Ali Yuzir
Deputy Director, Disaster Preparedness & Prevention Center (DPPC)
Malaysia-Japan International Institute of Technology (MJIIT)
UTM Kuala Lumpur.
muhdaliyuzir@utm.my

The 2nd Symposium on JASTIP Disaster Prevention International Cooperation Research

(JASTIP-WP4 Symposium)

March 22-23 2017, Kihada Hall, Obaku Plaza, Uji Campus

Kyoto University, Japan

Project members:

Prof Ismail Abustan (USM)
Prof Masafumi Goto (MJIIT)
Dr Khammarul Azhari Razak (MJIIT)
Dr Noreliza Alias (UTM)
Dr Sumiaty Ambran (MJIIT)
Dr Norhayati Abdullah (MJIIT)
Dr Shoei Matsuura (JICA)
Choong Khai Lin (UUM)

MJIIT-UTM & JASTIP

Signing ceremony JAPAN-ASEAN Joint-Research Center

Between Malaysia-Japan International Institute of Technology (MJIIT) UTM with JASTIP February 2016

1st JASTIP Steering Committee Meeting in Bangkok February 2016

obal

JASTIP DISASTER PREVENTION JOINT LABORATORY

Community Initiative Research for SDG

Joint lab

Environment · Energy

Environment · Energy

National Science and Technology Development Agency (Thailand) (NSTDA)

Disaster Prevention

Malaysia-Japan International Institute of Technology (MJIIT)

Japan-ASEAN Joint Research to Achieve SDGS

Bio-resources · Biodiversity

JASTIP

Japan - ASEAN Science, Technology and Innovation Platform

Joint lab

Joint lab

Disaster Prevention × Biodiversity

Research into prevention of peat bog fires for biodiversity conservation and ecological restoration

Bio-resources · Biodiversity

Indonesian Institute of Sciences (LIPI)

innovative ● entrepreneurial ● global

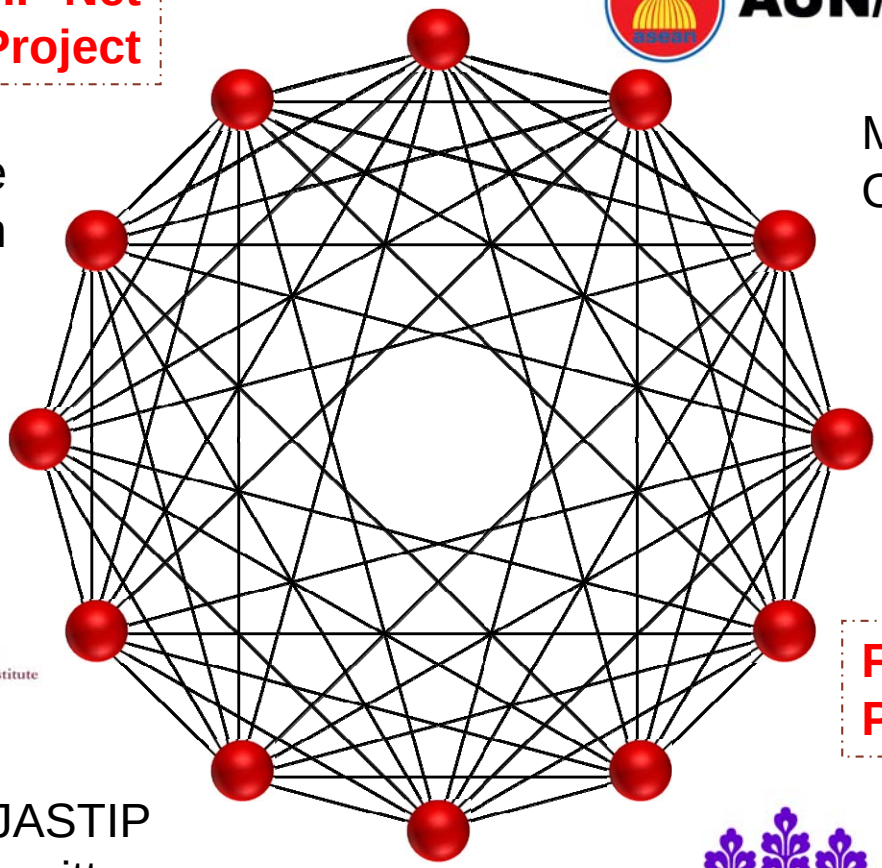
JASTIP JOINT LABORATORY

January 2017

Completion and operation of
The Japan ASEAN Joint Research Centre &

JASTIP Disaster Prevention Joint Laboratory
between Kyoto University and MJIIT

DPPC NETWORK



AUNSEED Regional Conference

JASTIP-Net Project

AUN/SEED-Net

MDRM Seminar & Open Day

DPPCare Community Outreach

JASTIP

UTM Malaysia-Japan International Institute of Technology (MJIIT)

Flagship Project

JASTIP Committee

DPPC Seminar

筑波大学 University of Tsukuba

innovative ● entrepreneurial ● global

INTEGRATED STUDY ON DISASTER MANAGEMENT IN MALAYSIA

Aftermath counter measure on water supply and sanitation in disaster area Cluster 3

Development of natural disaster vulnerability index for Malaysia Cluster 1

Machine learning and drones for disaster response and relief operation Cluster 4

Flood and landslide forecasting Cluster 2

JASTIP-NET PROJECT

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Assessing Water Quality in the Langat River Basin During Disaster Period Using Integrated Remote Sensing and Modeling Methodologies

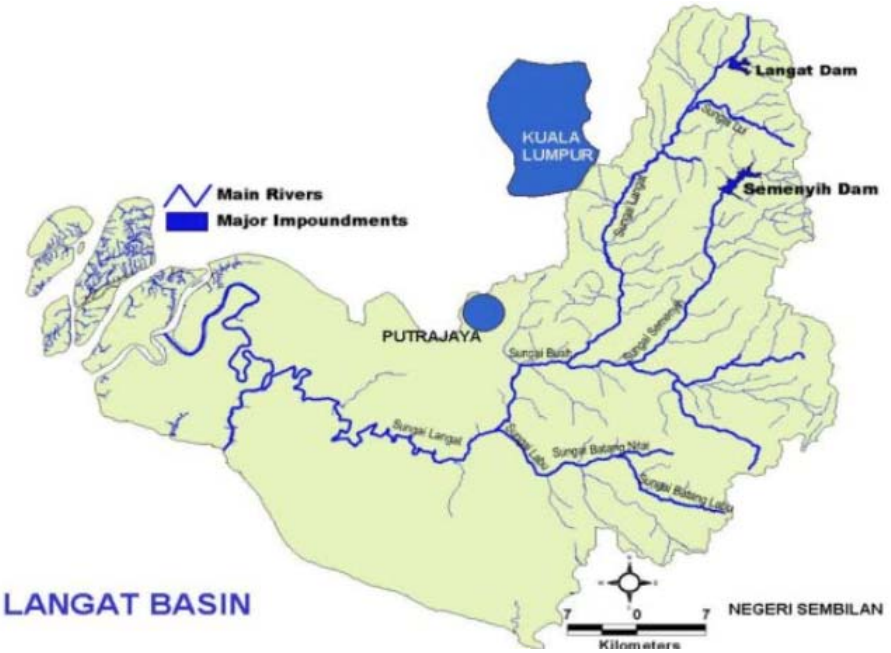
UTM
UNIVERSITI TEKNOLOGI MALAYSIA
Malaysia-Japan International Institute of Technology (MJIIT)

JASTIP

innovative • entrepreneurial • global

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

LANGAT RIVER BASIN



innovative • entrepreneurial • global

BACKGROUND

Where Langat River meets Semenyih River

(Source & copyright: Dr Casey Ngo/DS Dr Zaini Ujang retrieved via Facebook Langat River Friends group)

BACKGROUND – QUICK FACTS OF LANGAT RIVER BASIN

- Total catchment area – 2,348 km^2
- Length of main river – 141 km and situated 40 km east of Kuala Lumpur
- Three major tributaries – Langat River, Semenyih River and Labu River
- The main tributary, Langat River flows about 182 km from the main range Banjaran Titiwangsa at Northeast of Hulu Langat District and drain into the Straits of Melaka.
- The main reach of Semenyih River flows through the town of Semenyih, Bangi Lama and finally merges with Langat River at about 4 km to the east of Bangi Lama town.
- There are two reservoirs in the basin – Langat and Semenyih dams.

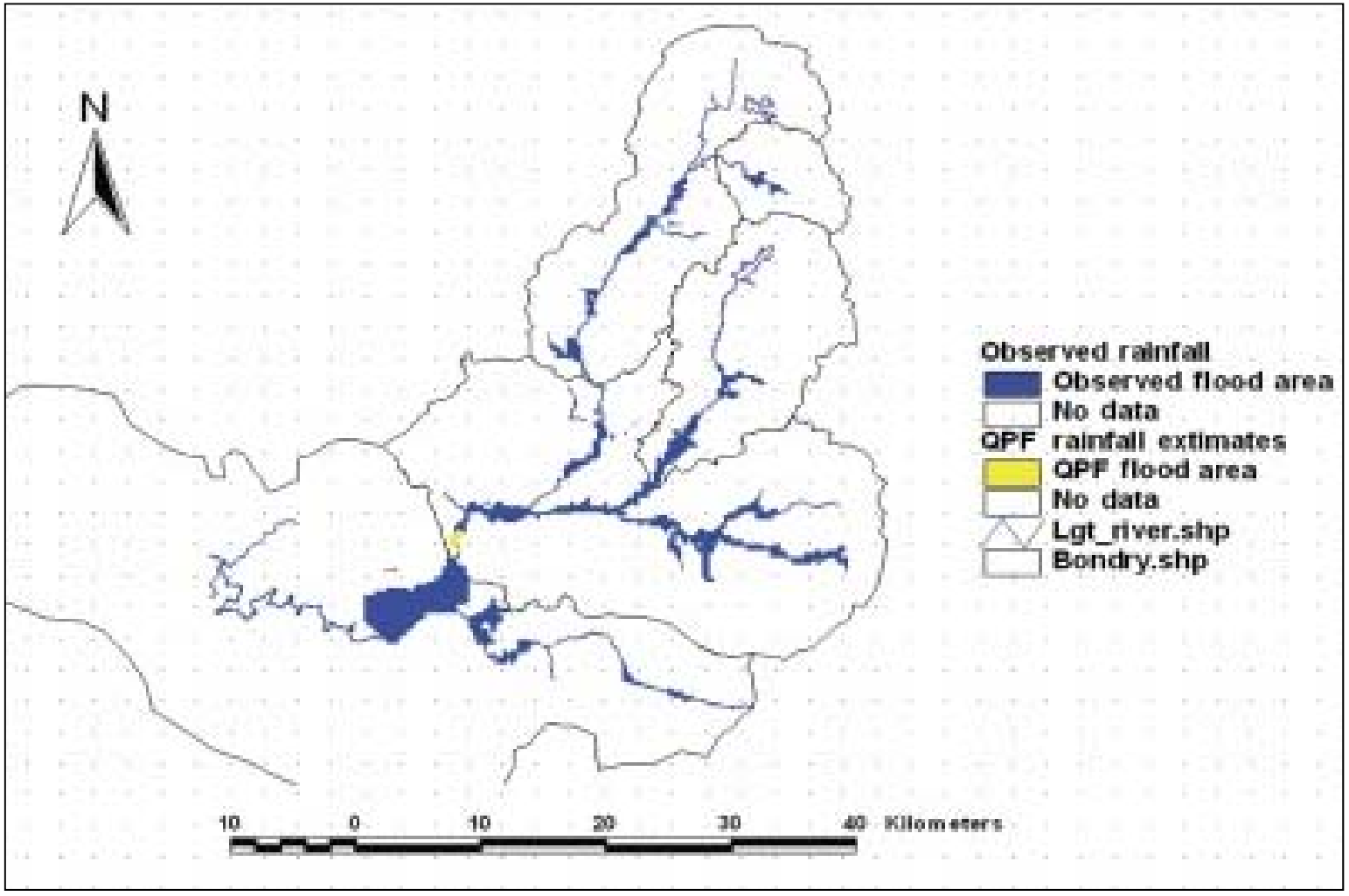
(Source: Ali et al., 2014; Huang et al., 2016)

ISSUES

- Subjected to regular and extreme flood conditions
- One of the longest river in Selangor with frequent flooding
- Experiencing flood since 1976 and one of the main cause is insufficient channel capacity

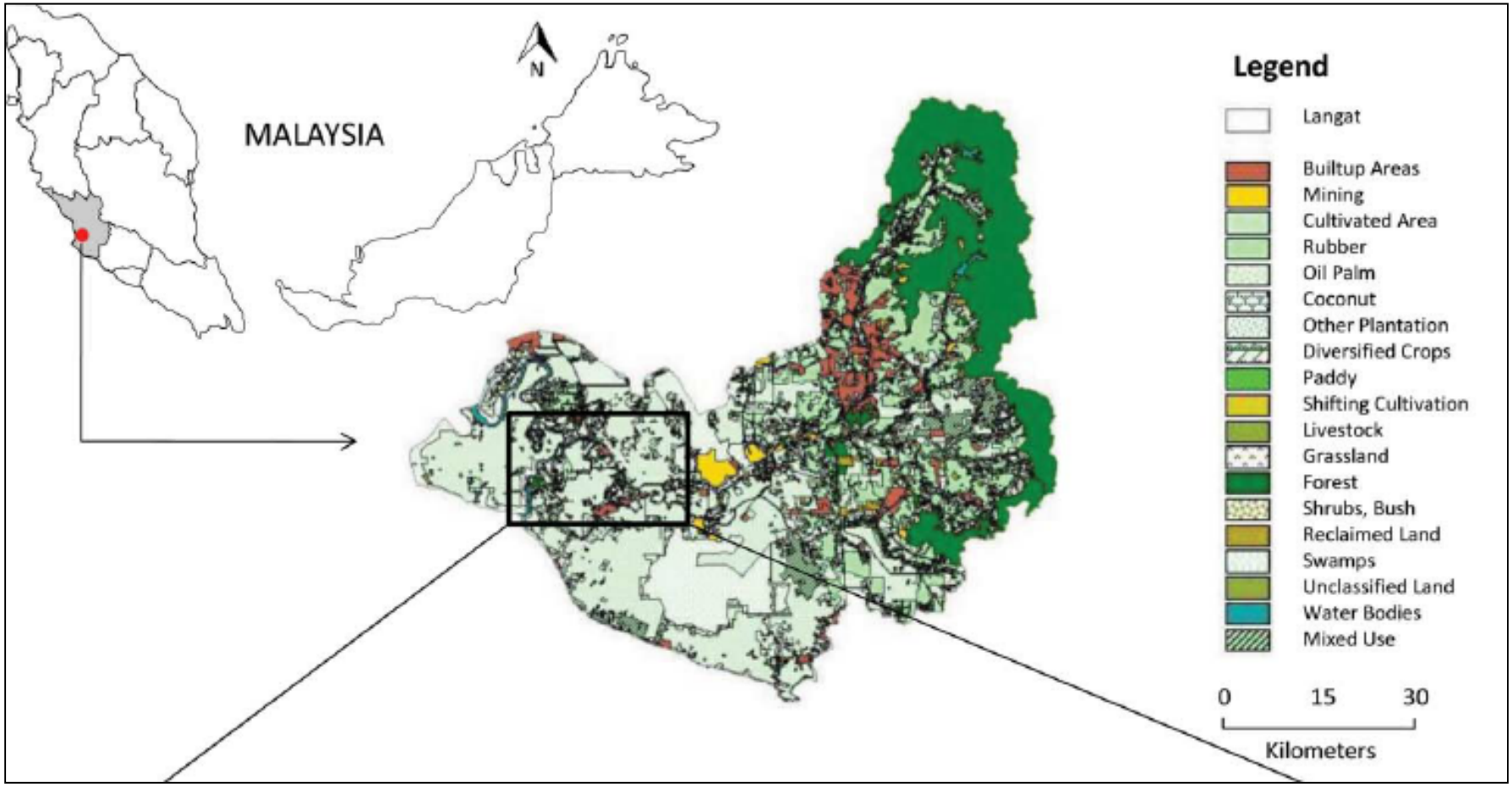
(Source: Mohammed et al., 2011)

ISSUES – FLOOD AREAS



Concerned flood areas (Source: Department of Mineral & Geosciences, 2003)

ISSUES – EXTENSIVE LAND USE



Concerned extensive land use (Source: Mokhtar et al., 2011)

ISSUES – POLLUTION AT SEMENYIH TREATMENT PLANT

- Closure of Semenyih Water Treatment Plant several times due to river pollution
- Langat River basin was affected as Semenyih is one of the catchment's tributaries
- The frequent closure has caused water ration problems for residents catered to receive water supply from the WTP
- Critical issues related to odor pollution forced the WTP to be closed for several times since October 2016

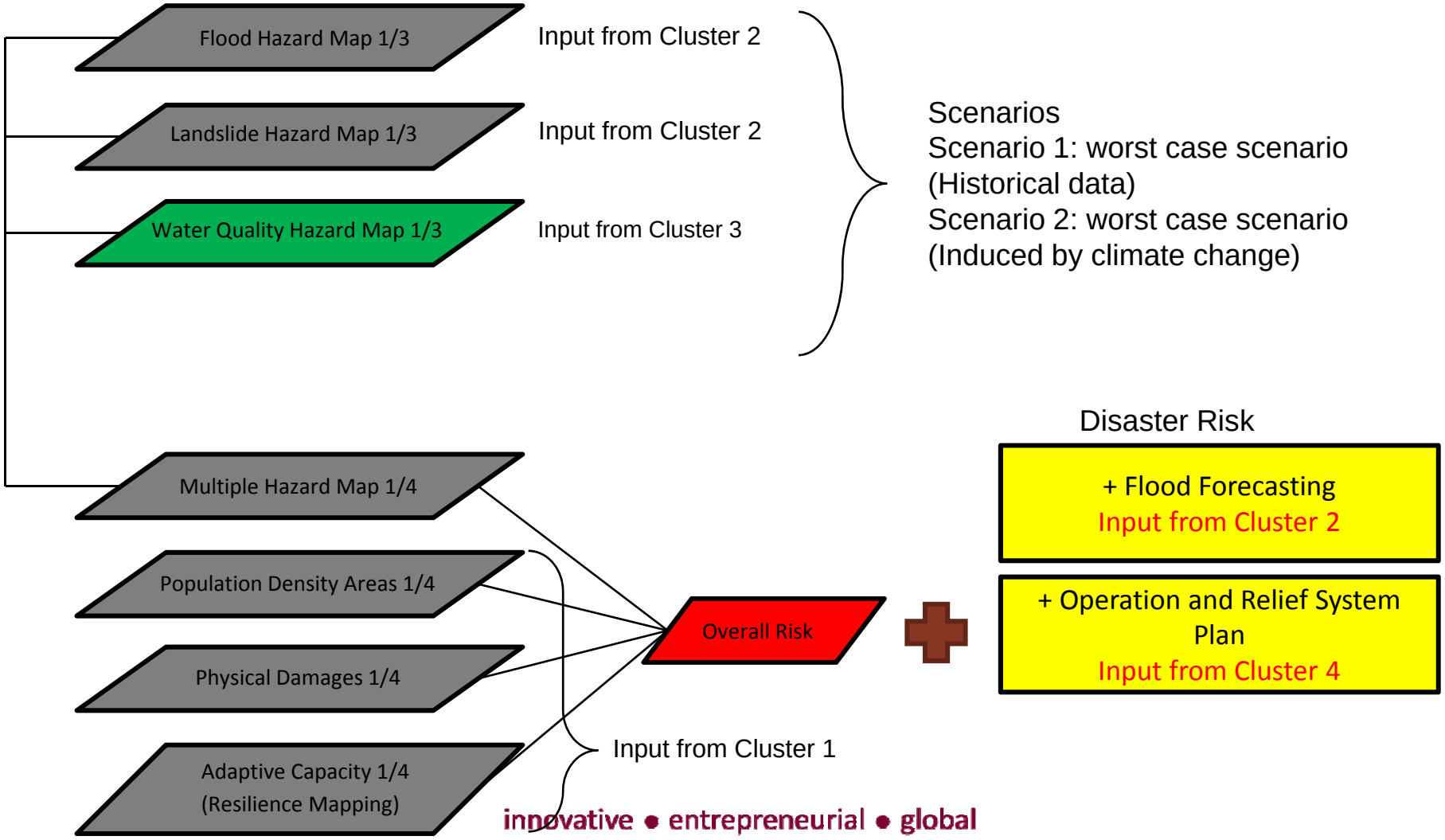
Numerous contamination incidents along Sg Semenyih

BY ELAN PERUMAL

Unscrupulous individuals have thrown rubbish right next to Sungai Semenyih. – filepic

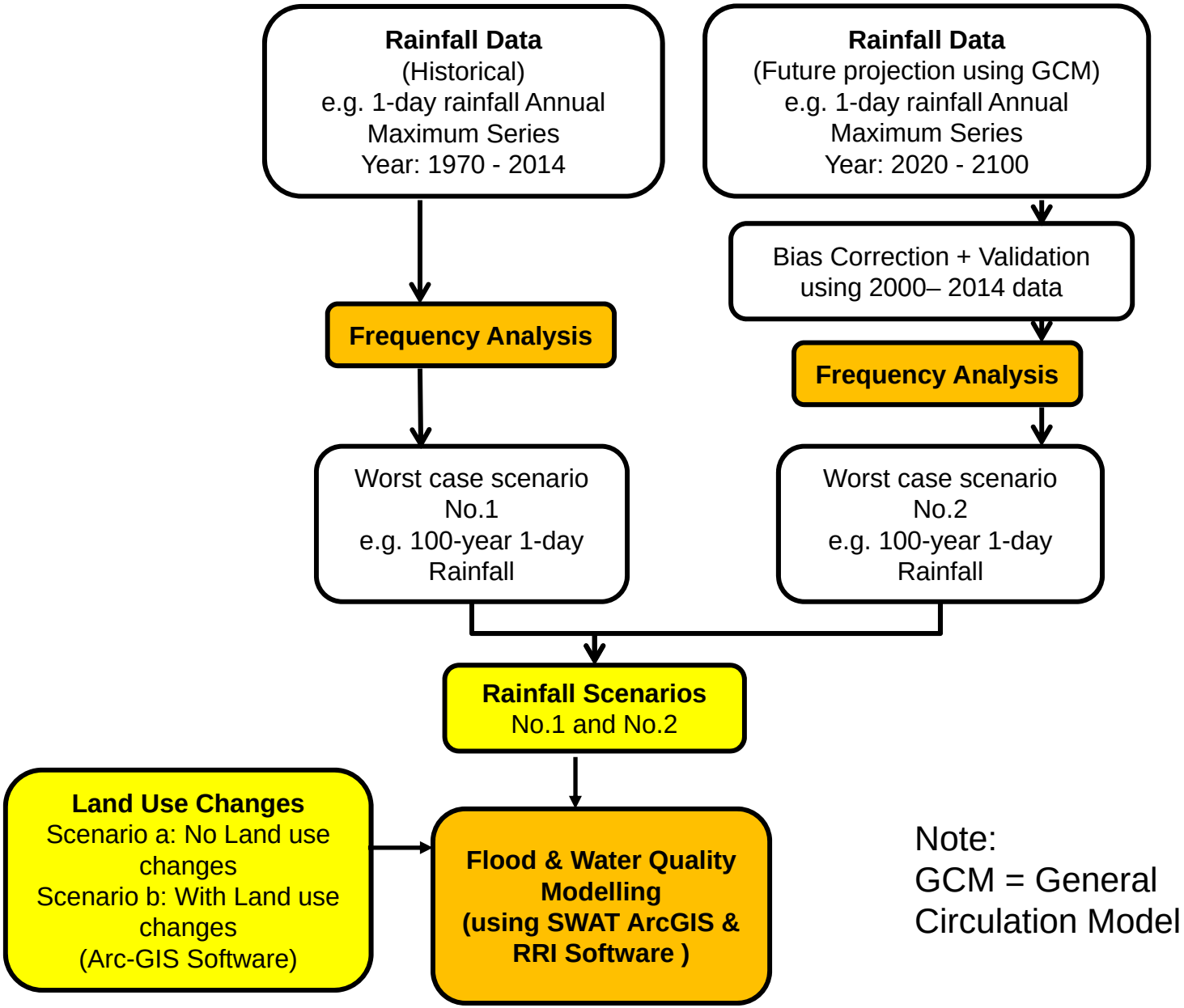
RESEARCH FRAMEWORK

Langat River Basin is chosen as one common study area based on historical data and an area induced by climate change



innovative • entrepreneurial • global

METHODOLOGY FRAMEWORK



Note:
GCM = General Circulation Model

METHODOLOGY FRAMEWORK: WATER QUALITY MODELLING

- **Geographic Information System Software – Soil and Water Assessment Tool (ArcGIS-SWAT) will be used to develop and analyzed water quality modeling**
- **This should include:**
  - Data collection
  - Data processing
  - SWAT model development
  - Model calibration and validation
  - Application to Langat River Basin

METHODOLOGY FRAMEWORK: FLOOD MODELLING

- **Rainfall Runoff Inundation (RRI) will be used to develop flood modeling**
- **This should include:**
  - Xsection of River Langat
  - Weather data

WHY MODELING

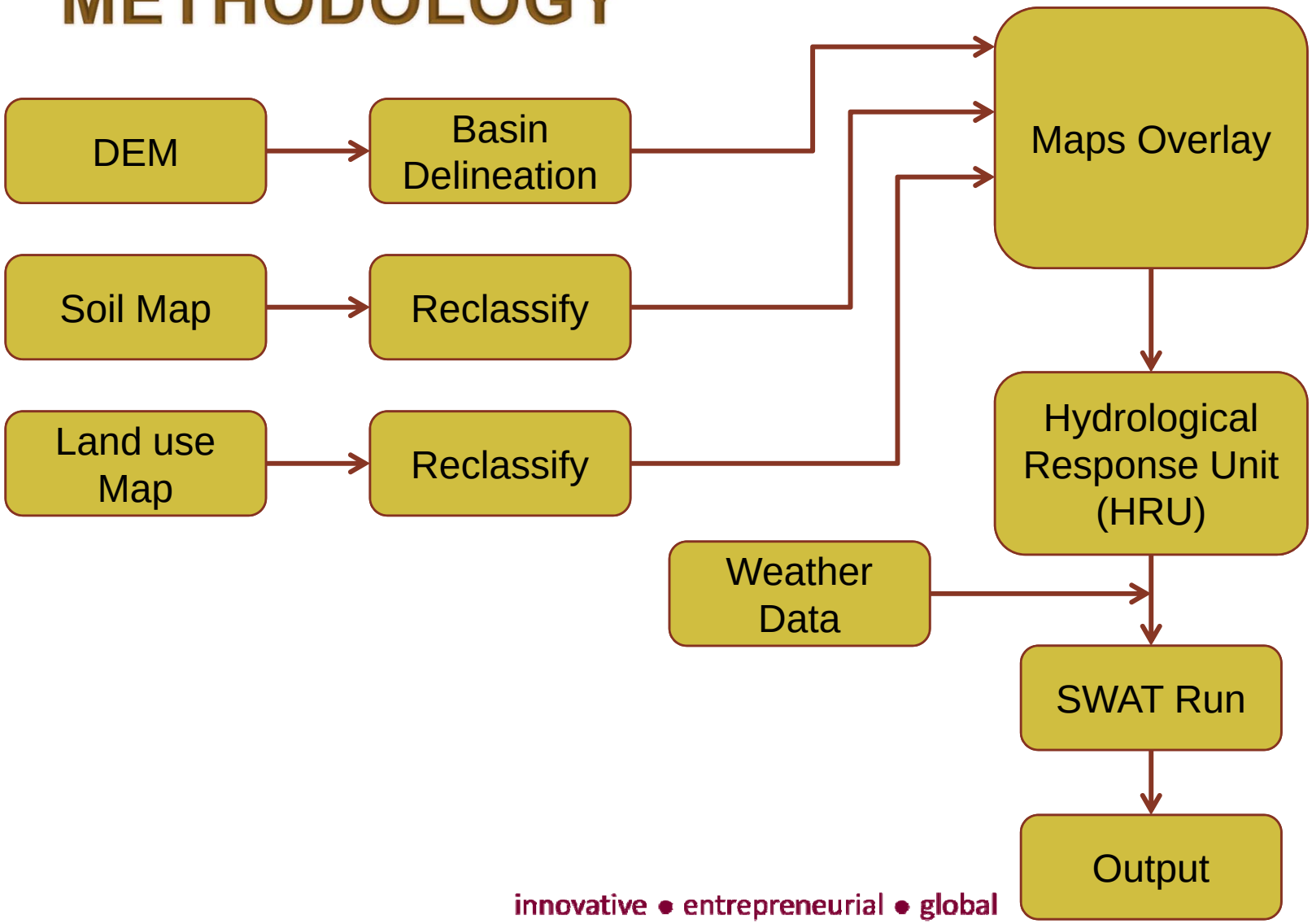
- **High annual rainfall may contribute to stormwater runoff in Langat River**
- **Field experiments and long term data collection are time and cost consuming**
- **Modeling is useful for prediction of future impacts of urban development to river water quality in Langat River Basin**

METHODOLOGY

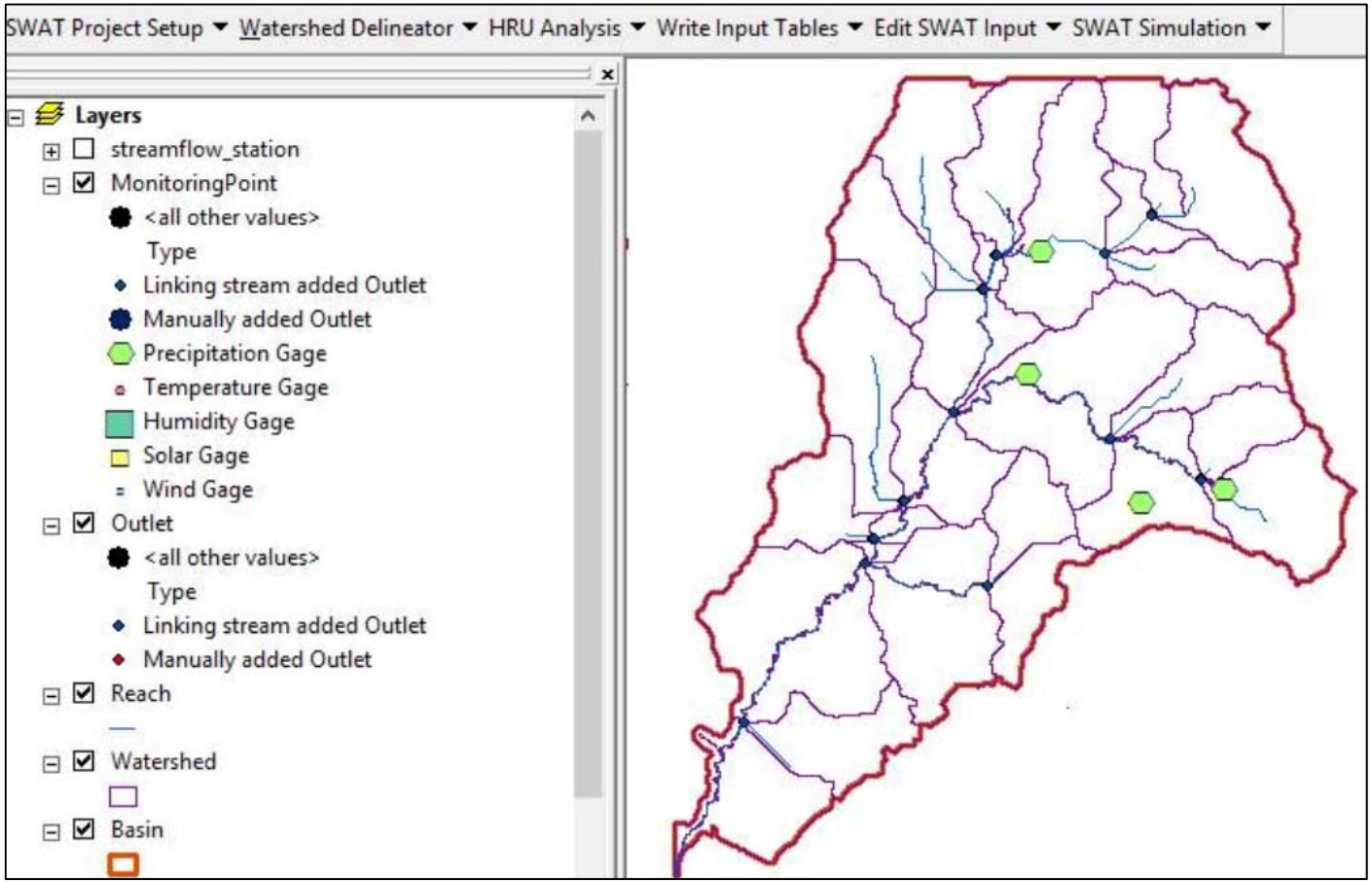
Input data and observed data for calibration and validation of the model

Types of Data	Sources of Data	Process	Period
1. Digital Elevation Model	SRTM	SWAT Input	
2. Land Use Map	Department of Agriculture Malaysia	SWAT Input	2006
3. Soil Data	Department of Agriculture Malaysia		
4. Weather Data	Department of Irrigation and Drainage Malaysia; Department of		2000-2010
5. Observed Water (COD, BOD, DO, SS..)	Department of Environment	Calibration & Validation	2000-2010
6. Point Source Pollution	Malaysia Palm Oil Board (MPOB)	SWAT Input	
7. Observed Stream Flow	Department of Irrigation and Drainage Malaysia	Calibration & Validation	2000-2010
8. Soil Properties		SWAT Input	

METHODOLOGY



EXPECTED OUTCOMES



Example of SWAT delineated Langat River basin area

THANK YOU