PERSIDANGAN *NATIONAL ENVIRONMENTAL HEALTH ACTION PLAN* (NEHAP) TAHUN 2020, 24 Sept, Zenith Hotel, Putrajaya
Tema: *Water and Health: Collaborative Efforts on Health and Environment*

"*Managing Water Resources, for the Consumer: Integrated Water Resources Management (IWRM) Approaches*".

Salmah Zakaria, PhD, FASc

Chair, ASM Water Committee

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https://www.akademisains.gov.my/

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1. Introduction

ASM and ASM Water Committee

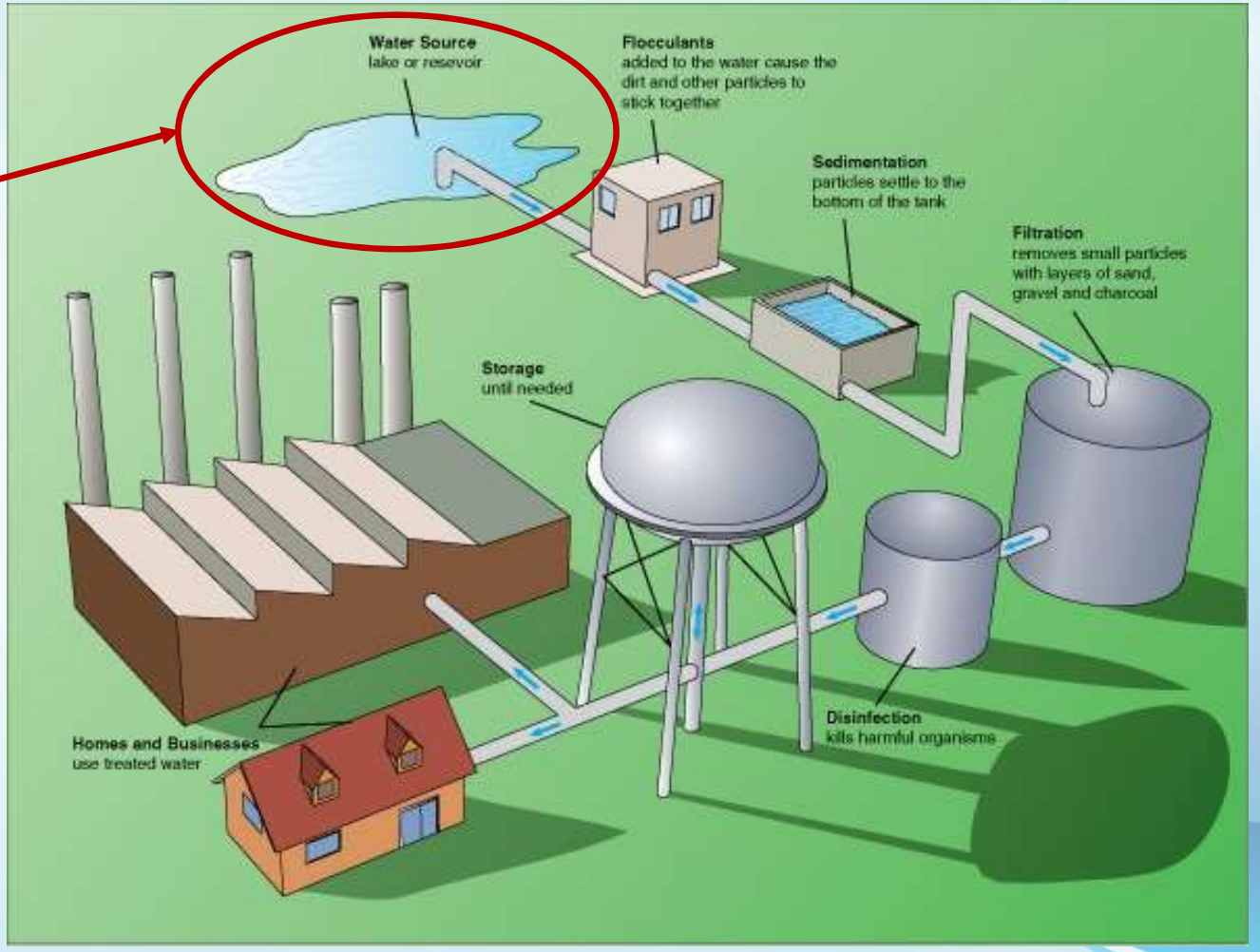
https://www.akademisains.gov.my/

- ASM is a Statutory Body formed on 1st February 1995 under the Academy of Sciences Malaysia Act 1994
- ASM Water Committee was formed to address the many issues and challenges faced by the water sector with the view of offering strategic advice to the authorities concerned
- The Committee adopted the IWRM ***paradigm*** as its central philosophy and thrust and is
- Guided by the ***IWRM General Framework***

Typical drinking water treatment processes

The Water Sources

- River basins
- Rivers
- Lakes
- Reservoirs



https://en.wikipedia.org/wiki/Water_purification

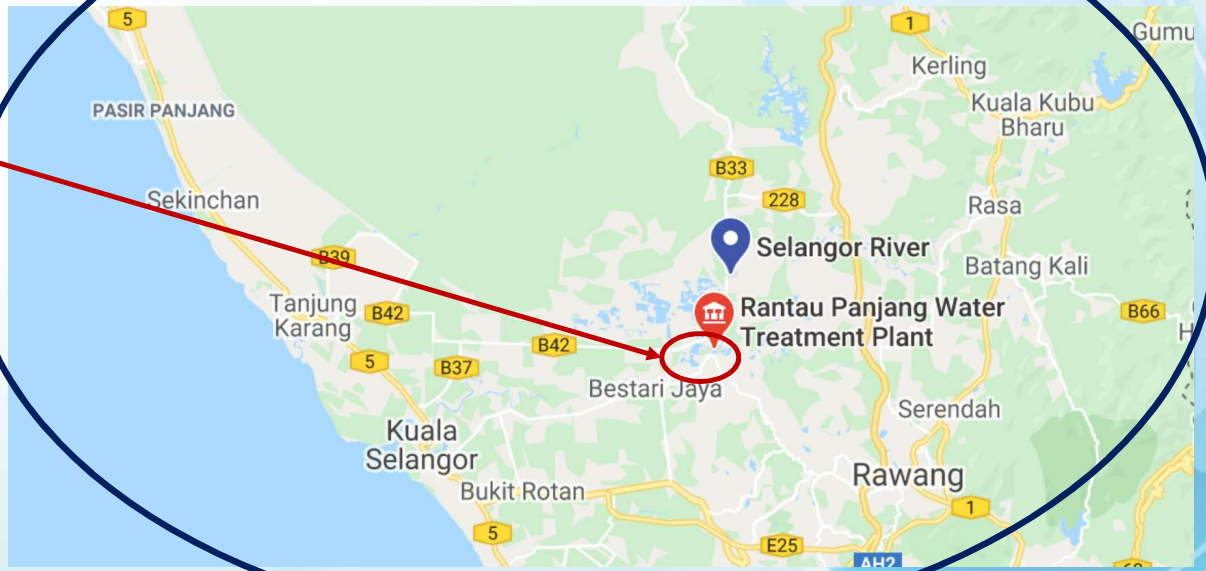
Managing the Water Resources for LRA Rantau Panjang

Rantau Panjang Water Treatment Plant

The Water Sources

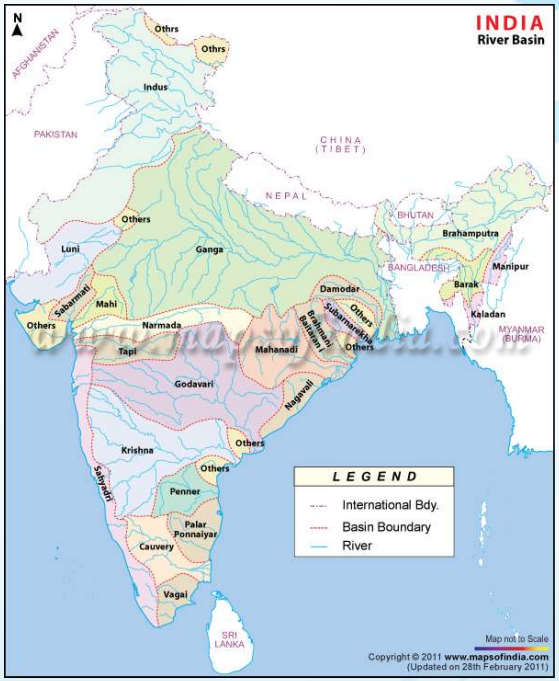
- River basins
- Rivers
- Lakes
- Reservoirs

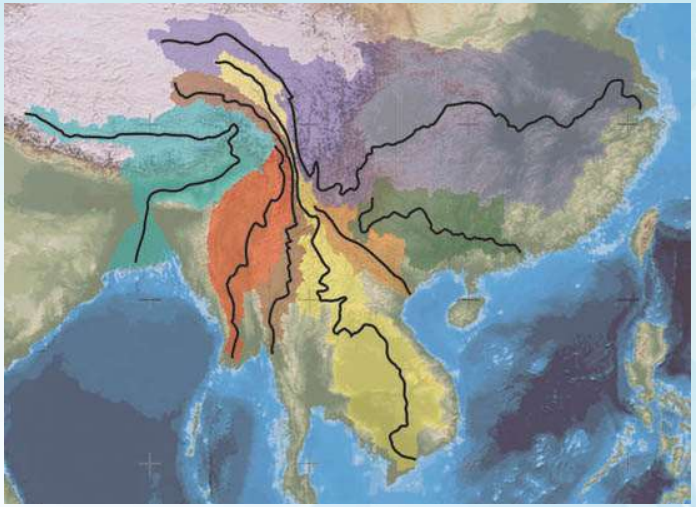
Selangor River Basin

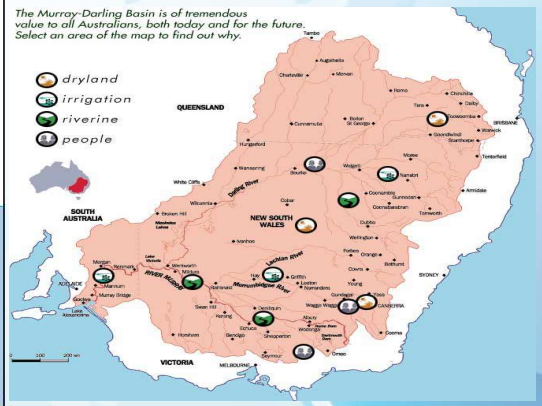


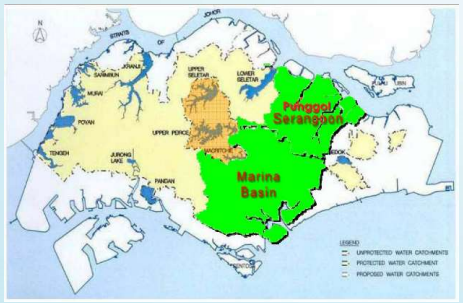
2. Sharing the same space - land and water

…. the river basins









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River Basins (RB) in Malaysia

Total = more than 2700
Bigger RB units = 189

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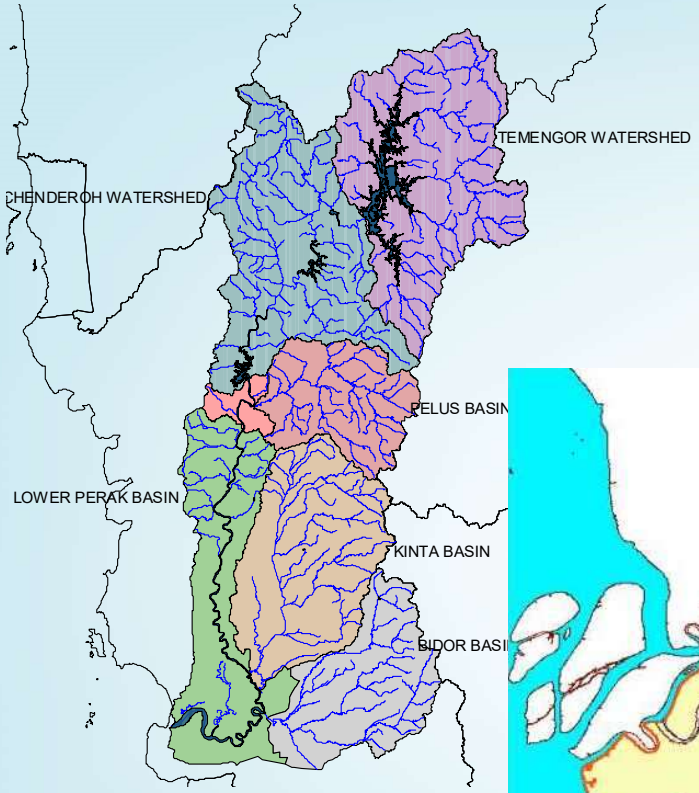
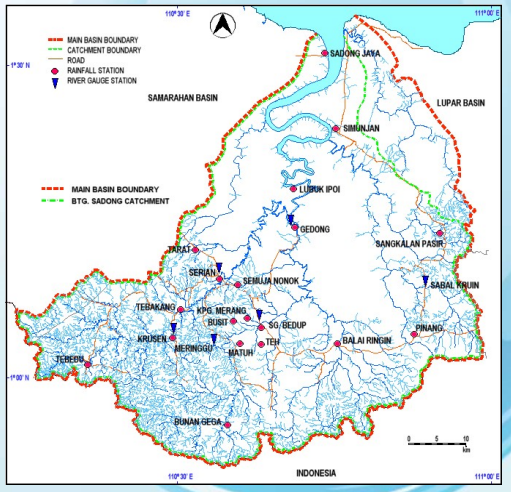
Rivers, tributaries and rivulets – are they Arteries or Veins of river basins?





Need to integrate water management

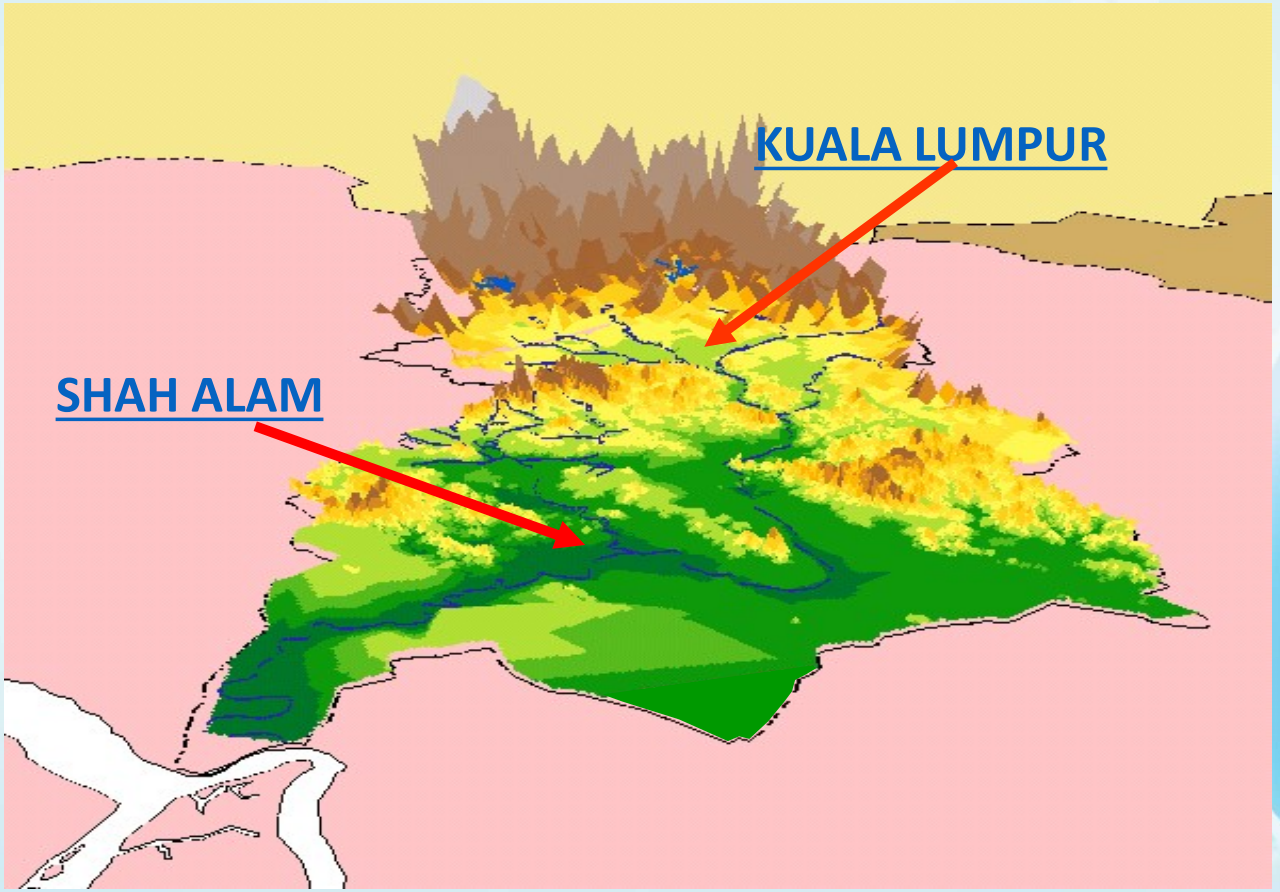
Star, Letters -Saturday, 19 Sep 2020

- In 2016, the Academy of Sciences Malaysia published a report titled "Transforming the Water Sector: National Integrated Water Resources Management Plan: Strategies and Road Map"
  - provided a comprehensive assessment of our water sector and recommendations for future efforts to safeguard our water resources
  - https://www.akademisains.gov.my/asm-publication/national-integrated-water-resources-management-plan-strategies-and-road-map/
- The main recommendation
  - States to set up an integrated water resources management plan.
  - With the establishment of state water resources management bodies, states will be able to integrate planning, monitoring, legal enforcement and management of water resources on a river-basin basis.
  - This will not only assist with response rate but also serve as a preventative tool to ensure that our water sources remain secure.

https://www.thestar.com.my/opinion/letters/2020/09/19/need-to-integrate-water-management?fbclid=IwAR038YF7C_KlLKvHF7iVFy9WHVkiErknKR81C3-nLIt6AEsIRXVFZNMptdM

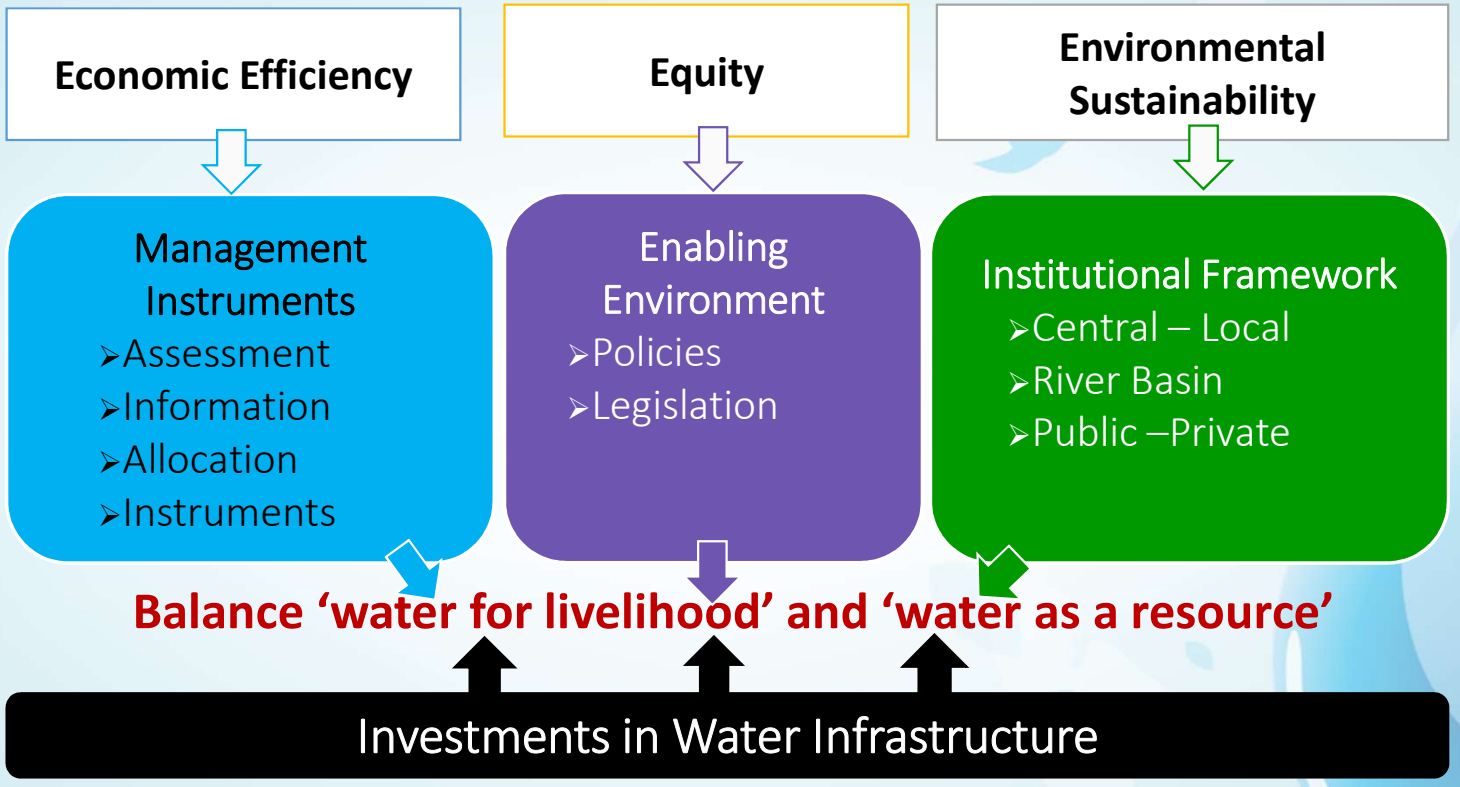
Klang River Basin

3-D



3. Integrated Water Resources Management - IWRM

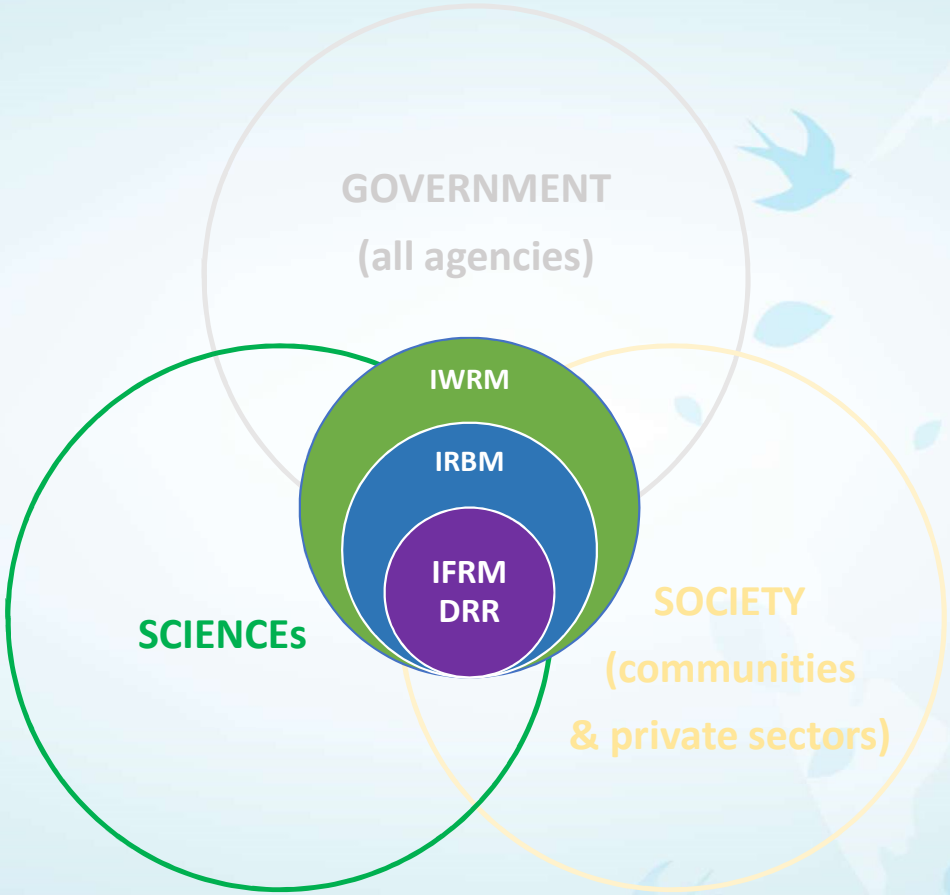
IWRM UNIVERSAL FRAMEWORK
Balancing Development Goals



…coordinated development and management of water, land and related resources… - Global Water Partnership

THE "INITIAL" BIG PICTURE

- **Previous focus on developing– the sciences of**
  - **enabling environment**
  - **institutional roles and**
  - **management instruments**



- **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

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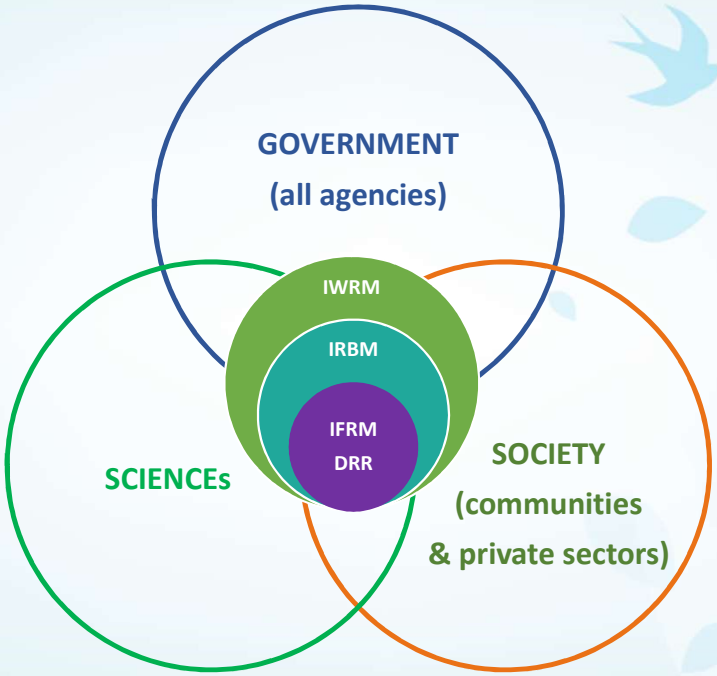
UPDATED BIG PICTURE – ASM 2016 and 8WWF8 2018,

- **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***



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While Malaysia has adopted IWRM since 8th MP, the **implementation is still marginal**…

Implementation categories	Score range	General interpretation for overall IWRM score
Very High	91-100	Plans and programmes are reviewed and revised
High	71-90	Most IWRM objectives are generally met
Medium-high	51-70	Most IWRM elements are being implemented under long term programme
Medium-low	31-50	IWRM elements are instituionalised, and inplementation is underway
Low	11-30	Some implementation of IWRM elements has begun
Very Low	0-10	Development of IWRM elements has generally not begun, or has stalled

The implementation of IWRM in Southeast Asia's countries

Country	Final IWRM Score	Section 1 Average Enabling environment	Section 2 Average Institution and participation	Section 3 Average Management Instrument	Section 4 Average Financing
SINGAPORE	100	100	100	100	100
PHILLIPINES	51	64	53	52	37
INDONESIA	48	52	53	52	36
CAMBODIA	46	54	46	50	32
MALAYSIA	43	46	47	47	32
VIETNAM	38	47	35	36	34
MYANMAR	27	17	21	27	45

No submission received from Brunei and Thailand *Source: United Nations Environmental Progarmme, 2018*

Malaysia is among 80% of countries (out of 172) that have laid the foundations for IWRM. The focus now is on how **to accelerate the implementation of IWRM** to achieve sustainable development.

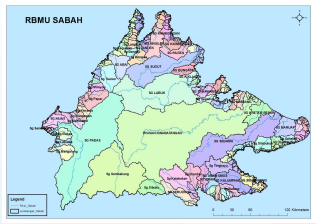
4. Challenges in IWRM

Issues and Challenges

- Fragmentation in water governance structures
  - As compared to needs of IWRM
- Rapid urbanisation and industrial development
  - Moving targets - water, land and related resources within the basin increasingly under stress
  - Deterioration of river water quality
  - Degradation on environment
- Climate change impacts
  - Variability in climate – becoming more extreme

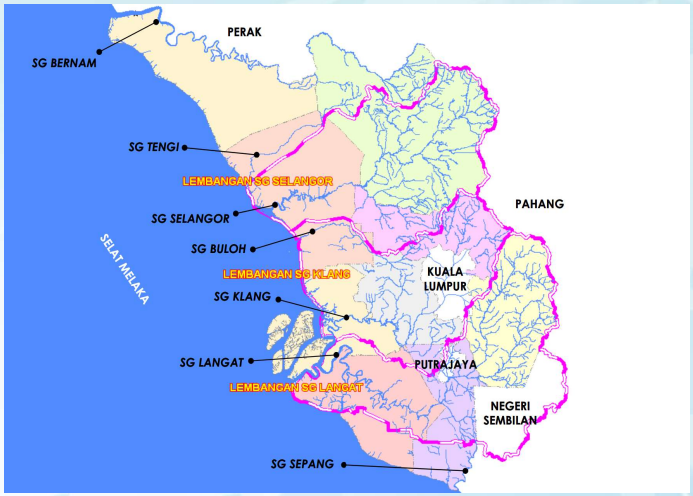
Fragmentation 1

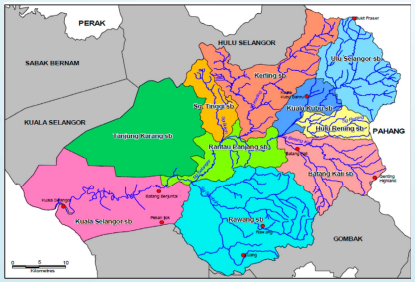
- Federal Constitution
  - Land and water is a state matter
  - Irrigation & drainage and water supply are on the concurrent lists

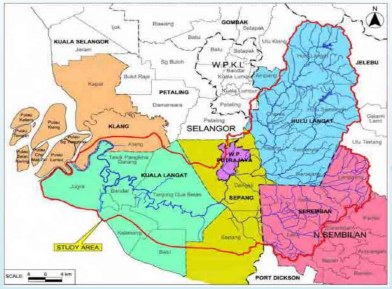


Fragmentation 2

- Many river basins are divided within several local authority management
  - Land and water is a state matter
  - Irrigation & Drainage and water supply on concurrent lists







Population increase, urbanisation, development, etc

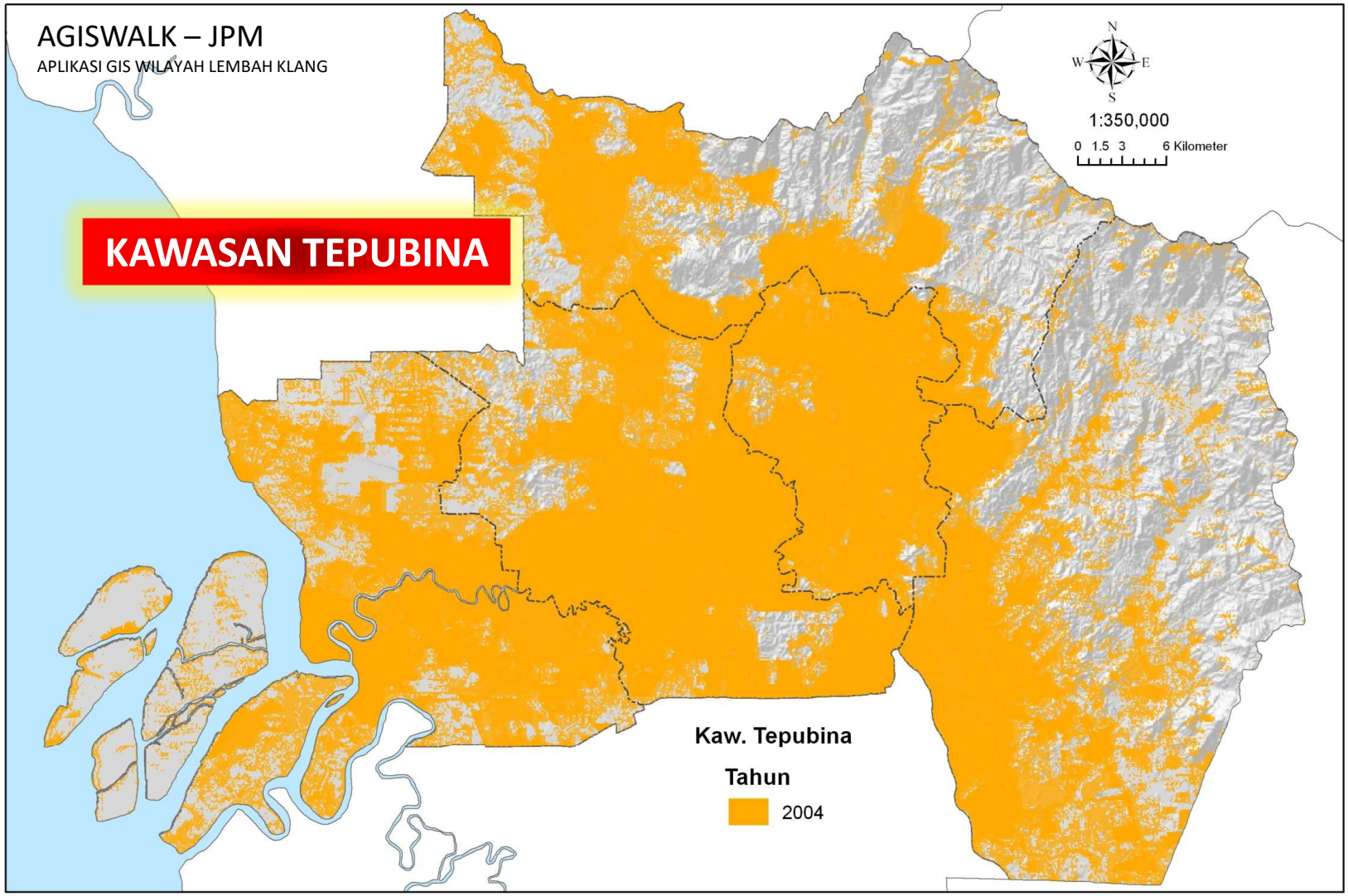
……moving targets

Increased
economic
activity

Finite, renewable,
yet vulnerable
water resource

Increased water use &
increased pollution

Increased competition and conflicts (local, national, international)
Sectoral (fragmented) management
Impacts of climate change


AGISWALK – JPM
APLIKASI GIS WILAYAH LEMBAH KLANG
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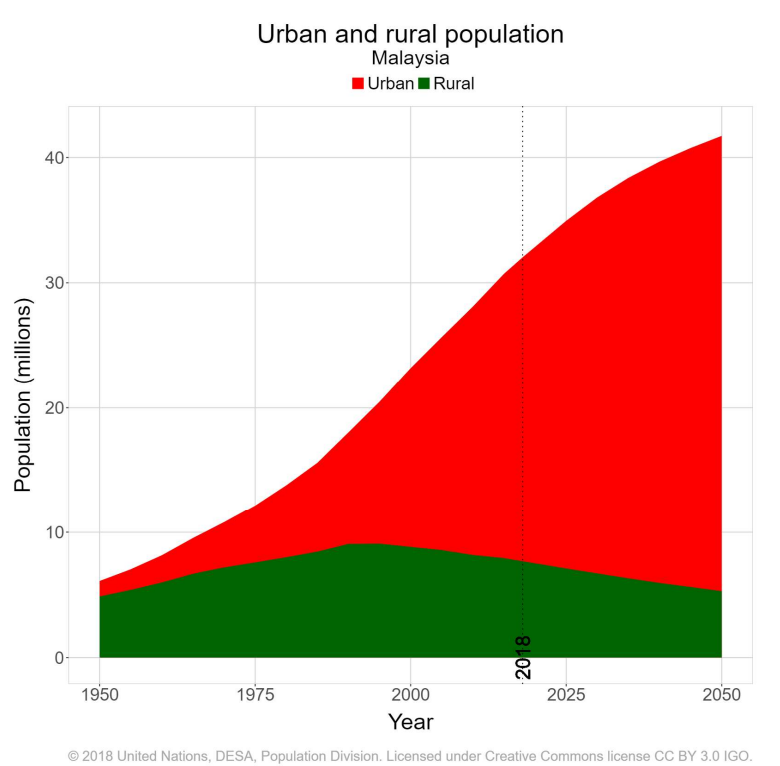
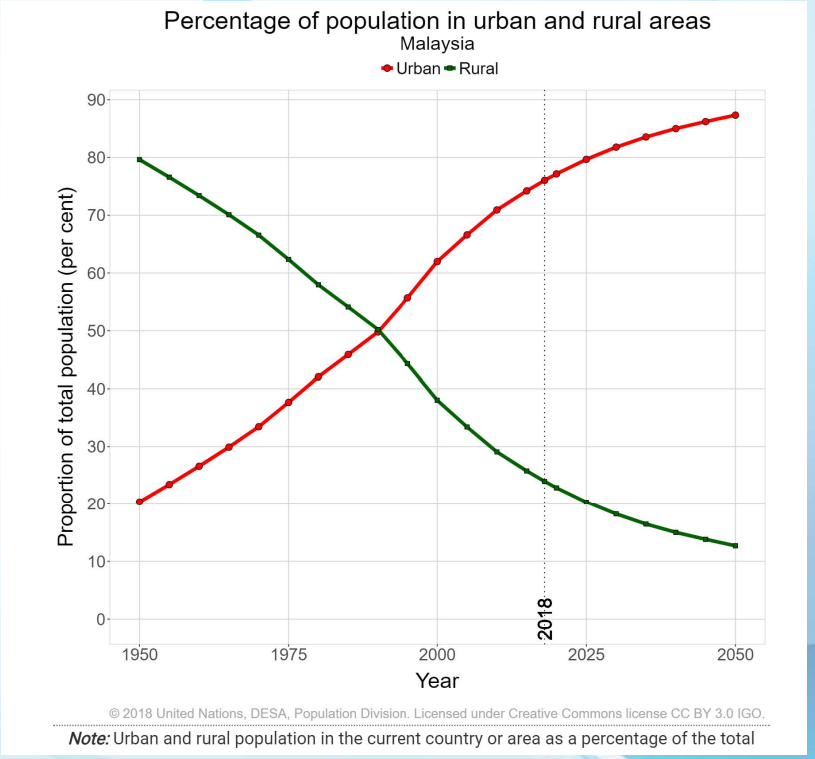
Urban Rural Population – Malaysia

UN-Department of Economic and Social Affairs, Population Dynamics





https://population.un.org/wup/Download/

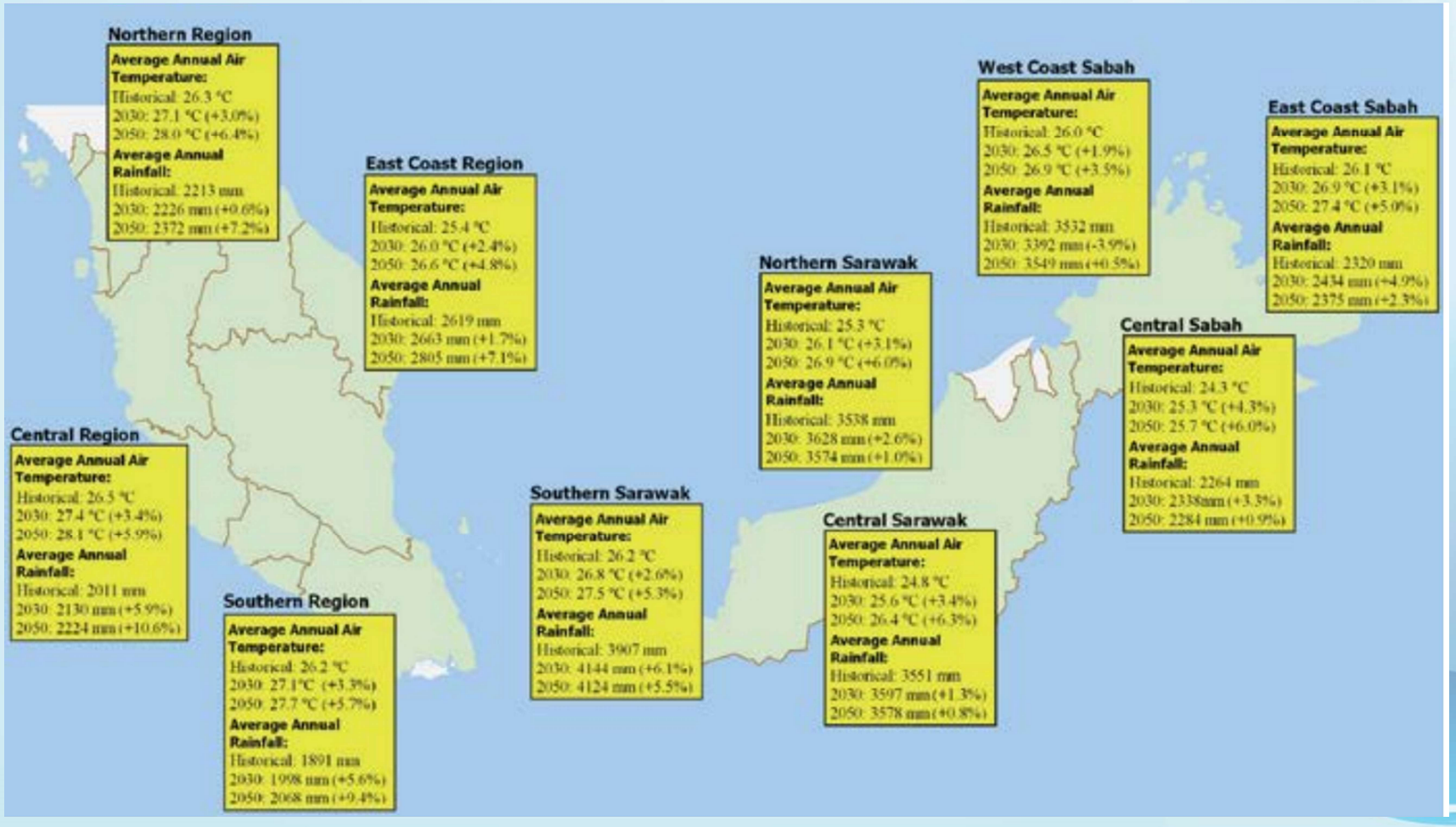
Climate changes – Moving/changing Variabilities

from NC3 – 3rd National Communication to UNFCCC

- Temperature
  - average annual air temp for Malaysia increases by 0.5C-1.0℃ (period of 2030); increase to 0.9-1.60℃ (period of 2050).
- Rainfall
  - increase rainfall during the period of 2030, except for West Coast of Sabah where it shows a reduction of 3.9%.
  - significant increment of rainfall in Southern Sarawak (6.1%), Central Region (5.9%) and the Southern Region (5.6%) in Peninsular Malaysia, and East Coast of Sabah (4.9%).
- Dry Spell
  - dry spells with Return Periods 5-10 years (up to 36.3% of rainfall reduction) may occur frequently.
  - a minimum number (1 to 2) of dry spell with Return Periods more than 20 years (more than 44% and up to 48.4% of rainfall reduction) may occur at several of the River Basins and Coastal Regions of Peninsular Malaysia.
  - the most severe ones are projected to occur during the period of 2025- 2035 in Peninsular Malaysia, whilst over in Sabah and Sarawak, they are expected to occur within 2045- 2055

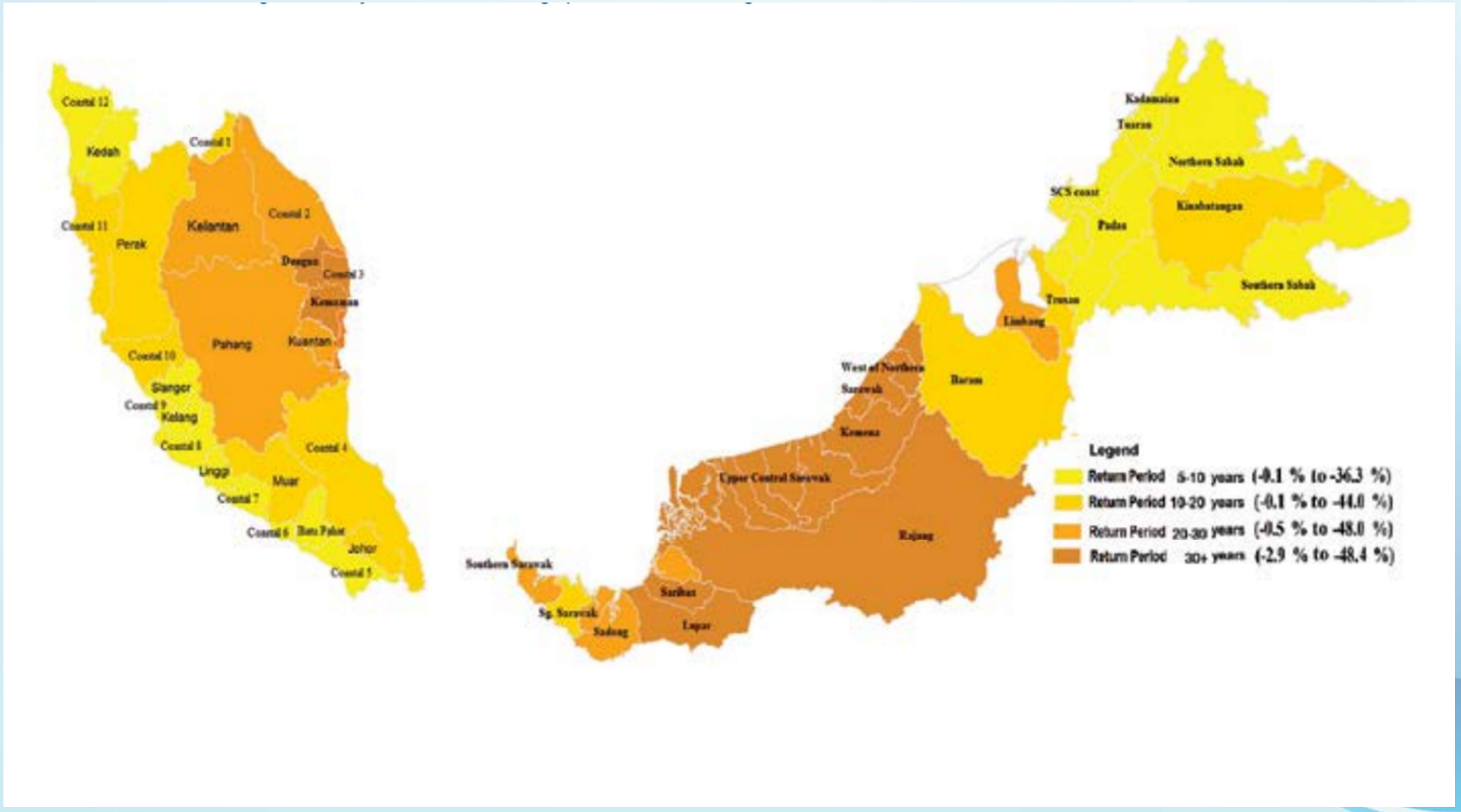
Projected Average Annual Temperature and Annual Rainfall

from NC3 – 3rd National Communication to UNFCCC



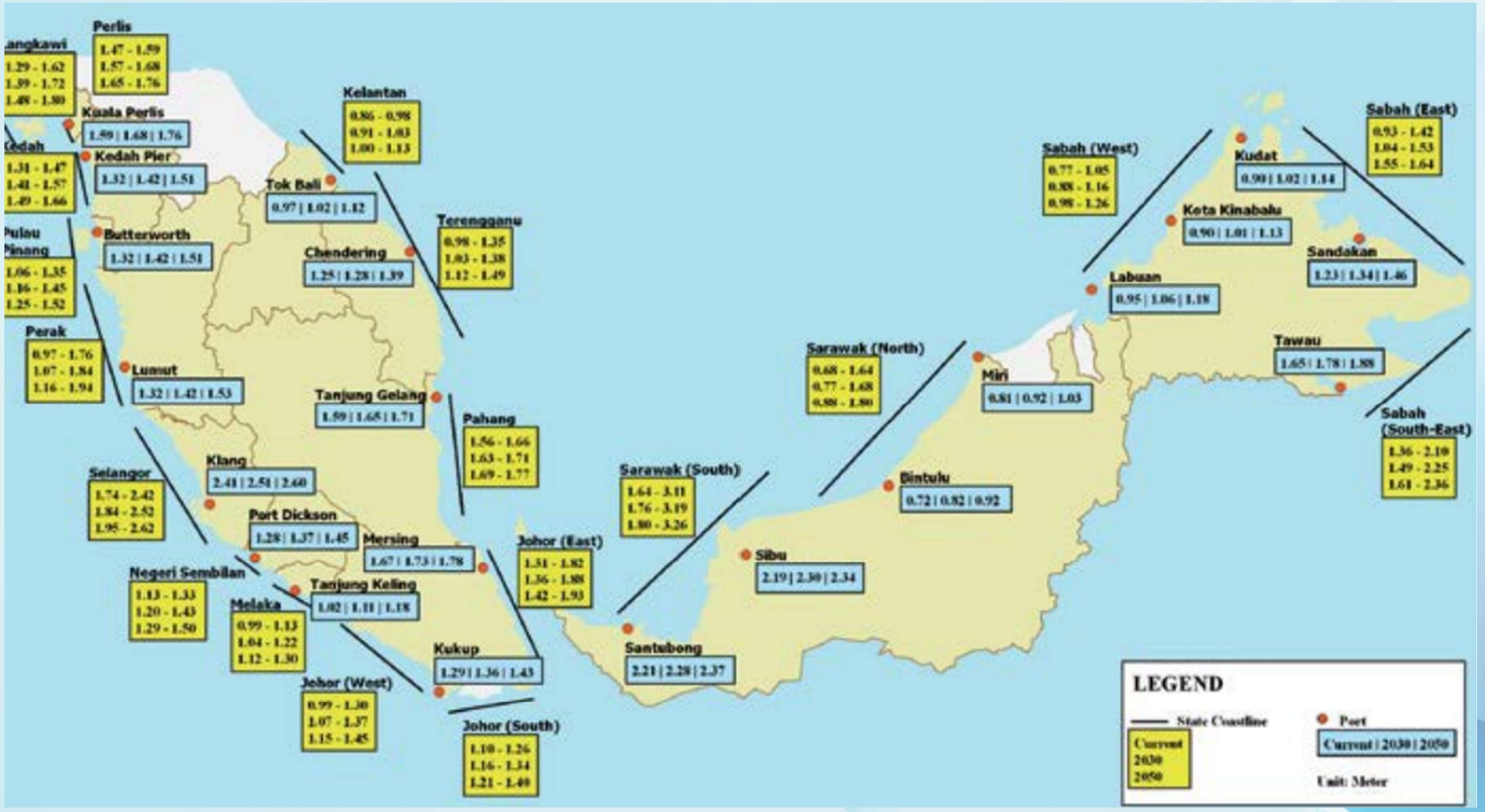
Projected Most Severe Dry Spell; Peninsular (2025-2035), Sabah and Sarawak (2045-2055)

from NC3 – 3rd National Communication to UNFCCC



Projected Range of Maximum Sea Levels (meters) for current 2016 and 2050

from NC3 – 3rd National Communication to UNFCCC



5. Moving Forward

From Keynote Address of TKP2 EPU @ the Engagement Session for Strategy Paper 16: Accelerate Implementation of Integrated Water Resources Management towards

WATER SECTOR TRANSFORMATION 12TH MALAYSIA PLAN 2021-2025, 17th July 2020

Improve our IWRM implementation in 12th MP

- From a score of 43
- Focusing on
  - People
  - Governance
  - Information, Research, Development, Innovation and Commercialization
  - Finance – alternative financing
  - Infrastructure and Technology

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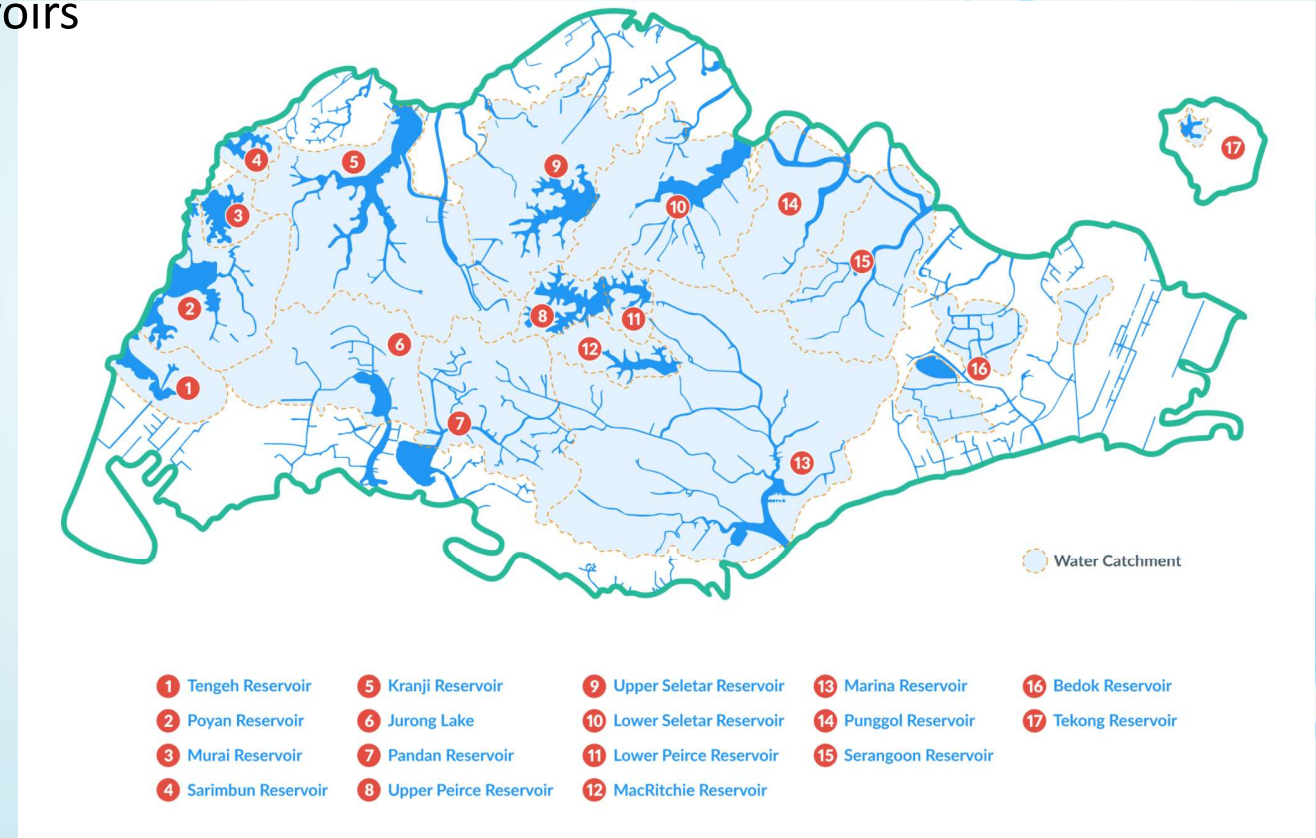
Singapore catchments

- Area about 710 km2 and growing urban areas
- Singapore collects and store all the rain that falls on two-thirds of its land to its 17 reservoirs



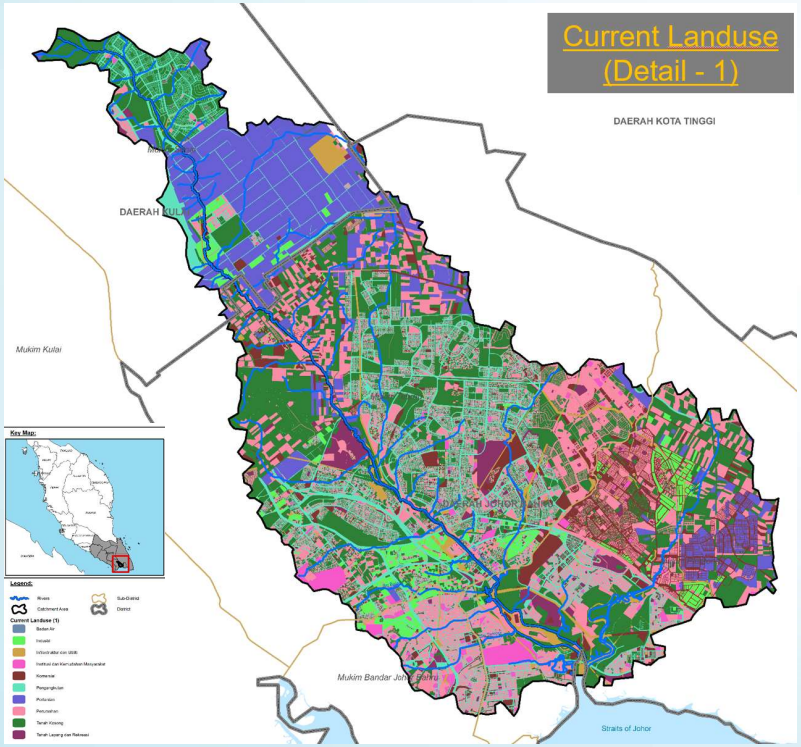
https://www.pub.gov.sg/watersupply/fournationaltaps/localcatchmentwater

Satellite image of Pasir Gudang area at the Strait of Tebrau

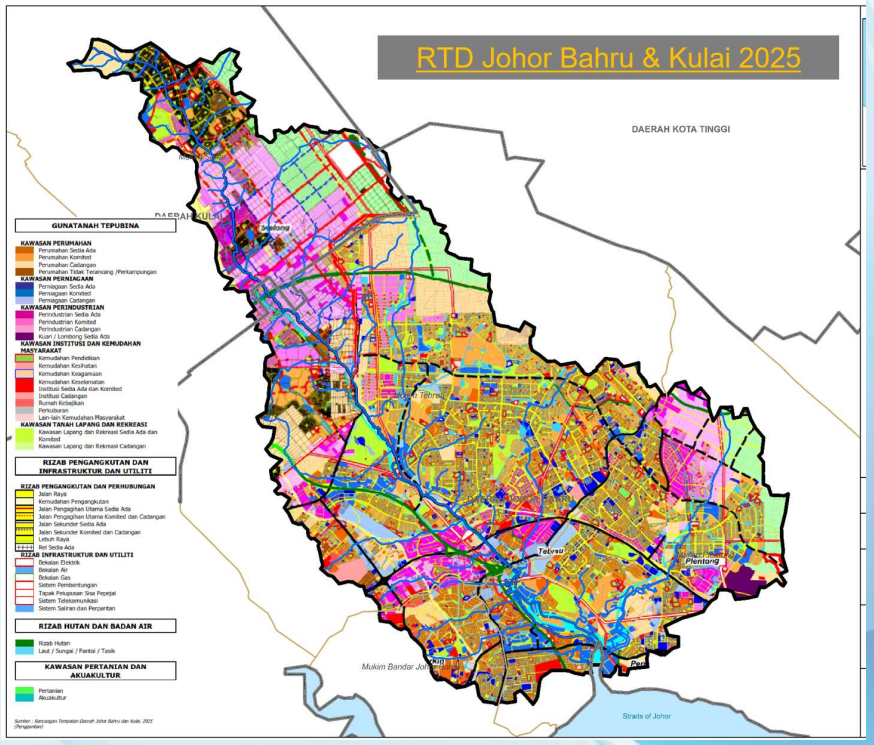
(Source: Malaysia Remote Sensing Agency)

Sg Tebrau River Basin

2017



2025



WATER SECTOR TRANSFORMATION 2040 AGENDA

The Water Sector Transformation 2040 (WST 2040) will set the strategic direction **towards repositioning the sector as a dynamic growth engine** while ensuring water security for all by 2040

Phase 1: 12th Malaysia Plan (2021-2025)	Phase 2: 13th Malaysia Plan (2026-2030)	Phase 3: 14th Malaysia Plan (2031-2035)	Phase 4: 15th Malaysia Plan (2036-2040)
Accelerating IWRM implementation	Uplifting indigenous technology at par with international standards	Achieving economies of scale	Becoming the regional water hub

WST 2040 Objectives

- Ensuring **water supply for all**
- Water sector as **a dynamic growth engine** to generate revenue, create job opportunities and increase efficiency in water management.

PHASE 1 (2021-2025)

12th MP will be the 1st phase of water sector transformation agenda which is to **accelerate implementation of IWRM and provide foundation for water sector transformation.**

TWELFTH MALAYSIA PLAN

Accelerating Implementation of IWRM Towards Water Sector Transformation 2040

OBJECTIVES

1. **WATER SECURITY AND SUSTAINABILITY**
2. **WATER AS AN ECONOMIC OPPORTUNITY**

DRIVER

PEOPLE

Empowering People to Drive Water Sector Transformation

ENABLERS

GOVERNANCE	INFORMATION & RDCI	FINANCE	INFRASTRUCTURE & TECHNOLOGY
Strengthening Governance of Water Sector at All Levels	Enhancing Data-Driven Decision-Making for Sustainability	Strengthening Financial Capacity for Water Sector Transformation	Developing Sustainable Infrastructure with Cost-effective Technology

Terima Kasih

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