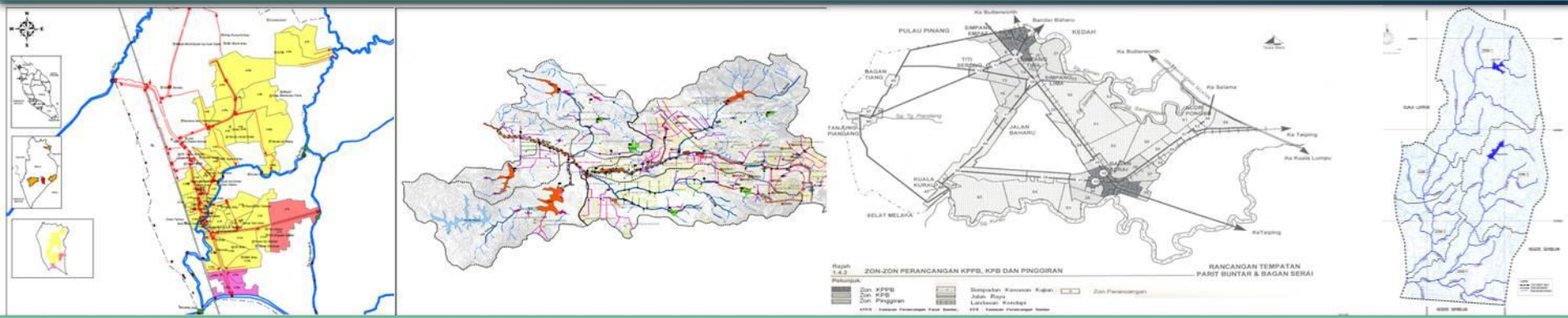




SWaM 2017

STORMWATER MANAGEMENT AND DRAINAGE MASTER PLAN (PISMA)

PISMA – Pelan Induk Saliran Mesra Alam



Presented by:
Hjh. Zalilah Binti Selamat
Bahagian Saliran Mesra Alam
Jabatan Pengairan dan Saliran Malaysia

OUTLINE

1

Introduction

2

PISMA

3

PISMA Output

4

RMK 11 PISMA Status

5

Conclusion

INTRODUCTION

Flood

- Major problem in Malaysia

Landuse For Urbanization

- Forest to agriculture
- Agriculture to urban areas

Increase Flood prone areas

- 29,800 sq.km
(about the size of Selangor + Perak)



TYPES OF FLOOD



Major Flooding

the main river overtop and cause widespread flooding of long duration



Flash Flood

a short duration flood that is very localized

- Flood condition varies from state to state.
- Flood level varies from 0.2m up to 5m(extreme cases).
- Size of flood <100 ha. to a few thousand ha.

FLASH FLOOD DEFINITION

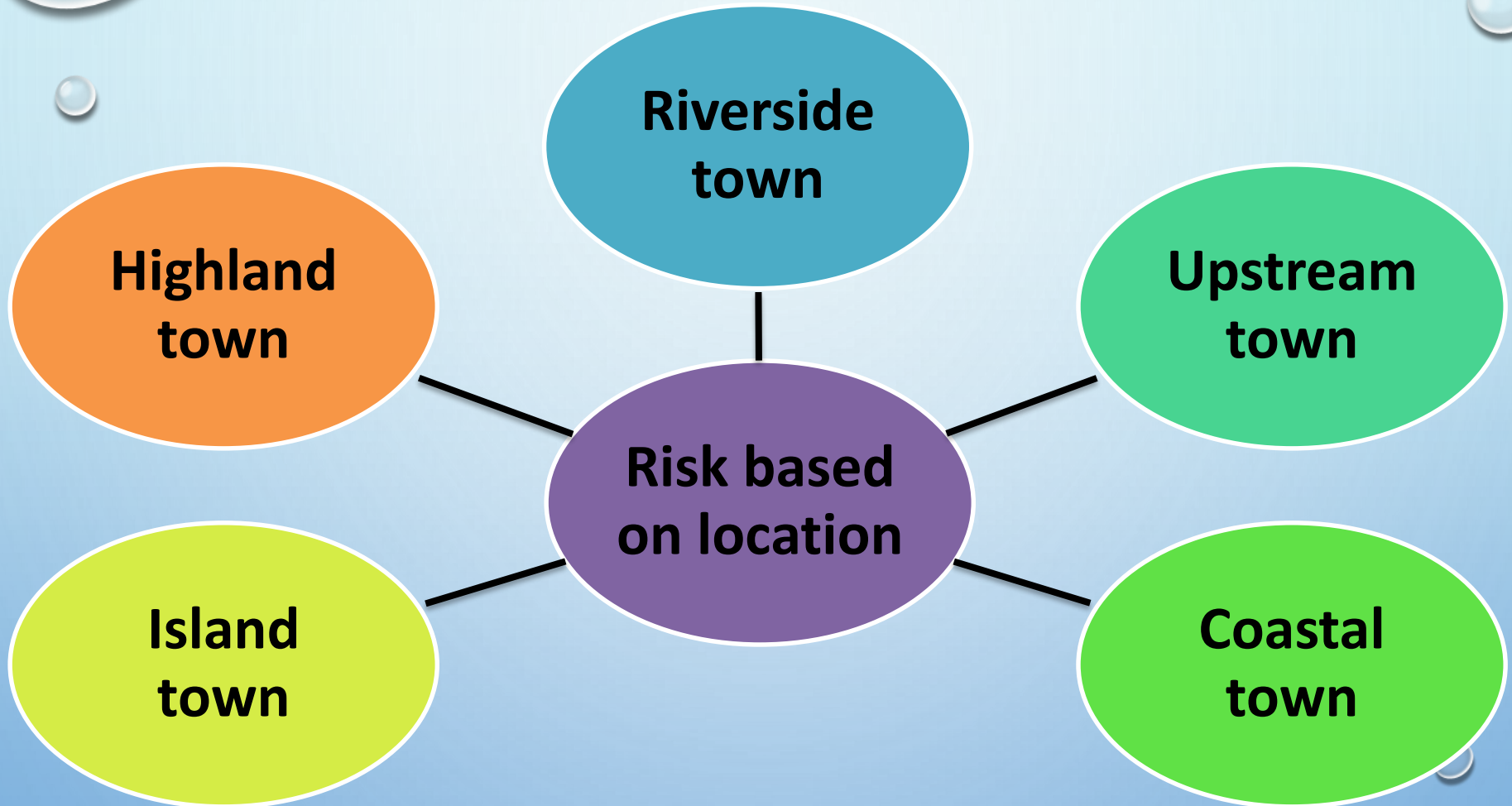


- **Usually** occur in **urban** areas
- Caused by **short, intense, localized** thunderstorms that occurs **< 3 hours**

– Flood water **rise almost immediately** during the storm and water will **recede within 6 hours** after the rain



Flood Prone Areas



**Classification of town based on
National Strategic Stormwater Management Plan (2007)**

SW RISKS ACCORDING TO LOCATION

No.	Location	Remark
1	Island Towns	Affected by tide and shortage of freshwater. Low lying areas are subject to floods from high tide and possible inadequate SWM infrastructure
2	Coastal Towns	Affected by tide. Low lying areas are subject to floods from high tide and possible inadequate SWM infrastructure
3	Riverside Towns	Low lying areas are subject to flooding from river overflows and possible inadequate SWM infrastructure
4	Upstream Towns	Flood likely caused by inadequacies from urban drainage
5	Highland Towns	Steep areas may cause slope failure, erosion and mudflows

CLASSIFICATION OF TOWNS BY RIVER BASIN LOCATION

Island Towns	Coastal Towns	Riverside Towns	Upstream Towns	Highland Towns
Penang Langkawi Tioman Pangkor	Johor Bahru Pontian Batu Pahat Muar Melaka Port Dickson Klang Lumut Butterworth Kota Bharu K. Terengganu Dungun Kertih Kemaman Kuantan Mersing	Kluang Seremban Kuala Lumpur Ipoh Sg. Petani Alor Setar Temerloh Mentakab Pekan Tampin Kuala Kangsar	Kajang Putrajaya Gemas Alor Gajah	Fraser's Hill Cameron Highlands Genting Highlands

Frequent Flash Flood

CAUSES OF FLOODING

- SHORT, INTENSE LOCALISED THUNDERSTORMS, THE TYPE OF STORM USUALLY EXPERIENCED IN THE EVENING
- RAPID AND UNCONTROLLED DEVELOPMENT IN CATCHMENT AREAS RESULTING IN HEAVY SILTATION
- OBSTRUCTIONS IN RIVER FLOW SYSTEM THAT REDUCE IN RIVER FLOW CAPACITY
- LIMITED AVAILABLE SPACE FOR RIVER IMPROVEMENT WORKS TO HANDLE THE EVER INCREASING FLOOD FLOW DUE TO ESCALATING URBANISATION PROCESS
- INSUFFICIENT INTERNAL DRAINAGE SYSTEMS WITHIN THE TOWN AREA → UNDERCAPACITY

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. A dark blue rectangular box is centered on the page, containing the text in white. The text is arranged in three lines, with the first line being the longest and the second and third lines being shorter, creating a balanced, centered layout.

CHANGE IN LANDUSED AND FLOOD

LANDUSE FOR URBANIZATION

JALAN BUKIT BINTANG - 1950



Jalan Bukit Bintang, circa 1950



Ampang Park, circa 1970

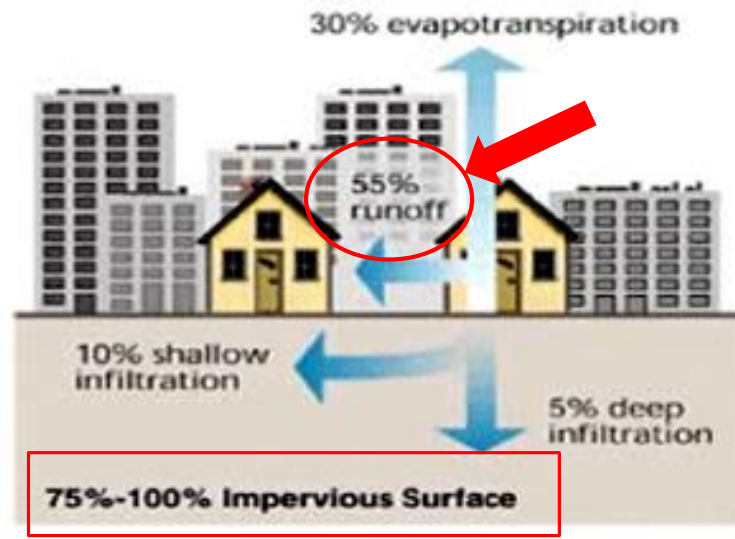
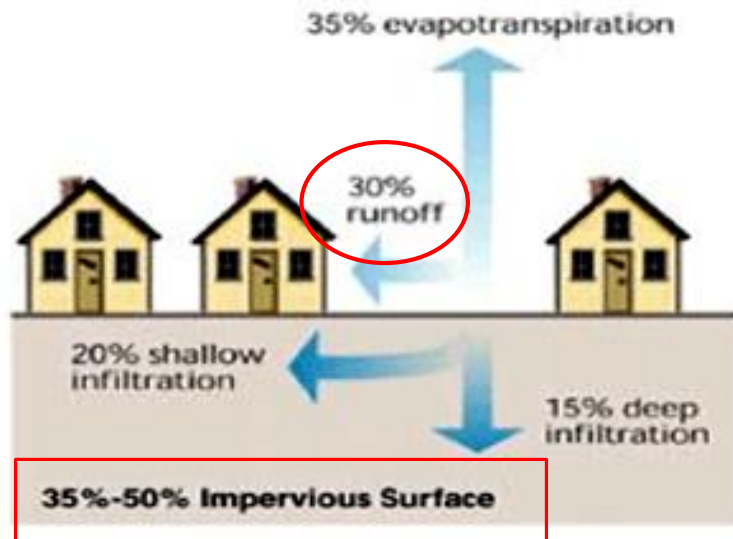
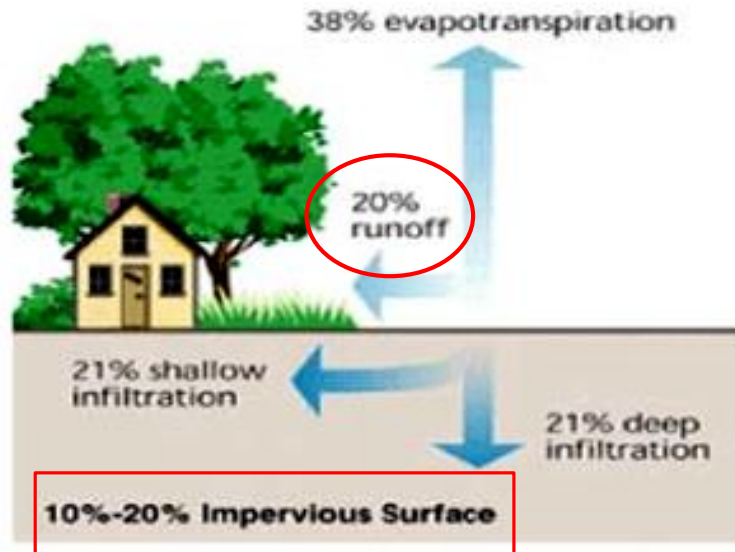
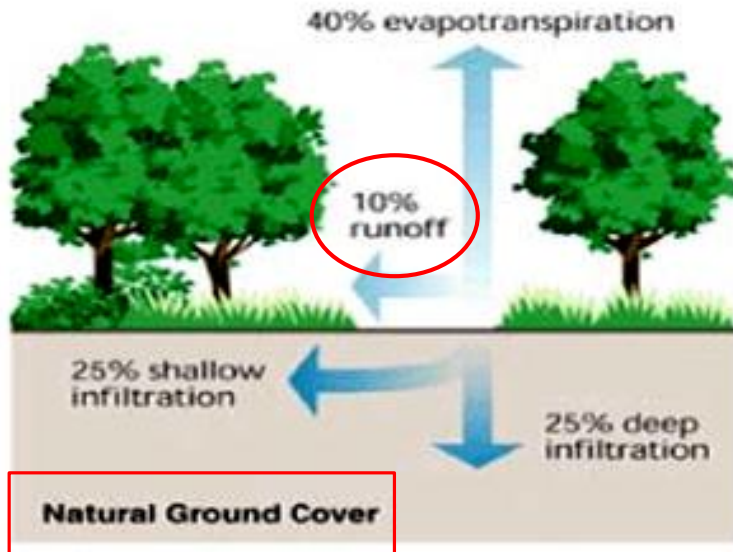


Jalan Bukit Bintang, circa 2017



Ampang Park, circa 2017

CHANGES IN HYDROLOGY AND RUNOFF DUE TO DEVELOPMENT



IMPACT OF UNCONTROLLED DEVELOPMENT



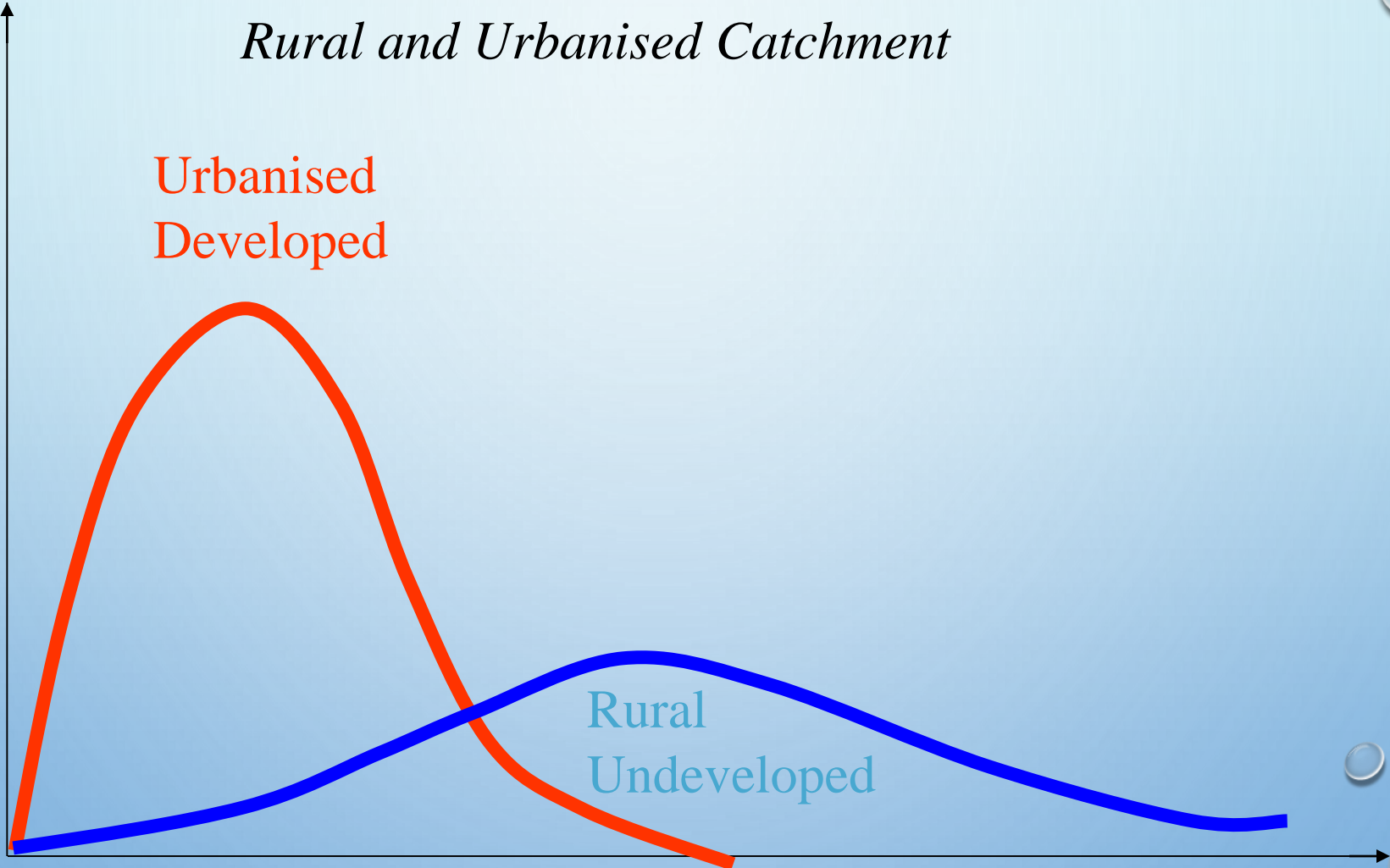
Flow

*Flow Characteristics
Rural and Urbanised Catchment*

Urbanised
Developed

Rural
Undeveloped

Time



LATEST FLASH FLOOD OCCURANCE



#MALAYSIABERSAMAMU



UTAMA BERITA SUKAN DUNIA HIBURAN BISNES RENCANA WANITA HUJUNG MINGGU

BERITA » Kes
Selasa, 8 Ogos 2017 | 5:43pm



KEADAAN banjir kilat yang berlaku di beberapa lokasi di bandar Muar akibat hujan lebat berterusan dan air pasang besar. -Foto ihsan APM

Muar dilanda banjir kilat Pada 8 Ogos 2017



Oleh Badrul Kamal Zakaria
badrukkamal@bh.com.my

Share Tweet 8+ Share

MUAR: Hujan lebat berterusan sejak tengahari tadi menyebabkan beberapa kawasan di sekitar daerah ini dilanda banjir kilat.



#MALAYSIABERSAMAMU



UTAMA BERITA SUKAN DUNIA HIBURAN BISNES RENCANA WANITA HUJUNG MINGGU

Foto
Jumaat, 11 Ogos 2017 | 12:23pm

Banjir di Melaka Pada 10 Ogos 2017



KEADAAN sebahagian kawasan bandar Melaka yang dinaiki air berikutan hujan lebat sejak 2 pagi hingga 6 pagi. - Foto ihsan pembaca

LATEST FLASH FLOOD OCCURANCE



#MALAYSIABERSAMAMU

UTAMA BERITA SUKAN DUNIA HIBURAN BISNES RENCANA WANITA HUJUNG MINGGU

BERITA » Nasional
Jumaat, 15 September 2017 | 9:05am



Banjir landa Georgetown

Oleh Fatim Fazlina Yaakob
bhnews@bh.com.my

f Share t Tweet g+ Share

GEORGETOWN: Hujan lebat sejak malam tadi, menyebabkan beberapa kawasan sekitar bandar raya ini dinaiki air antara 0.2 hingga 0.3 meter.



#MALAYSIABERSAMAMU

UTAMA BERITA SUKAN DUNIA HIBURAN BISNES RENCANA WANITA HUJUNG MINGGU

BERITA » Kes
Jumaat, 15 September 2017 | 11:21am



JALAN Kuah-Padang Matsirat, Langkawi dinaiki air sedalam sehingga 0.5 meter akibat hujan lebat pagi tadi - Foto ihsan Facebook Laporan Kemalangan Langkawi

Jalan Kuah dinaiki air pada 15 September 2017

Oleh Hamzah Osman
bhnews@bh.com.my

f Share t Tweet g+ Share

LANGKAWI: Hujan lebat awal pagi hari ini mengakibatkan beberapa jalan utama di sekitar pulau ini dilanda banjir kilat.

Antara jalan yang terjejas termasuk Jalan Kuah-Padang Matsirat, Kampung Yoi, Chandek Kura, Kedawang dan Lebuh Raya Langkawi apabila dinaiki air sedalam antara 0.3 meter hingga 0.5 meter.

STORMWATER MANAGEMENT AND DRAINAGE MASTER PLAN

PISMA

INTRODUCTION TO PISMA

PISMA

PISMA =

MSMA Concept + Master Plan

- A master plan that will give comprehensive guidance and instruction,
- A comprehensive long-term strategy,
- Compliance with MSMA 2nd Edition



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Kementerian Sumber Asli dan Alam Sekitar
Jalan Sultan Salahuddin, 50626 Kuala Lumpur,
MALAYSIA
Tel: +603 2697 2828
Fax: +603 2698 7973/ 2697 2412/ 2697 2411
Website: www.water.gov.my

STORMWATER MANAGEMENT AND DRAINAGE MASTER PLAN STUDY FOR KUANTAN TOWN



FINAL REPORT

JUNE 2010

VOLUME I
EXECUTIVE SUMMARY

Prepared by:

HYDEC

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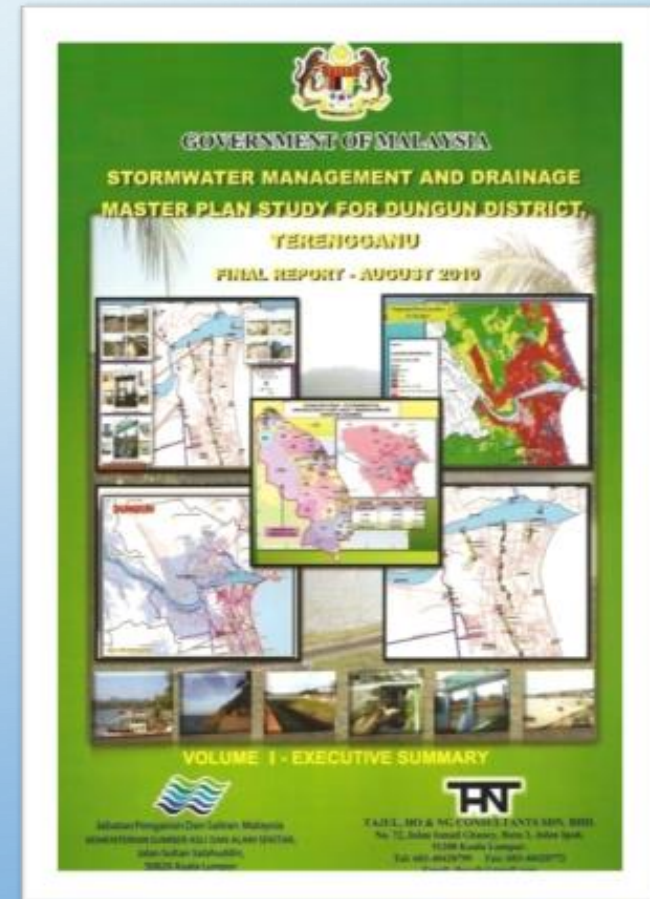
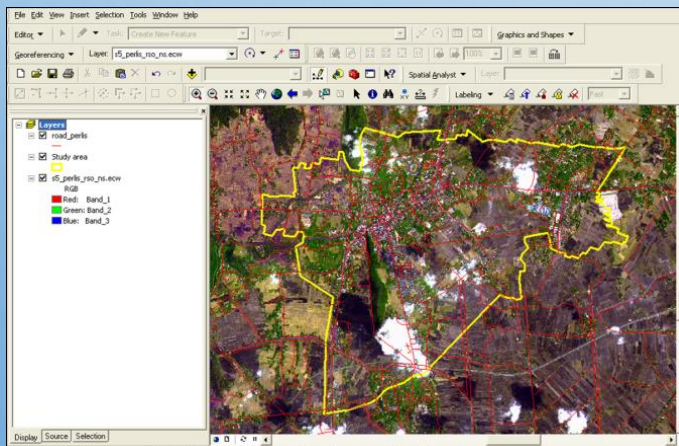


INTRODUCTION TO PISMA

The development of PISMA is to help solve the problem on flash floods and develop a master plan on how to effectively handle and overcome the occurrence of flash floods.

The output of this master plan are to:

- 1) Create a master plan for drainage
- 2) Create a master plan for water quality
- 3) Create an infrastructure inventory system based on GIS



PISMA TARGET GROUP

1

Developers

New Development

2

**Local
Governments**

Local Plans

3

**DID States &
Districts**

Approval &
Retrofitting

SCOPE OF WORK OF PISMA

1

- **Data and Information Collection**

2

- **Topographical and Engineering Surveys and Geotechnical Investigations**

3

- **Site Investigation and Field Inspection**

4

- **Analyse Existing Conditions**

5

- **Identify Stormwater Issues and Problem**

SCOPE OF WORK OF PISMA

6

- **Formulate Alternatives**

7

- **Compare Alternatives and Select Recommended Plan**

8

- **Development of Stormwater Management Master Plan**

9

- **Cost Estimates and Benefits**

10

- **Prepare Plan Implementation Program**



PISMA OUTPUT

PISMA STUDY OUTPUT



EXAMPLE OF PISMA STUDY (OUTPUT)

EXISTING DRAINAGE

Thoroughly studied by the consultant to identify the most comprehensive solution for the flash flood.

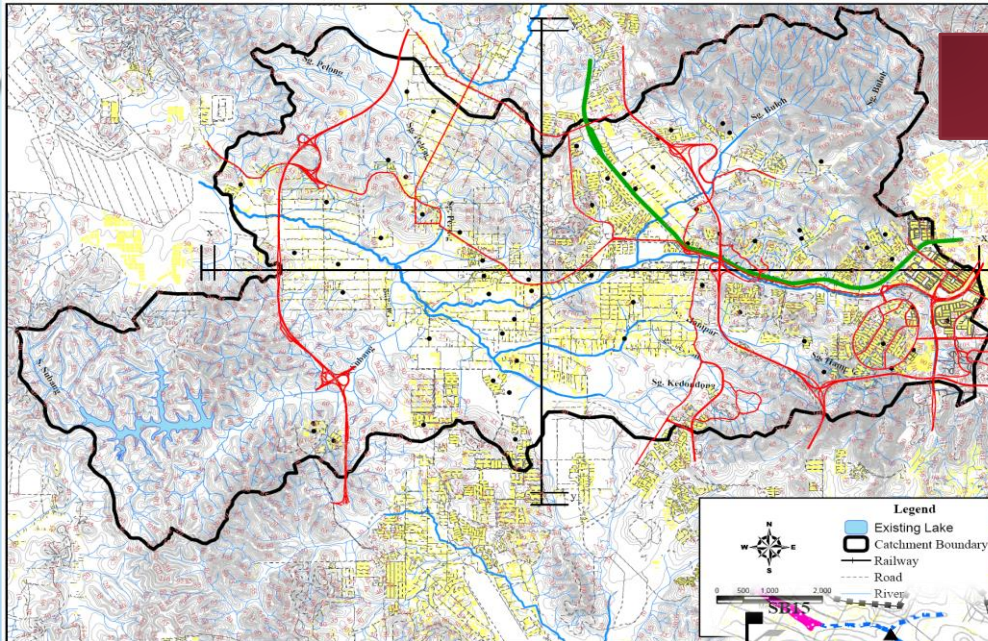
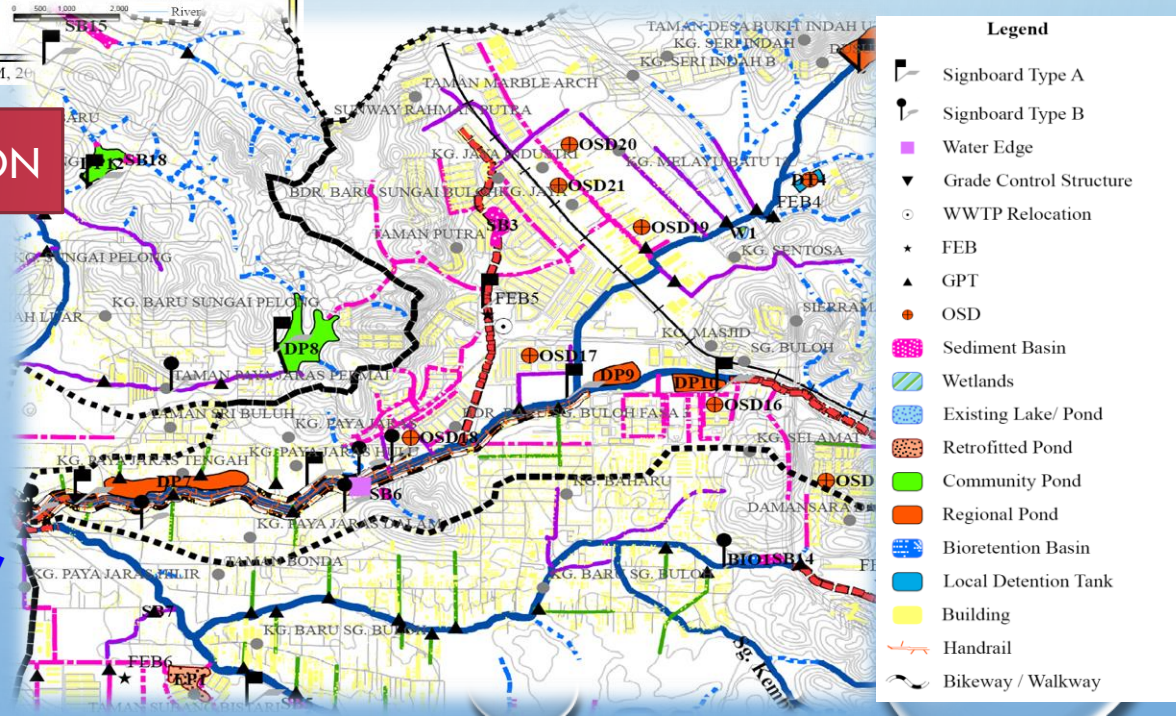


Figure 2-2: Topography of Upper Sg. Buloh Catchment (JUPEM, 2005)

PISMA STUDY PROPOSED SOLUTION

The proposed option can be in:

- Structural approach
(Channelisation, retention pond, pump drainage and etc.)
- Non-structural approach
(Landuse management & zoning, Public Outreach Program, Enforcement (ESCP) and etc.)



MSMA CONCEPT IN PISMA (OUTPUT)

MUDFLOWS



ESCP- CONSTRUCTION



SMELLY DRAIN



QUALITY CONTROL



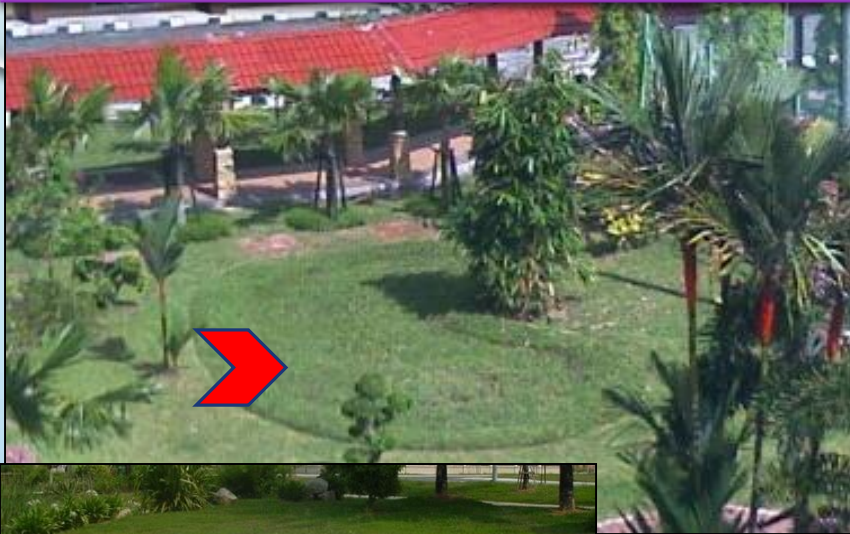
FLASH FLOOD



QUANTITY CONTROL



On Site Detention Pond (Dry Pond)



On Site Retention Pond



Wetland



Outfall Structure



Filtration Structure



Silt Fence



Silt Trap





11th MALAYSIA PLAN

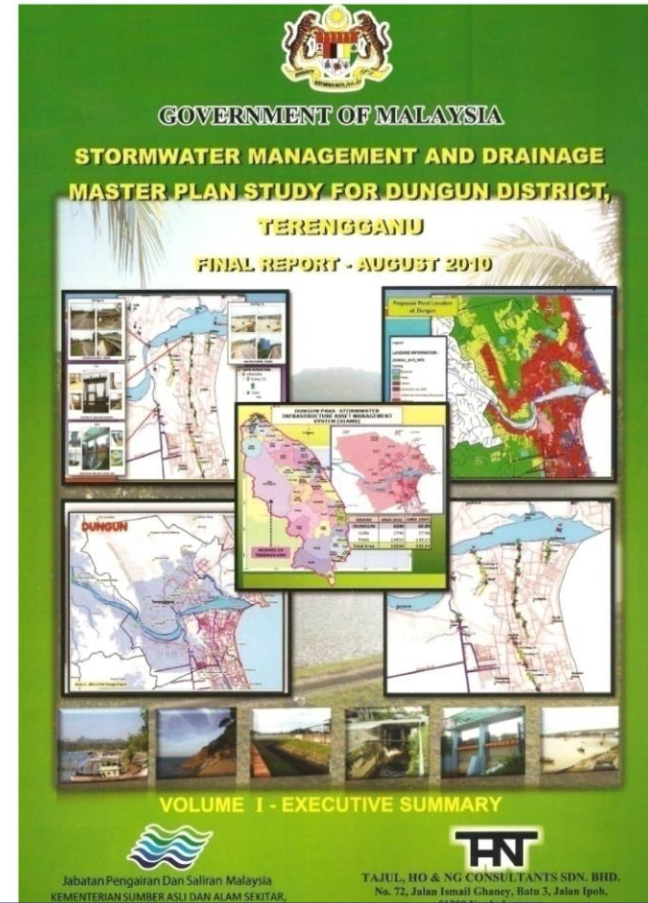
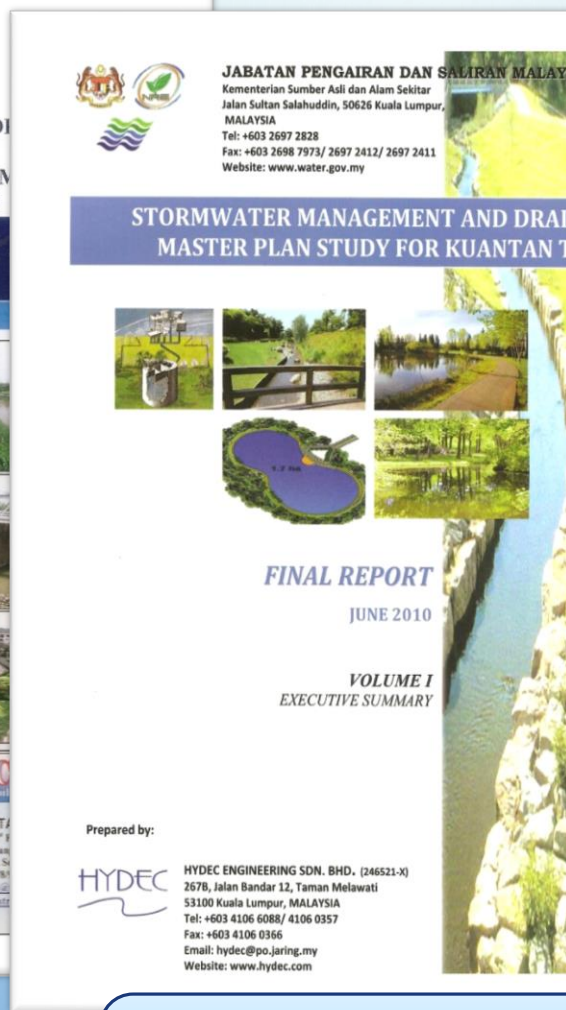
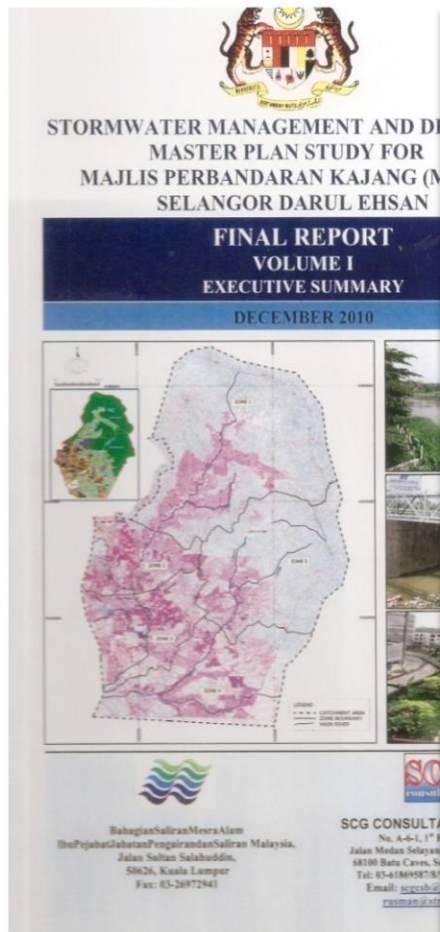
11th MP IMPLEMENTATION STATUS

17 STORMWATER MANAGEMENT AND DRAINAGE MASTERPLAN (PISMA) STUDY HAD COMPLETED UNTIL 2010

No.	State	Study Area
1.	Perlis	Kangar, Arau dan Padang Besar
2.	Perak	1. Parit Buntar dan Bagan Serai 2. Ipoh 3. Manjung, Lumut dan Sitiawan
3.	Selangor	1. Klang 2. Sungai Besi dan Seri Kembangan 3. Bandar Sungai Buloh 4. Kajang
4.	Sabah	1. Tuaran, Mengatal dan Talipok 2. Tawau
5.	Sarawak	1. Kuching dan Kota Samarahan 2. Miri
6.	Johor	Pasir Gudang
7.	Kelantan	1. Tanah Merah 2. Pasir Mas
8.	Terengganu	Dungun
9.	Pahang	Kuantan

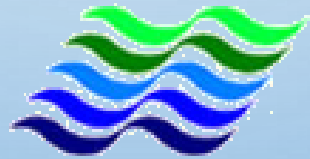


CONCLUSION



Reference for state governments and local authorities

THANK YOU



Prepared By:
**BAHAGIAN SALIRAN MESRA ALAM
JPS MALAYSIA**