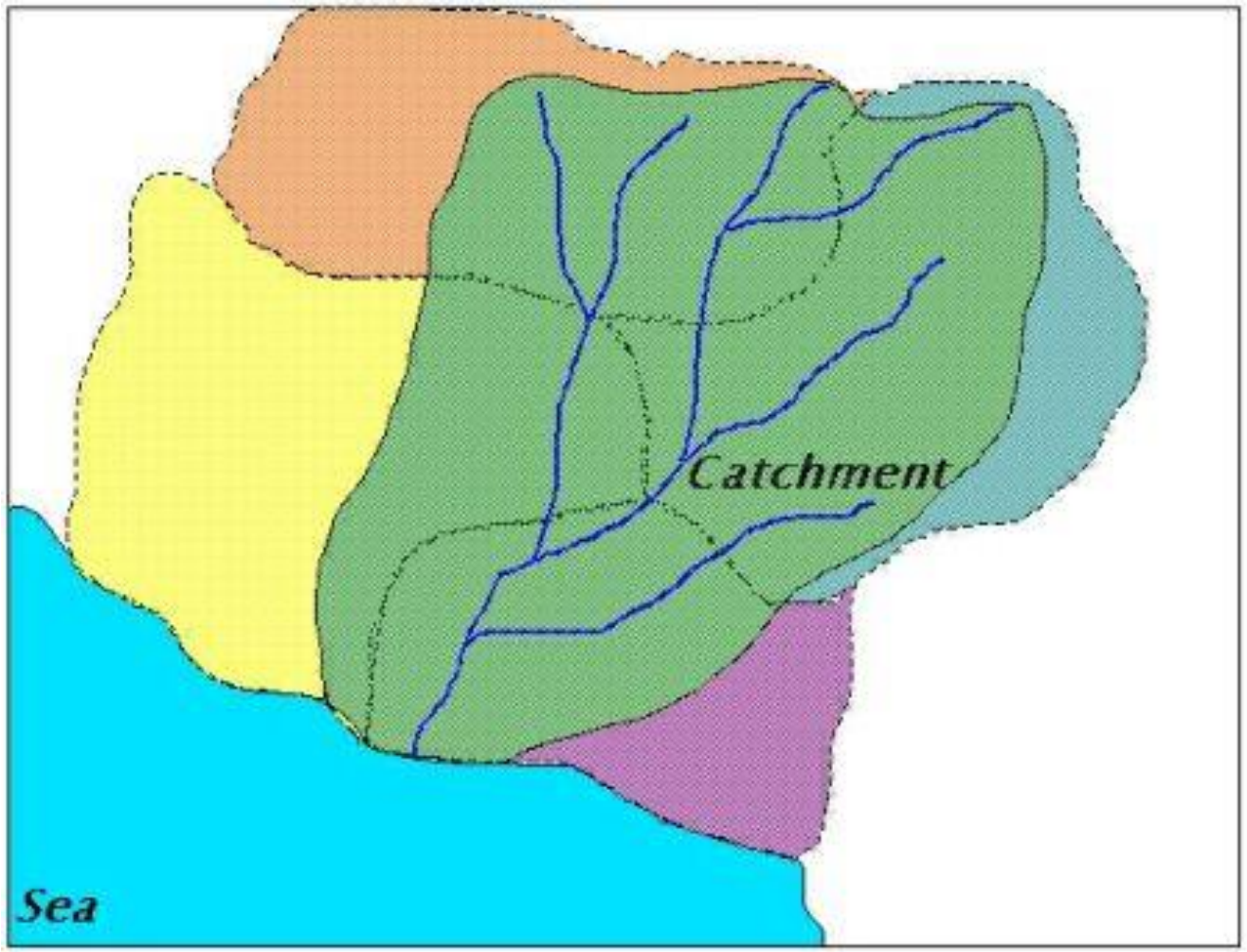
Part of District D3 within River Basin A



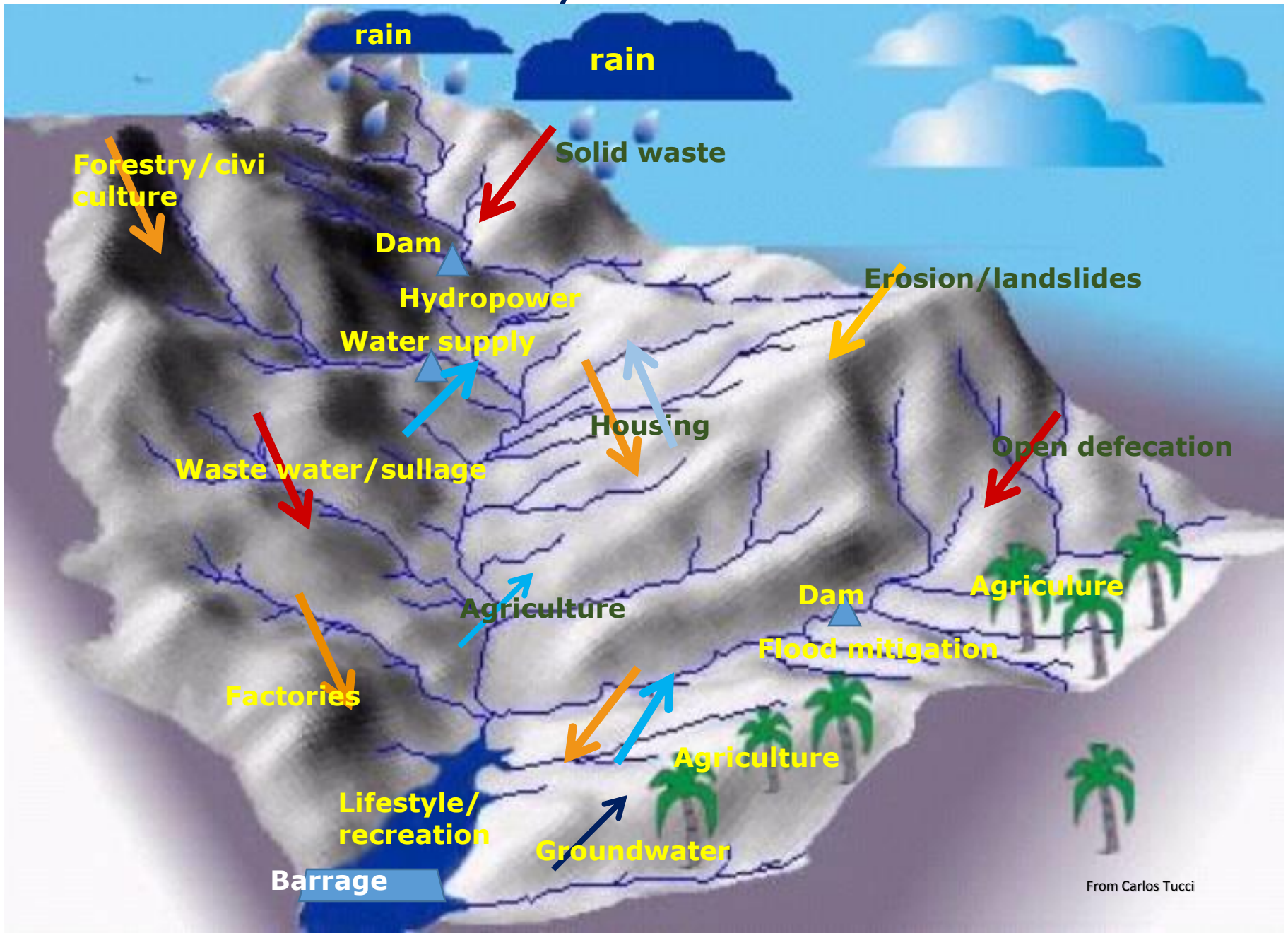
Part of District D4 within River Basin A



The area of River Basin A are parts of Districts D1-D4



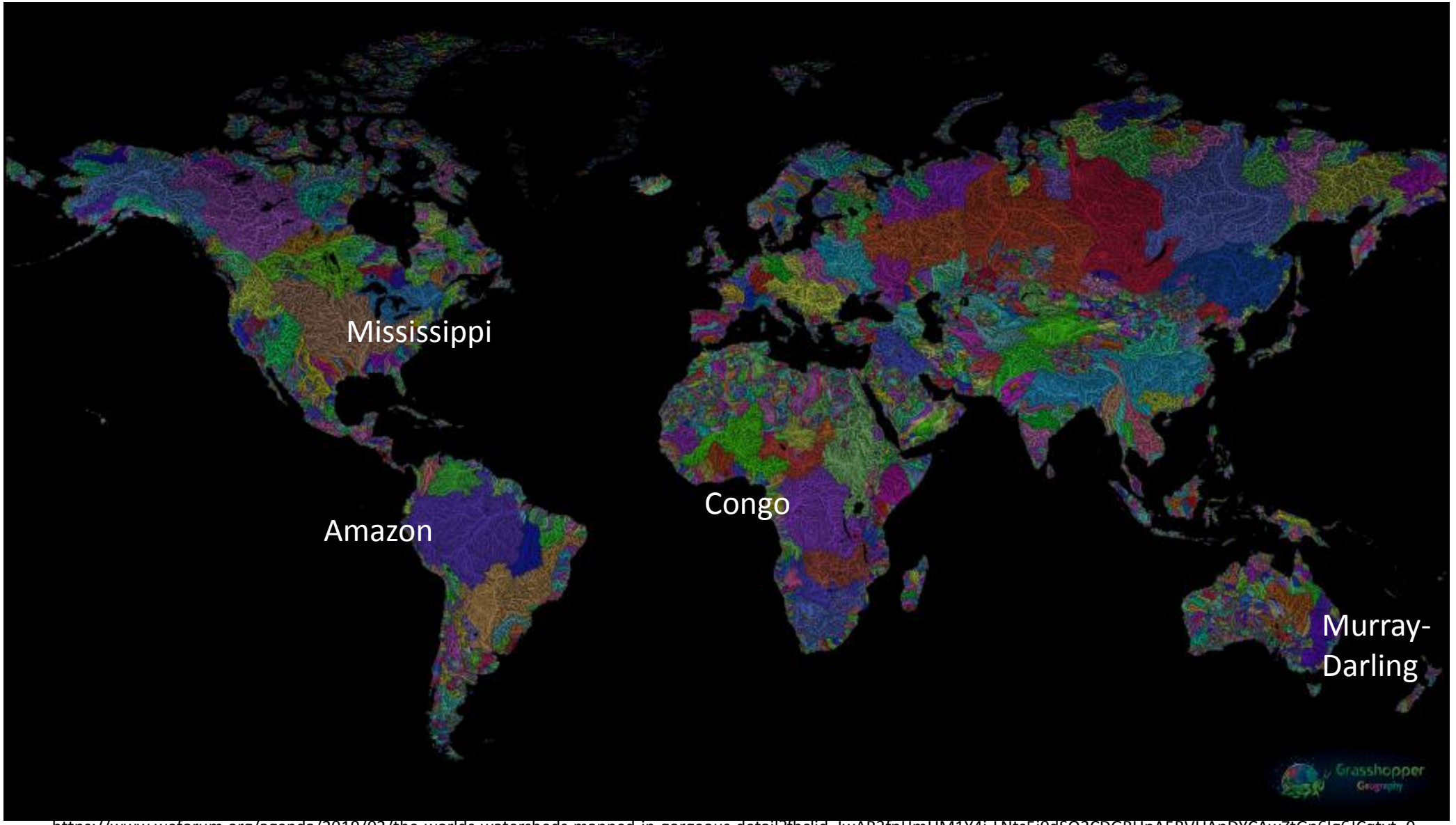
River Basins – every one lives in a river basin



Global riverbasins

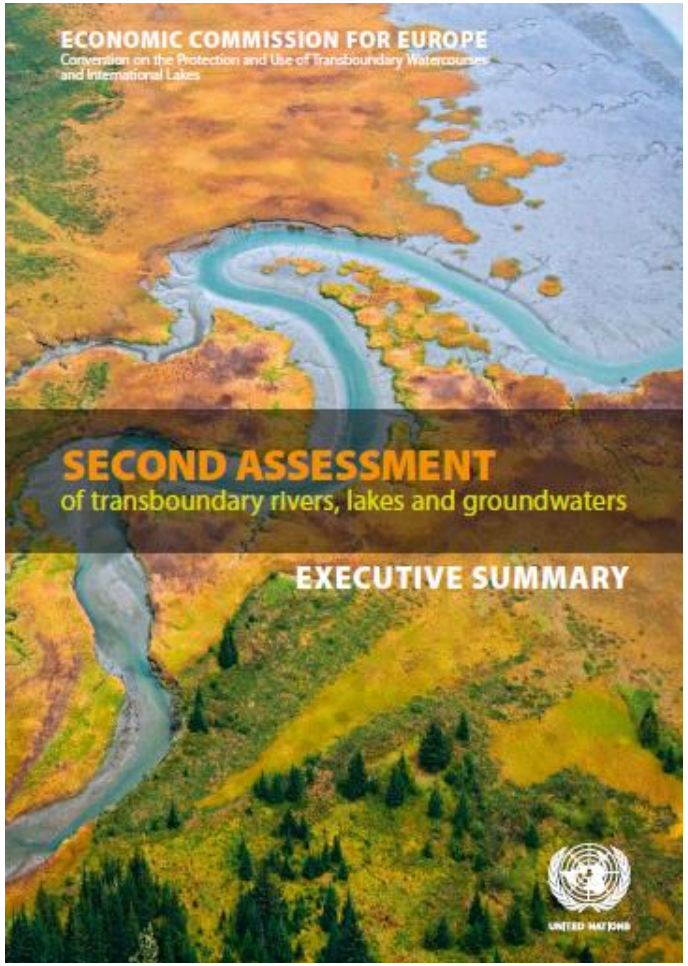
Global Land mass – jigsaw puzzles of river basins

Latest pictoral representation of global river basins



https://www.weforum.org/agenda/2019/02/the-worlds-watersheds-mapped-in-gorgeous-detail?fbclid=IwAR3fpHmUM1Y4i-LNts5j0dSO2CDGRUpA5RVUApDYCAwZtGp6Ig6JCqtvt_0

Water Convention – UN ECE, 2nd Assessment



- Most Comprehensive and up-to-date of European & Asian transboundary waters,
- For 7thMinisterial Conference in Astana, Sept 2011, lead by Finland
- Strengthen measures at local, national and transboundary levels to
  - Protect and ensure quantity, quality and sustainable use of transboundary water resources
    - Both surface and groundwater
  - Holistic approach, commitment to IWRM
    - water resources management: an integral part of ecosystems, human societies and economies
  - Include
    - Drainage Basins of the Sea of Okhotsk and Sea of Japan
    - Drainage Basins of the Aral Sea and other Transboundary Waters in Central Asia
    - Drainage Basins of the Caspian Sea

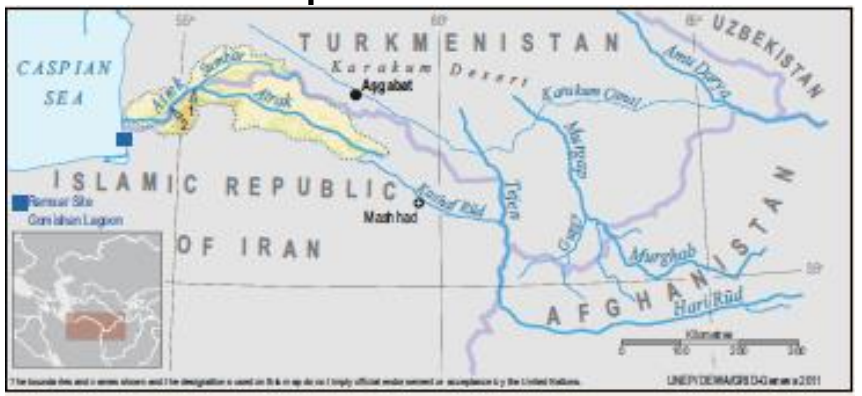
Drainage Basins of Sea of Okhotsk and Sea of Japan

Drainage Basins of the Aral Sea & other Transboundary Waters in Central Asia

Drainage Basins of the Caspian Sea

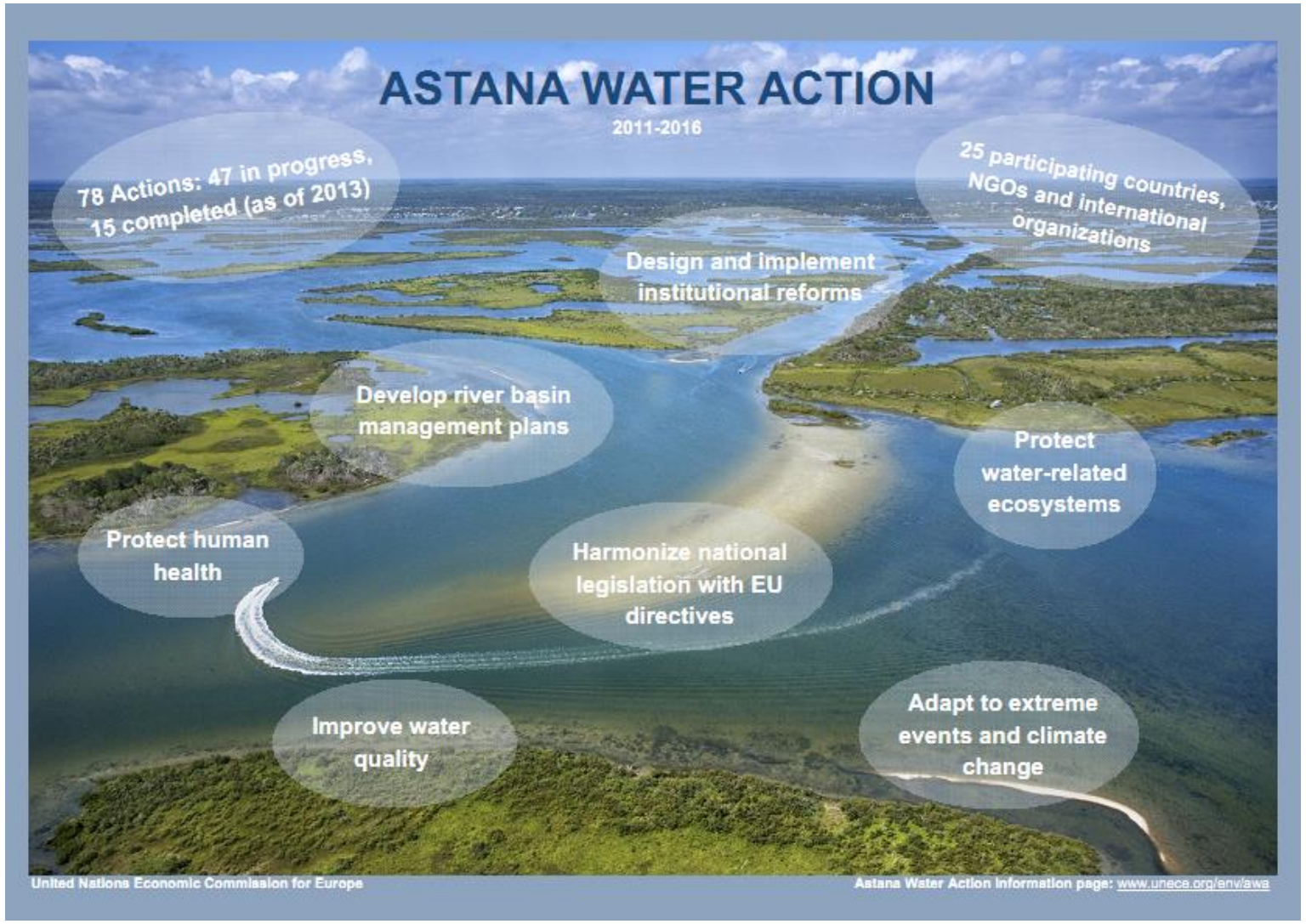
North of Caspian Sea

East of Caspian Sea



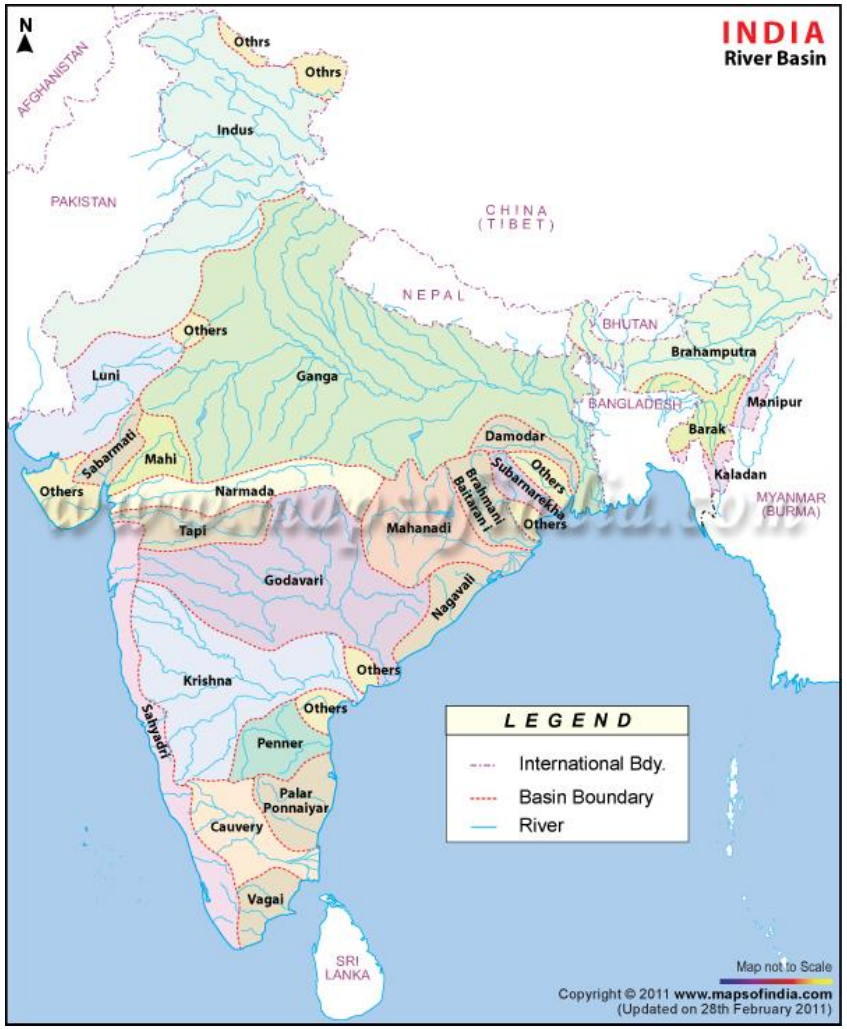
West of Caspian Sea

Astana Water Action

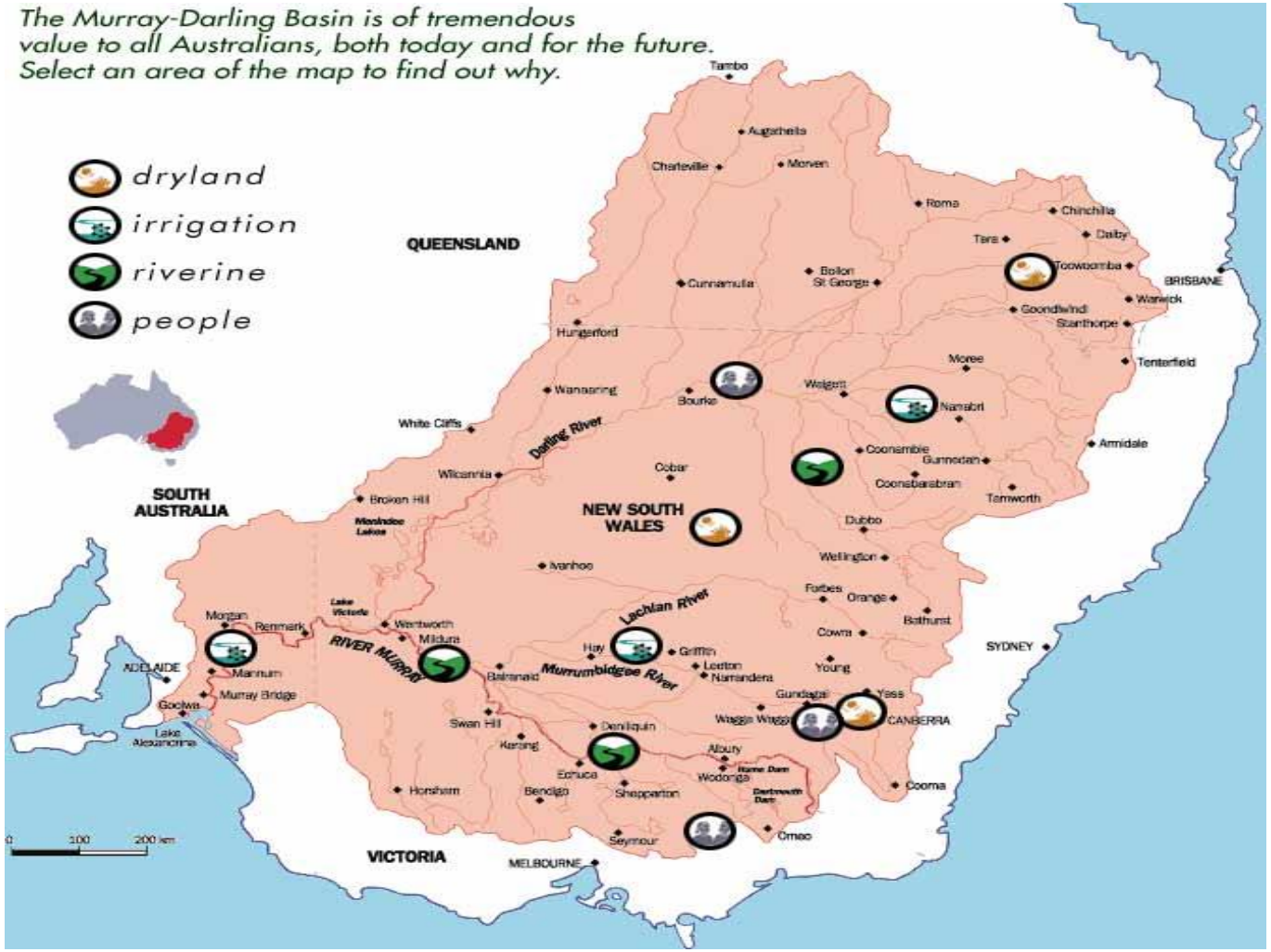


Major river basins in Africa

Indian sub-continent



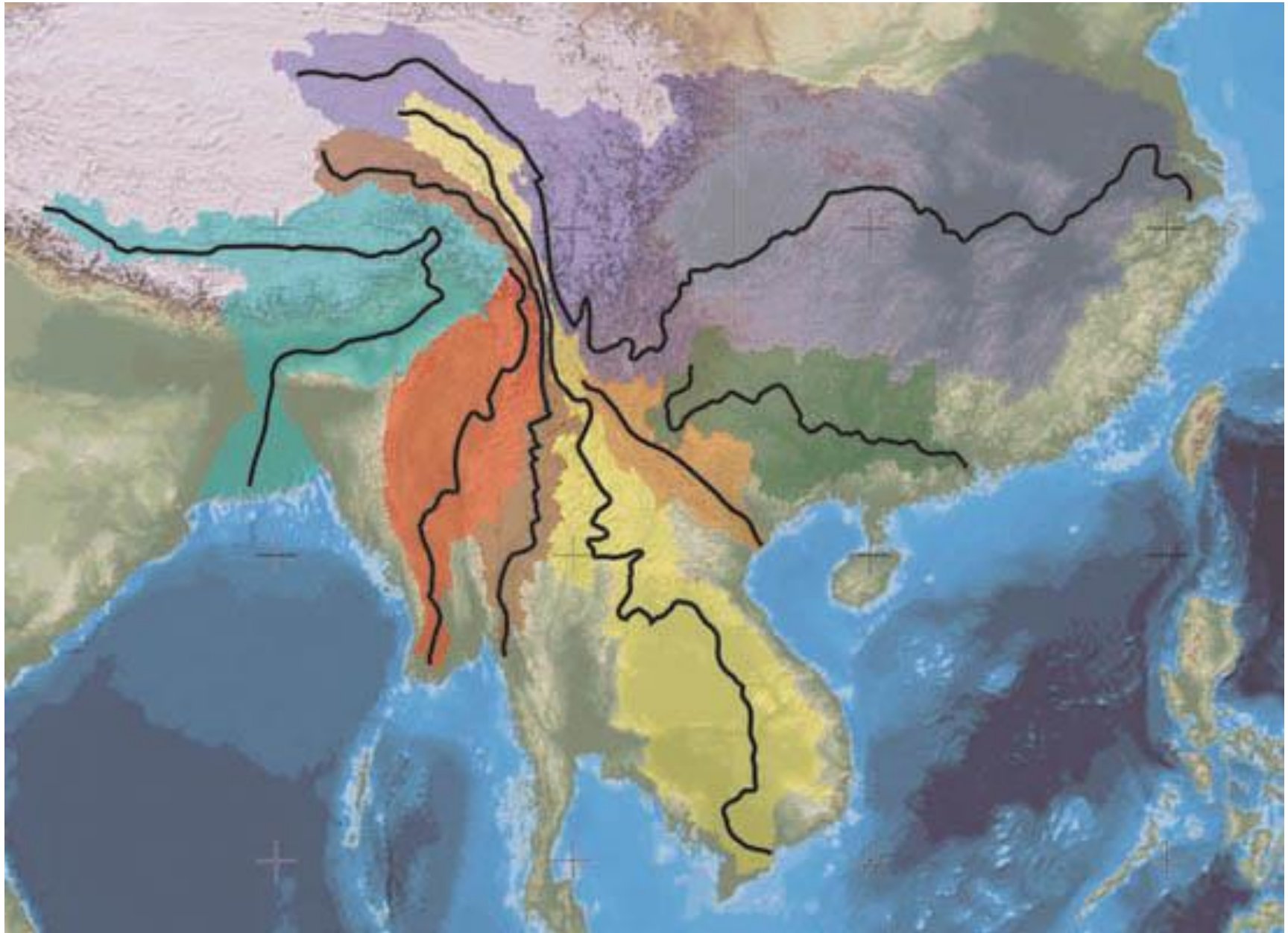
Murray-Darling Basin, Australia



Management of water resources by 5 States

Queensland, New South Wales, South Australia, Victoria, Federal Territory

Mainland Southeast Asia



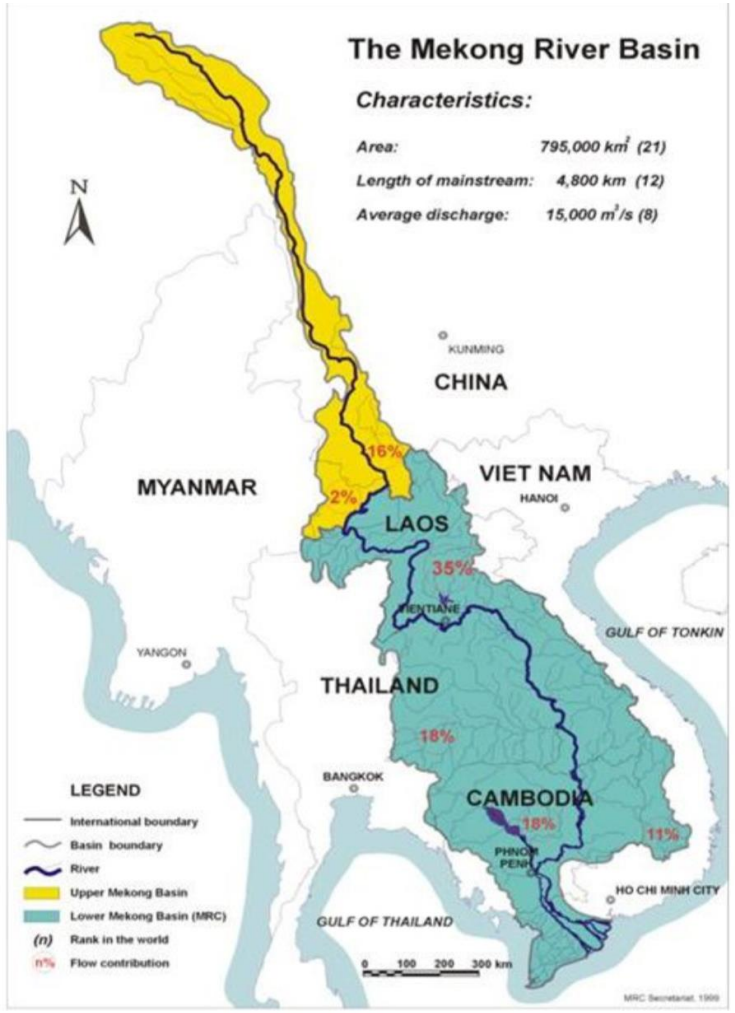
Mekong River Basin

http://www.mrcmekong.org/

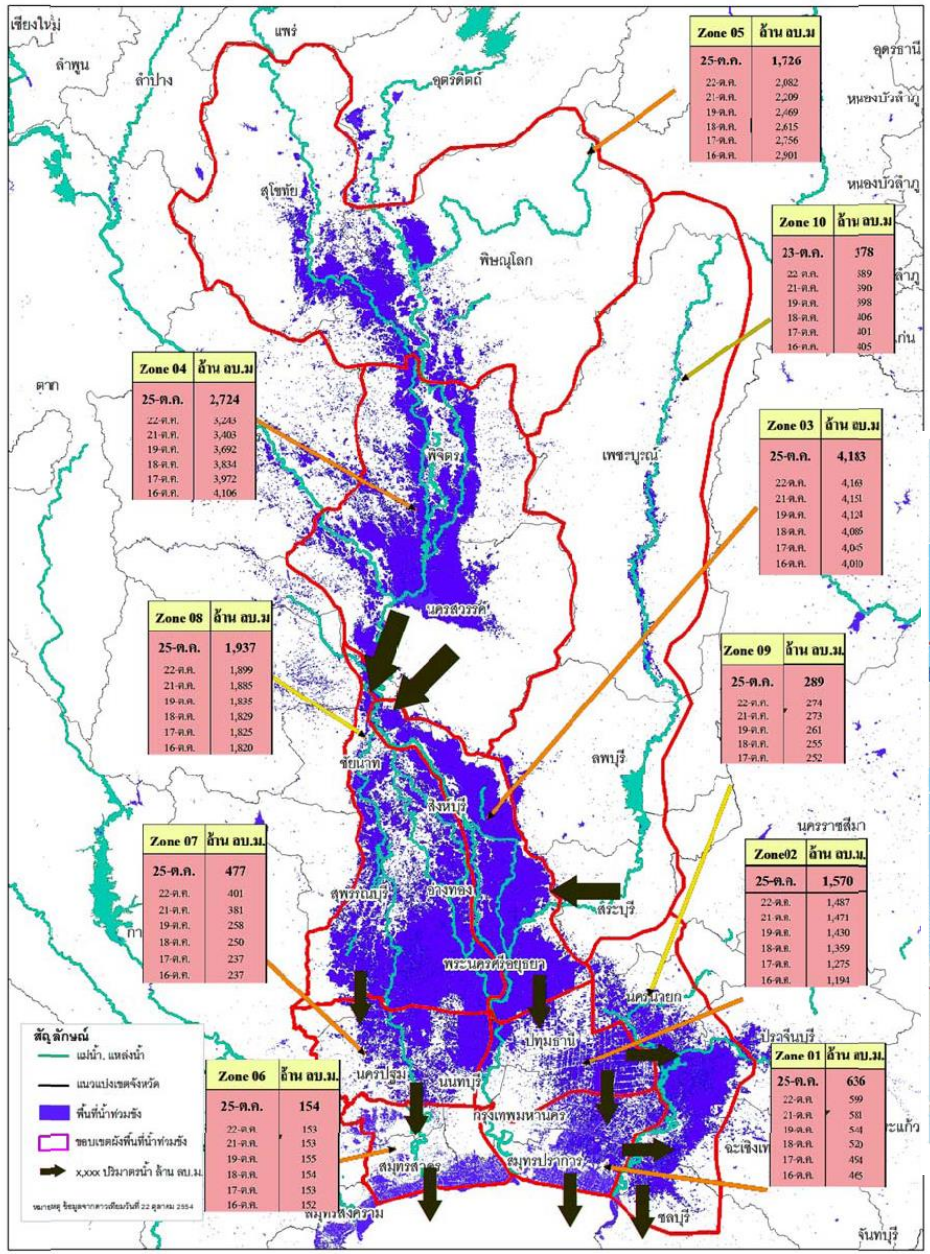
The Mekong Basin is an International River Basin

Each nation makes a contribution to water flow in the Mekong River:

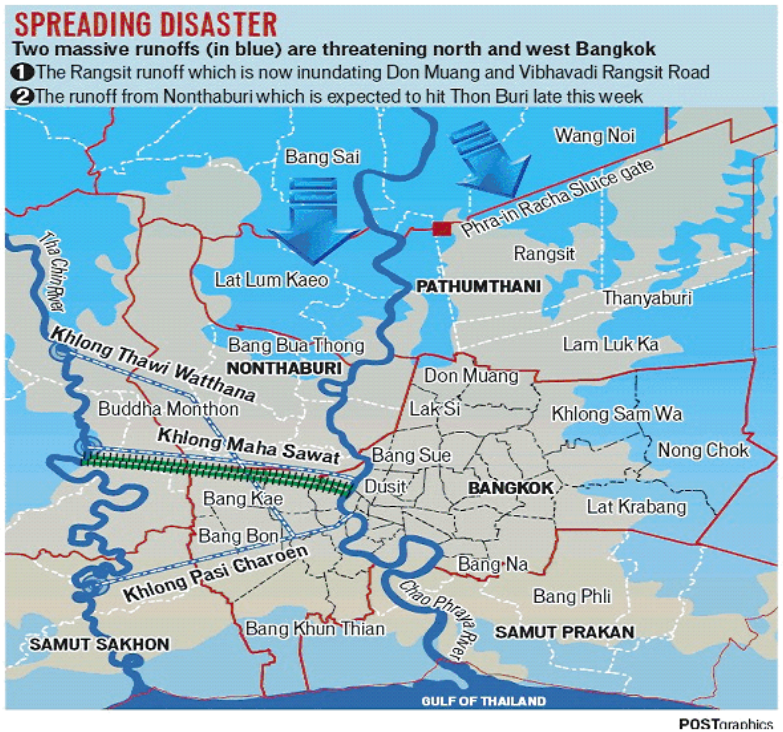
China	16%
Myanmar	2%
Laos	35%
Thailand	18%
Cambodia	18%
Viet Nam	11%



- Very Comprehensive Study for Lower Mekong
- Uploaded by the Mekong River Commission (MRC)
  - Assessment of Basin-wide Development Scenarios
  - Basin Development Strategy
  - Basin Action Plans



Chao Phraya River Basin = 157,924 km^2
Average Annual Rainfall = 1500mm
Whole of Chao Phraya flood waters, pass through Bangkok

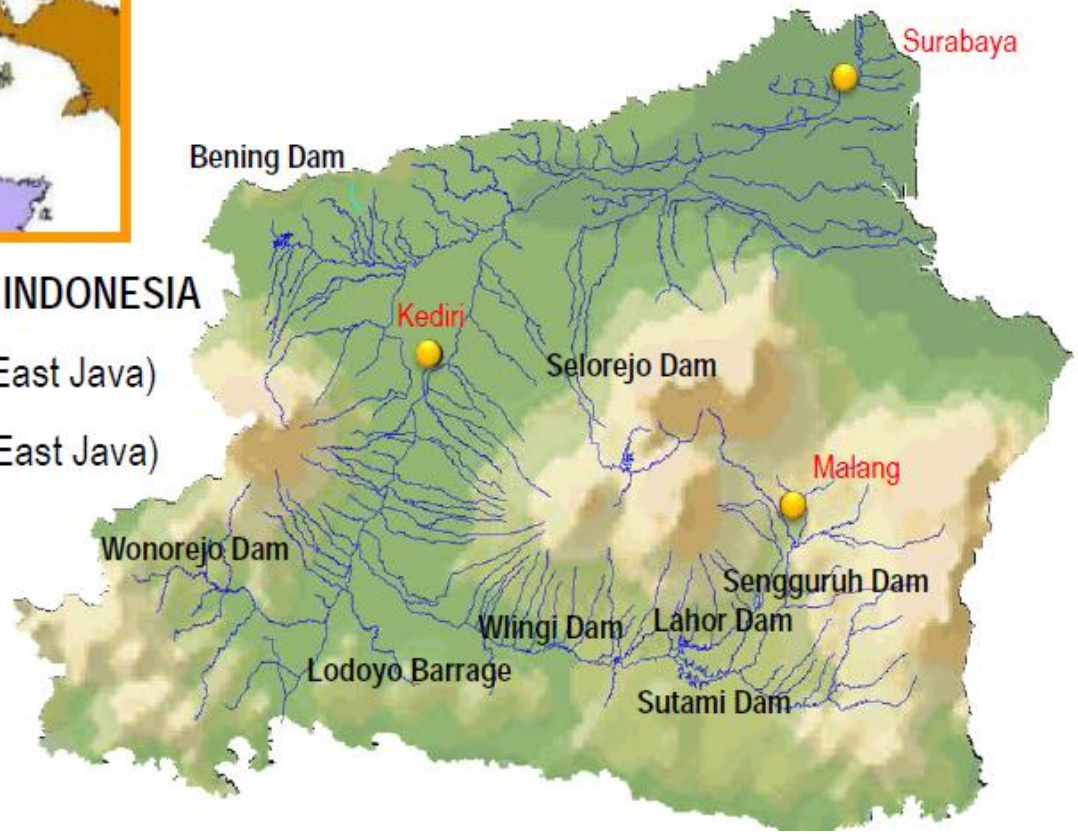


http://flood.gistda.or.th/

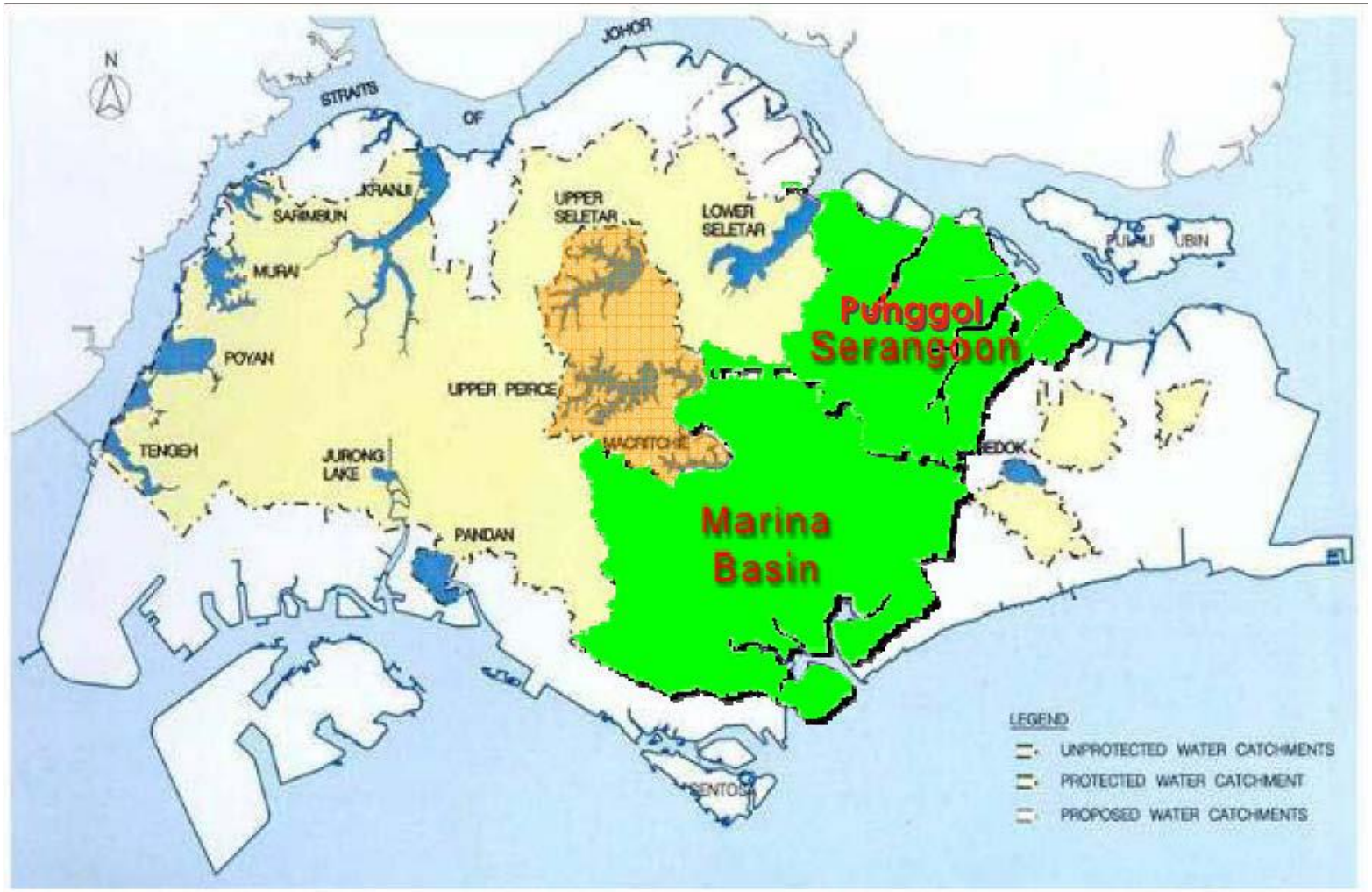
Brantas River Basin - Indonesia

THE BRANTAS RIVER BASIN, EAST JAVA, INDONESIA

- Catchment Area : 11,800 km^2 (25% of East Java)
- Population (2010) : 15.6 million (43% of East Java)
- Annual Rainfall : 2,000 mm
- Annual Runoff : 11.8 billion m^3
- Mainstream Length : 320 km



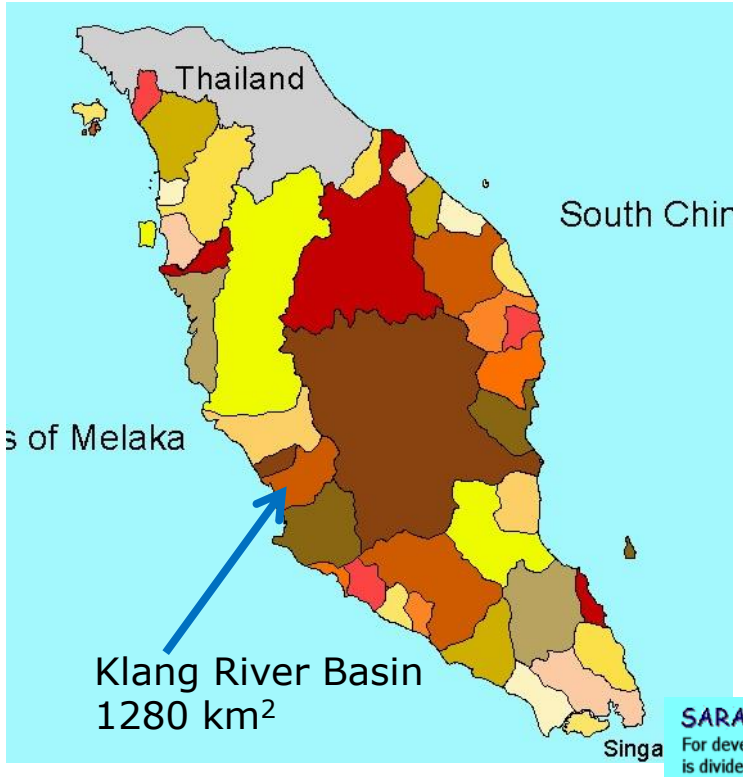
Singapore River Basins

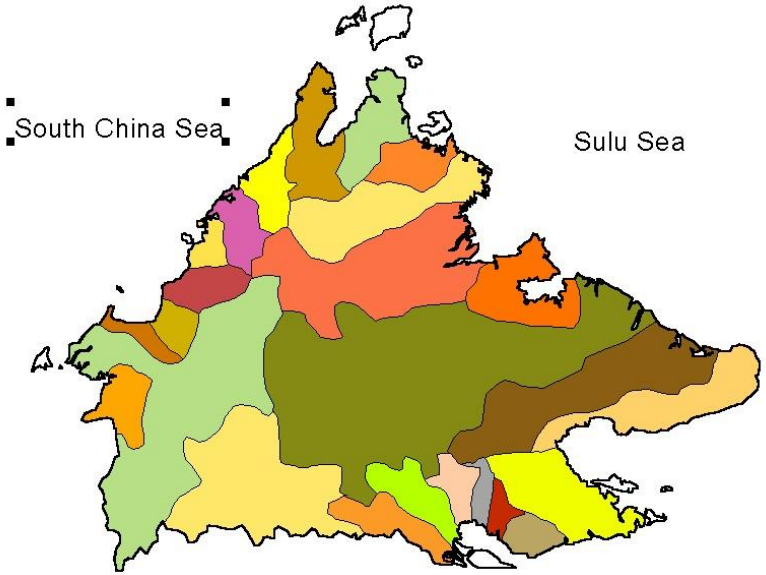


Area of Singapore main island - 694 km^2
Marina Basin – 1/5 of Singapore about 139 km^2
Av Rainfall 2000mm/yr
Population – 5.1 million (2012)

Source: www.nea.gov.sg/cms/pcd/Management

River basins in Malaysia



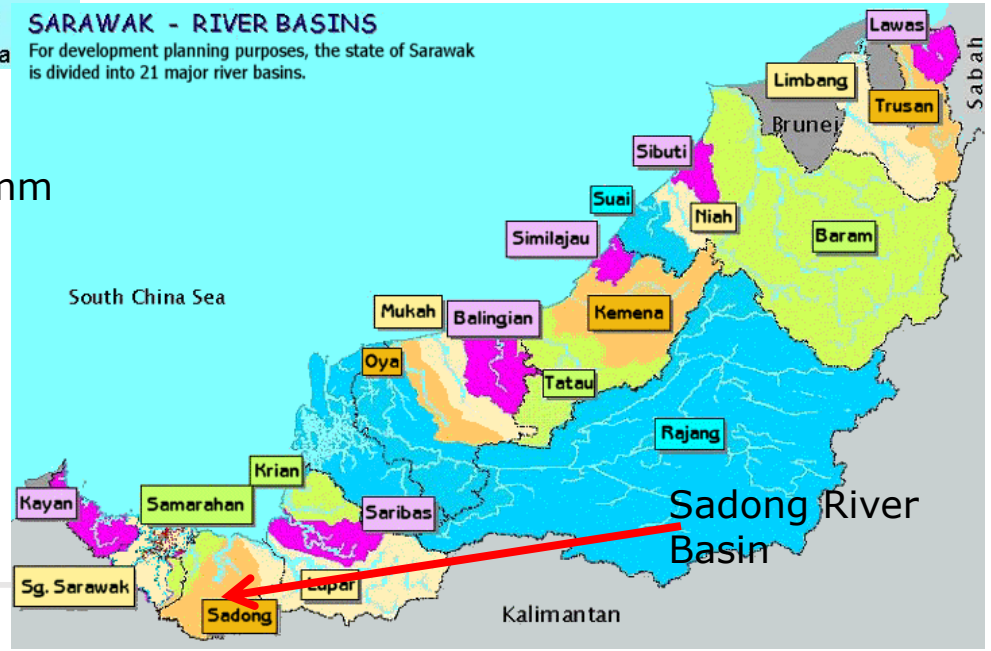


Malaysia - 330,000 km²

Average Annual Rainfall 1500mm to 4500 mm

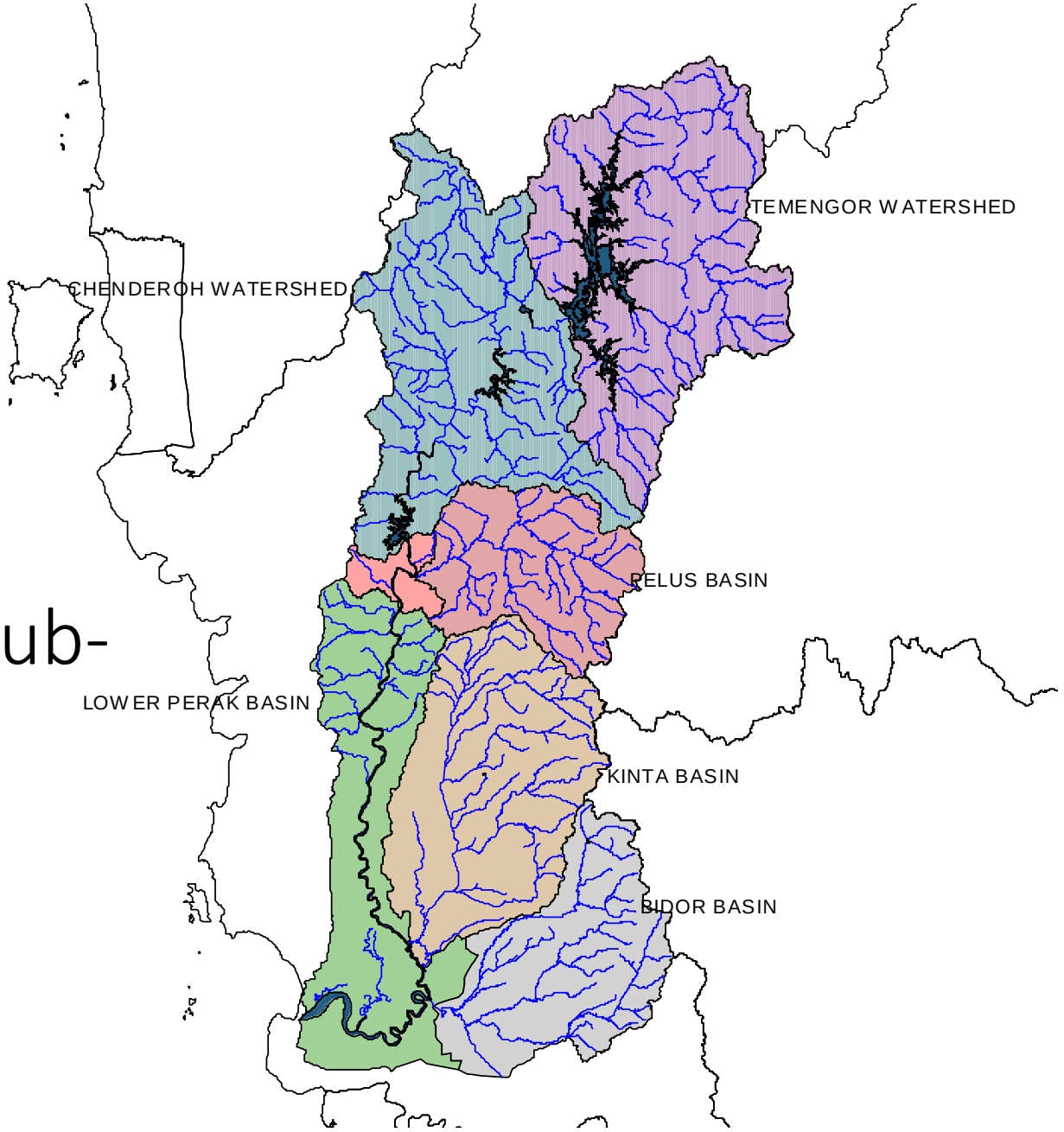
189 River Basins Management Units (RBMU) in Malaysia

Circa early 2000



Sungai Perak and its sub-basins and tributaries

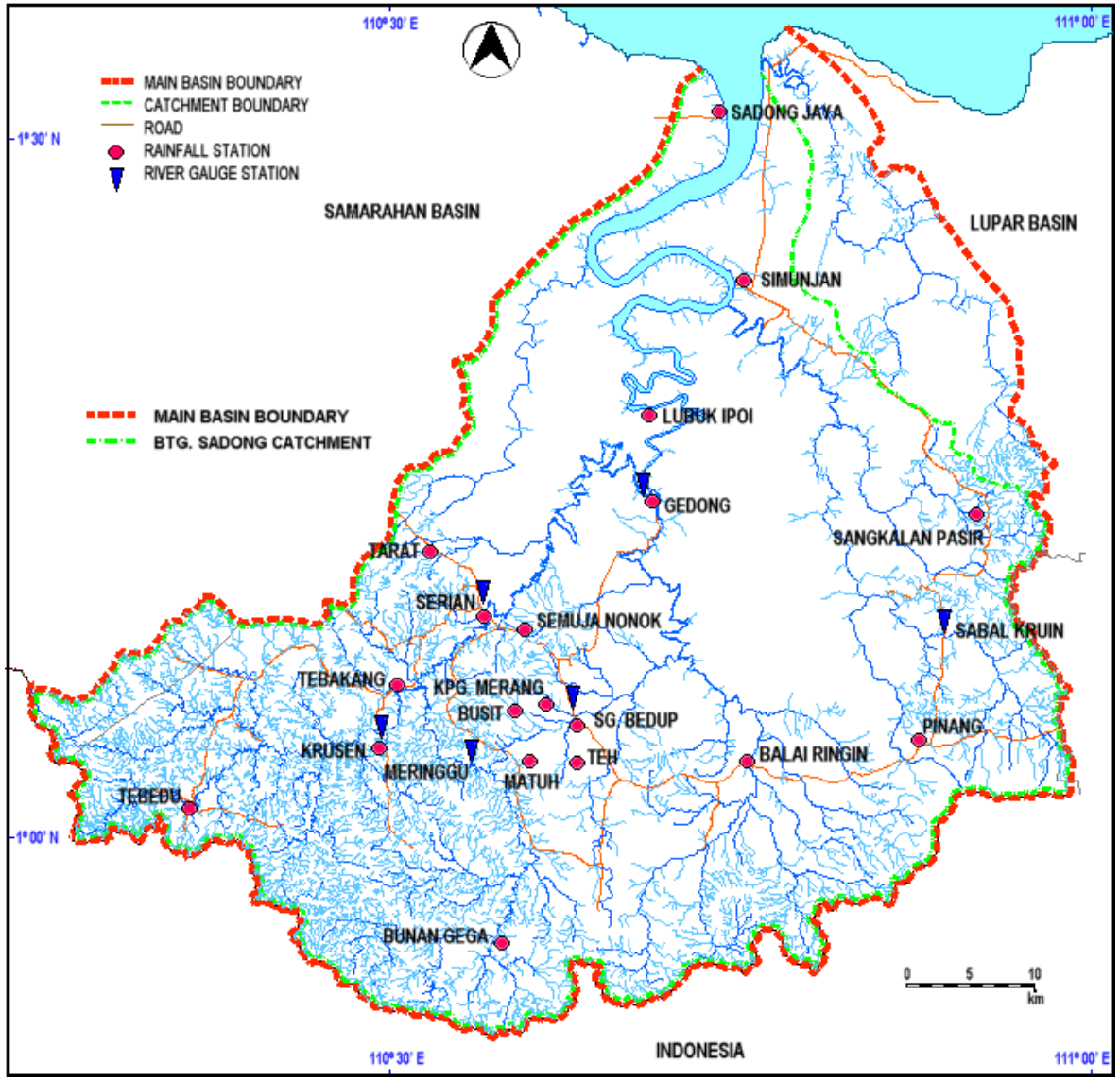
Before 1999 – JICA Study



Sadong River Basin - Tributaries & Catchments

Area: 3,543 km square
Length:150 km

Circa early 2001?

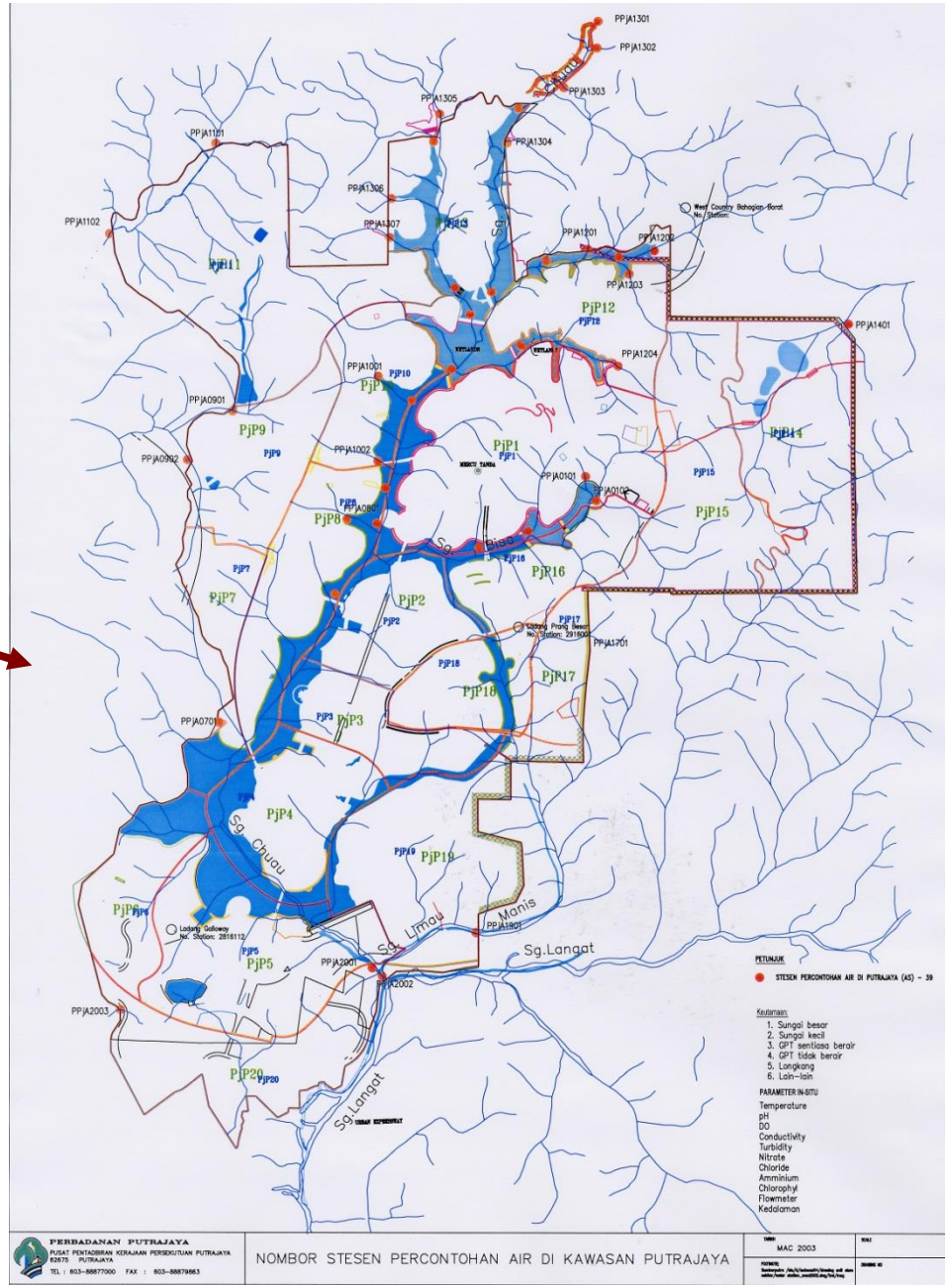


Langat River Basin - Tributaries & Catchments, circa early 2000

Putrajaya

Malaysia's Administrative Centre
49 km sq

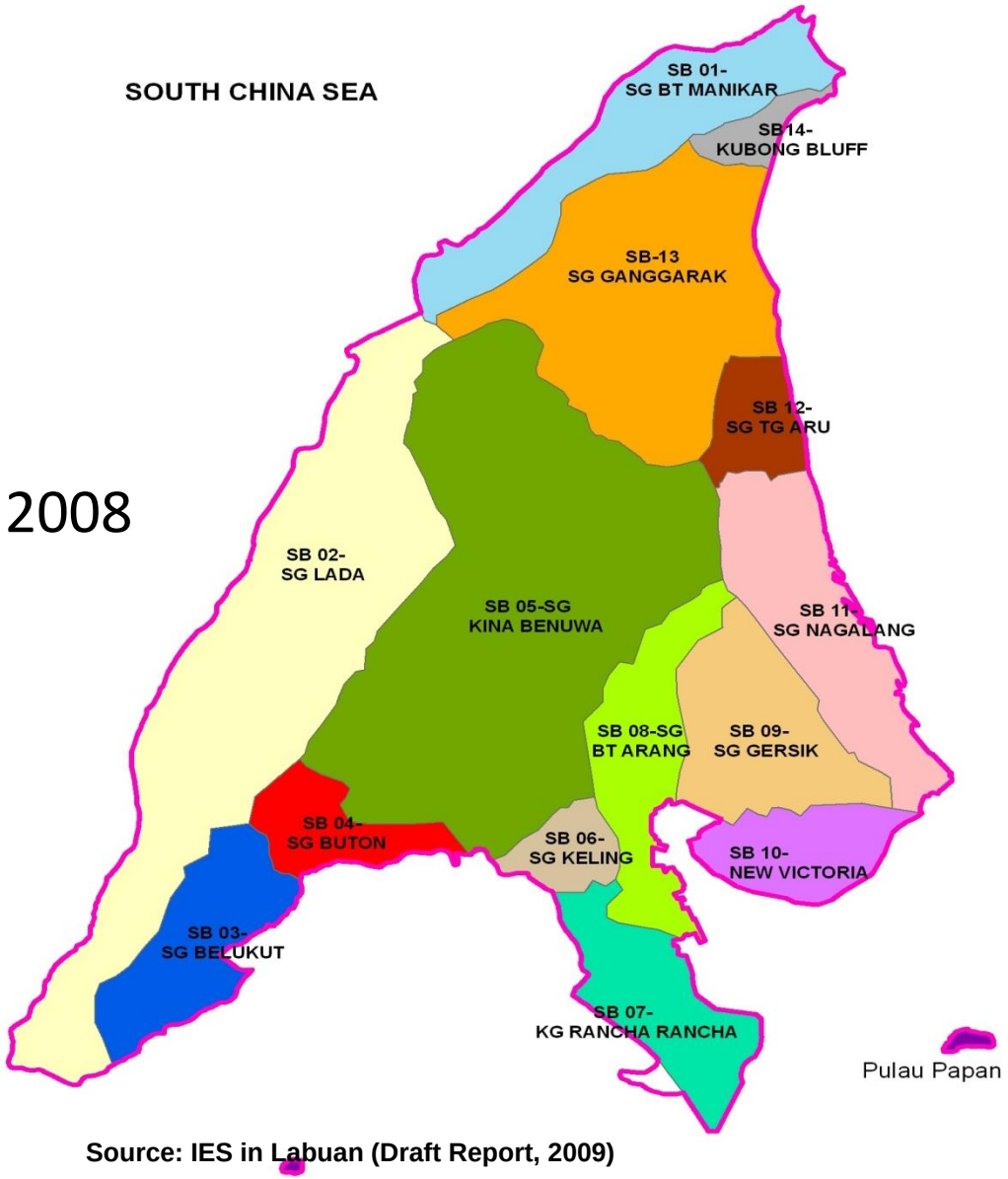
Putrajaya Catchment, Sg Chuau Catchment, is a tributary of Langat River System



From: Perbadanan Putrajaya

River Basins in Labuan – 92 km sq

Circa 2008



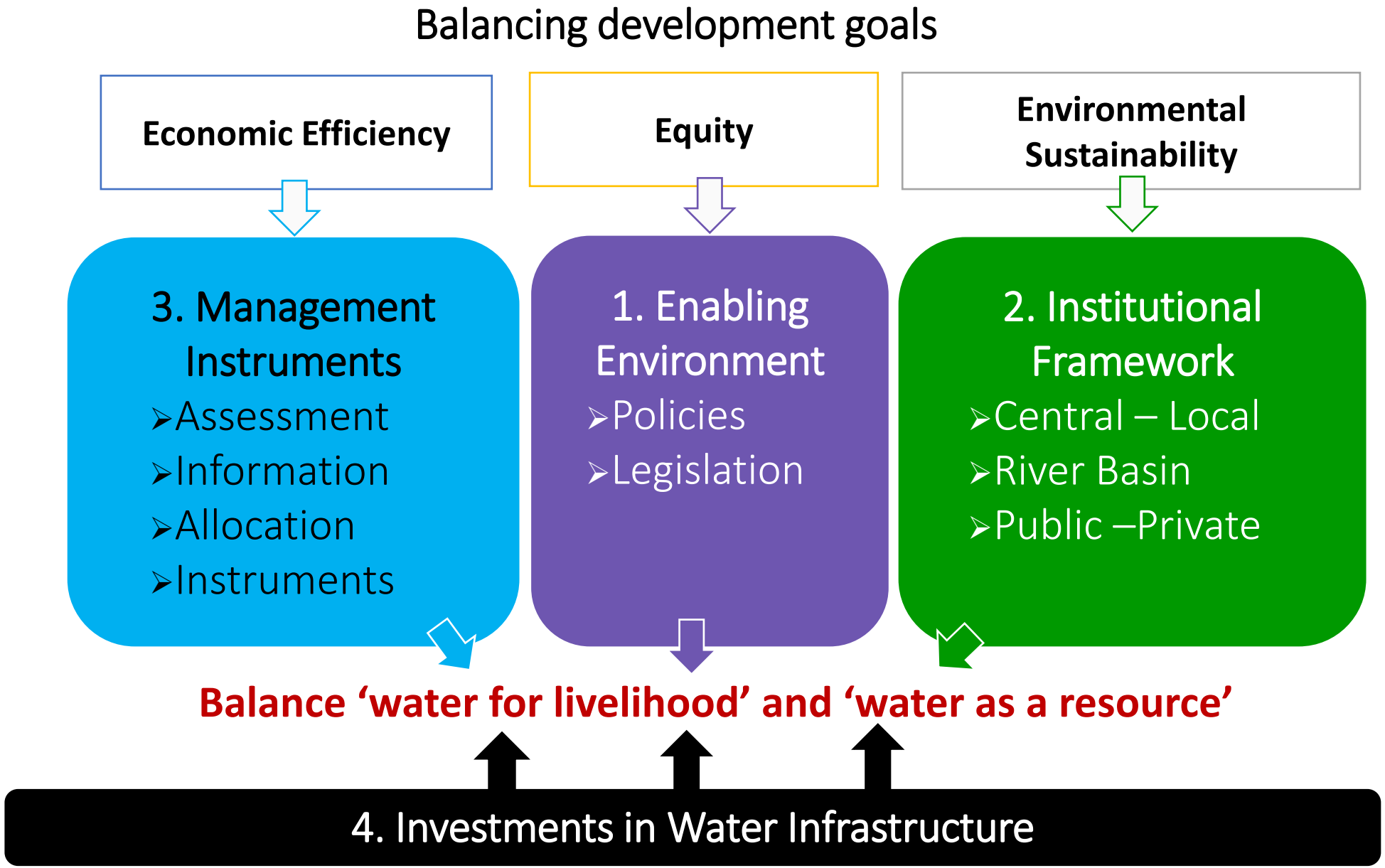
Source: IES in Labuan (Draft Report, 2009)

LEGEND :

- Project Boundary
- Sub-Basin Boundary
- SB01-Sg Bt Manikar
- SB02-Sg Lada
- SB03-Sg Belukut
- SB04-Sg Buton
- SB05-Sg Kina Benuwa
- SB06-Sg Keling
- SB07-Kg Rancha Rancha
- SB08-Sg Bt Arang
- SB09-Sg Gersik
- SB10-New Victoria
- SB11-Sg Nagalang
- SB12-Sg Tg Aru
- SB13-Sg Ganggarak
- SB14-Kubong Bluff
- Satellite Islands

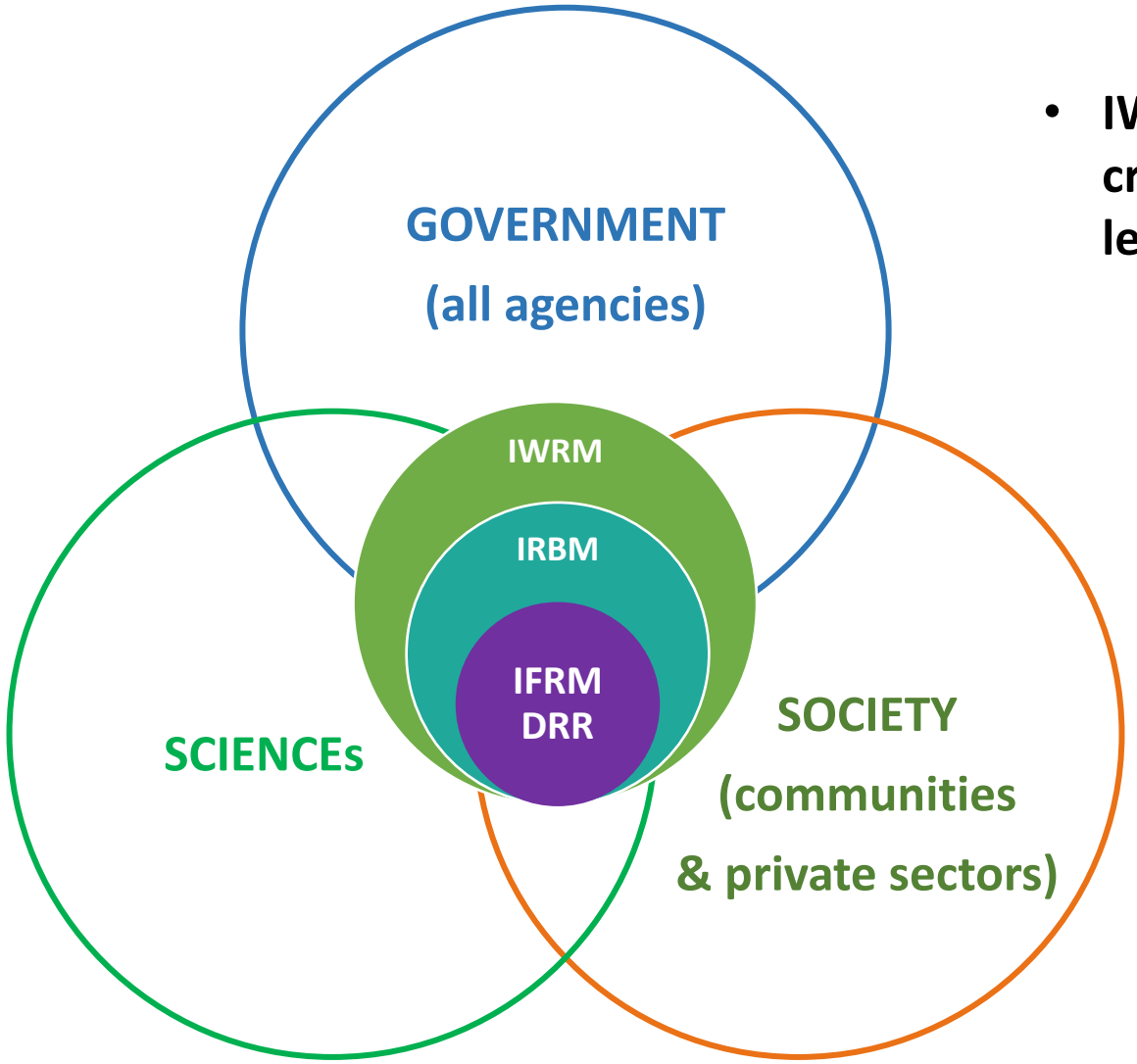
Moving Forward IWRM

IWRM General Framework



THE BIG PICTURE

- **Previous focus – on the science. The 3 pillars of IWRM**
  1. **enabling environment,**
  2. **institutional roles**
  3. **management instruments**
- **Need to move implementation to all – ASM NIWRMP**
- **Must include explicit financing alternatives – ASM NIWRMP**



- **IWRM requires a cross-sectoral, multi-level approach**

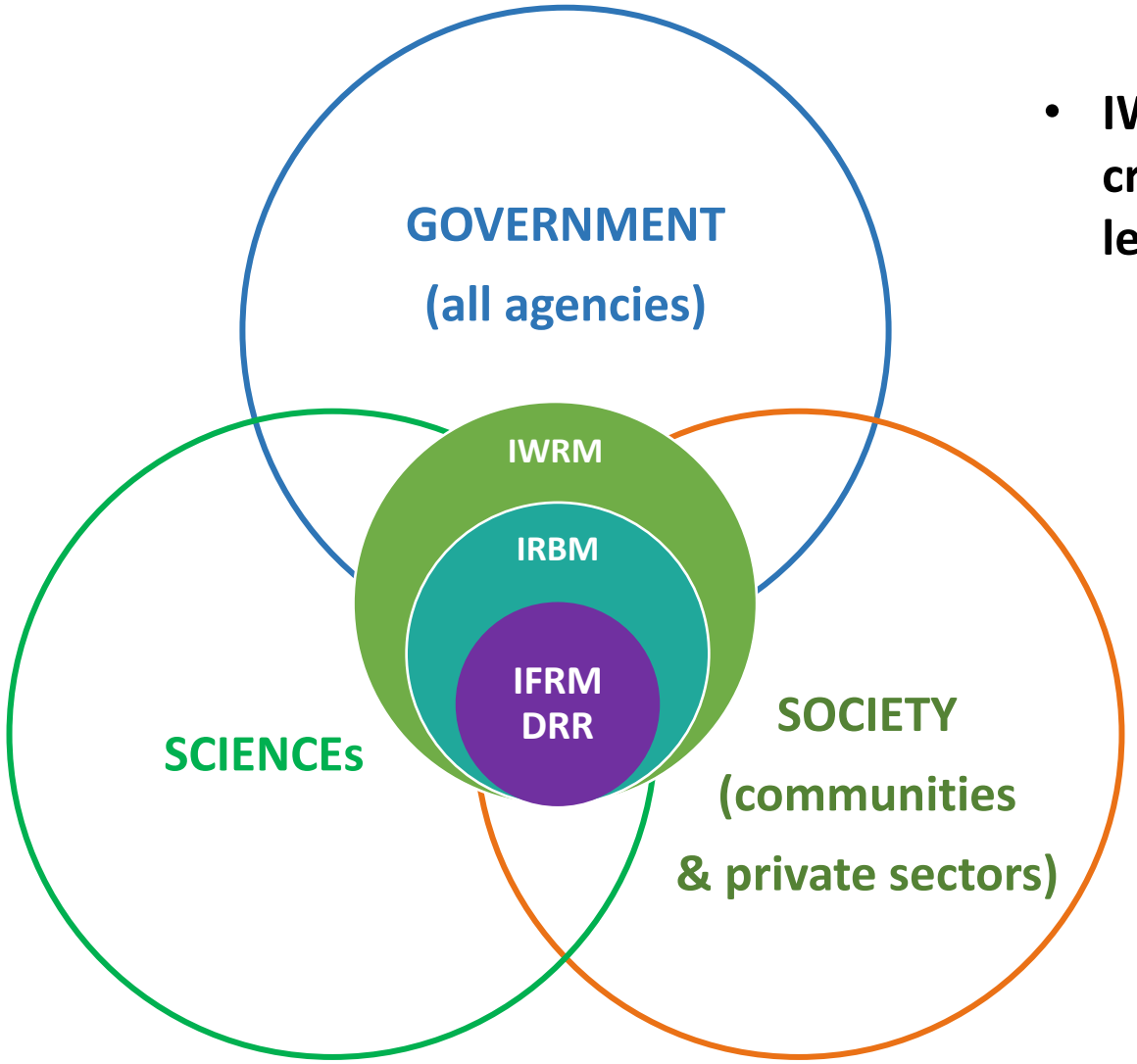
Components

IWRM – Integrated Water Resources Management
IRBM – Integrated River Basin Management
IFRM – Integrated Flood Risk Management
AWM – Agriculture Water Management
UFWM – Urban Flood Water Management
DRR – Disaster Risk Reduction
CCIA – Climate Change Impact Adaptation,
Storm water management
Urban water management
etc

THE BIG PICTURE

- **The proposed 6 pillars of IWRM @ 8WWF, Brasilia Mac 2018**

1. ***enabling environment,***
2. ***institutional roles***
3. ***management instruments***
4. ***Adequate Financing***
5. ***Effective Strategies***
6. ***Operating Mechanism, bridging strategy setting to problem solving***



- **IWRM requires a cross-sectoral, multi-level approach**

Components

IWRM – Integrated Water Resources Management
IRBM – Integrated River Basin Management
IFRM – Integrated Flood Risk Management
AWM – Agriculture Water Management
UFWM – Urban Flood Water Management
DRR – Disaster Risk Reduction
CCIA – Climate Change Impact Adaptation,
Storm water management
Urban water management
etc

Proposed Strategy Paper

i. Malaysia Makmur (developed) by 2040
ii. Current status/situations of water related performances/ activities
iii. Issues and challenges facing water sector in Malaysia
iv. Strategies/initiatives to transform water sector in the 12th Malaysia Plan (with proposed implementing agencies)
v. Proposed KPIs/ National Targets to be achieved by 2025 and 2030 (considering the existing global and national targets);
vi. Estimated costs/ timelines needed to implement proposed strategies/ initiatives for the period of 5-10 years (if possible).

Terima Kasih