



**PERSIDANGAN KE-8  
NATIONAL ENVIRONMENTAL HEALTH ACTION  
PLAN (NEHAP) TAHUN 2022**

**27 SEPTEMBER 2022**

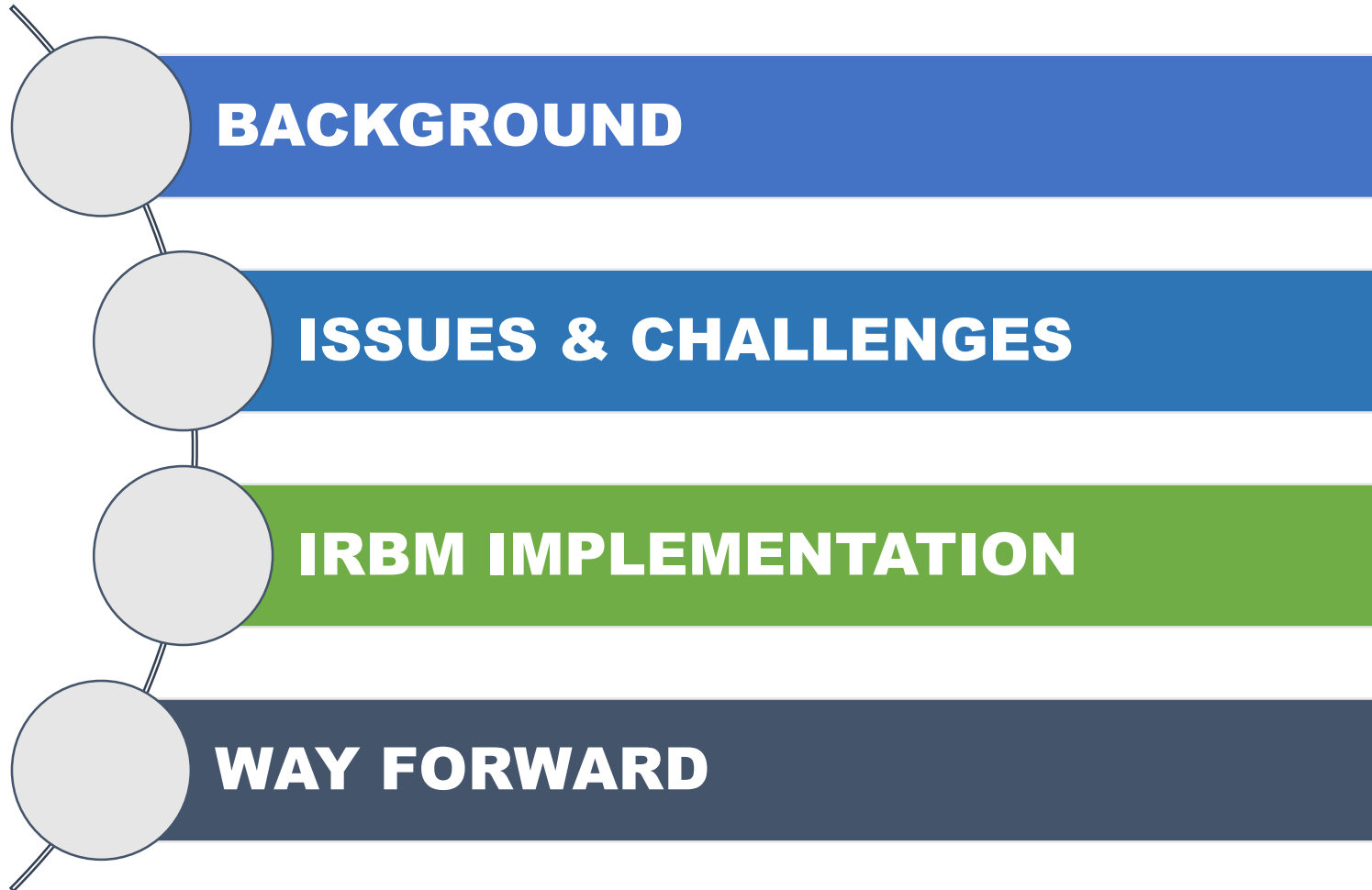
**INTEGRATED RIVER BASIN MANAGEMENT (IRBM)  
TOWARDS SUSTAINABLE DEVELOPMENT IN  
SELANGOR**

**HASLINA BINTI AMER**  
**Principal Assistant Director,**  
**Selangor Water Management Authority (LUAS)**





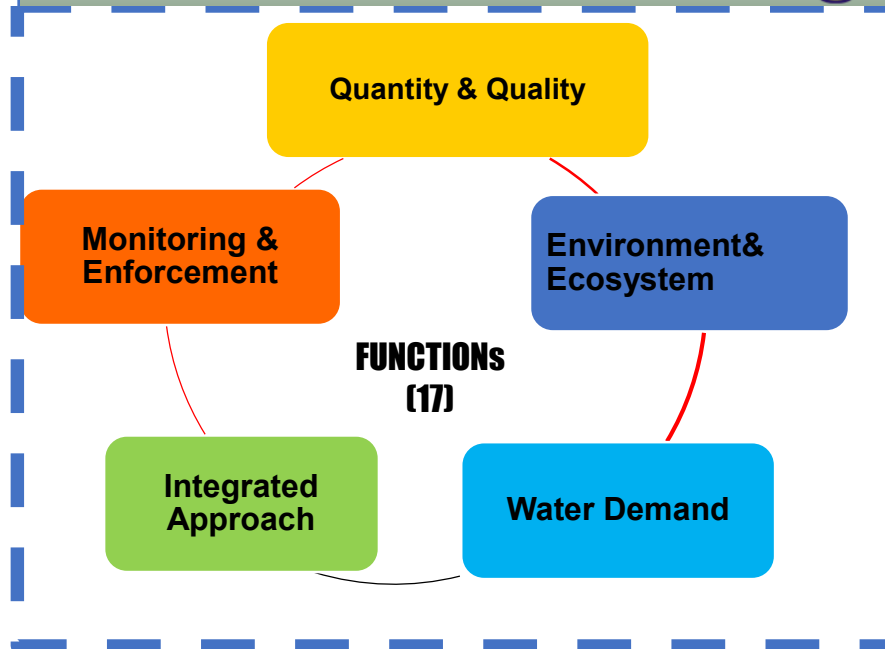
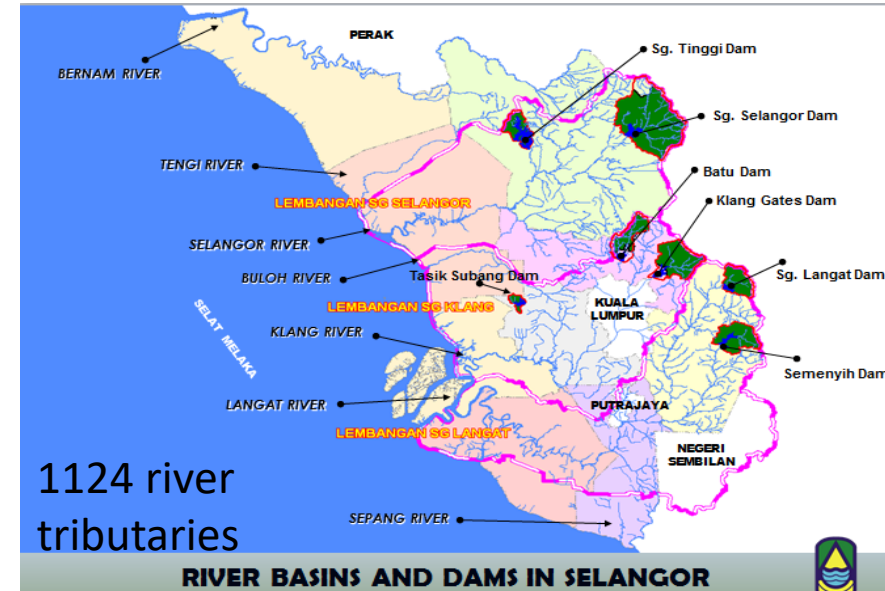
# OUTLINE





## BACKGROUND

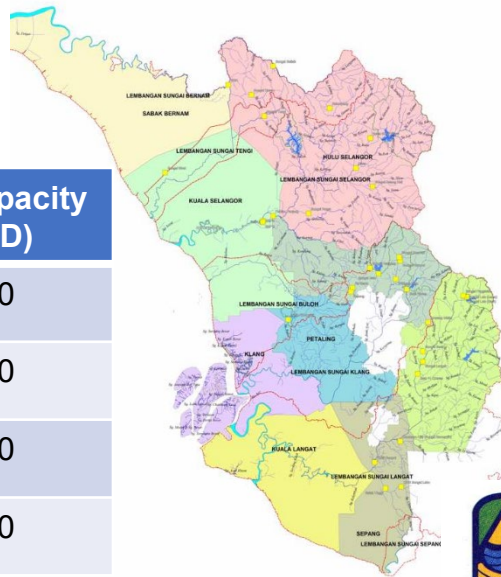
- **Selangor Water Management Authority (SWMA/LUAS)** is a one-stop agency/**River Basin Authority** for the management of **water resources, river basin, water bodies, ground water and coastal waters** in the **State of Selangor** under the Selangor Waters Management Authority Enactment 1999.
- The **river-basin approach to water management in Malaysia** was initiated with the establishment of **Lembaga Urus Air Selangor (LUAS)** in 1999. (Source: RMK- 8 (2001-2005) ,( Chapter 19 : Environment and Sustainable Resource Management) )





## WATER RESOURCES AVAILABILITY IN SELANGOR

- Selangor together with the Federal territories of Kuala Lumpur and Putrajaya covers an area of 8,104 km<sup>2</sup>.
- Population : 6.32 million
- The core sectors of Selangor's economy are commerce, industries and services. The most developed state in the country.



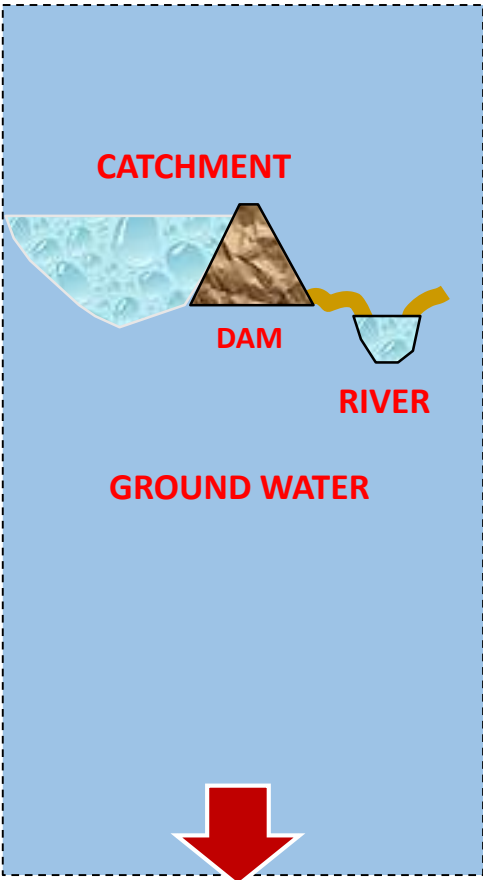
Particular	Amount
Annual Rainfall	2.19m
Annual Evapotranspiration	1.28m
Annual seepage to ground	0.15m
Annual Runoff	0.76m
Total Annual Runoff	7,074 MCM
Average Runoff	19,383 MLD
Utilization for water supply (5,000 MLD)	26%
Utilization for irrigation (1,600 MLD)	8%
Total Utilization (6,600 MLD)	34%

River Basin	GW Capacity (MLD)
Langat	860
Klang	630
Selangor	810
Bernam	630

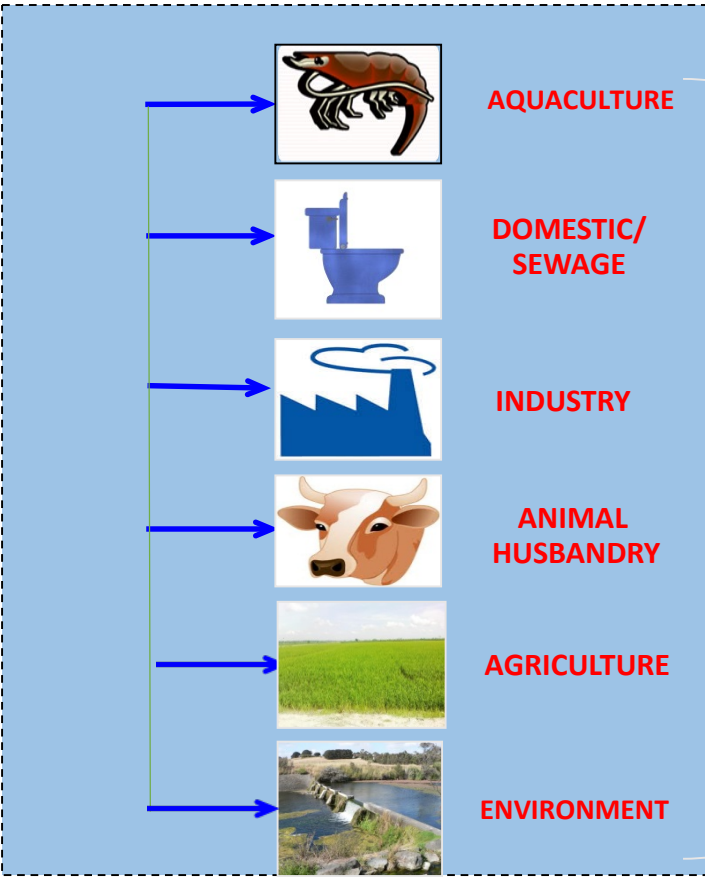


# JURISDICTION

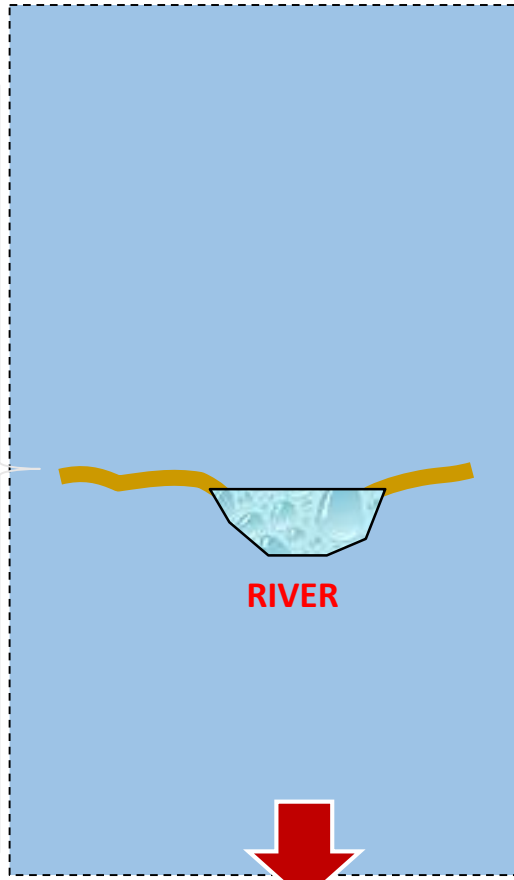
## WATER RESOURCES



## WATER USAGE



## USED WATER



## QUALITY CONTROL

- **LUAS**
  - DOE
  - Local councils
  - Related agencies

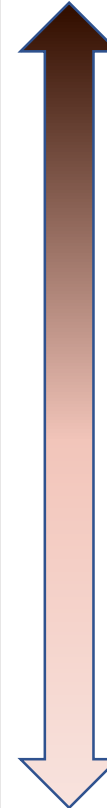
- **LUAS**
  - DOE
  - Local councils
  - Related agencies



## ISSUES & CHALLENGES

- Rapid urbanisation and industrial development that have resulted in water, land and related resources within the basin becoming increasingly under stress
- Threat of climate change, creating extreme variability in climate
- Deterioration of river water quality
- Degradation on environment
- Trans-boundary nature of the shared river basin illustrates the complexities to implement IRBM
- Water security challenges – Too much water, too little water, too dirty water

too much



too little



**Too much or too little water – management issues**



## IRBM IMPLEMENTATION IN SELANGOR

Gazettement : LUAS IRBM Plan Regulation 2019

**POLICY 1: Ensure Sufficient Water**



**POLICY 2: Ensure Clean Water**



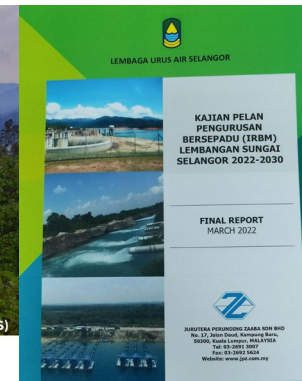
**POLICY 4 : Environmental Conservation**



**POLICY 3: Protection Against Flood**



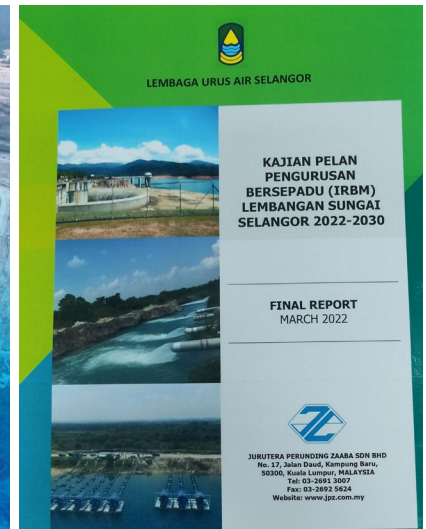
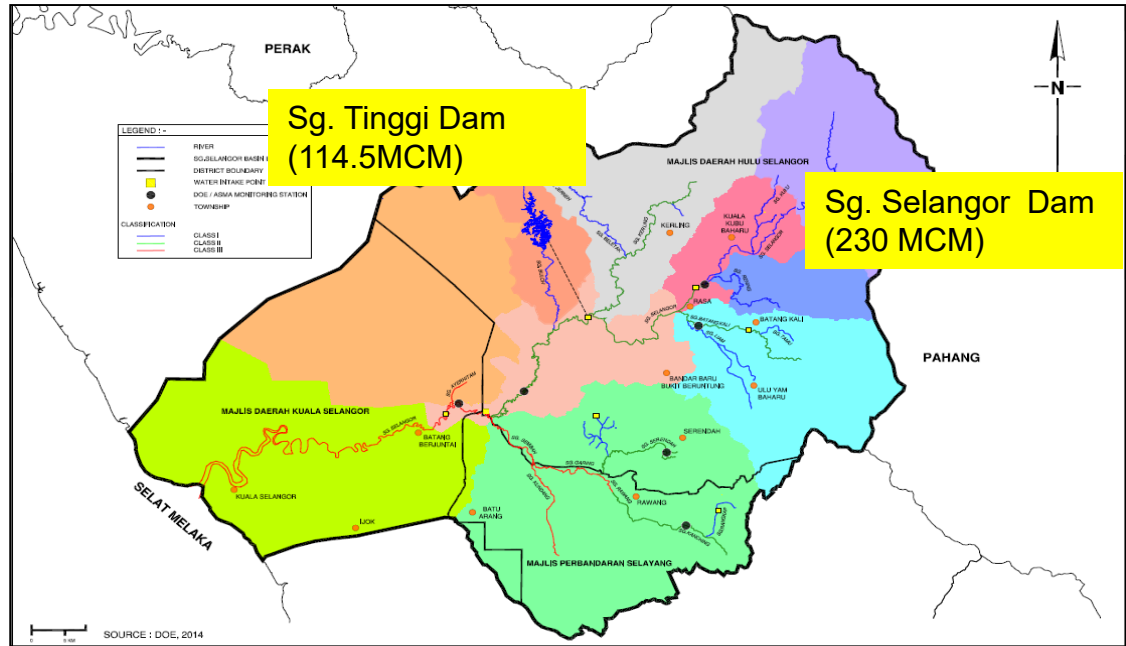
lowing an hour-long afternoon downpour on Nov 12. -





## SELANGOR RIVER BASIN

- The basin covers an area of 2,200 km<sup>2</sup> and is 110 km long, which constitutes about 28% of the state.
- It contains ten sub-basins, which are Ulu Selangor, Kerling, Kuala Kubu, Sungai Tinggi, Rantau Panjang, Batang Kali, Tanjung Karang, Rawang and Kuala Selangor.
- It is the third largest river basin in Selangor after the Sungai Langat and Sungai Bernam basins. The main land use is agriculture.
- The main tributaries Sembah River, Kanching River, Kerling River, Rawang River and Tinggi River.
- Selangor River Basin contribute more than 60% water supply (3000 MLD) for Selangor and Klang Valley.



### Sungai Selangor IRBM Policy (2022-2030)

**Policy 1: Ensure sufficient water**

**Policy 2 : Ensure clean water**

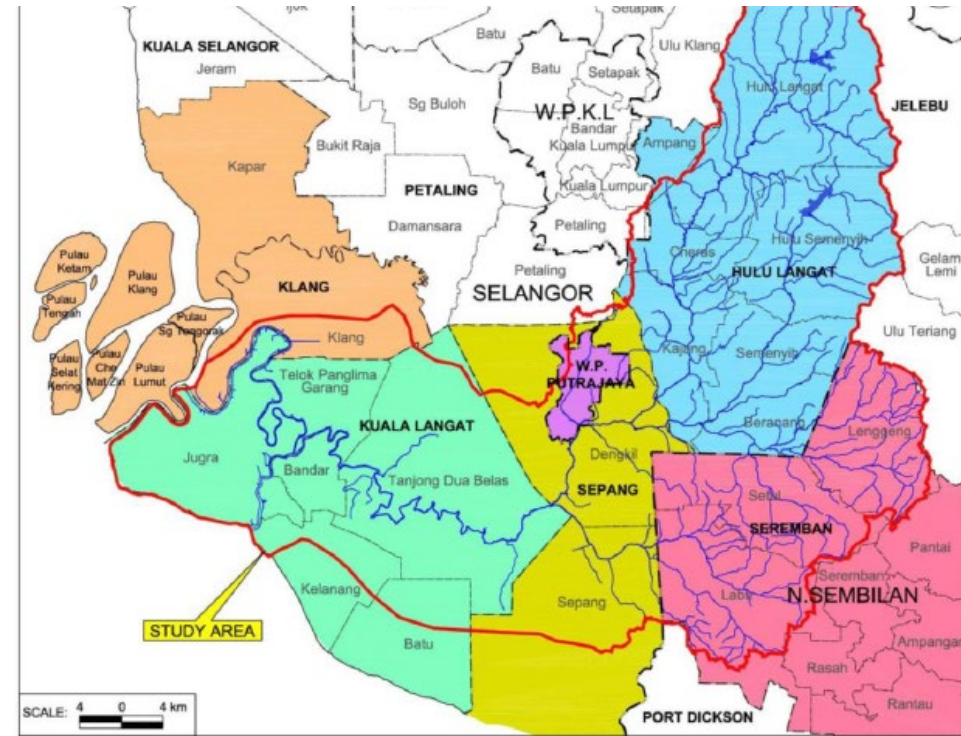
**Policy 3: Protect against flood**

**Policy 4 : Conserve fireflies and ecosystem**



## LANGAT RIVER BASIN

- The Sungai Langat basin is the second largest river basin with a length of approximately 200 km and an area of 2,423 km<sup>2</sup>.
- It extends into two states, with 76% of the river basin in Selangor and 20% in Negeri Sembilan and about 4%, covers part of the Federal Territory of Putrajaya.
- The main tributaries of the Sungai Langat basin are Sungai Semenyih, Sungai Beranang and Sungai Labu with six sub – basins.
- The river provides important natural resources to support economic activities and also as inland river navigation. The river supplies about 1,000 million litres per day (MLD) of potable water (30%) of the total supply requirement of Kuala Lumpur and Selangor.



### Sg. Langat IRBM Policy (2022-2030)

**Policy 1: Ensure sufficient water**

**Policy 2 : Ensure clean water**

**Policy 3 : Reduce Risk Of Flooding**

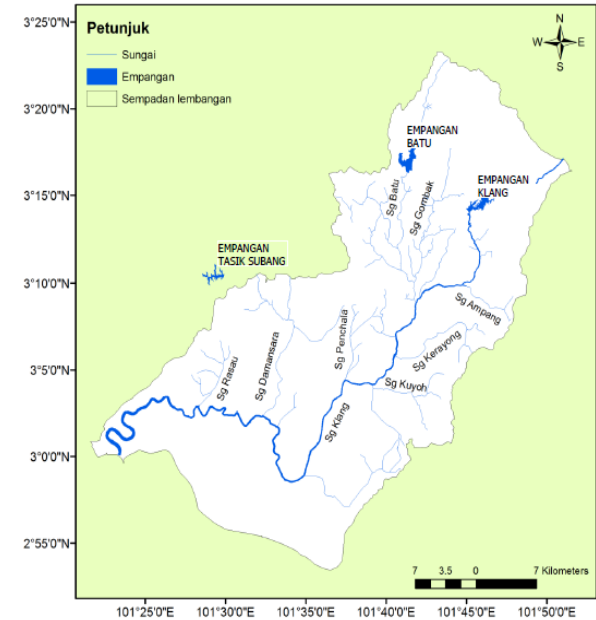
**Policy 4 : Facilities for river inland navigation**



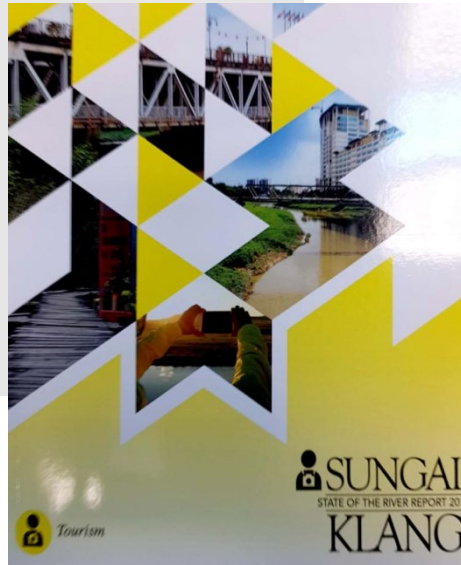


# KLANG RIVER BASIN

- Catchment area :1,288 km<sup>2</sup> with 13 main tributaries.
- Klang River : 120km with 80 km (Selangor ) dan 40 km ( Federal Territory of Kuala Lumpur)
- 2 main dams that functioned as water supply and flood mitigation (Batu Dam & Klang Gates Dam)
- River Of Life (ROL) Project in upstream Klang River (Kuala Lumpur) while Selangor Maritime Gateway (SMG) Project (State of Selangor) in the downstream area.



- Sg. Klang IRBM POLICY (2016-2021):**
- Policy 1- Ensure Sufficient Water**
  - Policy 2- Ensure Clean Water**
  - Policy 3- Protection Against Flood**
  - Policy 4- Environmental Conservation**



\* Status : Review IRBM Plan



## **POLICY : ENSURE SUFFICIENT AND CLEAN WATER**

### **WATER QUANTITY AND QUALITY CONTROL**

- i** Charging and Licensing of Water Abstraction, s.41(2)
- ii** Written Approval of Alteration Activities, s.43(1)
- iii** Licensing of Emission or Pollutant Discharges, s.79(1) (Review)
- iv** Licensing of In Land Waterway Navigation, s.97(1)
- v** Licensing of Water Diversion For Hydro-Electricity, s. 42(3)

Source: LUAS ENACTMENT 1999



## POLICY IMPOSITION

- ❖ Based on S.43(1), to ensure natural physical condition of rivers, lakes & ponds is preserved & unaltered.
- ❖ Development based on natural physical condition of water bodies.
  - Selangor's River Management Strategy Policy
  - Selangor's Lake Management Strategy Policy





## **POLICY : ENSURE SUFFICIENT WATER**

### **WATER EXPLOITATION INDEX (WEI) : SELANGOR RIVER BASIN**

**Water Exploitation Index (WEI)** is the annual total freshwater abstraction in the basin as a percentage of its annual average available water from renewable freshwater resources

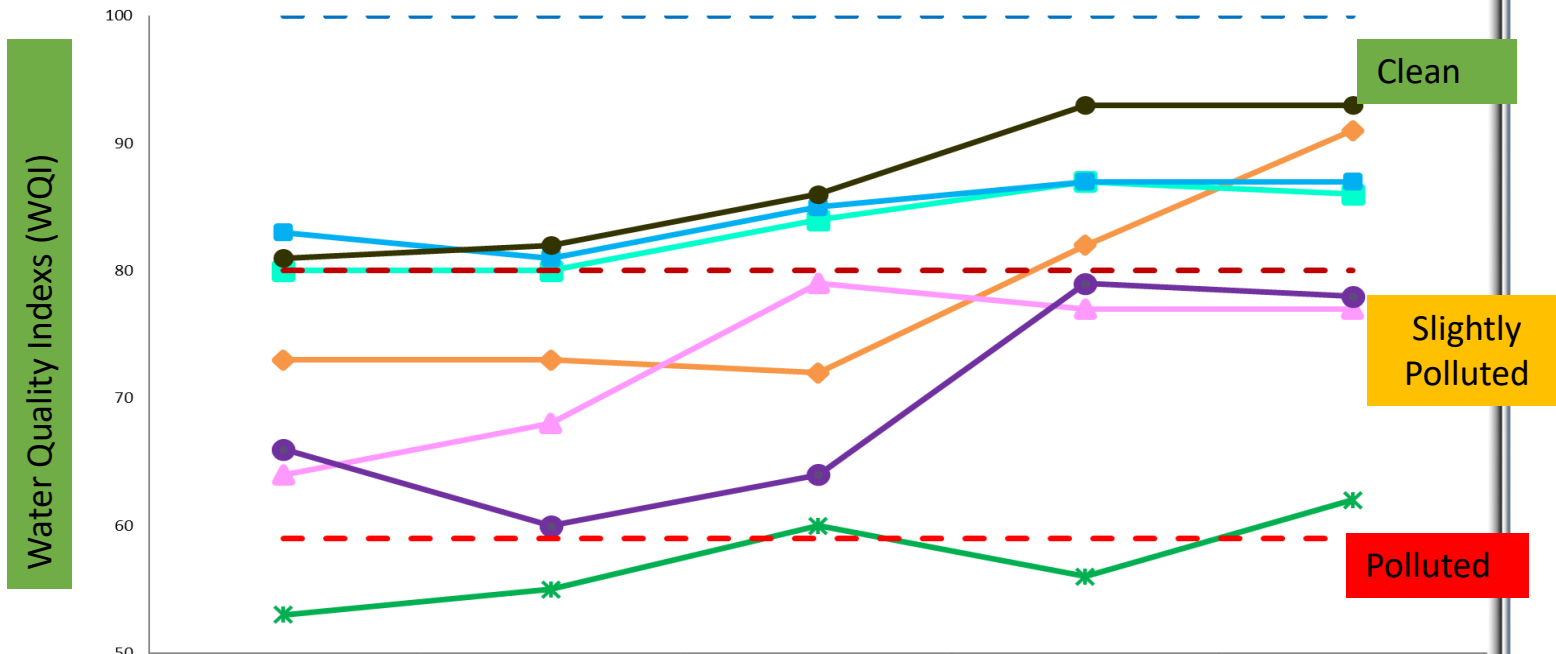
No.	Description	Unit	Average
1.	Annual Rainfall	m	2.24
2.	Annual Evaporation	m	1.28
3.	Annual Seepage	m	0.15
4.	Annual Runoff	m	0.81
5.	Annual Flow	MCM/ Year	1,783.08
6.	Average Flow over 2,200 sq.km	MLD	4,871.80
7.	Water Treatment Plant Intake	MLD	3,277.99
8.	Other abstractions	MLD	87.12
9.	Total Abstraction	MLD	3,365.11
10.	<b>Water Exploitation</b>	<b>%</b>	<b>72.21</b>

**CONCLUSION:** Based on WEI calculation, the total freshwater being utilised in the Sungai Selangor basin from 2016-2019 is **72.21%**, which indicates that there is sufficient raw water supply in the basin.



## POLICY : ENSURE SUFFICIENT AND CLEAN WATER

### Water Quality Indexs (WQI) In The State of Selangor River Basin 2018-Mac 2022



	2018	2019	2020	2021	Mac 2022
— Sg. Langat	73	73	72	82	91
— Sg. Selangor	80	80	84	87	86
— Sg. Klang	64	68	79	77	77
— Sg. Tengi	83	81	85	87	87
— Sg. Buloh	53	55	60	56	62
— Sg. Sepang	66	60	64	79	78
— Sg. Bernam	81	82	86	93	93
— Bersih (81-100)	100	100	100	100	100
— Sederhana Tercemar (60-80)	80	80	80	80	80
— Tercemar (0-59)	59	59	59	59	59

# POLICY : ENSURE SUFFICIENT AND CLEAN WATER

## SELANGOR MARITIME GATEWAY PROJECT



### RIVER CLEANING – The Interceptor 2.0

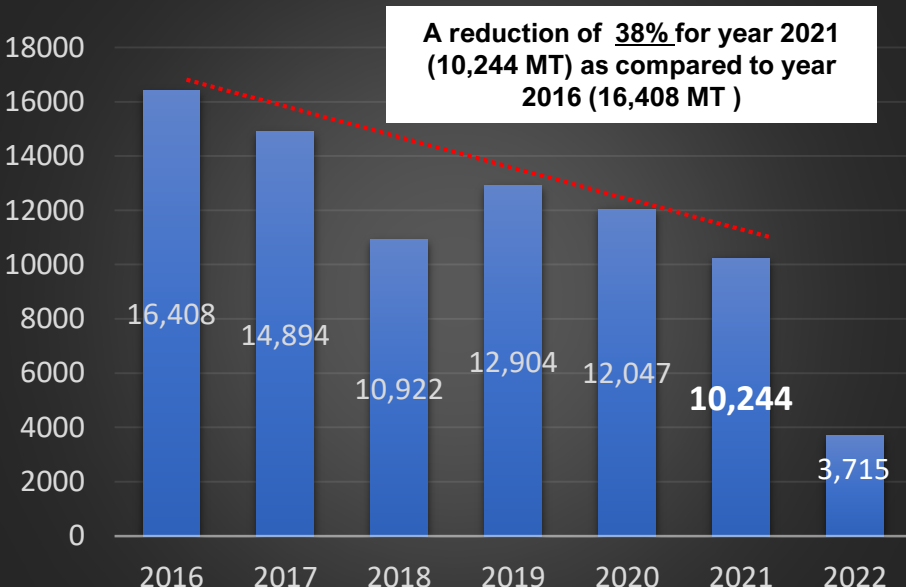


#### INTERCEPTOR 002 @ SG. KLANG

##### Deployment of Interceptor 002

Interceptor moored at Pangkalan Batu Urban Park on 20<sup>th</sup> August 2019

- The Interceptor is The Ocean Cleanup's answer for river plastic waste. It is the first scalable solution to prevent plastic from entering the world's oceans from rivers.
- It is 100% solar-powered and extracts plastic autonomously.



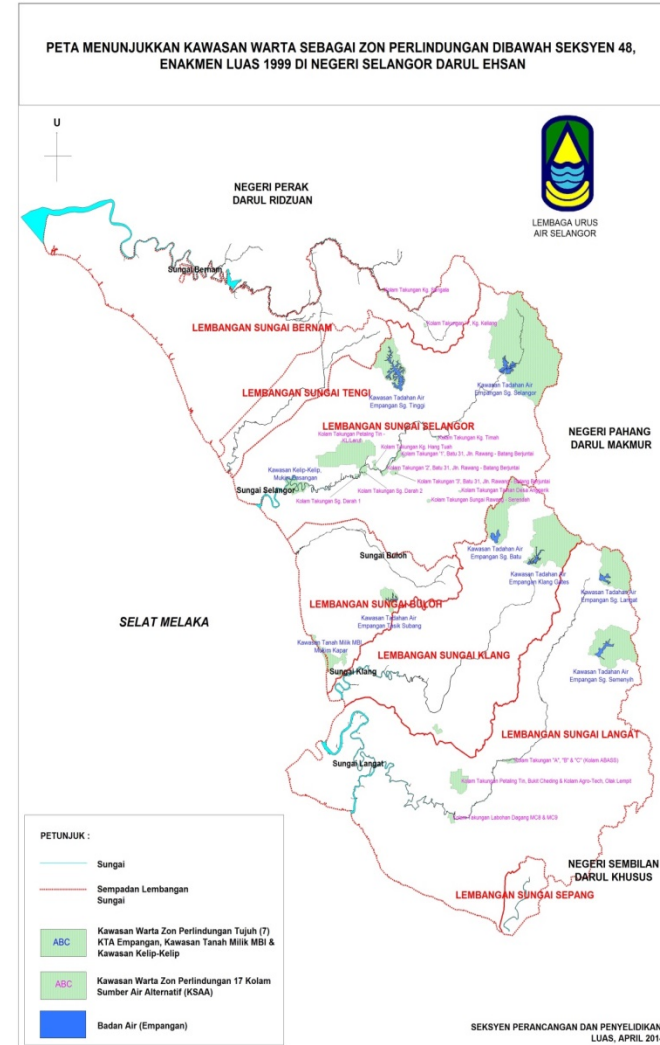


## POLICY : ENSURE SUFFICIENT AND CLEAN WATER Gazettement For Zone Of Protection (S,48 LUAS Enactment)

- Gazettement of 50 meter River Reserve as zone of protection (s48, LUAS Enactment 1999)
- Gazettement of 7 Dam Water Catchment on 2 Dec 2010(s48, LUAS Enactment 1999)
- Gazettement of **20 alternative ponds** for additional water resources (1,533 MCM)
  - Sg Rasau WTP (future)
- Development of lakes & ex-mining ponds as **alternative water resources (98 ponds)**
  - To reduce dependency on dam's water release
  - To optimize available water in the river during high flow



PUMPING OPERATION OF ALTERNATIVE PONDS (OPAK) AT BESTARI JAYA (800 MLD)





## POLICY : ENSURE SUFFICIENT AND CLEAN WATER

### Increase Supply with Construction of New Water Treatment Plant (WTP)

#### Langat 2 WTP- interbasin water transfer

- Source from Semantan River, Pahang
- Capacity of 1130MLD water treatment plant



#### Semenyih 2 WTP

- Source from A, B and C Alternative Pond
- Capacity of 200MLD water treatment plant



#### Labohan Dagang

- Source from Labohan Dagang MC8 & MC9 Alternative pond
- Capacity of 400MLD water treatment plan





**POLICY : ENSURE SUFFICIENT AND CLEAN WATER**

# WATER RESOURCES AND RIVER BASIN MANAGEMENT GOVERNANCE IN SELANGOR

STATE GOVERNMENT

LUAS BOARD  
Chairman: Chief Minister

Technical Committee  
(Chairman: State Secretary)

SELANGOR RIVER CONSERVATION COMMITTEE  
(Chairman: EXCO Of Infrastructure)

SELANGOR WATER RESOURCES EMERGENCY COMMITTEE  
(Manual Of Emergency Action Plan)  
Chairman: EXCO of Environment

SELANGOR RIVER BASIN & COASTAL MANAGEMENT COMMITTEE  
(Chairman: EXCO of Infrastructure)

RIVER BASIN TASK FORCE (SELANGOR, LANGAT, KLANG)  
(Chairman: LUAS Director )

IRBM PLAN MONITORING COMMITTEE  
(Chairman: LUAS Director )

ICM MONITORING COMMITTEE  
(Chairman: LUAS Director & PNLG President )



Not Critical (WTP)



Warning Level (WTP)



Danger Level (WTP)



### RIVER BASIN MANAGEMENT MONITORING MECHANISM





## INTEGRATED SURVEILLANCE & ACTION cont...



- **Water Resources Surveillance & Enforcement Operation (Ops Sumber Air Negeri Selangor)(24 hours Monitoring)**- to monitor critical river basin including dam water catchment for identifying the pollution sources and avoid the water intake shut down. 24 hours operation involving various agencies.

- The Selangor State Government has directed for 24 hours monitoring in river basins especially Selangor River and Langat Rivers Basin started January 2020 during festive season and continue on 17 April 2020.

- Establishment of LUAS QUICK SQUAD/SKUAD PANTAS (river patrolling, 24 h)

❖ PLATFORM: **WHATSAPP OPS SUMBER AIR** (coordination among agencies)



## LUAS QUICK SQUAD

TAHUKAH ANDA?

### SKUAD PANTAS LEMBAGA URUS AIR SELANGOR (LUAS)



#### MENGAPA SKUAD PANTAS DITUBUHKAN ?



Memperkasa Ops Sumber Air Negeri Selangor.



Meningkatkan keberkesanan tindakan pencegahan pencemaran.

#### OBJEKTIF UTAMA PENUBUHAN SKUAD PANTAS



28

Kakitangan  
SKUAD PANTAS



Melaksanakan pemantauan 24 jam di kawasan-kawasan sensitif sumber air.



Memastikan kelangsungan sumber air Negeri Selangor sentiasa terjamin dan terpelihara.

Meminimakan risiko henti tugas loji rawatan air (LRA).

#### PENDEKATAN OPERASI SKUAD PANTAS

Rondaan 24 jam di lembangan - lembangan sungai.



Pemantauan Statik & berkala bagi memastikan status kualiti air dan meningkatkan tahap kualiti sumber air.

TALIAN ADUAN ☎ 019-2647904 ✉ aduan@luas.gov.my

Facebook Lembaga Urus Air Selangor Instagram lembagaurusairselangor Twitter @luas\_selangor

- ❖ Established 1 Dec 2020
- ❖ **Objective** : To monitor the critical river basin (24 hours) and mitigate any emergency river pollution and to avoid water intake shutdown due to pollution.
- ❖ **Monitoring Method** : Static and River Patrolling by water sampling and drone monitoring.
- ❖ **Reference** Selangor State Water Resource Emergency Manual
- ❖ **Document:** State Water Pollution Action Plan



## RIVER BASIN MONITORING AND SURVEILANCE : SEMENYIH & LANGAT RIVER BASIN

LEMBAGA URUS AIR SELANGOR (LUAS)



**SUNGAI SEMENYIH (SS1),**  
Rinching Hill

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.



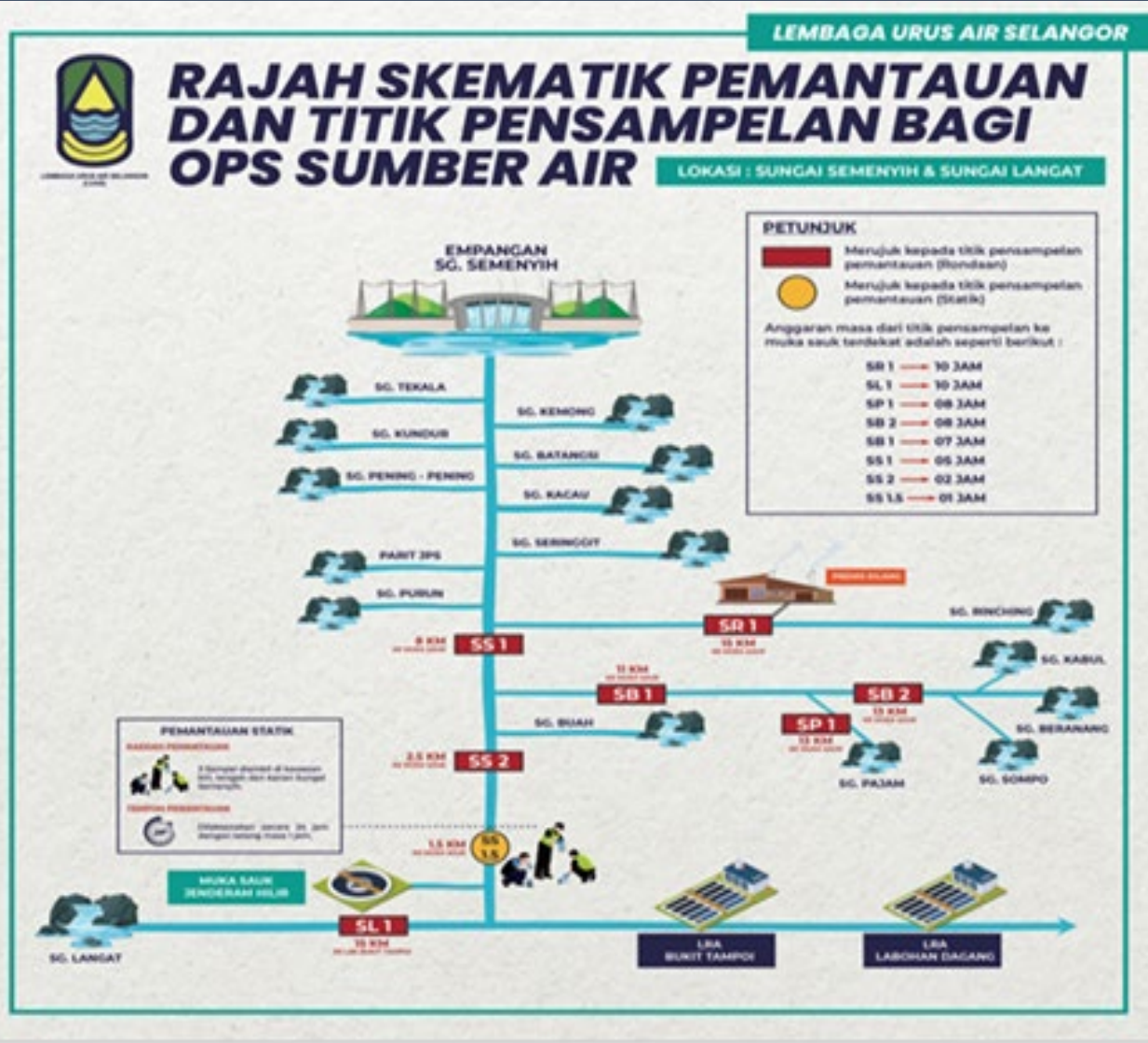
**SUNGAI SEMENYIH (SS2),**  
Jambatan Intake 1.5 Jenderam.

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.



**SUNGAI LANGAT (SL1),**  
Jambatan Teras Jerang.

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.



**SUNGAI PAJAM (SP1)**  
Jambatan Sg Pajam.

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.



**SUNGAI BERANANG (SB2),**  
Jambatan Sg Beranang.

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.



**SUNGAI BERANANG (SB1),**  
Jambatan Teras Jerang selepas MIG Farm.

- Bau normal 0 ton.
- Tiada aktiviti mencurigakan.





### TURBIDITY POLLUTION IN BATANG KALI RIVER



**Batang Kali Water Intake temporary shutdown due to the high turbidity from earth work activity upstream of water intake on 17 Feb 2022**



### PALM OIL SPILL AT LANGAT RIVER



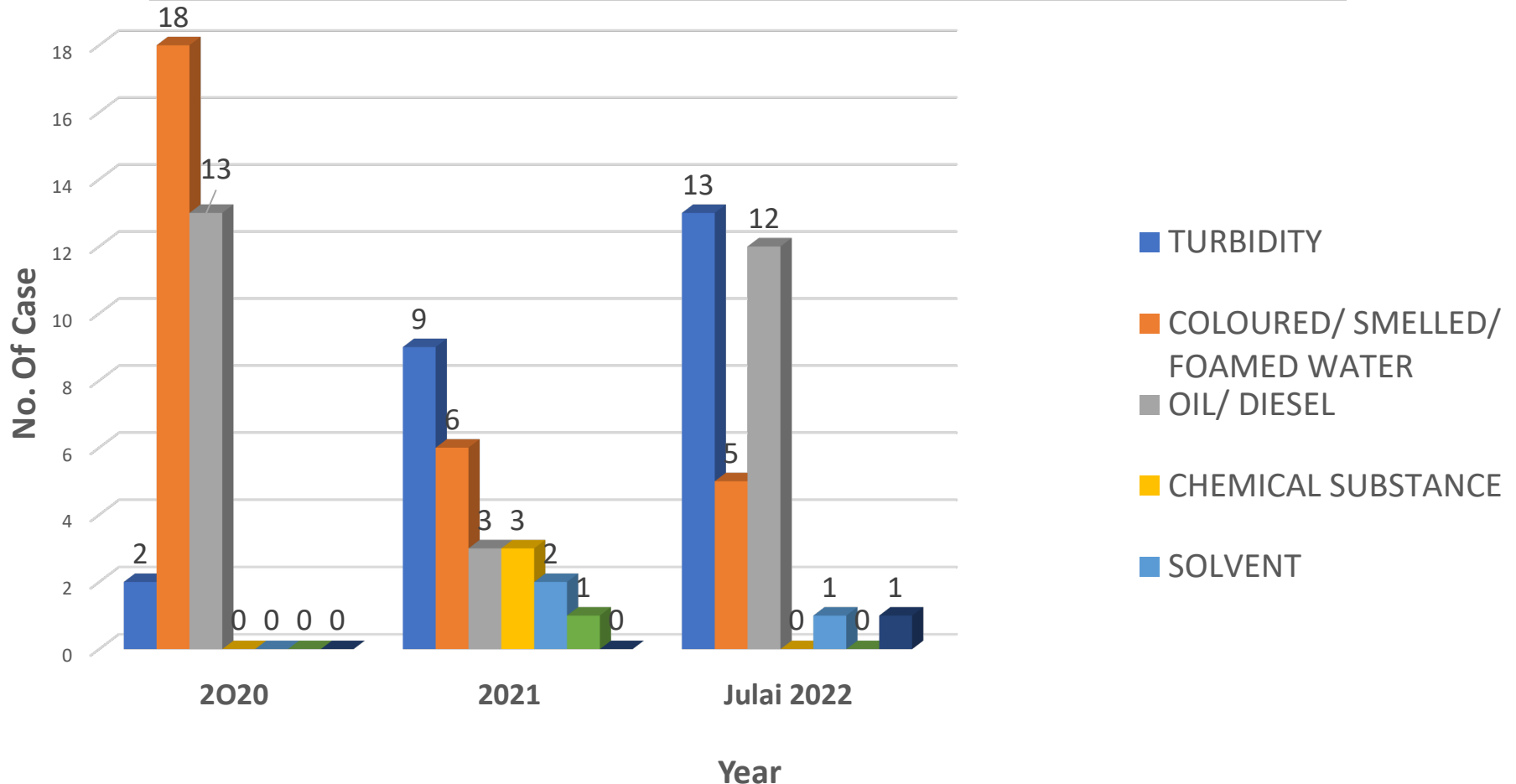
Palm Oil spill due to lorry accident Km 36.8 Arah Utara (Persimpangan Nilai Utara Bandar Serenia)  
on 28 July 2022



## POLICY : ENSURE SUFFICIENT AND CLEAN WATER

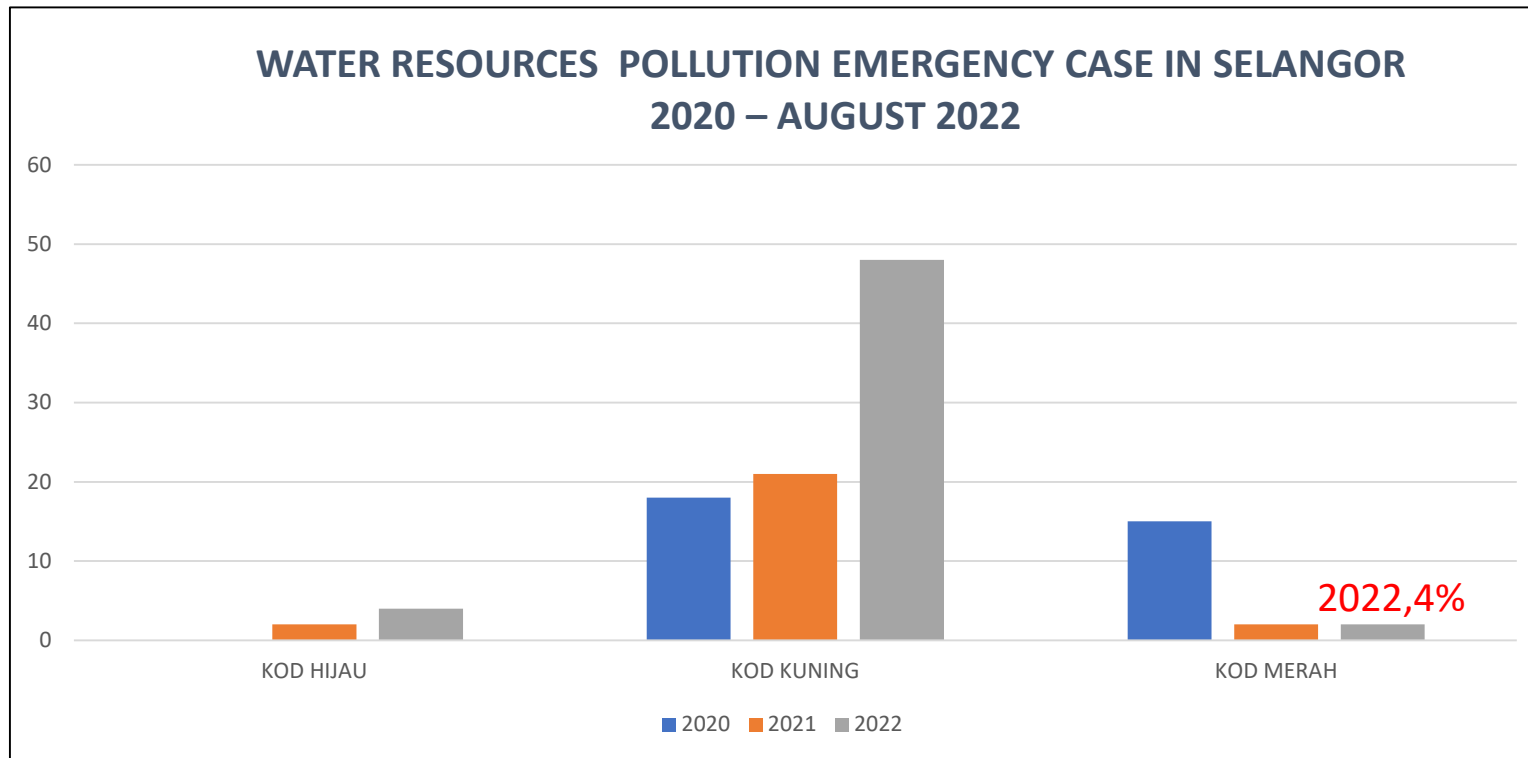
LEMBAGA URUS AIR SELANGOR (LUAS)

**CHART OF WATER RESOURCES POLLUTION EMERGENCY CASE AT SELANGOR RIVER BASIN AND LANGAT RIVER BASIN 2020-2022**





## POLICY : ENSURE SUFFICIENT AND CLEAN WATER



TAHUN	KOD HIJAU	KOD KUNING	KOD MERAH
2020	-	18	15
2021	2	21	2
2022	4	48	2
JUMLAH	6	87	19



LEMBAGA URUS AIR  
SELANGOR (LUAS)

# LEMBAGA URUS AIR SELANGOR

**POLICY : ENSURE SUFFICIENT AND CLEAN WATER**

# LUAS

## **STRENGTHEN LEGAL & ENFORCEMENT**

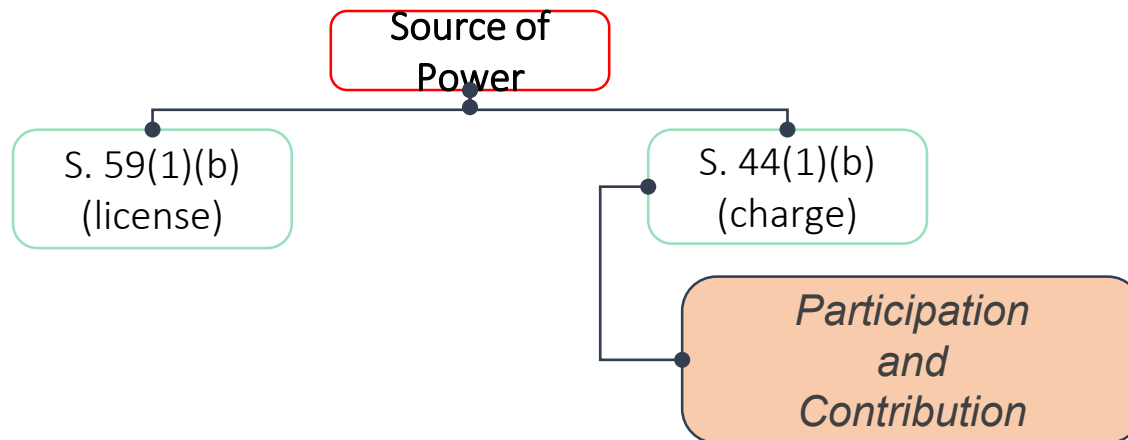
- ❖ LUAS Enactment (Amendment) 2020 approved to ensure its relevant with current situation and also enhancement on punishment & penalties,(s79)
- ❖ Stricter & higher compound enforcement
- ❖ Scheduled surveillance and enforcement on licensed activities
- ❖ Strengthening compliance to orders under S.121(1) & S.122(1)
- ❖ Incentives for *whistle blower* (S 104)





### INTRODUCTION OF ZERO DISCHARGE POLICY & *POLLUTERS PAY PRINCIPLE* THROUGH DRAFTING OF NEW REGULATION

#### 1. Peraturan-Peraturan Pelesenan Pembuangan Air Kembalian, Bahan Buangan Atau Bahan Pencemar (Negeri Selangor) 202X (DRAF)



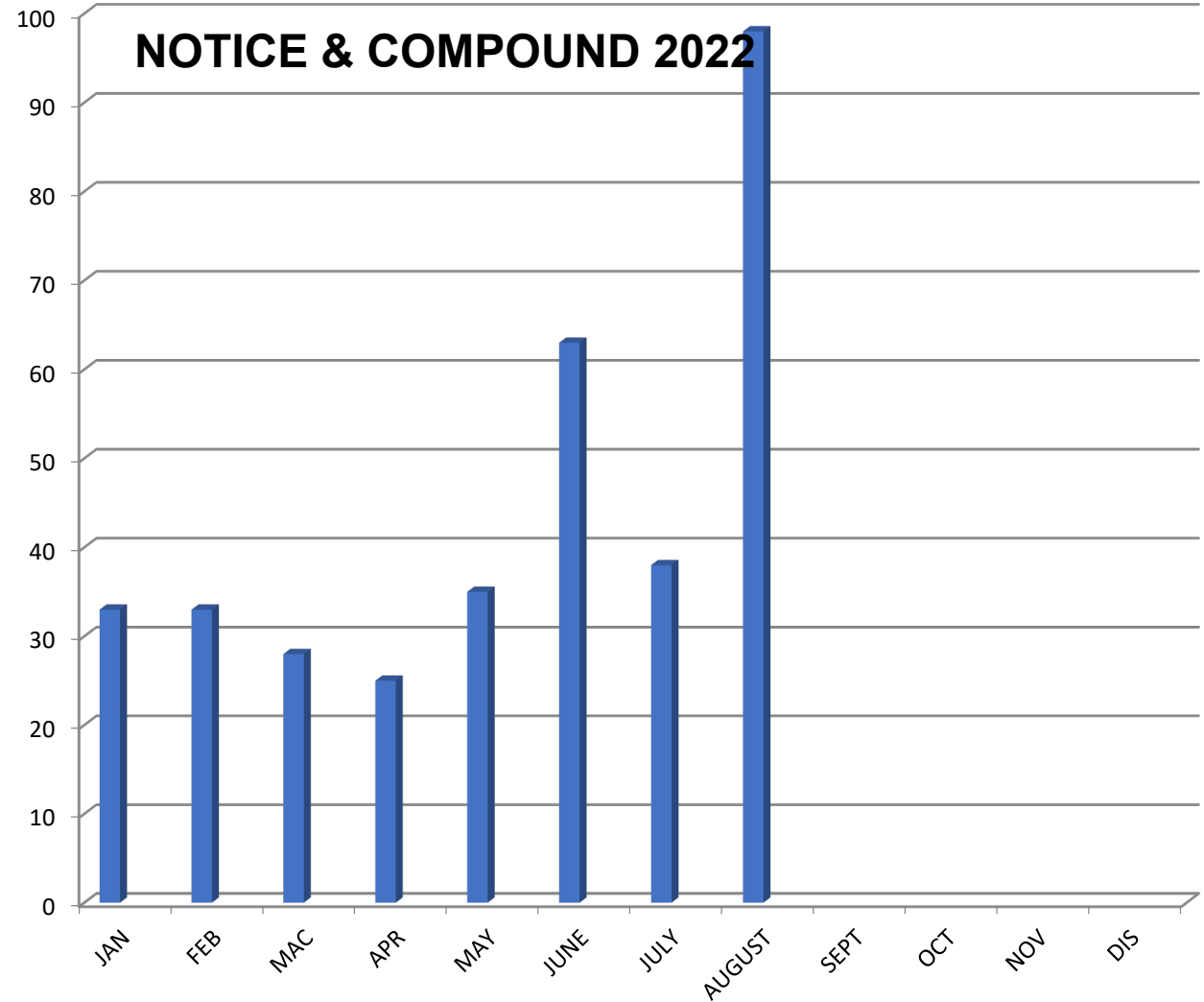
REPLACE

Peraturan-Peraturan Kemasukan Atau Pelepasan Bahan  
Pencemar (Negeri Selangor) 2012



## POLICY : ENSURE SUFFICIENT AND CLEAN WATER

### INTEGRATED ENFORCEMENT IN RIVER BASIN TASK FORCE





## TECHNOLOGY APPLICATIONS cont...

### ❖ Application of IOT and relevant technology for surveillance

- Data integration & sharing with relevant agencies
- LUAS Intelligent Support System (LiSS)
  - ✓ To optimize available water resources
- Integrated Water Resources Information Management System (IWRIMS)
  - ✓ River level, water quality & dam's capacity surveillance
  - ✓ Data Sharing with DID, Air Selangor, MET, LLSB and DOE (MOU)
- Installation of RMS/telemetry station as early warning system upstream of WTP intake points



# Stesen Telemetri (Online) Lembangan Sg. Langat dan Lembangan Sg. Klang

## Stesen Telemetri (Online)

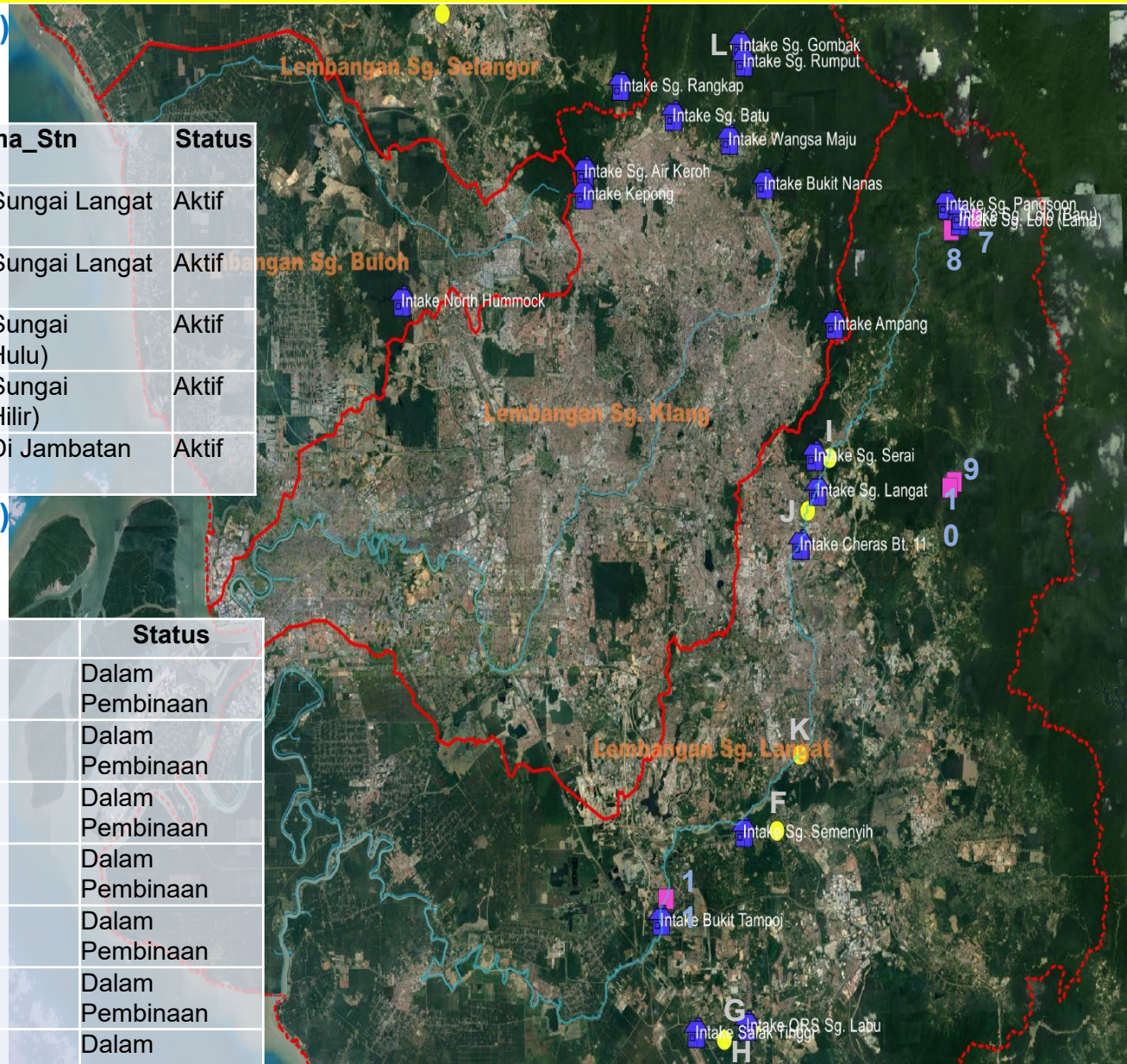
Milik  
LUAS

ID	Stn_ID	Jenis_Stn	Nama_Stn	Status
7	60-001-001-01/02	Kuantiti	Empangan Sungai Langat (Hulu)	Aktif
8	60-001-002-04	Kuantiti	Empangan Sungai Langat (Hilir)	Aktif
9	60-002-003-01/02	Kuantiti	Empangan Sungai Semenyih (Hulu)	Aktif
10	60-002-004-04	Kuantiti	Empangan Sungai Semenyih (Hilir)	Aktif
11	60-001-005-01/02/03	Kualiti	Sg. Langat Di Jambatan Dengkil	Aktif

## Stesen Telemetri (Online)

Milik Pengurusan Air  
Selangor

ID	Jenis_Stn	Nama_Stn	Status
F	Kualiti	RMS 4 Dengkil	Dalam Pembinaan
G	Kualiti	RMS Sg. Labu	Dalam Pembinaan
H	Kualiti	RMS Labu Lanjut	Dalam Pembinaan
I	Kualiti	Sg. Langat	Dalam Pembinaan
J	Kualiti	Cheras Bt. 11	Dalam Pembinaan
K	Kualiti	RMS Bukit Tampoik UKM	Dalam Pembinaan
L	Kualiti	RMS Gombak	Dalam Pembinaan





### TECHNOLOGY APPLICATIONS

#### ❖ Identification of effective technology on water resources occurrence tracing

- Odour pollution tracing instrument/technology
- High tech drone deployment for surveillance/investigation/tracing (especially for inaccessible area)

#### ❖ Cloud seeding

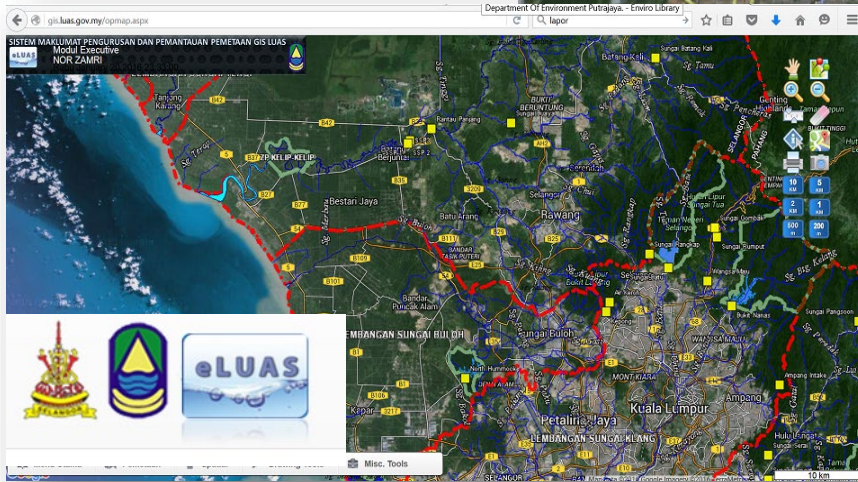
- Initiative started in 2014
- To enhance rainfall on dam & river basin catchment area
- To increase river water availability while reducing dependency on dam's water release
- Co-operation with MET Malaysia.





## INVENTORY MAPPING

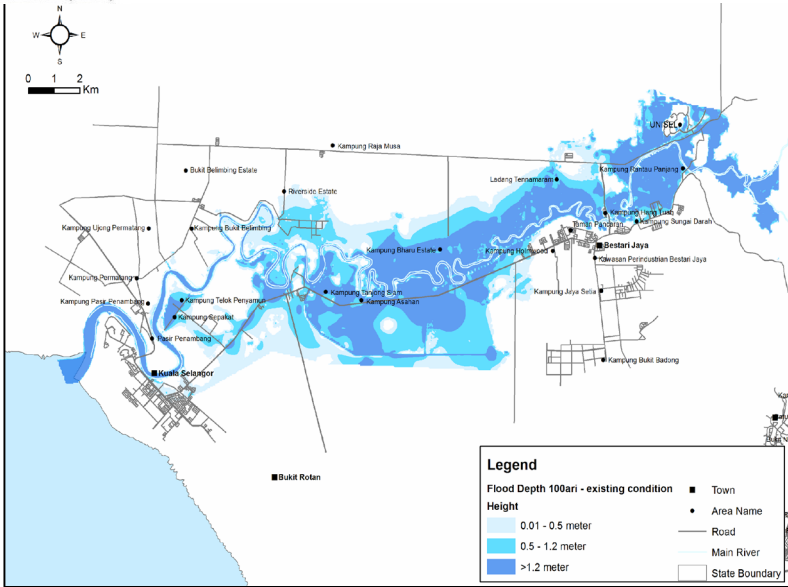
- ❖ Integrated surveillance on land use inventory along river reserves (Drone monitoring):
  - Sg. Rinching, Sg. Beranang, Sg. Klang, Sg. Damansara & Sg. Sembah (2018)
  - Sg. Langat, Sg. Selangor, Sg. Buloh (2020)
- Mapping of potential pollution sources in River Basin by using GIS to enhance the monitoring for each sub basin.
- Mapping and land use inventory along selected river at 50 meters both side of the river reserve for potential pollution and integrated enforcement.



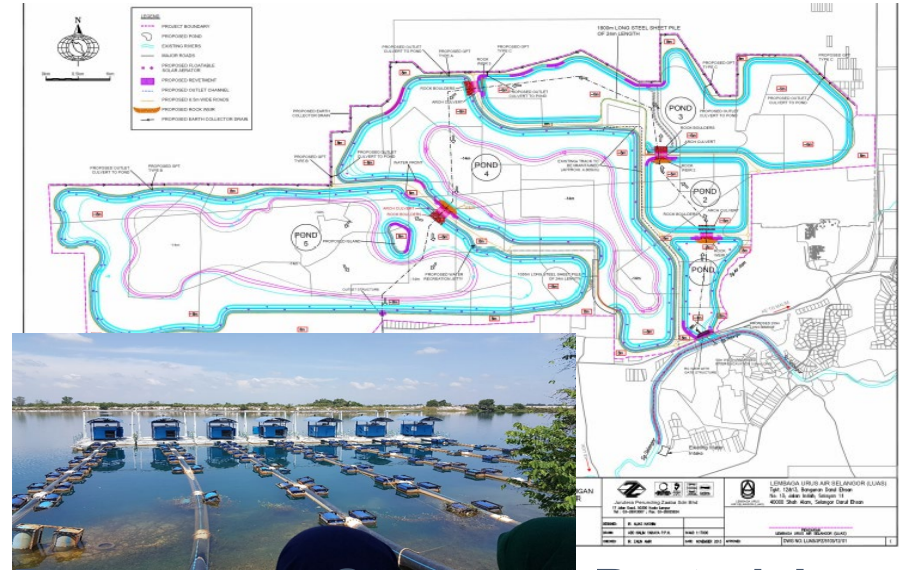


## POLICY : PROTECTION AGAINST FLOOD

LEMBAGA URUS AIR SELANGOR (LUAS)



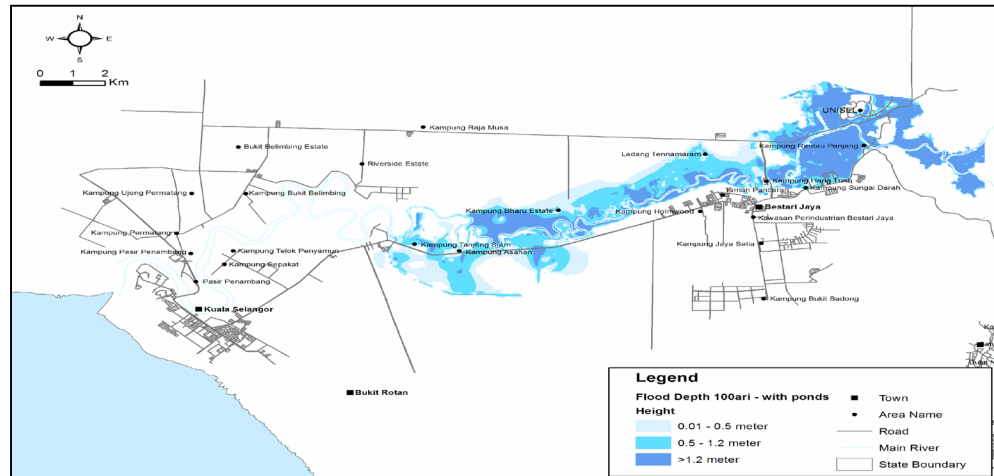
### Existing Flood Risk Plan: Sungai Selangor



### Downstream Storage at Bestari Jaya (HORAS 3000) new approach for multipurpose solution



- Water resources availability : 3,000 MLD;
- Combination of surface water and aquifer;
- Utilisation of flood water during high flow;
- Environmental improvement



### Flood Risk Plan After Storage Construction





## **POLICY : ENVIRONMENTAL CONSERVATION**

### **RIVER REHABILITATION ROAD MAP/PLAN cont...**

- ❖ Short & long term strategies and actions which includes policy for river development and rehabilitation.
- ❖ **Strategy 1 : River Physical Development**
  - Upgrading riverbank based on environmental friendly approach
  - Developing Riverside Landscape Plan (such as River Trails)
  - Developing River Info Centre





## POLICY : ENVIRONMENTAL CONSERVATION

### RIVER REHABILITATION PLAN

#### ❖ Strategy 2 : River Reserve Cleanliness & River Water Quality

- Implementing Polluters Pay Principle
- Application of Zero Discharge Policy (future)

#### ❖ Strategy 3 : Public Awareness & Stakeholder Involvement

- Friends of River program, 44 FoR (empowerment of river community)
- Educational module for public outreach program
- Developing web based application for database, monitoring & reporting by community on their river program.



Friends of Langat River

A river rehabilitation using public participation model. Langat River ecosystem provides resources up to 60% water supply in Kelang Valley.





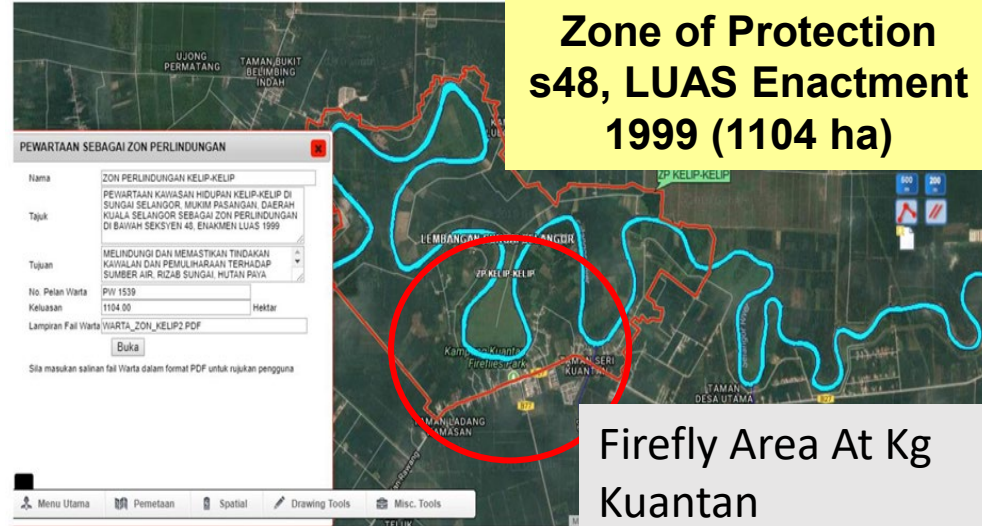
# POLICY : ENVIRONMENTAL CONSERVATION

## MANGROVE CONSERVATION AREA AT MUKIM KAPAR, KLANG



Zone of Protection s48, LUAS Enactment 1999 (1441 ha)

## FIREFLY CONSERVATION AREA AT SELANGOR RIVER



Zone of Protection s48, LUAS Enactment 1999 (1104 ha)

Firefly Area At Kg Kuantan

- Restoration of degraded habitats through rehabilitation and re-vegetation programs (FRIM&UPEN)
- Fireflies Monitoring Program (LUAS-FRIM (Phase 1-3))



Tree Planting Program at ORS Hang Tuah , Bestari Jaya



## POLICY : ENVIRONMENTAL CONSERVATION

### PUBLIC PARTICIPATION & AWARENESS PROGRAMS

- Awareness program such as **Beach Cleanup** & **Mangrove Replanting Program** has been organized yearly.
- Implementation of State Policy **“No plastic bags and polystyrene containers campaign/policy (started 1 Jan 2017).** Plastics threat for the ocean and marine ecosystem.



Beach Cleanup Program at Jeram Beach, Kuala Selangor District



Mangrove Replanting Program





LEMBAGA URUS AIR SELANGOR (LUAS)

## POLICY : ENVIRONMENTAL CONSERVATION

Launching Friends Of Rivers (FOR)  
26 September 2020

Local community collaboration

Community Empowerment

Integration of community towards sustainable river environment



The FOR Guidelines can be downloaded at [www.luas.gov.my](http://www.luas.gov.my)



LEMBAGA URUS AIR  
SELANGOR (LUAS)

# LEMBAGA URUS AIR SELANGOR

# LUAS

## **POLICY : ENVIRONMENTAL CONSERVATION**

### **GUIDELINES FOR PROGRAM/ACTIVITY IMPLEMENTATION UNDER THE INITIATIVE FRIENDS OF RIVERS (FOR) STATE OF SELANGOR**



- These guidelines are provided by the LUAS as a reference and guide to FOR in implementing programs/activities in the river/water source area so that;
  - i) It is in line with the provisions outlined in LUAS Enactment 1999 and other related written laws, and
  - ii) It is in line with the original purpose/objective of this initiative which is community empowerment as one of the stakeholders responsible for the preservation and conservation of rivers/water resources.



## POLICY : ENVIRONMENTAL CONSERVATION

### INITIATIVE PROGRAMME FRIENDS OF RIVERS (FOR) STATE OF SELANGOR



INITIATIVE PROGRAMME FOR  
STATE OF SELANGOR 2022 AT  
FOR MELAWATI RIVER 3, HULU  
KELANG ON 5 JUN 2022



## SUMMARY

### ❖ Ensuring IMPLEMENTATION OF IRBM requires;

- **Political will & commitment**

- ✓ Law & policy making (*Zero Discharge Policy (future)*)
- ✓ *Water Governance*
- ✓ Interstate understanding

- **Resources**

- ✓ Financial for operation & technology investment
- ✓ Human resource for field-enforcement

- **Stakeholder accountability**

- ✓ Each agency's operation & jurisdiction directly/indirectly has impact towards water resources
- ✓ End user/consumer/public is accountable on how they use water





*THANK YOU*  
“WATER FOR ALL”



SUSTAINABLE  
DEVELOPMENT  
GOALS