

MEA 12MP Kick-Off Conference  
Kick off Conf 12<sup>th</sup> Malaysia Plan, 2 July 2019, Hotel Marriot IOI, Putrajaya

# ***Transforming the Water sector***

## ***Working in an integrated manner***

*Salmah Zakaria, FASc*

*Chair, ASM Water Committee*

*Academy of Sciences Malaysia*  
<https://www.akademisains.gov.my/>

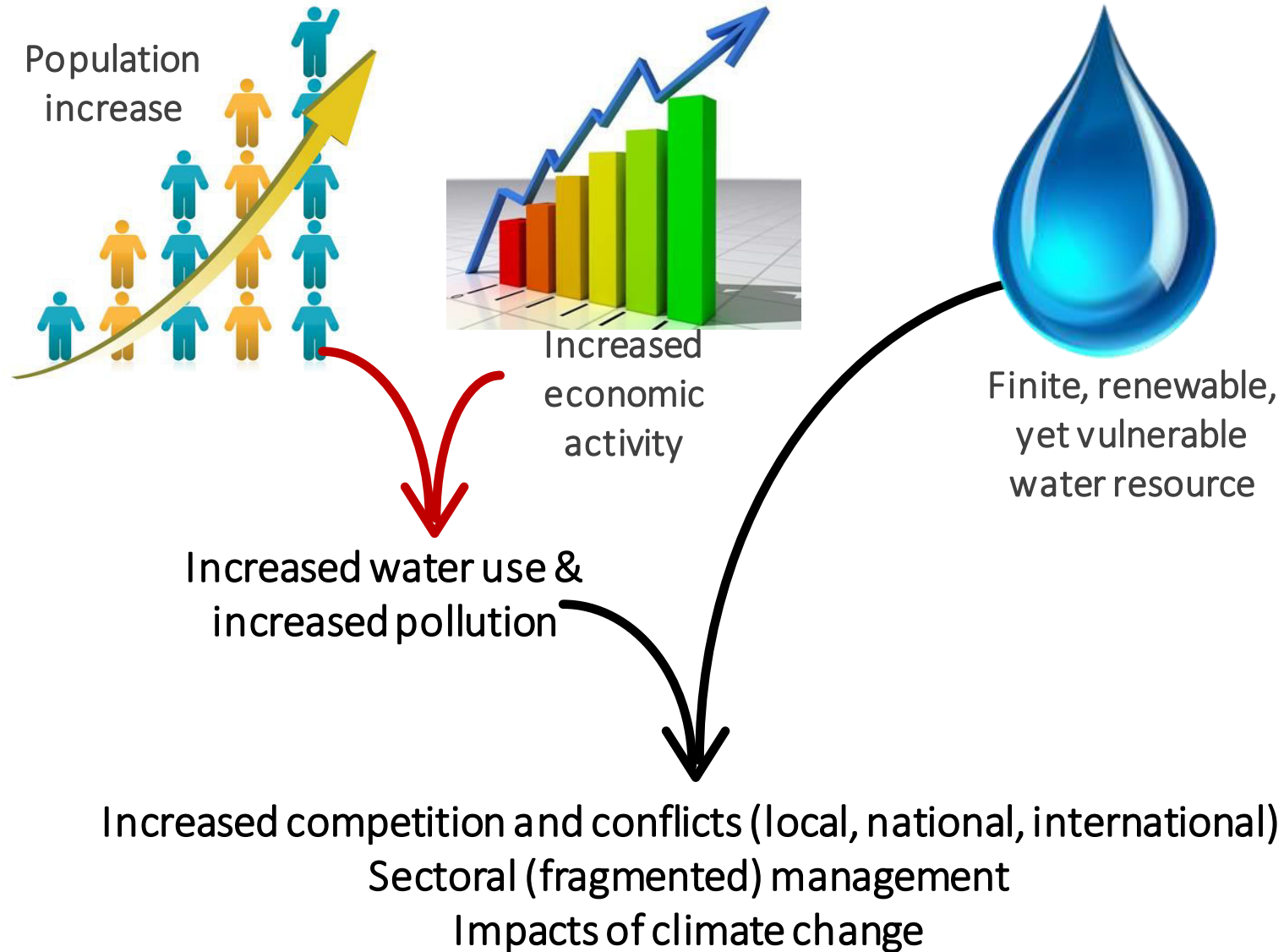
# The transformation....by 2040 ....

- .... drinking direct from the tap
- .... clean water in the rivers and water bodies
- .... flash floods, generally, a thing of the past
- .... the water sector – a vibrant economic sector

# Challenges in Managing Water

*...moving targets*

# MEA 12MP Kick-Off Conference





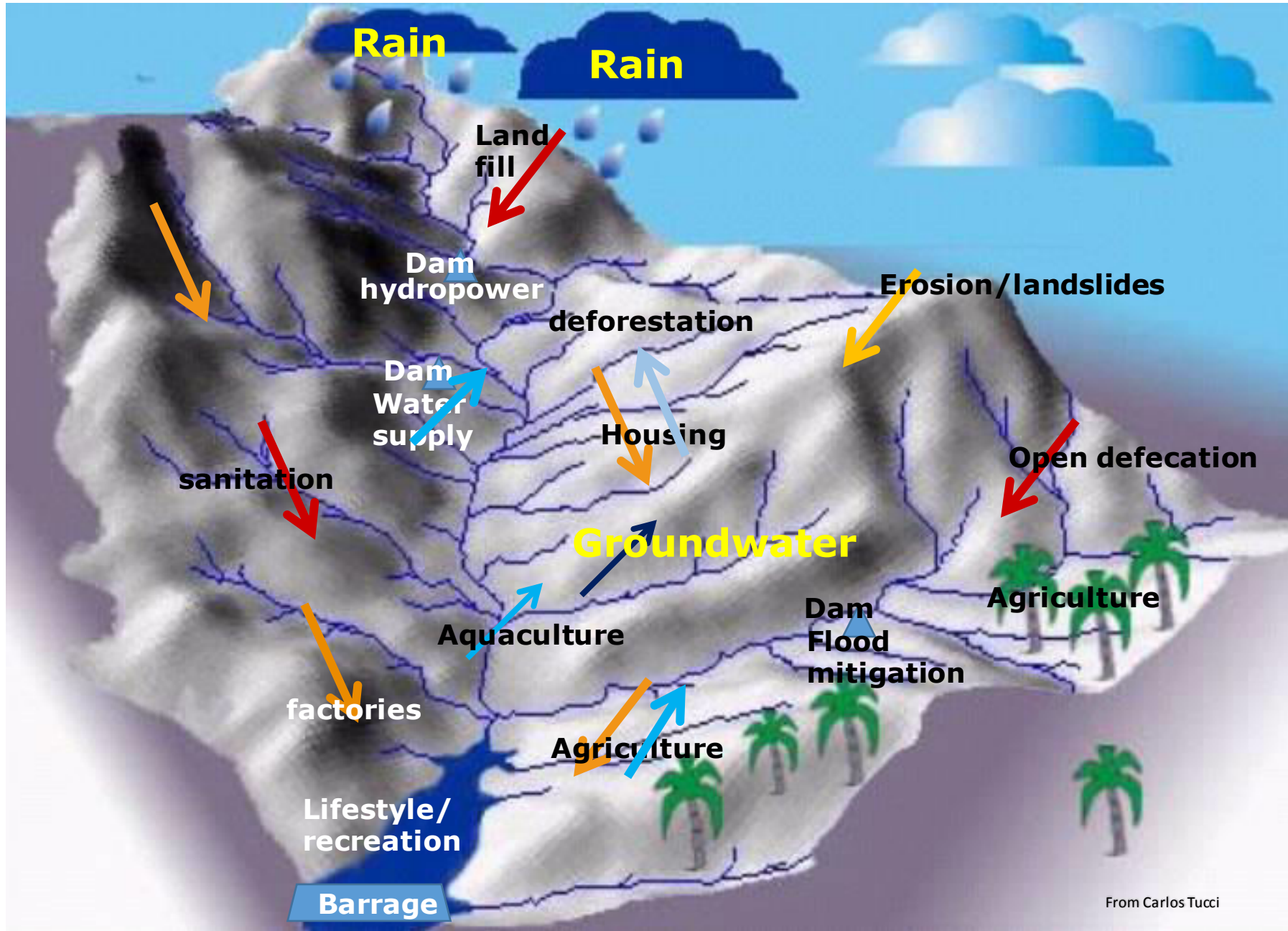
We share the same space  
*... the river basin*

MEA 12MP Kick-Off Conference

# The River Basin

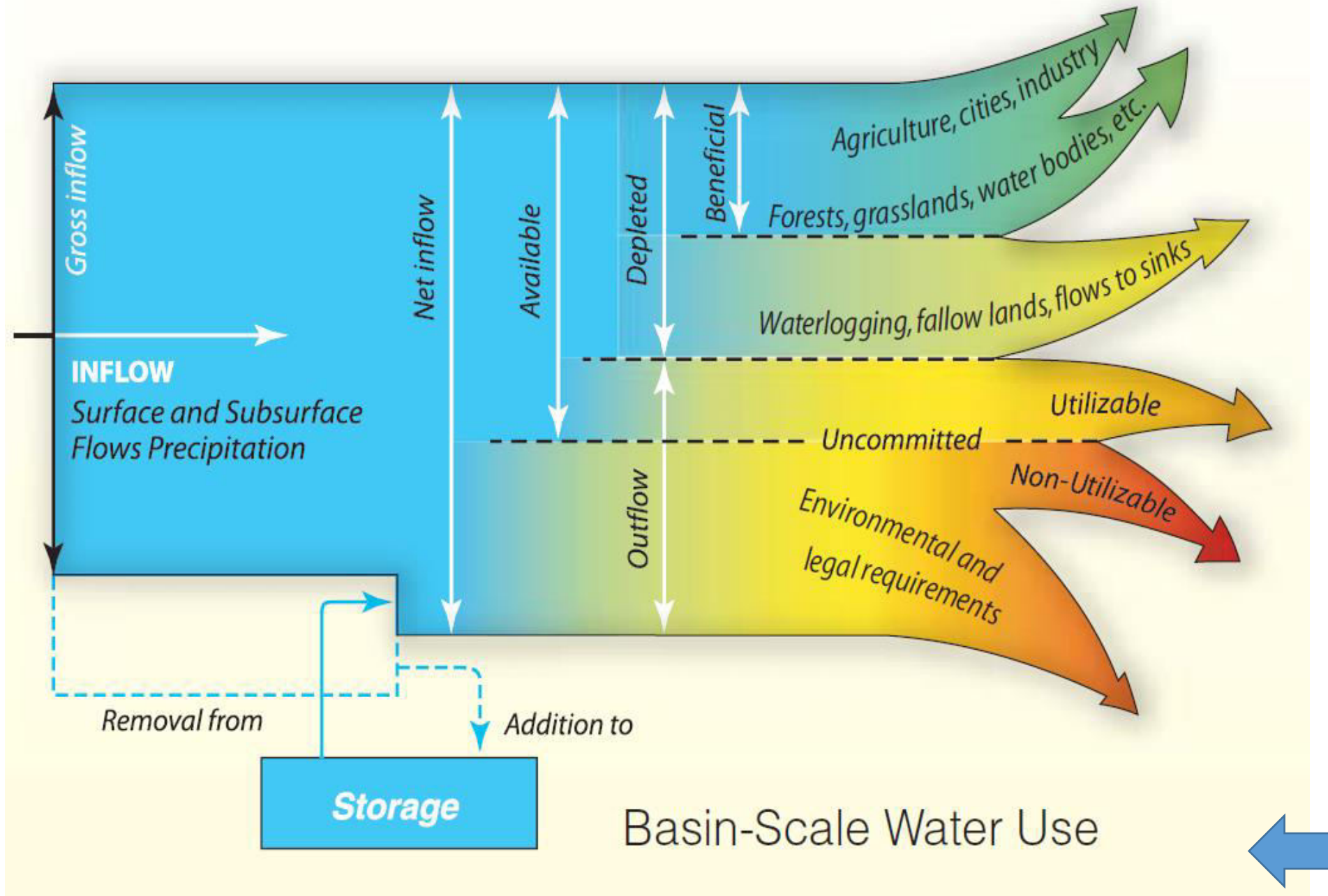


MEA 12MP Kick-Off Conference  
**The River Basin**



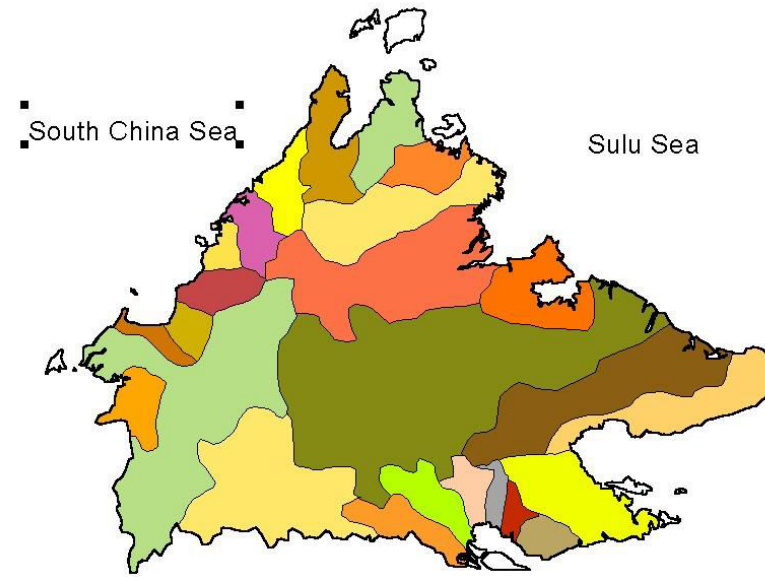
From Carlos Tucci





# River Basins in Malaysia

# MEA 12MP Kick-Off Conference



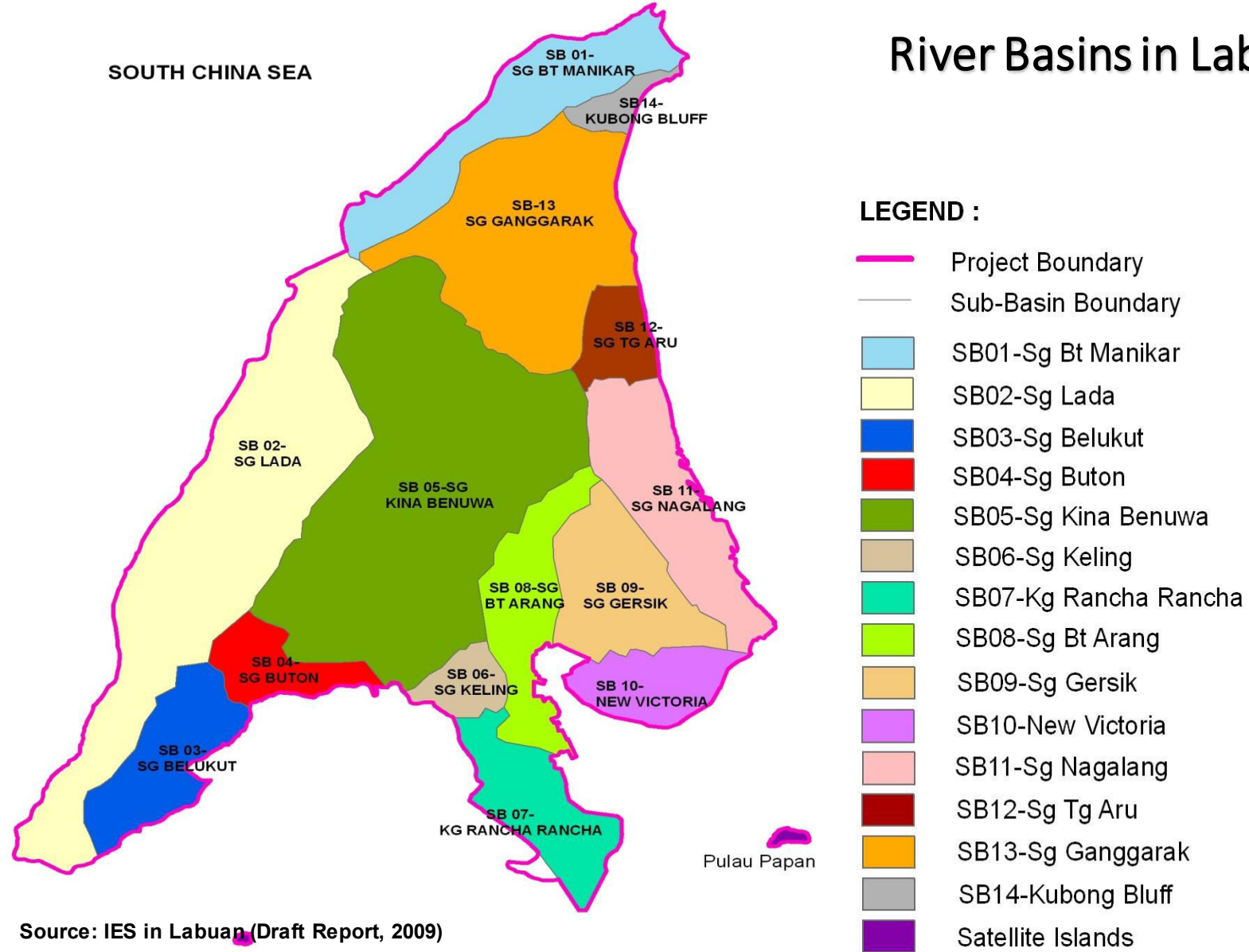
**SARAWAK - RIVER BASINS**  
For development planning purposes, the state of Sarawak is divided into 21 major river basins.

Malaysia - 330,000 km<sup>2</sup>  
Average Annual Rainfall 1500mm to 4500 mm

## 189 River Basins Management Units (RBMU) in Malaysia (2004)

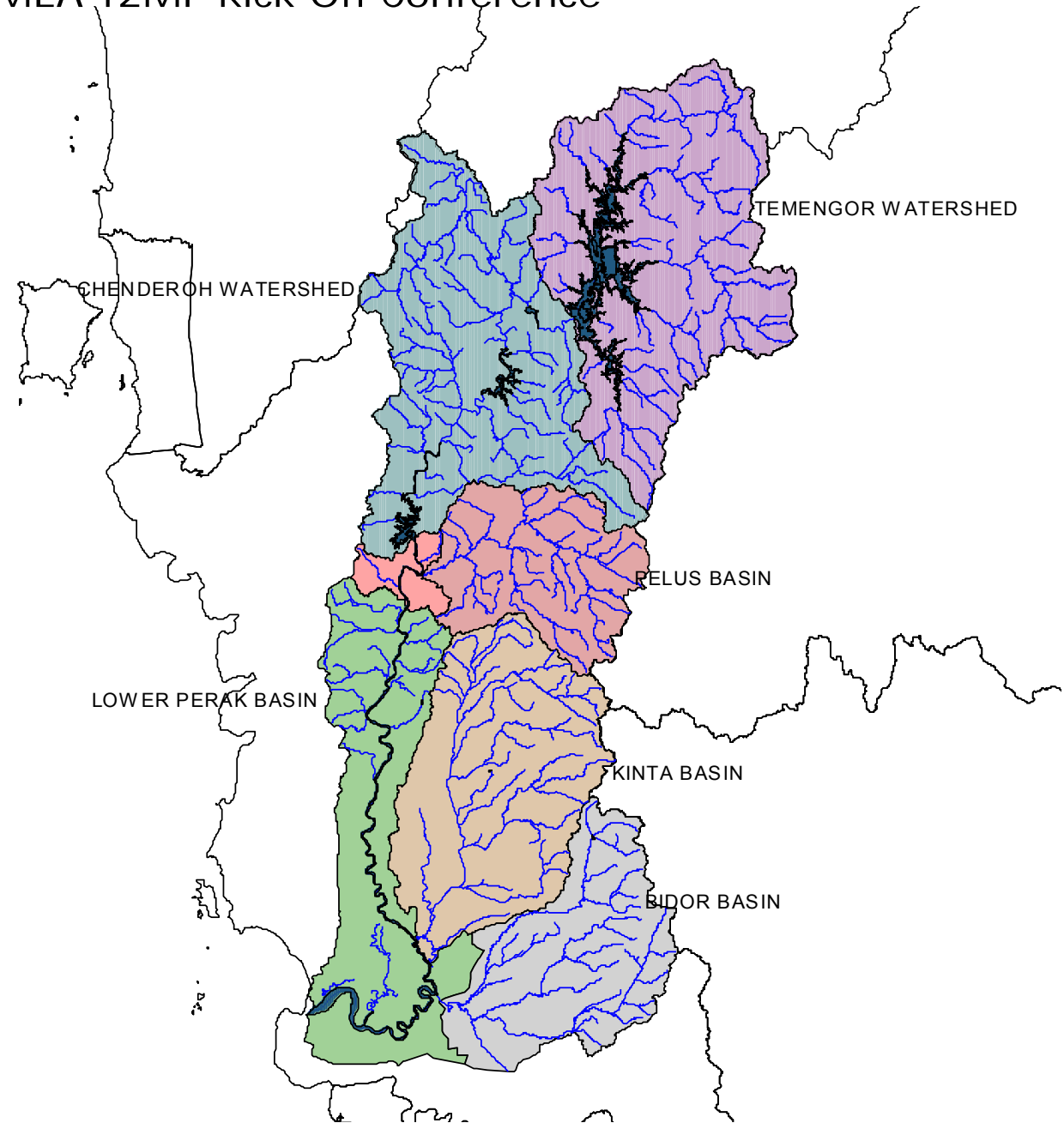


## River Basins in Labuan



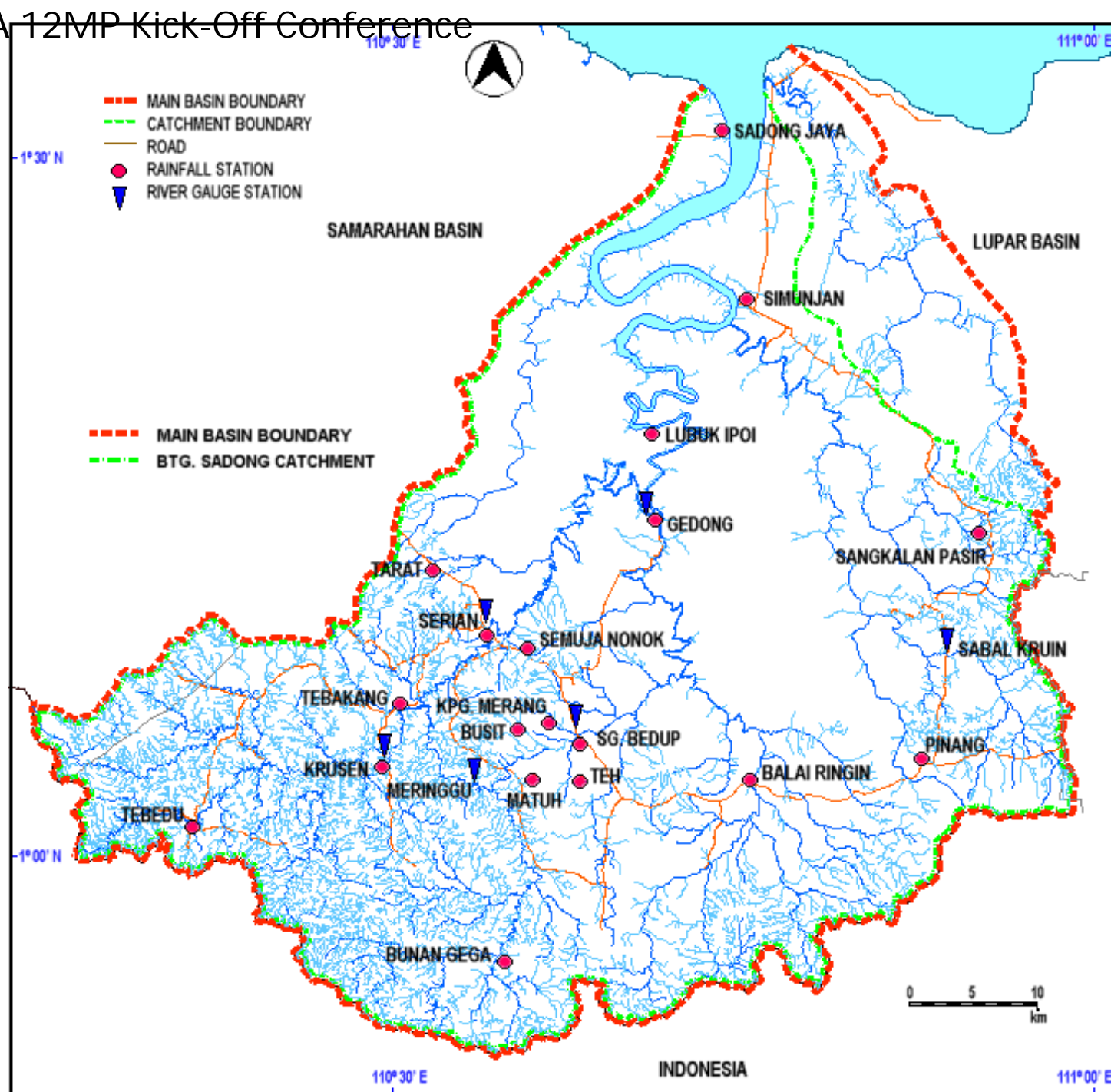
Source: IES in Labuan (Draft Report, 2009)

# Sungai Perak River Basin - sub-basins & tributaries





# Sadong River Basin - sub-basins & tributaries



# Langat River Basin – sub-basins & tributaries



# River Basins

*.... of the world*

# Global Land mass – jigsaw puzzles of river basins





# Major river basins in Africa



© Copyright Transboundary Freshwater Dispute Database, 2000

# International River Basins of Asia



Examples of .....

# Developments in our river basins

# Klang River Basin and Klang Valley

*2 different defined areas*



# KL Flood Mitigation Project – mid 1970s -2000

- 1971/72 Big Flood
- Targeted to be completed by 2000
- Components -include
  - *Canalised part of Klang and Gombak river*
  - *Klang-Gates Dam Extension, by 3 metres*
  - *New Batu Dam*

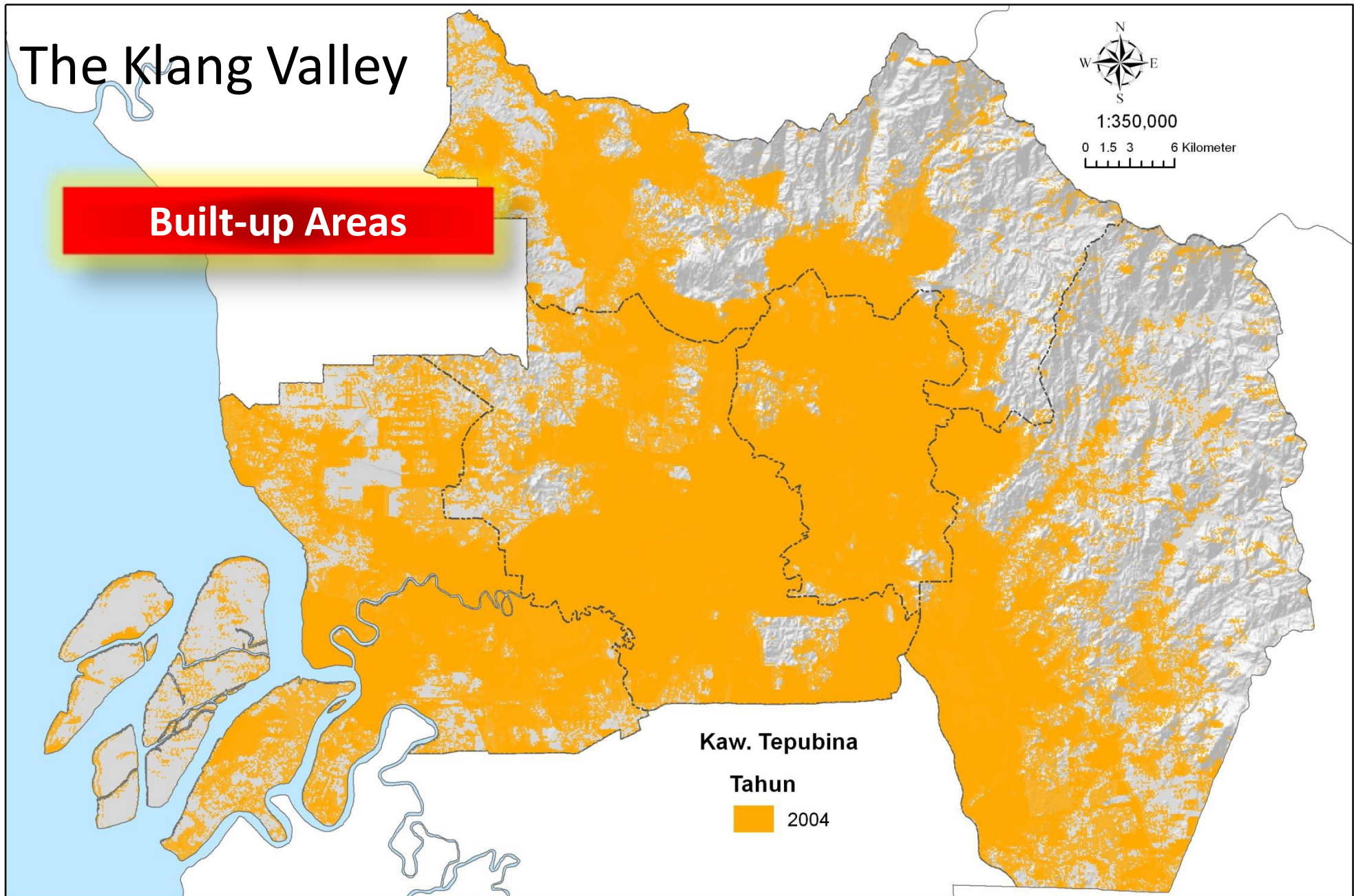
## River Basin

A geographical physical unit

## Sungai Kelang River Basin

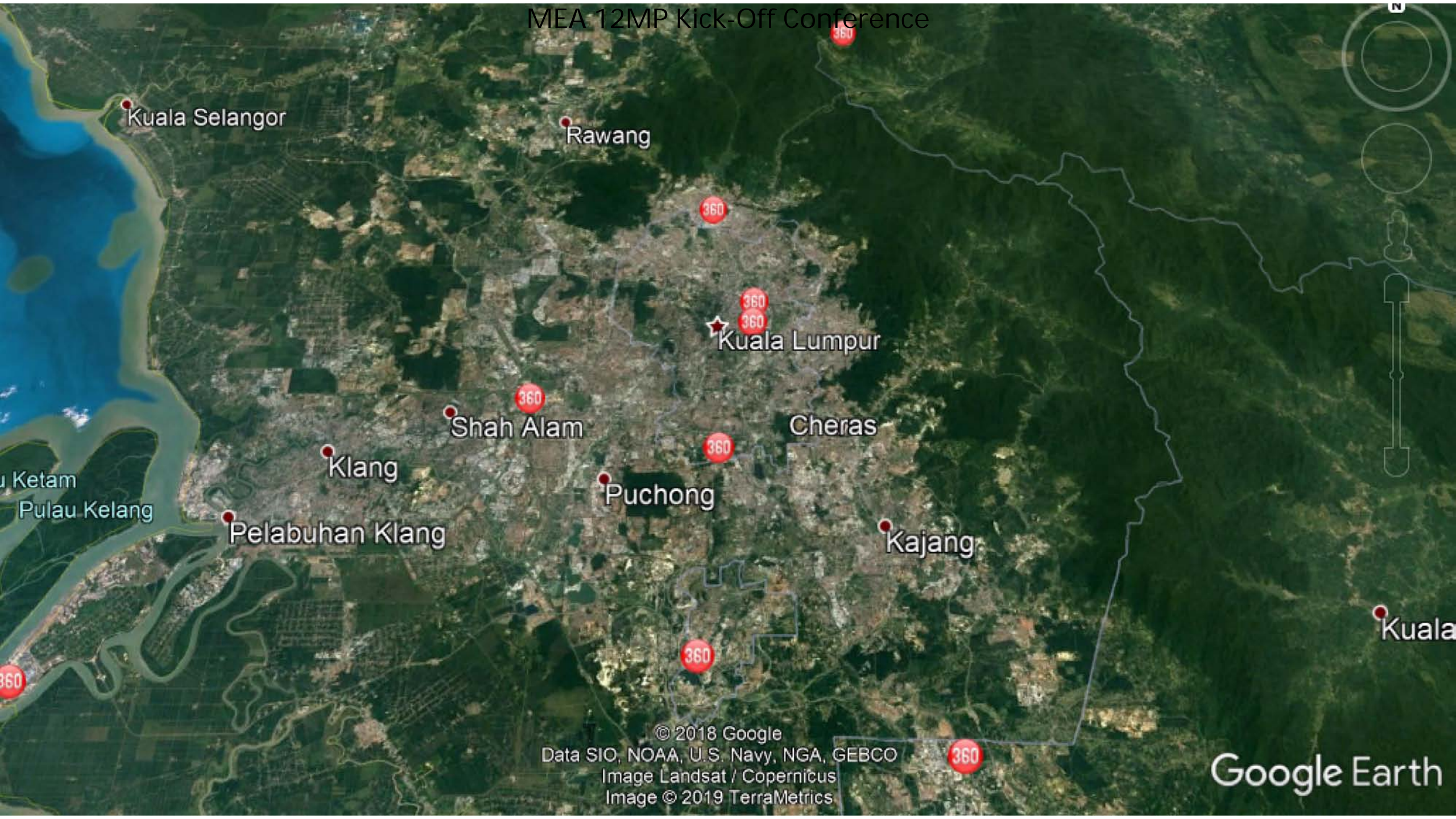
8 Local Authorities







# MEA 12MP Kick-Off Conference



Kuala Selangor

Rawang

360

360

360

360

360

360

360

Pulau Ketam  
Pulau Kelang

Klang

Shah Alam

Puchong

Cheras

Kajang

Pelabuhan Klang

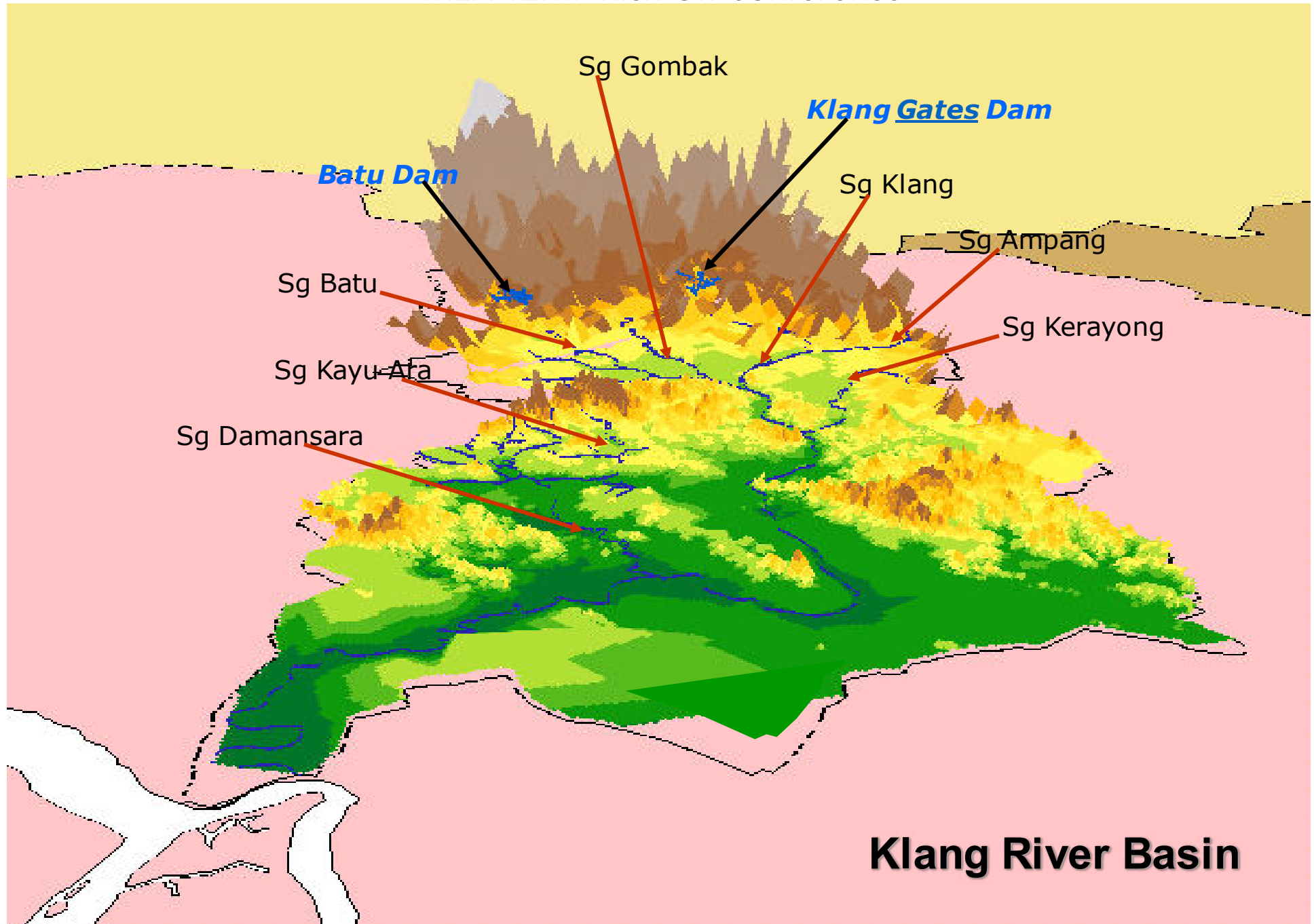
Kuala Lumpur

Kuala

© 2018 Google  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat / Copernicus  
Image © 2019 TerraMetrics

Google Earth



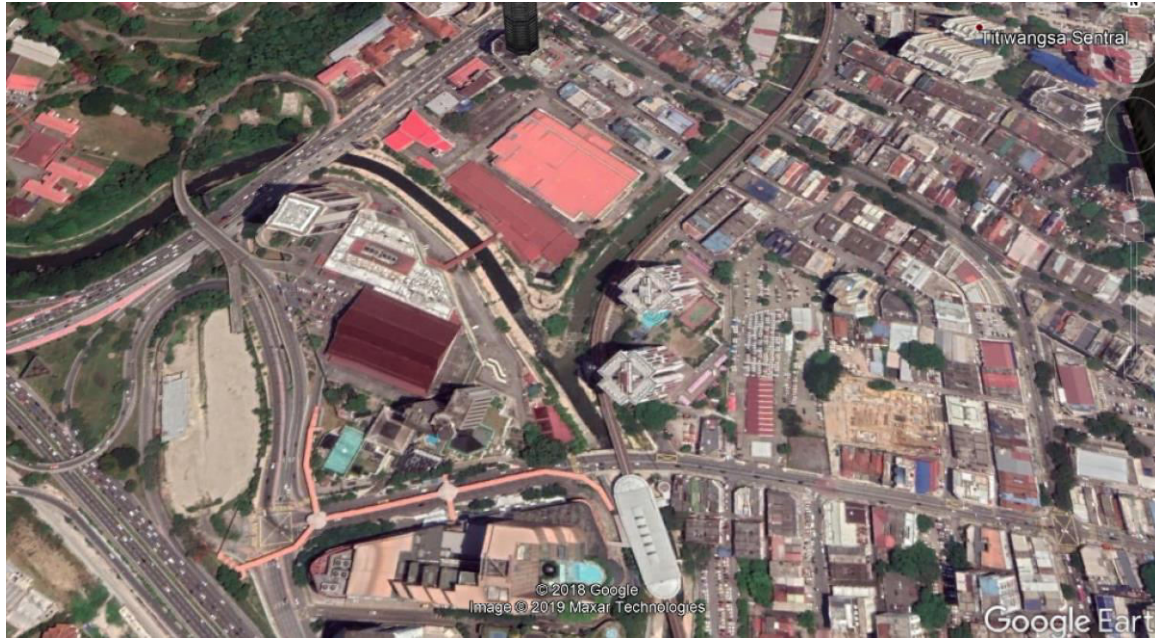


# MEA 12MP Kick-Off Conference





# MEA 12MP Kick-Off Conference



Confluence of Batu & Gombak Rivers

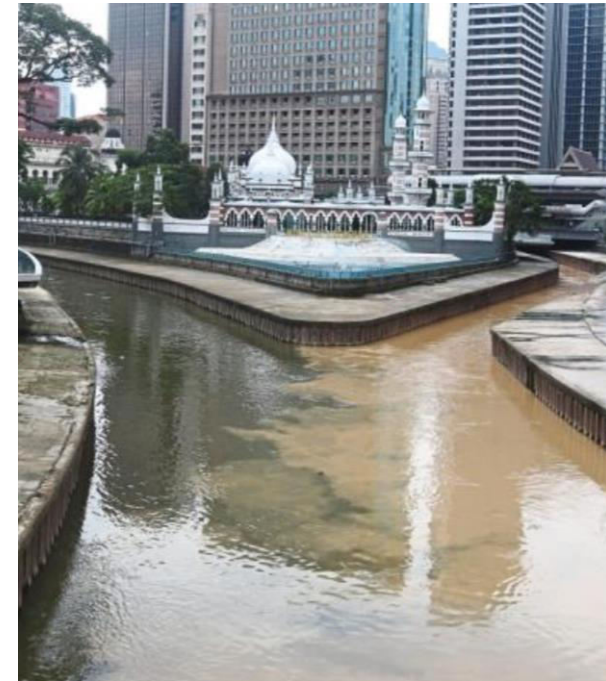
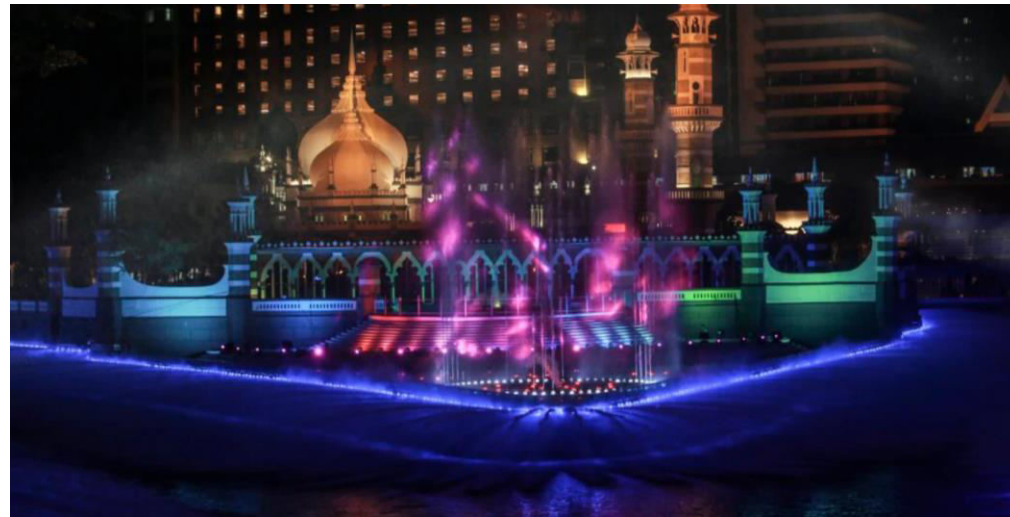




# MEA 12MP Kick-Off Conference



Confluence of Gombak and Klang Rivers

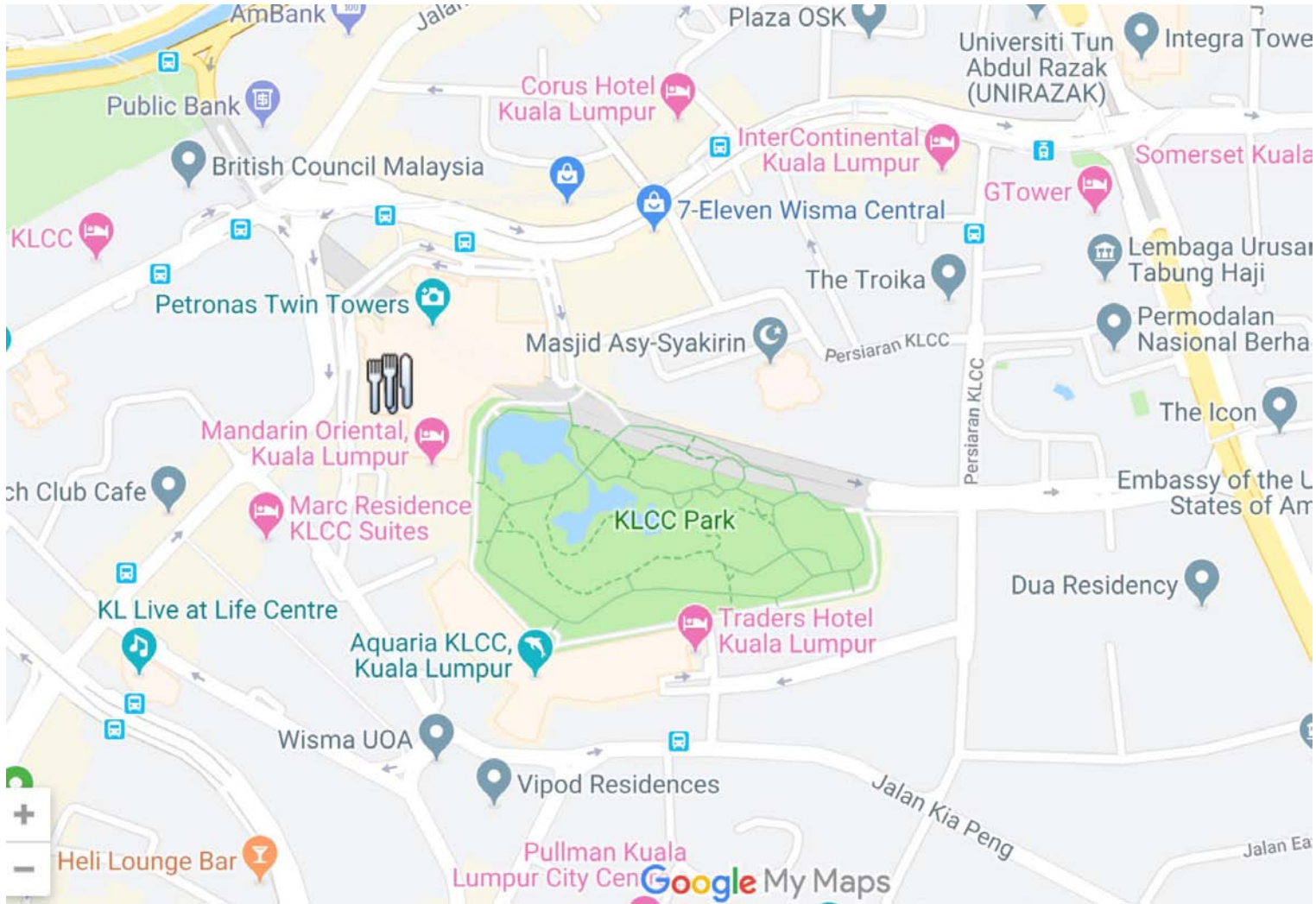




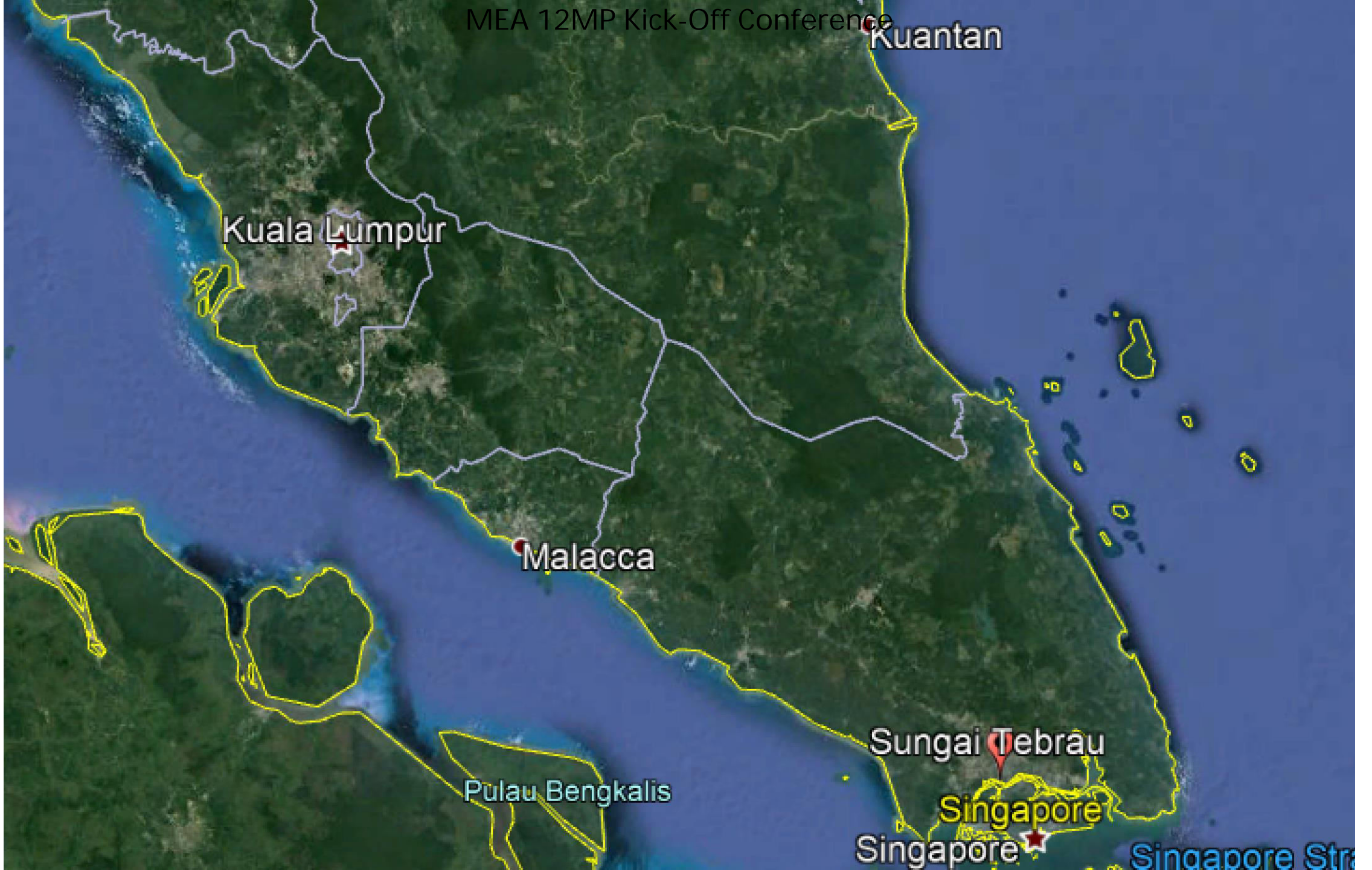
# MEA 12MP Kick-Off Conference



# MEA 12MP Kick-Off Conference







Kuantan

Kuala Lumpur

Malacca

Sungai Tebrau

Pulau Bengkalis

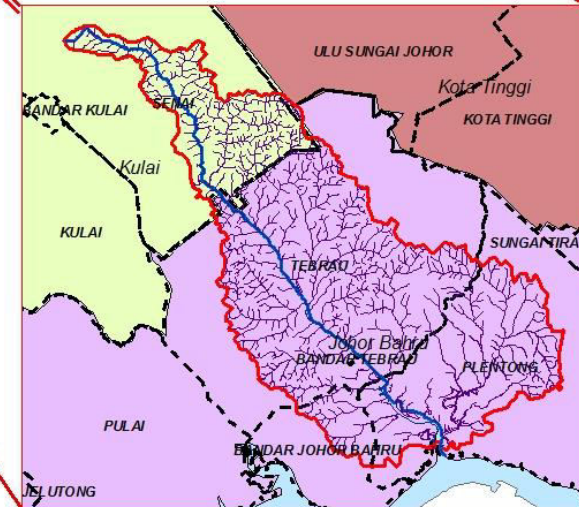
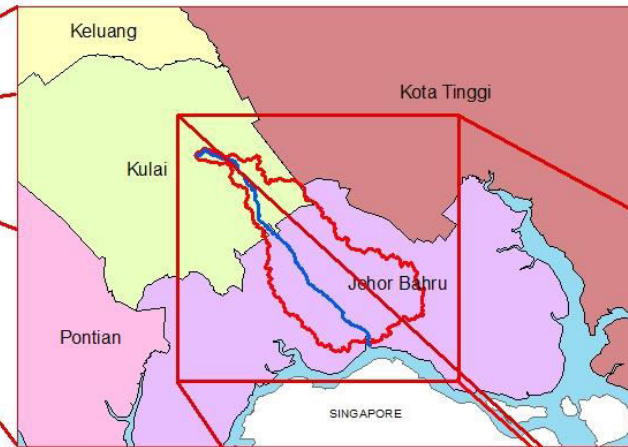
Singapore

Singapore

Singapore Stra

*Lembangan Sg Tebrau*

# MEA 12MP Kick-Off Conference Location Plan



**Legend**

- Sungai Tebrau
- Catchment Sg Tebrau
- Mukim Johor

**Daerah Johor**

- Johor Bahru
- Keluang
- Kota Tinggi
- Kulai
- Pontian

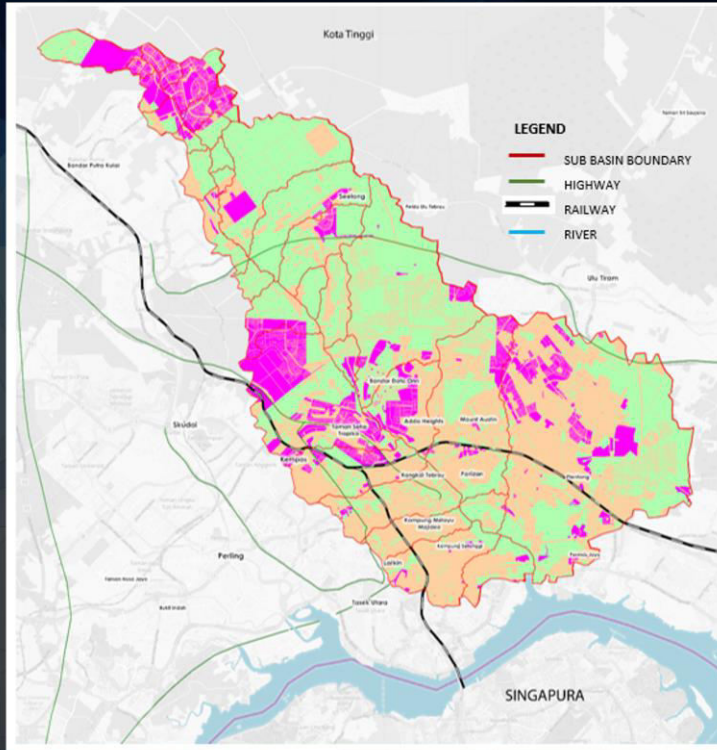


# MEA 12MP Kick-Off Conference

## SG TEBRAU RIVER NETWORK

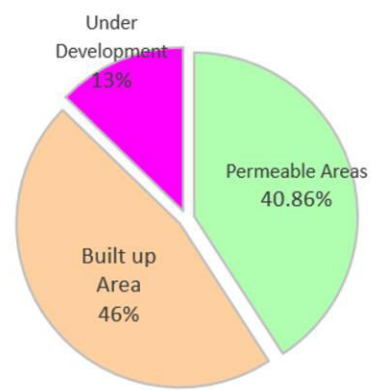


**DISTRIBUTION OF PERMEABLE AND IMPERMEABLE LAND USE**

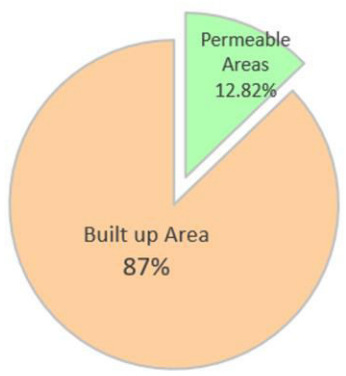


TYPES	HECTARE	%
PERMEABLE	9,194.55	40.86
BUILT UP AREA	10,433.66	46.37
UNDER DEVELOPMENT	2,871.79	12.76
TOTAL	22,500.00	100.00

YEAR 2018



YEAR 2025



DoE 2017 Report on Pollution

# 51 Sungai Tercemar di Malaysia

**SUNGAI HELAS 3**  
Memerlukan rawatan intensif

- Sungai Juru, Pulau Pinang
- Sungai Pinang, Pulau Pinang/Kedah
- Sungai Perai, Pulau Pinang/Kedah
- Sungai Nyamok, Perak
- Sungai Sungai Serokai, Perak
- Sungai Wangi, Perak
- Sungai Air Busuk, Selangor/Kuala Lumpur
- Sungai Belongkong, Selangor/Kuala Lumpur
- Sungai Bunos, Selangor/Kuala Lumpur
- Sungai Buloh, Selangor
- Sungai Merlimau, Melaka
- Sungai Seri Melaka, Melaka
- Sungai Simpang Kanan, Johor
- Sungai Semberong, Johor
- Sungai Skudai, Johor
- Sungai Chemangar, Johor
- Sungai Semenchu, Johor
- Sungai Kim-Kim, Johor
- Sungai Sungai Anak Sedili, Johor
- Sungai Sarang Buaya, Johor
- Sungai Sanglang, Johor
- Sungai Melatal, Pahang/Johor
- Sungai Jebong, Pahang/Johor
- Sungai Alor Lintah, Kelantan

**SUNGAI HELAS 4**  
Hanya untuk tujuan pengairan

- Sungai Jawi, Pulau Pinang
- Sungai Rambai, Pulau Pinang
- Sungai Jelutong, Pulau Pinang/Kedah
- Sungai Kereh, Pulau Pinang/Kedah
- Sungai Pertama, Pulau Pinang/Kedah
- Sungai Raja Hitam, Perak
- Sungai Kuyoh, Selangor/Kuala Lumpur
- Sungai Kerayong, Selangor/Kuala Lumpur
- Sungai Ulu Choh, Johor
- Sungai Melana, Johor
- Sungai Danga, Johor
- Sungai Latoh, Johor
- Sungai Perembi, Johor
- Sungai Masai, Johor
- Sungai Buluh, Johor
- Sungai Kempas, Johor
- Sungai Ayer Merah, Johor
- Sungai Bala, Johor
- Sungai Sebulung, Johor
- Sungai Plentong, Johor
- Sungai Tebrau, Johor
- Sungai Pandan, Johor
- Sungai Tampoi, Johor
- Sungai Sengkuang, Johor
- Sungai Alor B, Kelantan

**SUNGAI HELAS 5**  
Air yang tercemar teruk

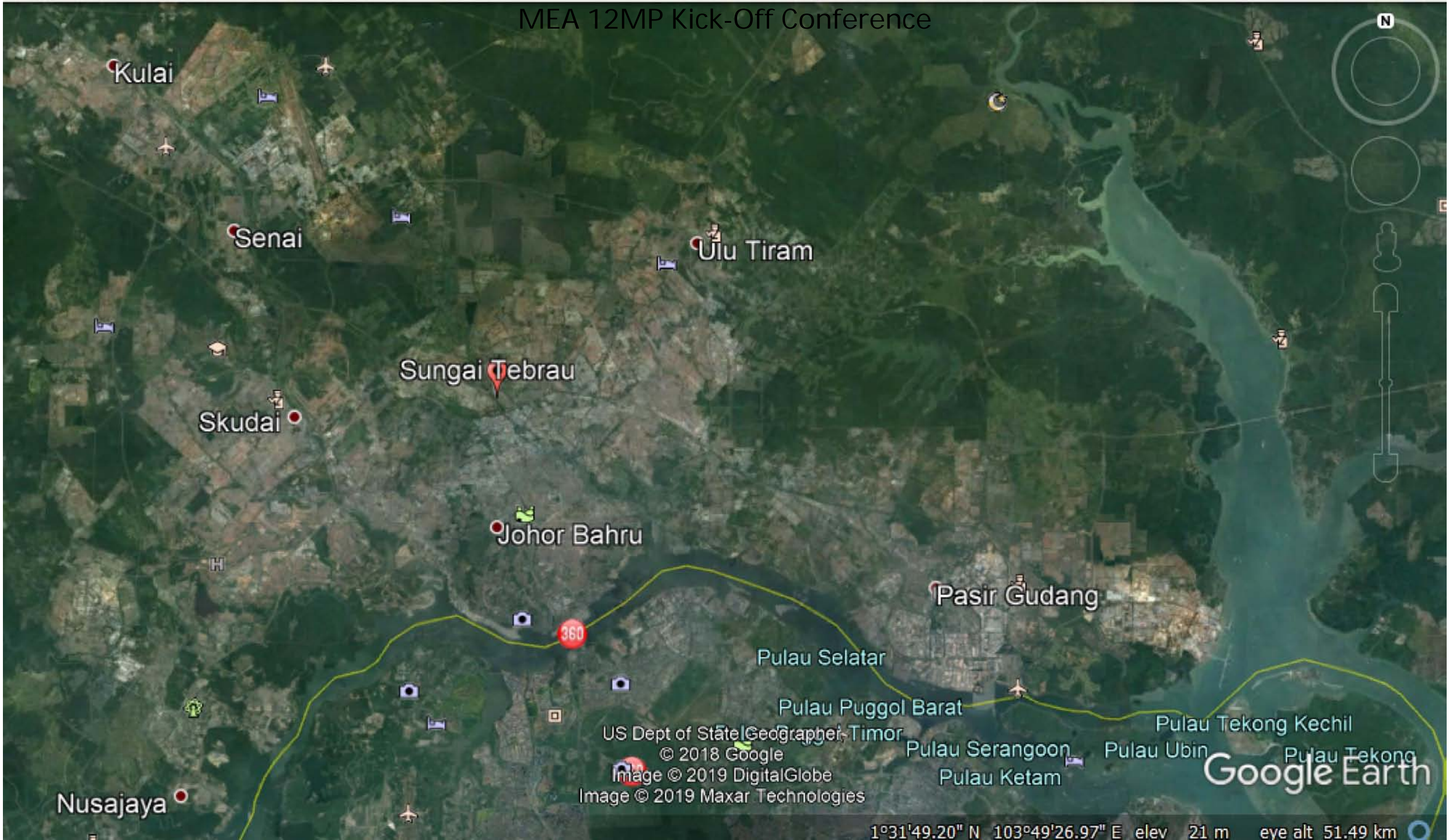
- Sungai Tukang Batu, Johor

Sumber: Jabatan Alam Sekitar, 2017

Infographic by Nash Hamzah © Astro Awani Network Sdn. Bhd. (2018)



# MEA 12MP Kick-Off Conference



Kulai

Senai

Ulu Tiram

Sungai Tebrau

Skudai

Johor Bahru

Pasir Gudang

Nusajaya

Pulau Selatar

Pulau Puggol Barat

Pulau Serangoon

Pulau Ketam

Pulau Tekong Kechil

Pulau Ubin

Pulau Tekong

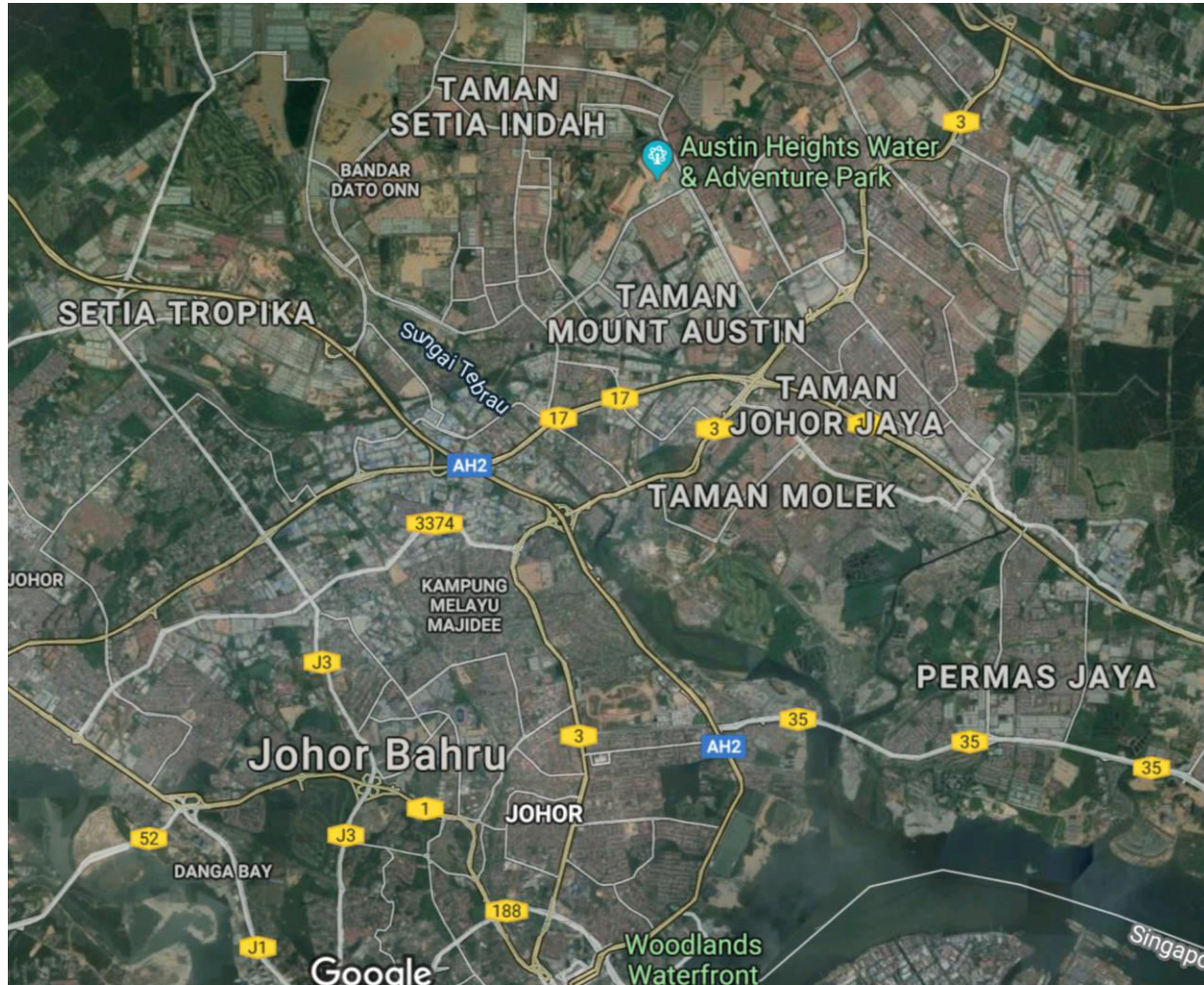
US Dept of State Geographer-Timor  
© 2018 Google  
Image © 2019 DigitalGlobe  
Image © 2019 Maxar Technologies

Google Earth

1°31'49.20" N 103°49'26.97" E elev 21 m eye alt 51.49 km



# MEA 12MP Kick-Off Conference



*Pasir Gudang*



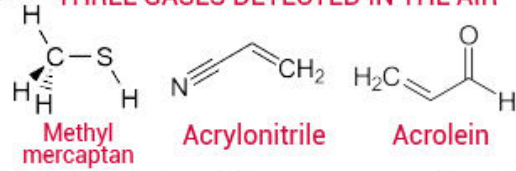
# MEA 12MP Kick-Off Conference



## PASIR GUDANG AIR POLLUTION UPDATE



### THREE GASES DETECTED IN THE AIR



The presence of methyl mercaptan considered an anomaly  
Could have an adverse effect on children & people suffering from asthma

Rapid development & a high concentration of chemical enterprises in the area has had an effect on the environment's loading capacity, impacting the land, air & rivers

The absence of a buffer zone between the chemical industry, schools & residential area has put people at risk



**250**  
chemical  
factories  
in Pasir Gudang



“ However, these three gases were not detected in the blood and urine samples of 10 patients from eight schools ”

Yeo Bee Yin  
Minister of Energy, Science, Technology, Environment and Climate Change

### VICTIMS (as of June 27, 2019)

**748** people

- 709 treated as outpatients
- 39 warded

**6 patients**, aged 10-17, showed symptoms of anxiety

They will be treated & referred to a child psychiatrist

“ Members of the public are advised to seek immediate medical attention at the nearest health facility if they suffer symptoms like breathing difficulty, nausea, vomiting, dizziness, headache, muscle cramps & weakness ”

Datuk Seri Dr Dzulkefly Ahmad  
Health Minister





Masai

Masa 2019 Off Conference

Pasir Gudang

Taman Pasir Putih

Sungai Kim Kim

Kawasan Perindustri

Pelabuhan Johor Pasir Gudang

Kampung Pasir Putih

Pulau Puggol Barat

© 2018 Google  
Image © 2019 Maxar Technologies  
Image © 2019 CNES / Airbus  
US Dept of State Geographer

Google Earth

# ASM National IWRM Plan

*“Transforming the Water Sector: National IWRM Plan – Strategies and Roadmap” - December 2016*



# ASM (Academy of Sciences Malaysia)

<http://www.akademisains.gov.my/>

- Statutory Body formed on 1<sup>st</sup> February 1995 under the Academy of Sciences Malaysia Act 1994
  - The President of ASM is appointed by the King
- Entrusted with the mandate
  - Independent "Thought Leader" the science, technology and innovation (STI) arena.
- Mission
  - *“To Pursue, Encourage and Enhance excellence in the fields of Science, Engineering and Technology, for the development of the Nation and the benefit of Mankind”*
- Established ASM Water Committee in 2008

## ASM Water Committee

- To address the many issues and challenges faced by the water sector with the view of offering strategic advice to the authorities concerned;
- Committee adopted the [IWRM paradigm](#) as its central philosophy and thrust
- Guided by the [IWRM General Framework](#);
- Recognized the need for a National IWRM Plan based on the IWRM Framework
  - *for an inclusive and Concurrent Management of both Natural and Built Infrastructure*
  - to provide the correct stimulus to ensure the implementation of IWRM nation-wide

## ASM Water Committee

- To address the many issues and challenges faced by the water sector with the view of offering strategic advice to the authorities concerned;
- Committee adopted the [IWRM paradigm](#) as its central philosophy and thrust
- Guided by the [IWRM General Framework](#);
- Recognized the need for a National IWRM Plan based on the IWRM Framework
  - *for an inclusive and Concurrent Management of both Natural and Built Infrastructure*
  - to provide the correct stimulus to ensure the implementation of IWRM nation-wide

# IWRM Paradigm

## Integrated Water Resources Water Management (IWRM)

*“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*

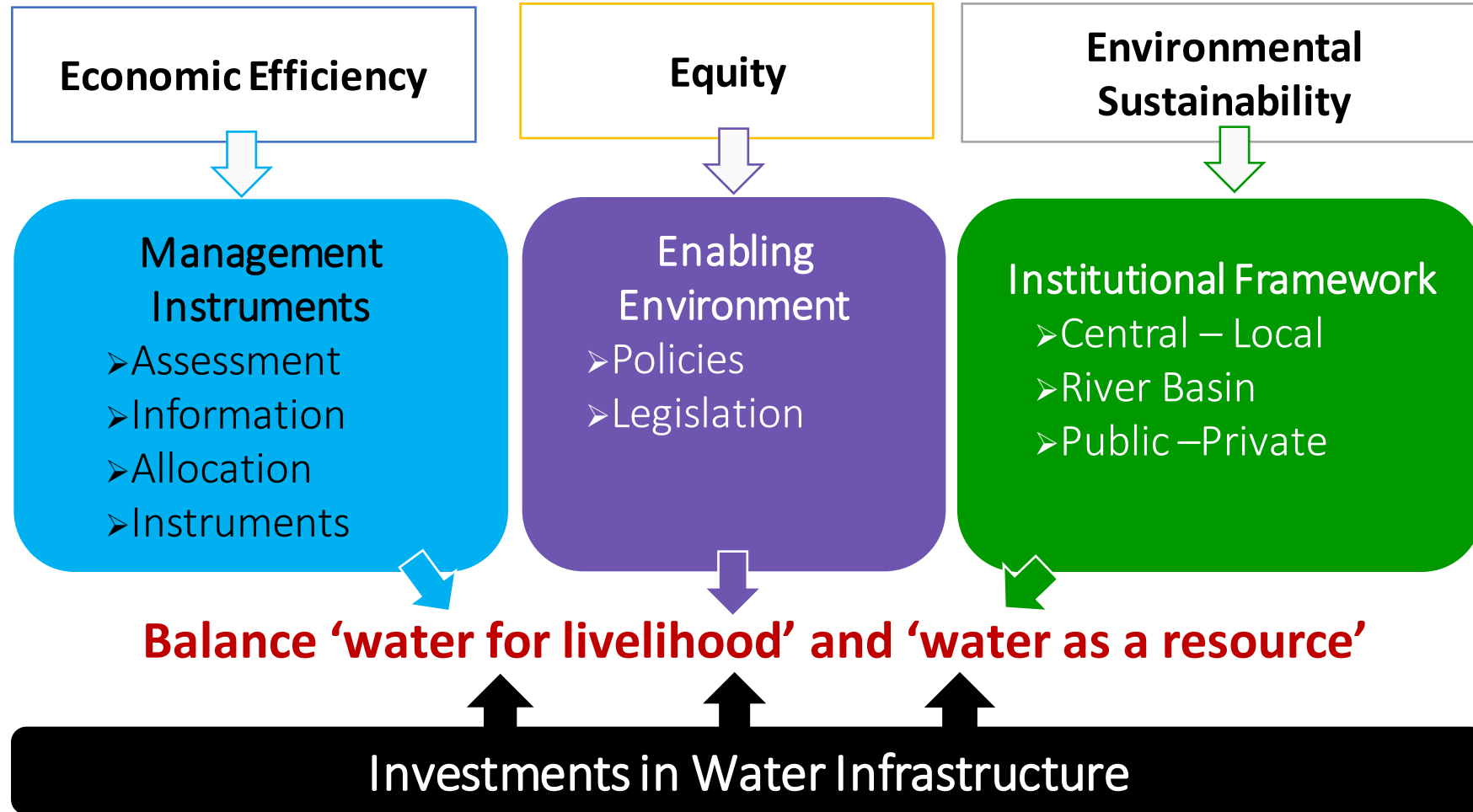


## ASM Water Committee

- To address the many issues and challenges faced by the water sector with the view of offering strategic advice to the authorities concerned;
- Committee adopted the [IWRM paradigm](#) as its central philosophy and thrust
- Guided by the [IWRM General Framework](#);
- Recognized the need for a National IWRM Plan based on the IWRM Framework
  - *for an inclusive and Concurrent Management of both Natural and Built Infrastructure*
  - to provide the correct stimulus to ensure the implementation of IWRM nation-wide

# IWRM UNIVERSAL FRAMEWORK

## Balancing Development Goals



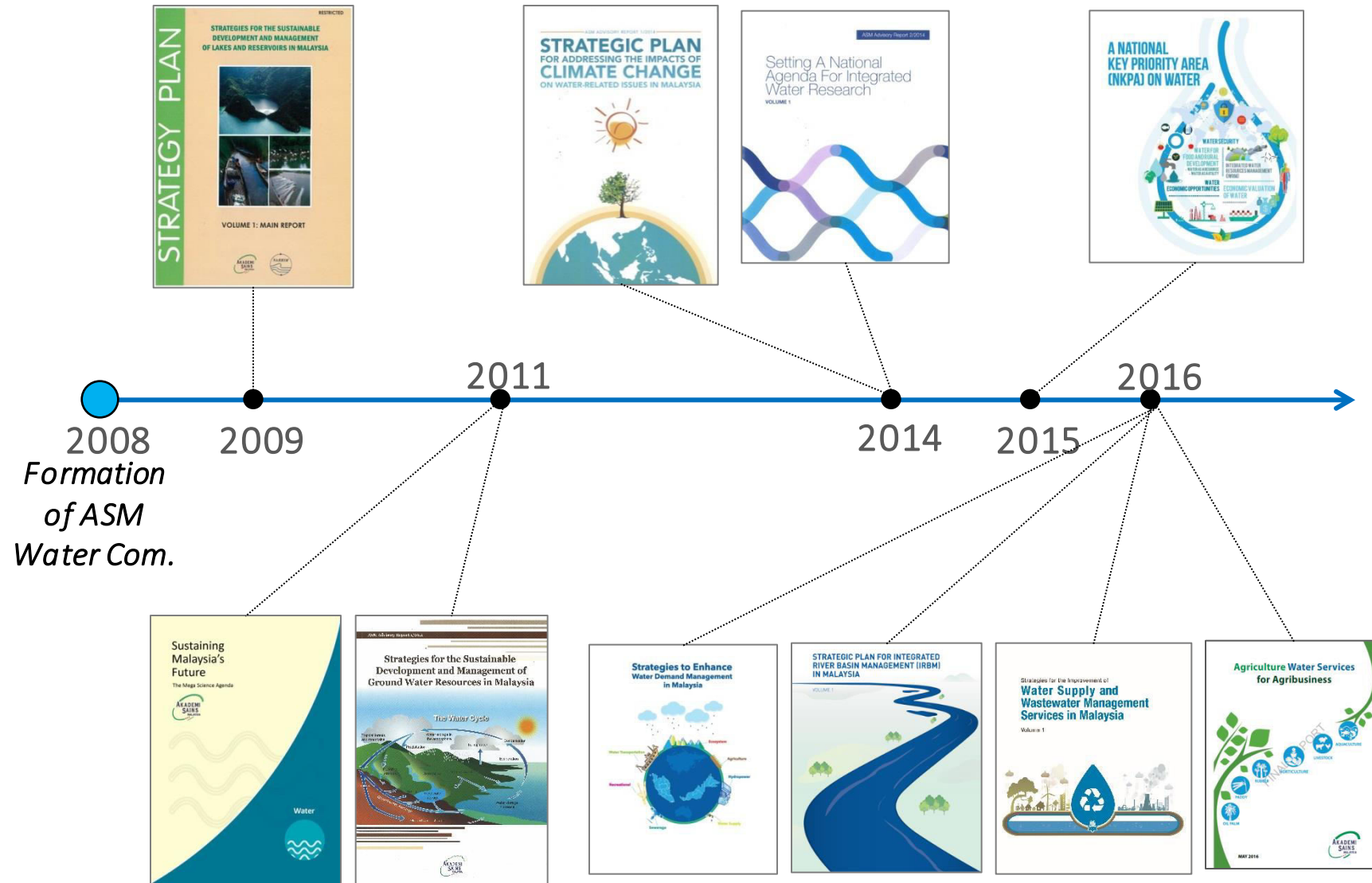
*...coordinated development and management of water, land and related resources... -  
Global Water Partnership*

## ASM Water Committee

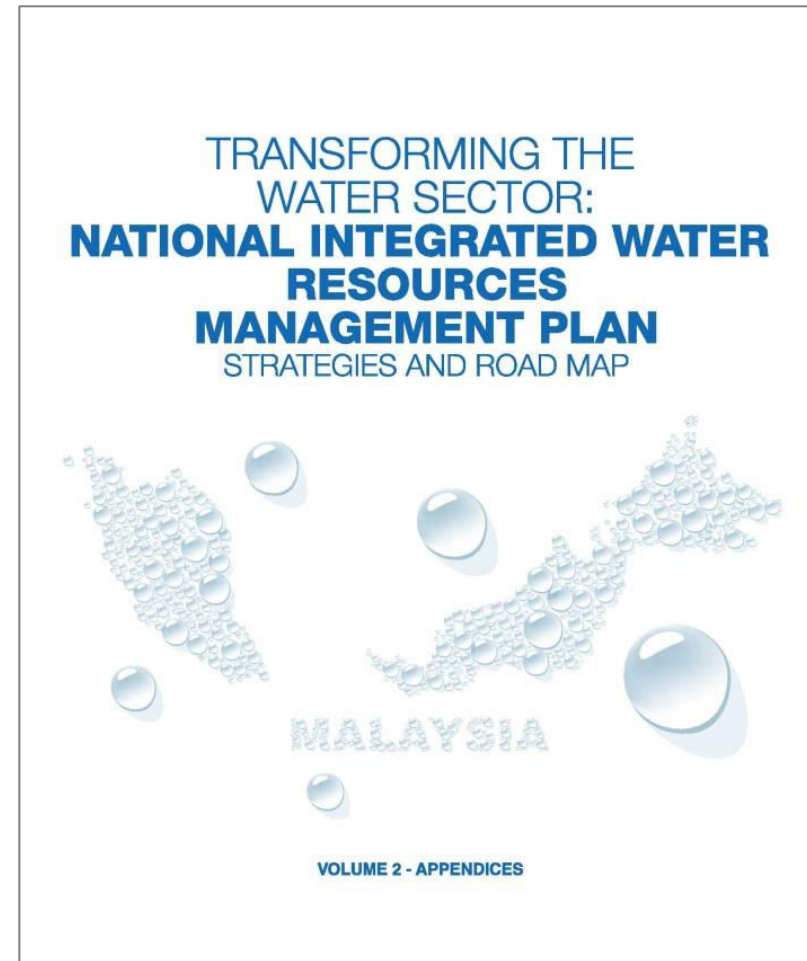
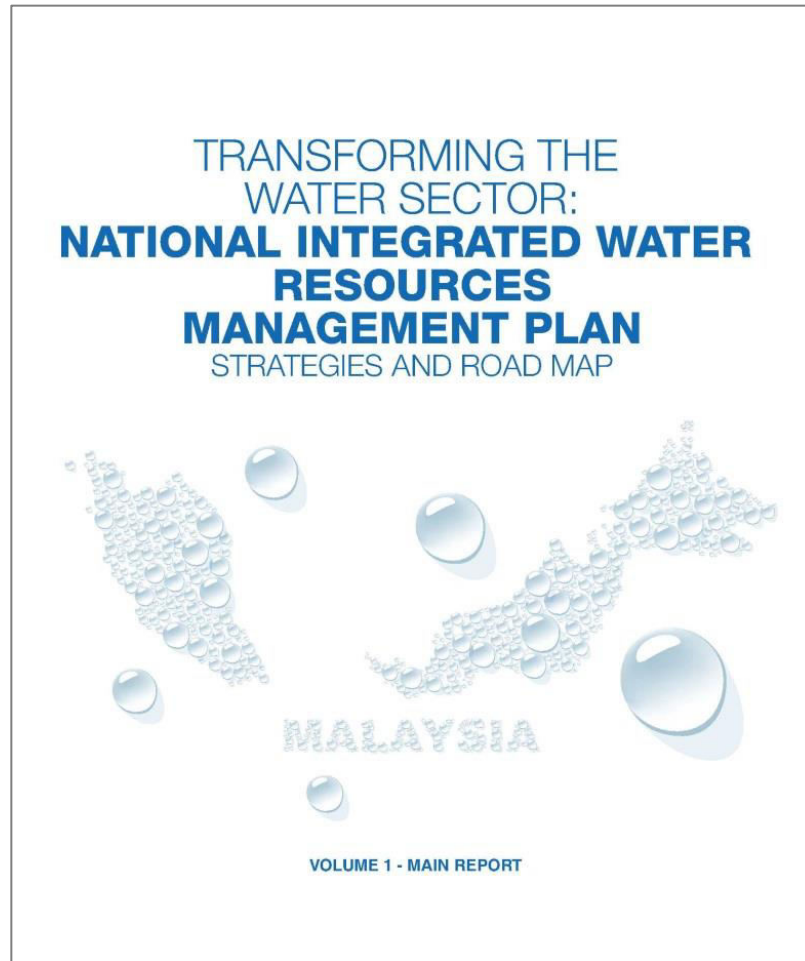
- To address the many issues and challenges faced by the water sector with the view of offering strategic advice to the authorities concerned;
- Committee adopted the [IWRM paradigm](#) as its central philosophy and thrust
- Guided by the [IWRM General Framework](#);
- Recognized the need for a National IWRM Plan based on the IWRM Framework
  - ***for an inclusive and Concurrent Management of both Natural and Built Infrastructure***
  - to provide the correct stimulus to ensure the implementation of IWRM nation-wide



# Published Reports from ASM Water Committee



# MEA 12MP Kick-Off Conference

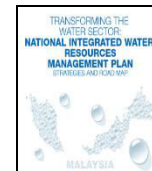
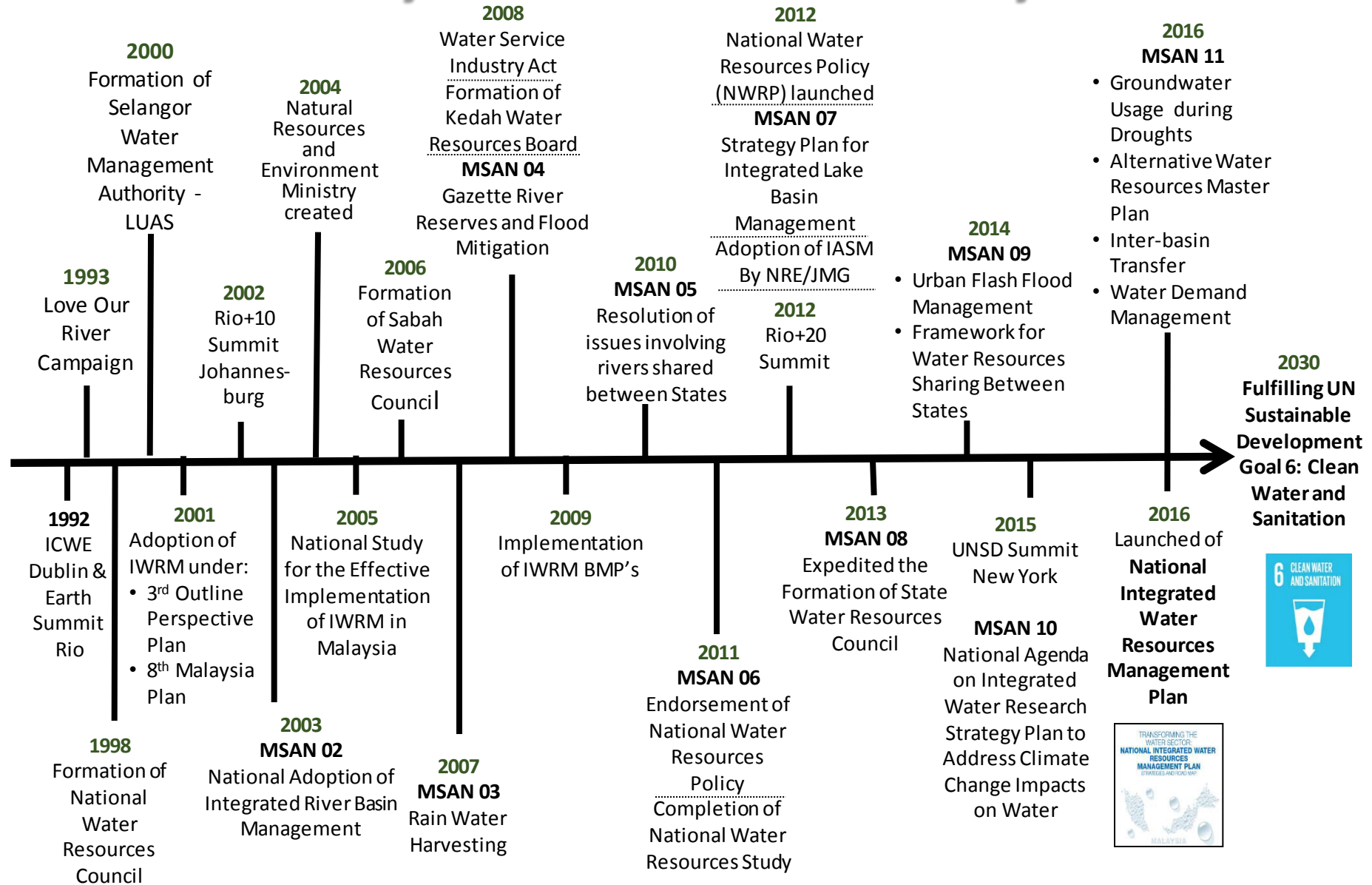


## NIWRMP Reports by Shahrizaila Abdullah et al

- **Volume 1 – Main Report** - [https://issuu.com/asmpub/docs/web\\_vol1\\_gf](https://issuu.com/asmpub/docs/web_vol1_gf)
- **Volume 2 – Details of Chapters 3,4,5 dan 6** - [https://issuu.com/asmpub/docs/web\\_vol2\\_gf](https://issuu.com/asmpub/docs/web_vol2_gf)

# MEA 12MP Kick-Off Conference

## IWRM – Key Milestones in Malaysia





# 17 Sustainable Development Goals

*UNGA, Sept 2015*

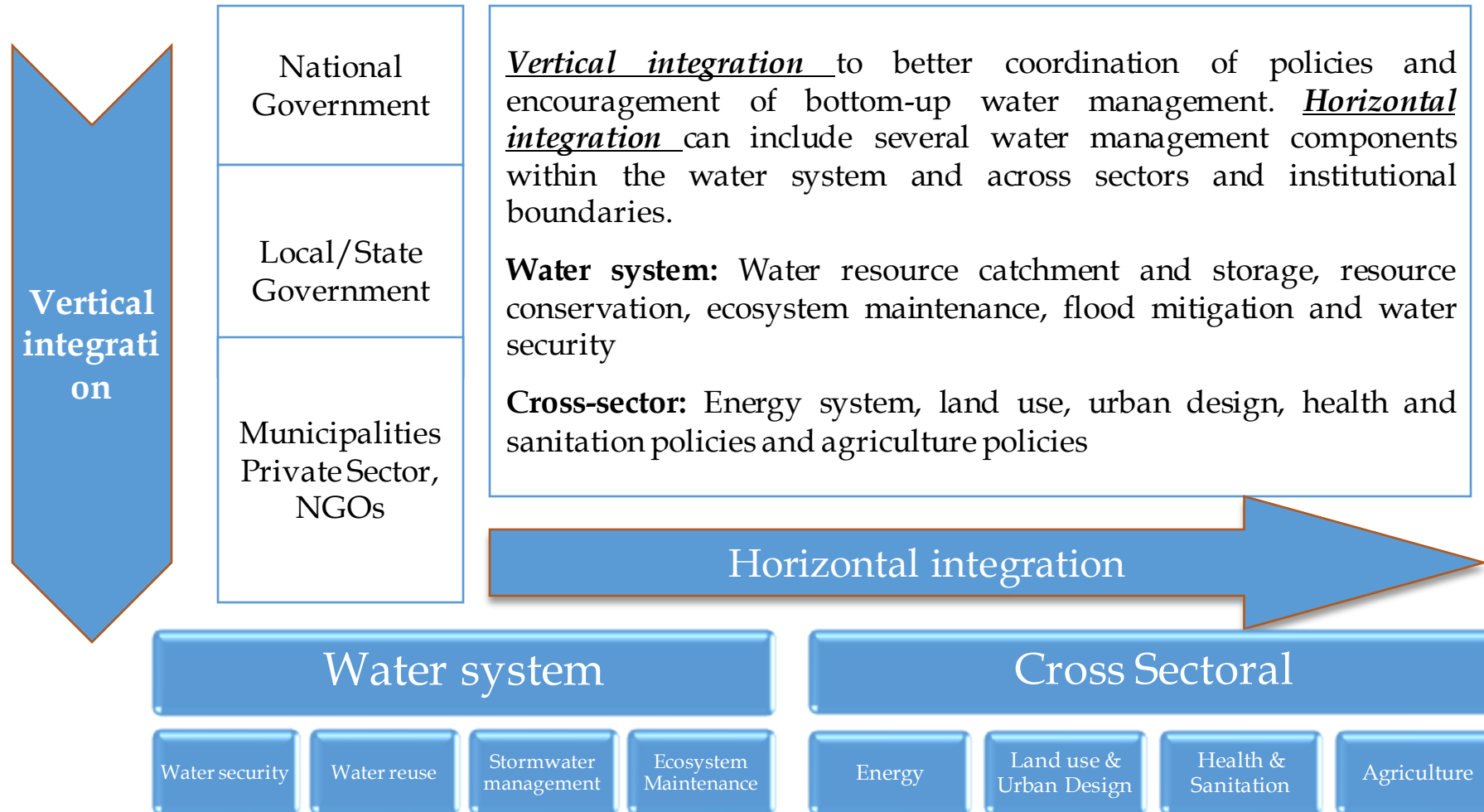


# INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) Paradigm

*“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*

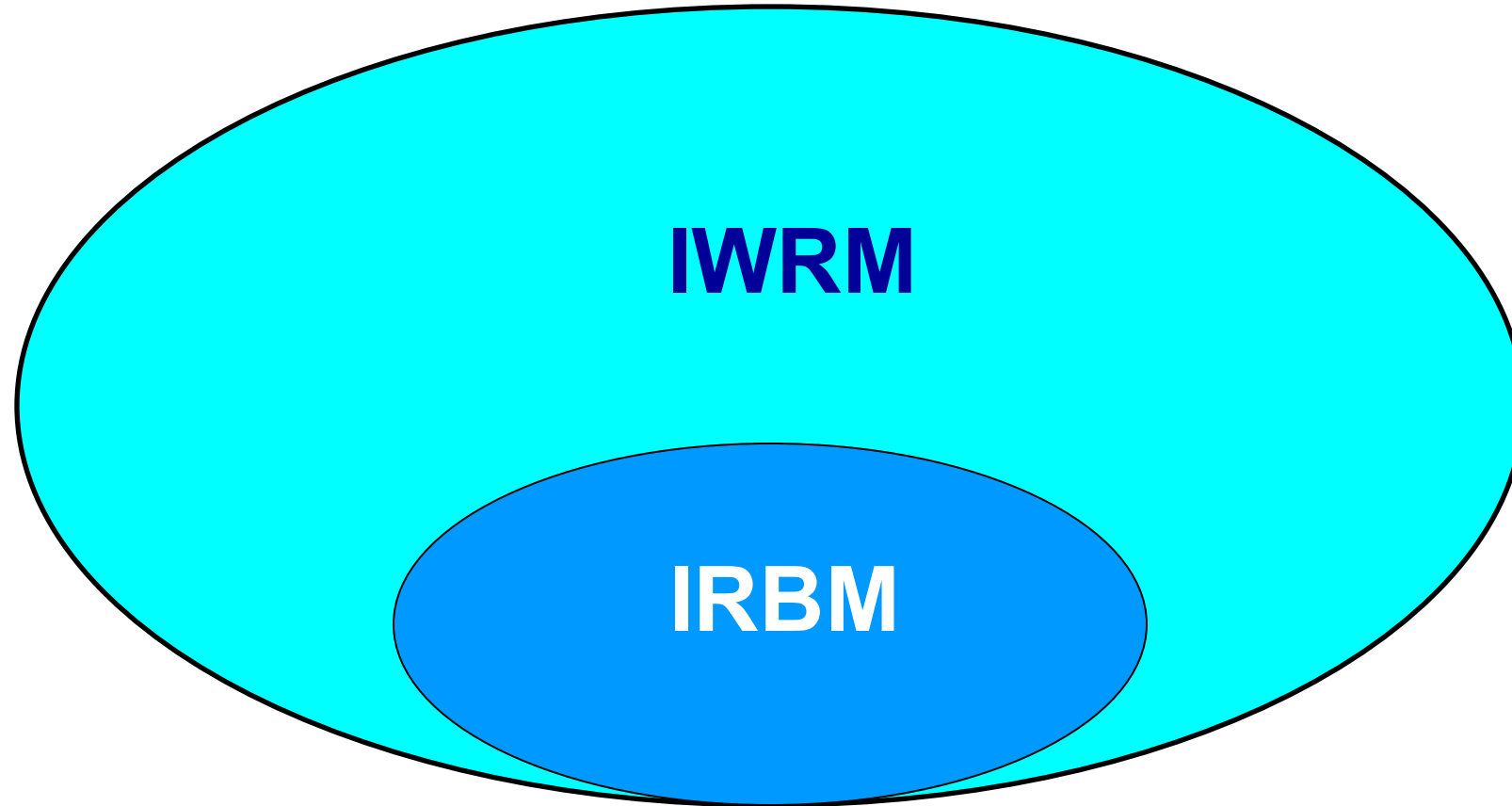
# Integration in IWRM



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

# Current Status of IWRM in Malaysia

- Fragmented management, a legacy from the colonial past, continues to be the practice both at national and state levels.
- IWRM yet to be institutionalized by water related ministries, line agencies and state administrations nation-wide
- Awareness raising initiatives on IWRM from time to time especially by water-related NGOs at national level not taken up for implementation by water ministries, line agencies and state agencies
- Some of the limited successes noted to-date:
  - Establishment of MSAN in 1998
  - Creation of the NRE Ministry in 2004 and resultant [National IWRM Institutional Framework](#) – clear separation of powers between “water as a resource” and “water for livelihood”
  - Successful implementation by MOA dating back to the 1970s in the creation of integrated management agencies such MADA, KADA and the IADAs to manage large agricultural development areas.
  - At the state level, LUAS in Selangor and to a certain extent SWRC in Sabah and LSAN Kedah are examples of efforts taken to institutionalize IWRM in their functional activities
  - National Water Resources Policy (NWRP) launched in March 2012





# Preparing for the formulation of a National IWRM Plan

- [IWRM and related sub-sets and sub-themes](#)
- Conducted in-depth studies on selected sub-themes undertaken by Task Forces led by ASM Fellows that involved a status review, strategic stakeholder consultations leading to the publication of a strategy plan or advisory report
- Completed studies by ASM-led Task Forces classified as [Component Plan study reports](#)
- For remaining sub-themes commissioned expert reviews by selected subject matter specialists and classified as [Complementary Component Plan study reports](#)
- [Review of State IWRM plans – LUAS Case Study](#)

# IWRM Sub-sets and Sub-themes

- Integrated River Basin Management
  - Integrated Lake Basin Management
  - Integrated Aquifer System Management
  - Water Demand Management
  - Water Supply and Wastewater Management
  - Integrated R&D Agenda for Water
  - Climate Change and Water
  - Water and Agriculture
  - Integrated Urban Water Management
  - Integrated Flood Management (JPS)
  - Integrated Drought Management (JPS)
  - Water Quality Management
  - Water and Health
  - Water and Land Use (National Physical Plan)
  - Virtual Water and Water Footprint
  - Water and Green Growth
  - Water Financing
  - Water as a Business
  - Water and Gender
  - S&T Awareness, Advocacy and Capacity Building
  - International Networking and Collaboration
- Special Studies
- Mega Science Study on Water
  - NKPA on Water
  - Water, Food, Energy (WFE) Nexus – jointly with JPS

# Component Plan Study Reports by ASM-led Task Forces as of May 2016

No	Component Plan Study Report	Date of Completion	Submission to Lead Ministry	Endorsement by MSAN
1.	Integrated Lake Basin Management	2009	NRE - 2010	1 November 2012 (MSAN 07)
2.	Integrated Aquifer Systems Management	2011	NRE - 2012	NA*
3.	Water Demand Management	2016	EPU/NRE/KeTTHA/MOA - 2016	NA*
4.	Water Supply and Wastewater Management	2016	KeTTHA - 2016	NA*
5.	National Agenda for Integrated Water Research	2014	NRE/MOSTI - 2015	15 October 2015 (MSAN10)
6.	Climate Change and Water	2014	NRE/MOSTI - 2015	15 October 2015 (MSAN10)
7.	Integrated River Basin Management	2016	NRE	NA*
8.	Water and Agriculture	2016	MOA	NA*
9.	NKPA on Water	2015	EPU/NRE/KeTTHA/MOA	NA*
10.	ASM Mega Science Study: Water Sector	2011	Cabinet/EPU - 2012	NA*

\*NA- Not Applicable



# Complementary Component Plan Reports (1)

No.	Complementary Component Plan Studies	Relevance to IWRM	Lead Implementing Ministry/Authority/ Agency
1	Integrated Flood Management	Water as a Resource	NRE/State Governments
2	Integrated Drought Management	Water as a Resource	NRE/State Governments
3	Water Quality Management	Water as a Resource	NRE/State Governments
4	Water and Land Use(National Physical Plan)	Water as a Resource (addressing trans boundary issues)	MUWHLG/State Governments
5	Water and Health	Water as a Resource and for Livelihood	MOH/State Governments
6	Water and Green Growth	Water as a Resource and for Livelihood	KeTTHA/NRE/MOA/ State Governments
7	Water and Gender	Water as a Resource and for Livelihood	NRE/KeTTHA/MWFCD/ MOA/MPIC/MOSTI/ MUWHLG/MRRD/MOHE/MOH/State Governments
8	Virtual Water and Water Footprint	Water as a Resource and for Livelihood	EPU/NRE/KeTTHA/MOA/ MPIC/FMM/State Governments

## Complementary Component Plan Reports (2)

No.	Complementary Component Plan Studies	Relevance to IWRM	Lead Implementing Ministry/Authority/ Agency
9	Water Financing	Water as a Resource and for Livelihood	EPU/MOF/State Governments
10	Water-Food-Energy Nexus	Water as a Resource (addressing trans boundary issues)	EPU/NRE/MOA/KeTTHA/ State Governments
11	S&T Awareness, Advocacy and Capacity Building	Water as a Resource and for Livelihood	NRE/KeTTHA/MOA/MPIC/MOSTI/M UWHLG/MRRD/ MOHE/State Governments
12	International Networking and Collaboration	Water as a Resource and for Livelihood	NRE/KeTTHA/MOA/MPIC/MOSTI/M UWHLG/MRRD/ MOHE/State Governments
13	Integrated Urban Water Management	Water as a Resource and for Livelihood	MUWHLG/State Governments
14	NWRP Action Plan	Water as a Resource and for Livelihood	NRE/State Governments

## State IWRM Plans: Case Study on LUAS

1. State IWRM Plans: Governance, Scope and Content
2. Overview of Current Status Nation-wide
3. State Water Management Authorities (SWMAs) - Vision, Mission, Objectives and Programmes

➤ LUAS Case Study (State of Selangor)

- a) Background including Vision, Mission & Objectives
- b) Current Status

<b>i. Enabling Environment</b>	<b>ii. Institutional Framework</b>
<b>iii. Management Instruments</b>	<b>iv. Investments in water infrastructure</b>

- c) [Strategies and Road Map to 2030](#)

5. Nation-wide Strategies and Road Map



# Rationale

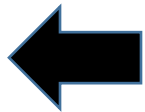
- Blessed with **abundant rainfall**, the adequate provision of quality water to meet the country's short, medium and long term needs is not one of water resources availability but more of **sound management and good governance**.
- Evolution of **IWRM** since its adoption in Malaysia in the early 1990s, has shown **limited success** to-date and weaknesses observed in its implementation.
- **Lack of tangible actions** by water related authorities at Federal and State levels to ensure the infusion of IWRM principles and practices in their respective sector or sub-sector activities.
- **Intra-ministry integration** and mechanisms for regular inter-ministry and Federal-State dialogue for the holistic management of water (both as a resource and as a utility) have yet to be institutionalized.
- Situation is no better with the **state administrations**
- Only **three states** have taken positive steps to **enact contemporary legislation adopting IWRM** as the central philosophy and have established institutional structures (such as LUAS) to facilitate the integrated management of water resources.



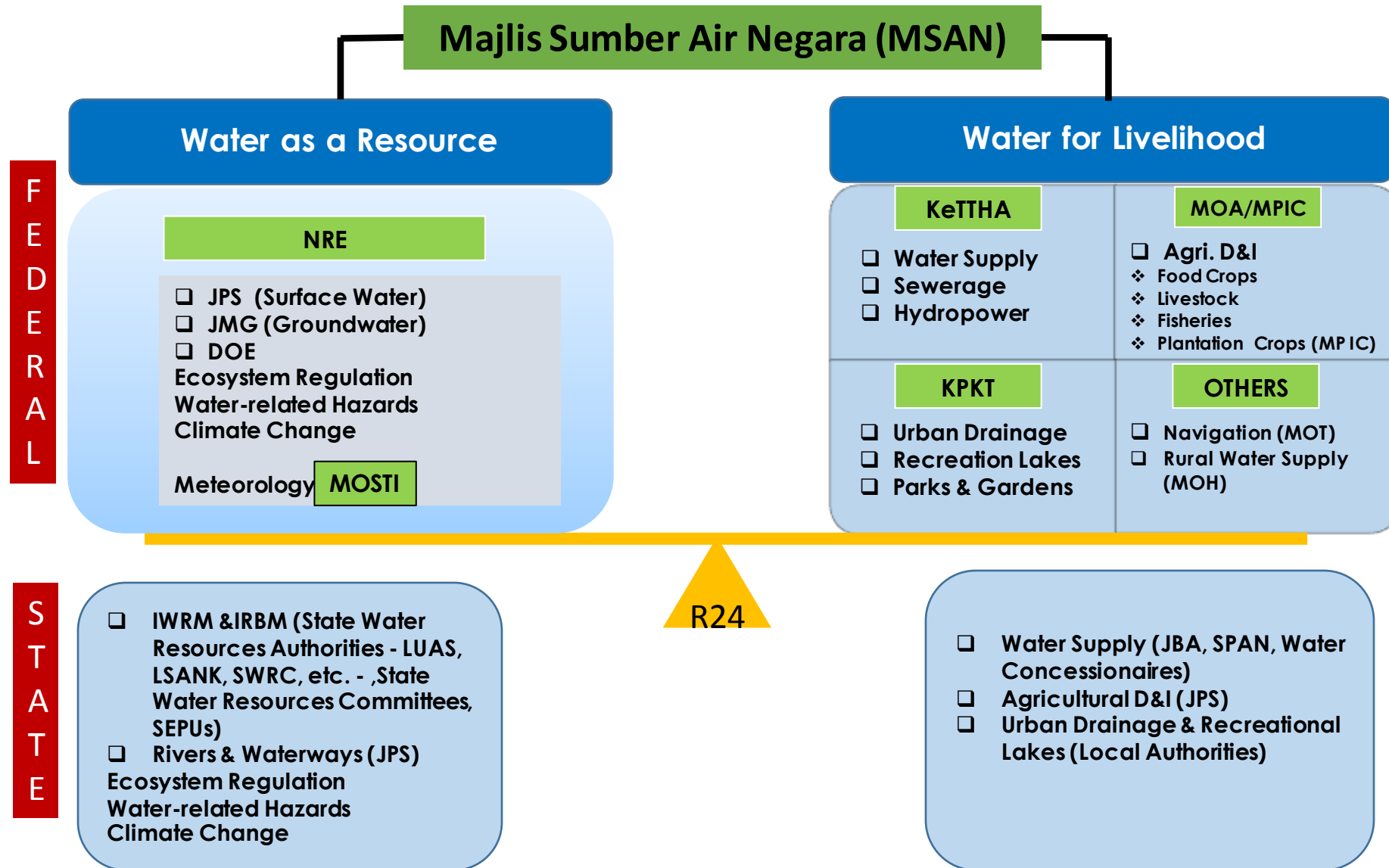


## Expectations - Vision 2020 and Beyond

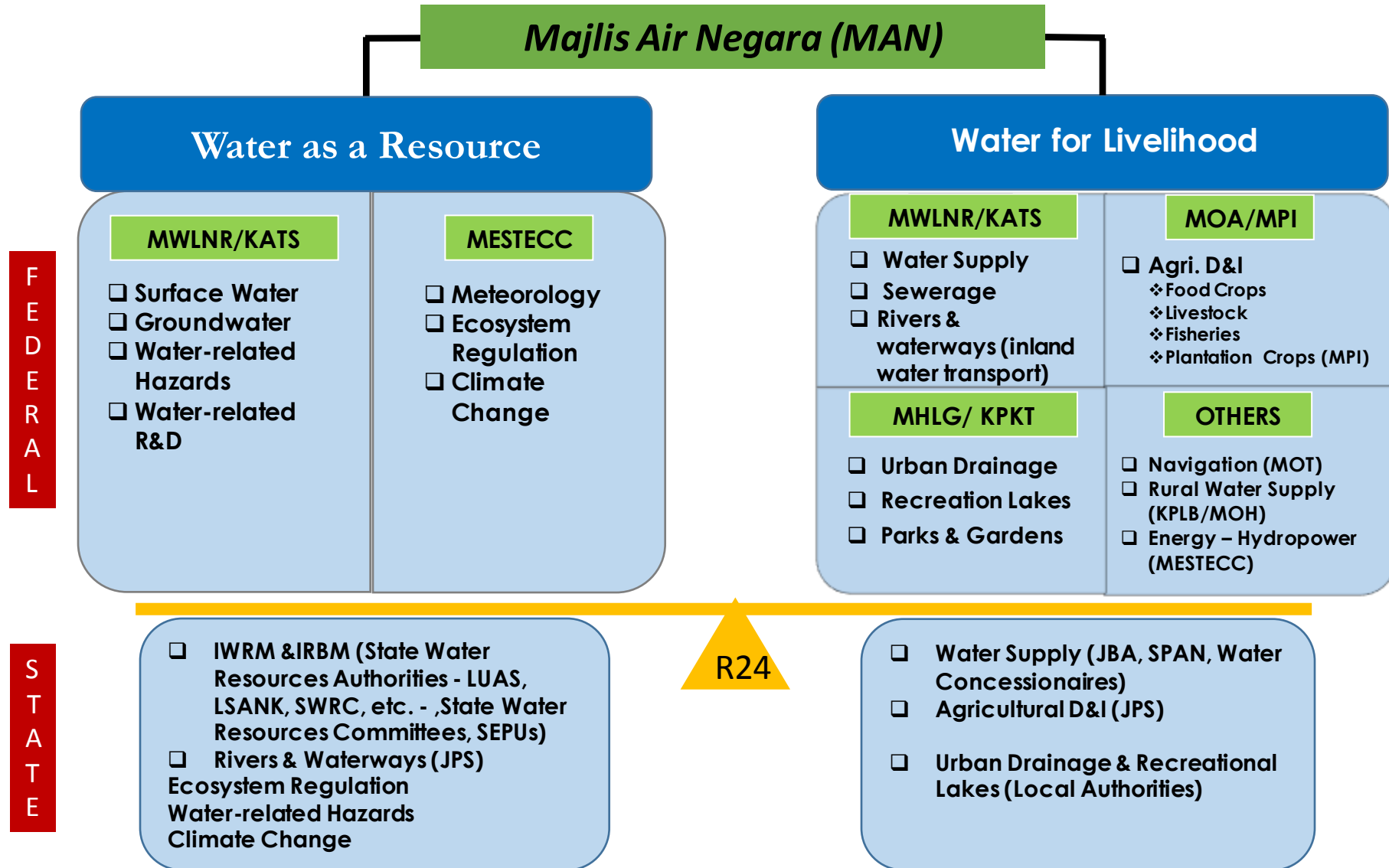
- Pivotal role of water in economic development and as integral part of the water-food-energy nexus
- **Implementation of IWRM across all sub-sectors and levels of hierarchy;**
- Optimum use of the full range of water resources development options used singly or conjunctively including wise waste-water reuse, treated or otherwise;
- **Well structured and regulated water industry providing quality & efficient services with rationalized tariff settings;**
- Green growth with care for the environment - “polluter pays” principles & low water footprint
- **3Rs (Reduce, Reuse & Recycle)**
- Ecosystems regulating functions restored and sustained;
- **Improved agricultural water management to ensure “more crop per drop”**
- Cultural shift for more water demand management than supply management
- **IUWM to counter urbanization impacts and ensure safe, clean water and adequate sanitation**
- Disaster ready
- **Climate Change prepared**
- Leading edge Science, Engineering, Technology & Innovation
- **Operational Excellence through continued skills development;**
- Sustainable Development Goals and Solutions by 2030
- **Concerted PPP support for a vibrant water sector, wealth creation and export of services**
- **NATIONAL WATER SECURITY**



MEA 12MP Kick-Off Conference  
 National IWRM Institutional Framework (2004 – May 2018)



MEA 1.2MP Kick-Off Conference  
**National IWRM Institutional Framework (Post May 2018)**



*MESTECC inadvertently became a strategic partner in sustainable water resources management because of added responsibilities in environment and climate change*

# Lead Authorities – Before 2018



Ministry of Natural Resources and Environment



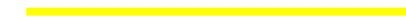
Ministry of Energy, Green Technology and Water



Ministry of Agriculture and Agro-Based Industry



Ministry of Urban Wellbeing, Housing and Local Government



Ministry of Health



Ministry of Transport



Economic Planning Unit



State Governments





# Lead Authorities – After 2018



Ministry of Water, Land and Natural Resources



MESTECC



Ministry of Agriculture and Agro-Based Industry



Ministry of Housing and Local Government



Ministry of Health



Ministry of Transport



Ministry of Economic Affairs



State Governments



## Other Lead Authorities Involved, Not Mentioned – after 2018



Ministry of Plantation Industries and Commodities



Ministry of Federal Territories



Ministry of Rural and Regional Development



Ministry of Education

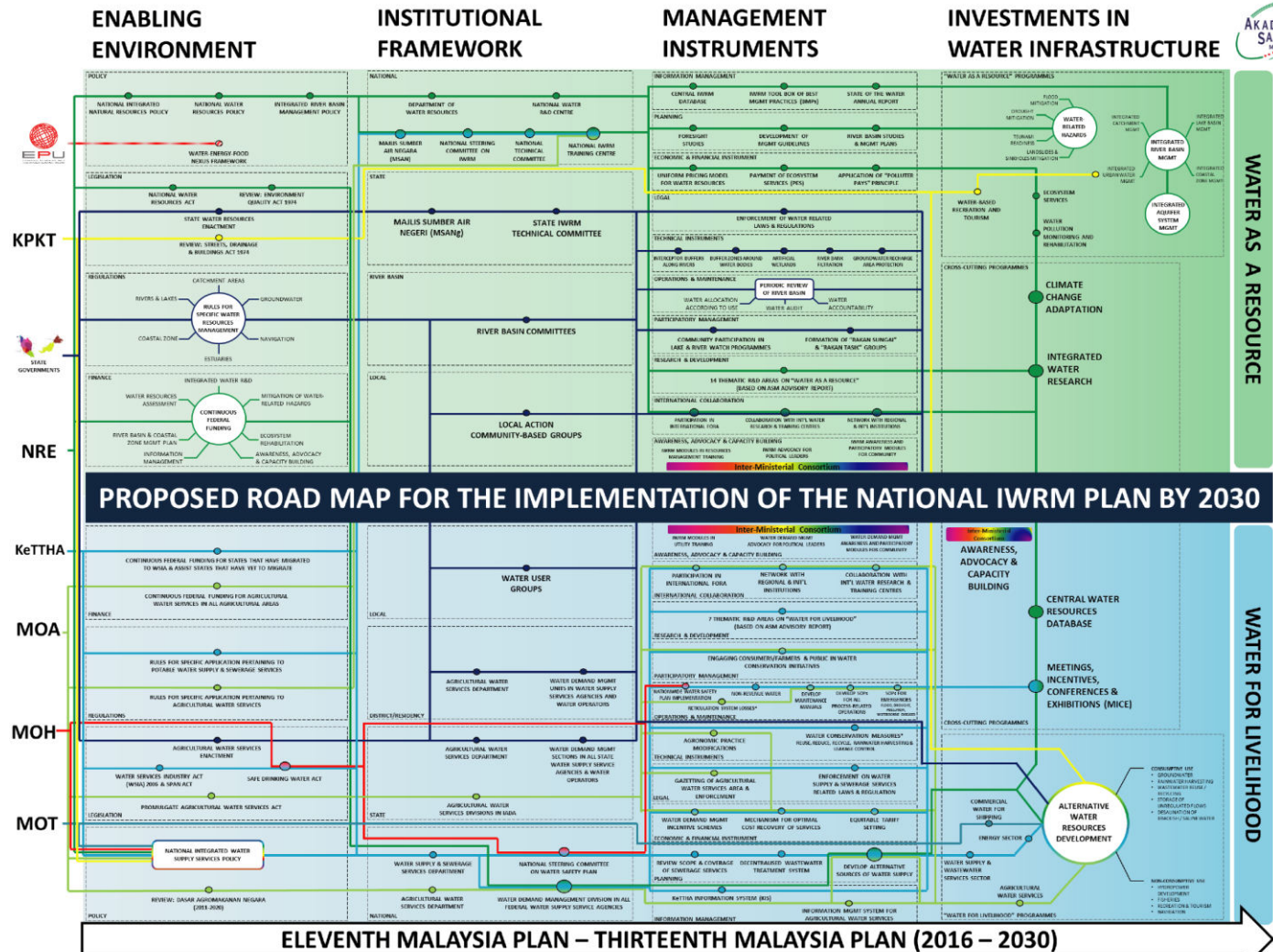


Ministry of Tourism and Culture



Ministry of Woman, Family and Community Development

# Recommendation of NIWRMP to be implemented concurrently for the whole country



WATER AS A RESOURCE

WATER FOR LIVELIHOOD



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. Proposed Roadmap for the Implementation of the National IWRM Plan by 2030.

If you'd like to know more about this work, please go to [www.akademisains.gov.my](http://www.akademisains.gov.my) to contact us.

# Moving forward

- Recommendations from NIWRMP & spill overs
- Review of the IWRM Pillars – from 3 to 4 to 6
- Replicating successful initiatives
- MEA initiatives



# The NIWRMP 25 recommendations

- 1. Overarching - 2**
- 2. Enabling Environment – 10** (include proposed Federal legislation and State Enactments to strengthen WR management )
- 3. Institutional Framework – 5** (include recommendation that ecosystem rehabilitation and restoration measures be included in the list of Federal funded activities)
- 4. Management Instruments – 5** (central data based and green growth be pursued)
- 5. Investments in Water Infrastructure – 1** (a total of 95 EPPs)
- 6. NIWRM Plan implementation Management Structure – 1** (at both federal and state levels)
- 7. Champion/s – 1**

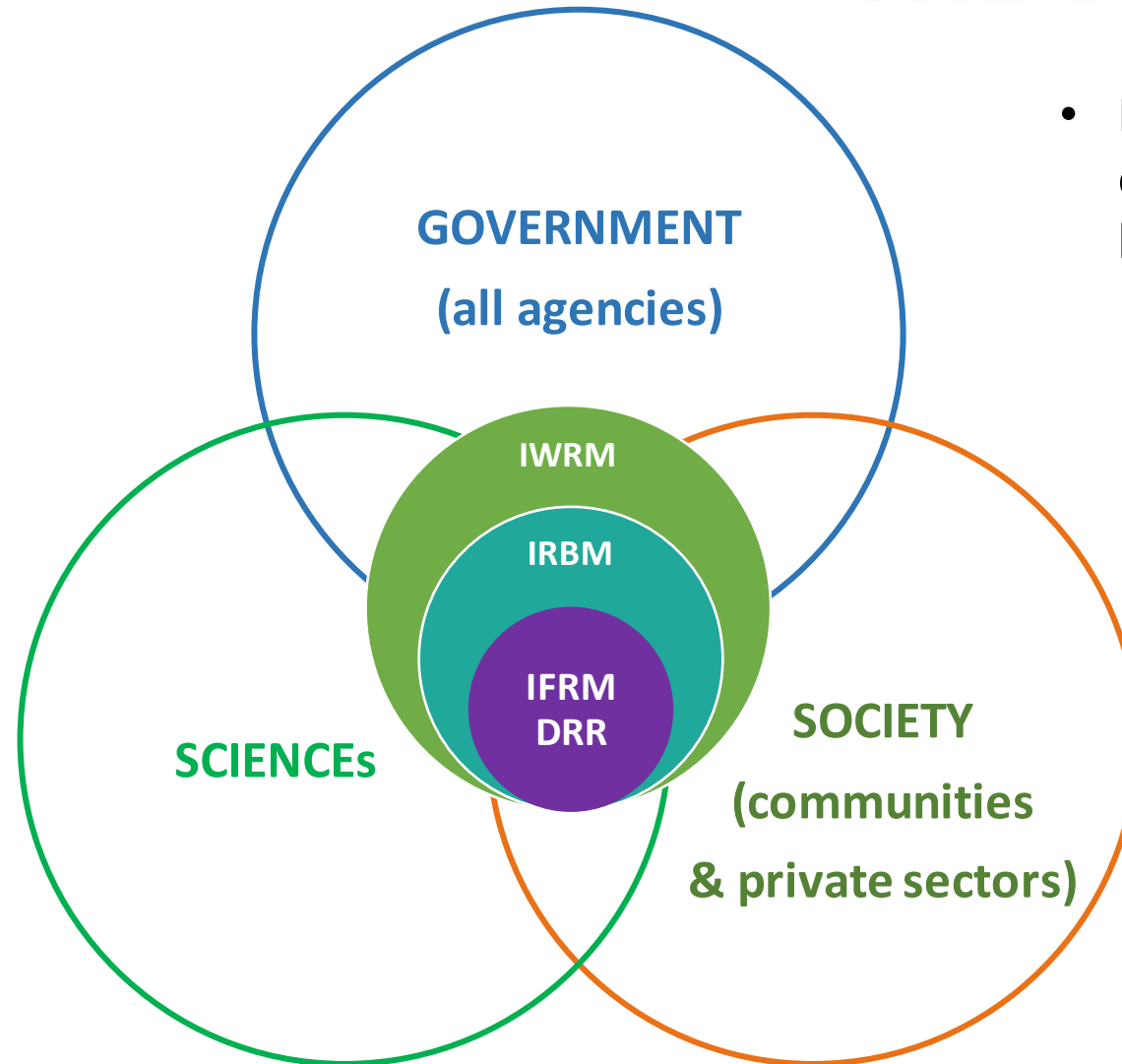
# Spill over from NIWRMP

- New task forces proposed
  - AACB –Advocacy, Awareness Creation & Capacity building, horizontal and vertical
  - Water-Food-Energy Nexus
  - IOT and IR4.0

# 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

# As we replicate we upscale

- Focus on the achievable deliverables, act on details
  - Prioritize and Strategize, eg
    - Pilots in sub-basin/sub-tributary management and small islands
    - Land/Flood zoning
      - Safe location for public utilities
      - Insurance schemes for housing, recreational and economic activities, etc
        - The more vulnerable (slopes, flood plains, wetlands, coastal areas) higher premiums
    - Fully treated waste water before discharging into rivers and drains – use of both centralized and decentralized modular structures
    - Fully managed solid waste - will not spilled into water bodies and recycled
  - Provide Time Frames and Key Performance Indicators
  - Provide incentives
  - Have a champion
    - *Respected and committed*
  - Have a Clarion Call (Similar to bring back the [Salmon](#) to the Rhine)
    - *Bring back ikan Kelah? udang galah?*

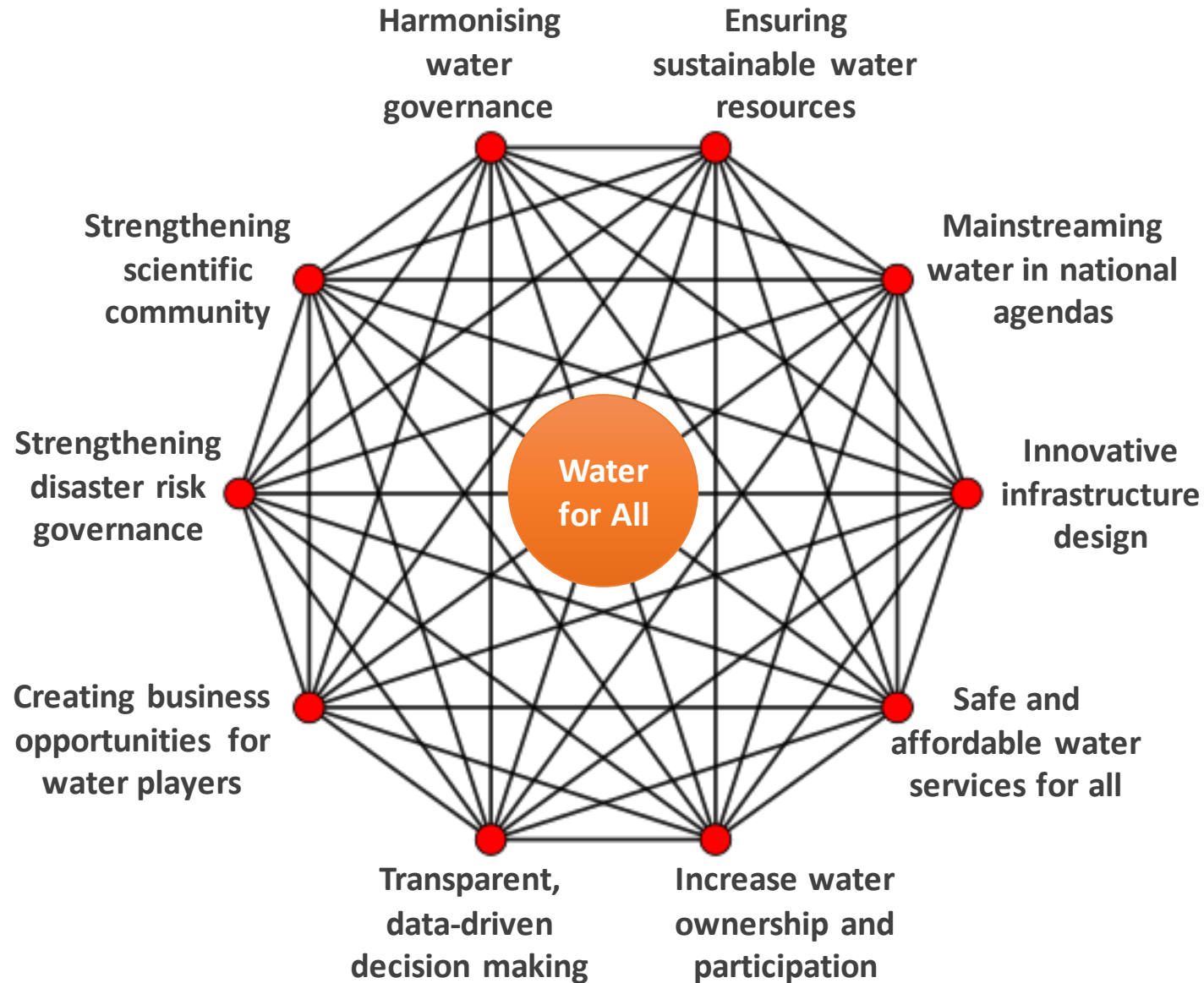


# MEA initiatives

# MEA is Developing a Strategy Paper on Transforming the Water Sector in the 12<sup>th</sup> Malaysia Plan and beyond

- with a series of Focus Group Discussions (FGDs) and TWG, analyzing ...

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



# The Dream

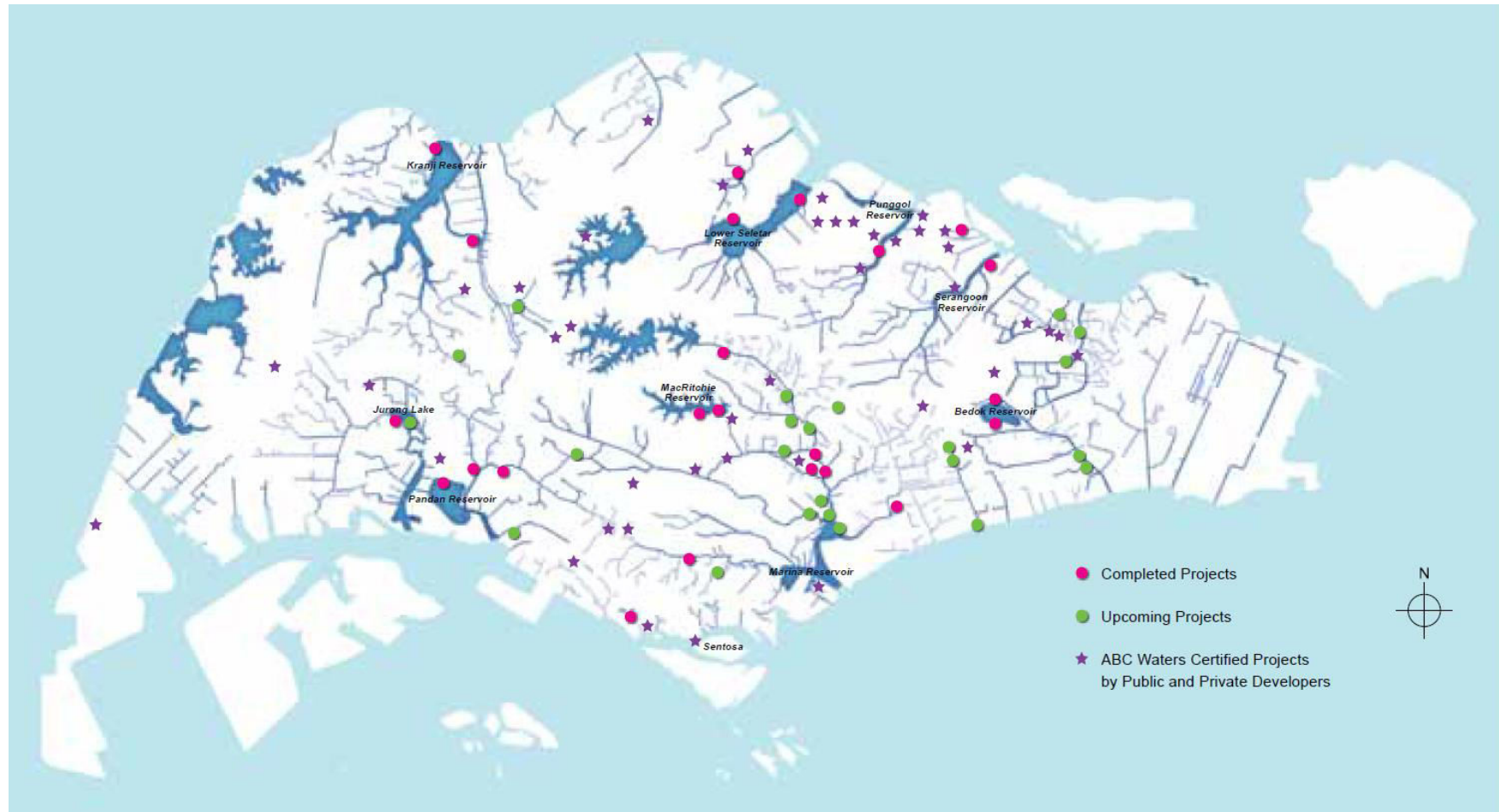
Transforming the Water Sector in 4 MP cycles, starting with 12<sup>th</sup> MP



# Targeted achievements by 2040

- Drinking direct from the tap
- Clean river waters, a viable and economic alternative water source
- Floods be better mitigated
- The water sector, a vibrant economic sector, contributing to the national GDP

# Singapore reservoirs



# Targeted achievements by 2040

- Drinking direct from the tap
- Clean river waters, a viable and economic alternative water source
- Floods be better mitigated
- The water sector, a vibrant economic sector, contributing to the national GDP

Terima Kasih