



ASEAN – JAPAN SMART CITIES NETWORK HIGH LEVEL MEETING

Workshop Session 1: Water and Resilience



SMART FLOOD MANAGEMENT AND RESPONSE SYSTEM

IOT



SMART CITY

- Introduction of Kuching City
- Sungai Sarawak River basin
- Kuching Barrage – Sungai Sarawak Regulation Scheme
- Flood Map of Kuching
 - ❑ *Flood Photographs of Kuching 2004*
 - ❑ *Flood Photographs of Kuching 2009*
 - ❑ *Flood Mitigation Plan*
 - ❑ *Flash Flood Event*
 - ❑ *Initiatives: Telemetry System, Intelligent Gauge, Flood Forecasting & Warning System*
 - ❑ *Proposal*
 - ❑ *Project Cost*



KUCHING CITY

★ the **CAPITAL** and the most populous city in **Sarawak** in Malaysia

570,407 (2019) POPULATION

PENINSULAR
MALAYSIA

SOUTH EAST ASIA

SARAWAK

NORTH EASTERN EUROPE

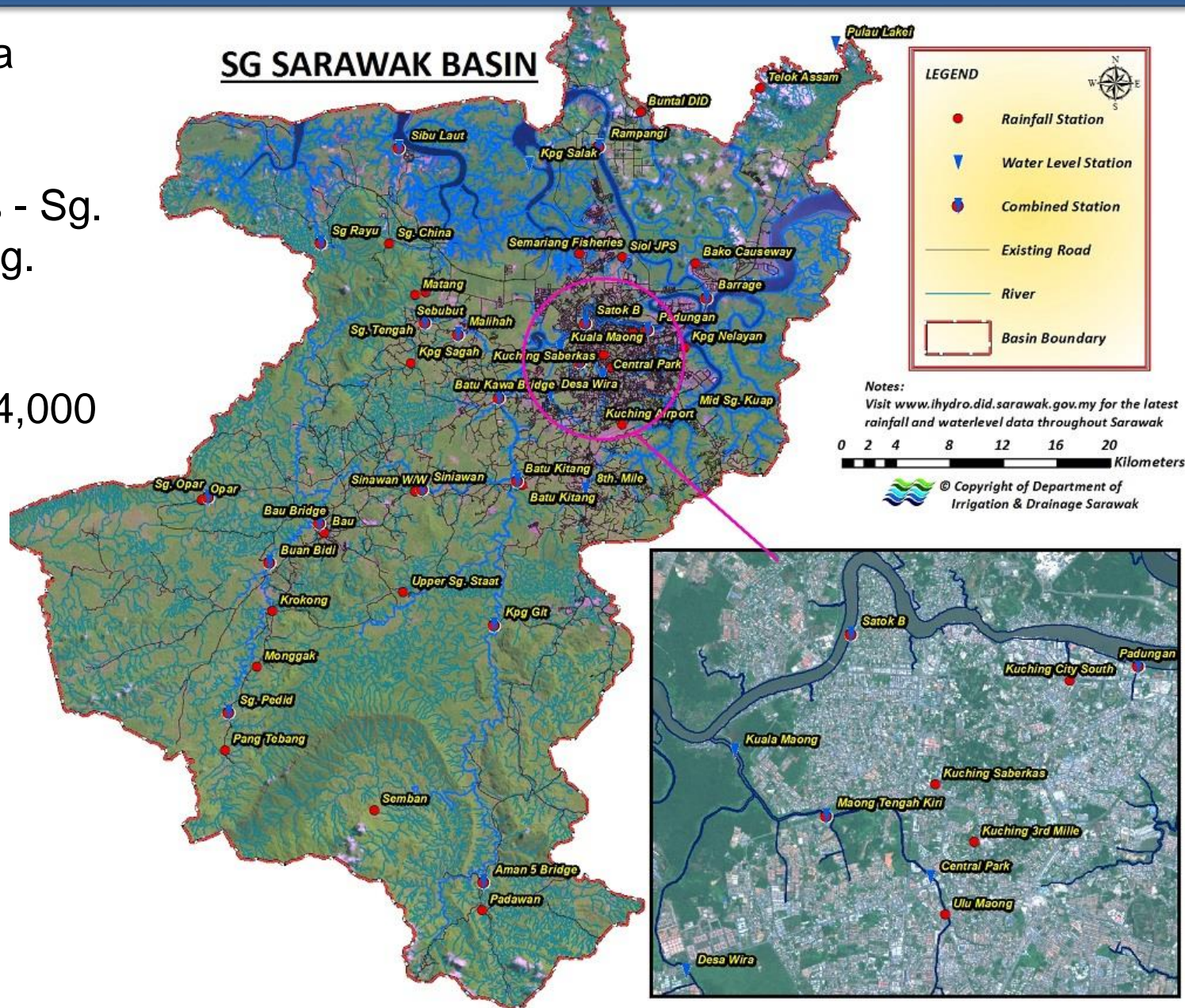
ESTONIA

1.3 MILLION POPULATION

3 TIMES BIGGER
than **ESTONIA**
2.8 MILLION POPULATION
Almost same size with
Peninsular Malaysia

Sungai Sarawak River Basin

- Catchment area 2,456km²
- Main tributaries - Sg. Sarawak Kiri & Sg. Sarawak Kanan
- Annual rainfall 4,000 - 5,000 mm



Existing Barrage – Sungai Sarawak Regulation Scheme

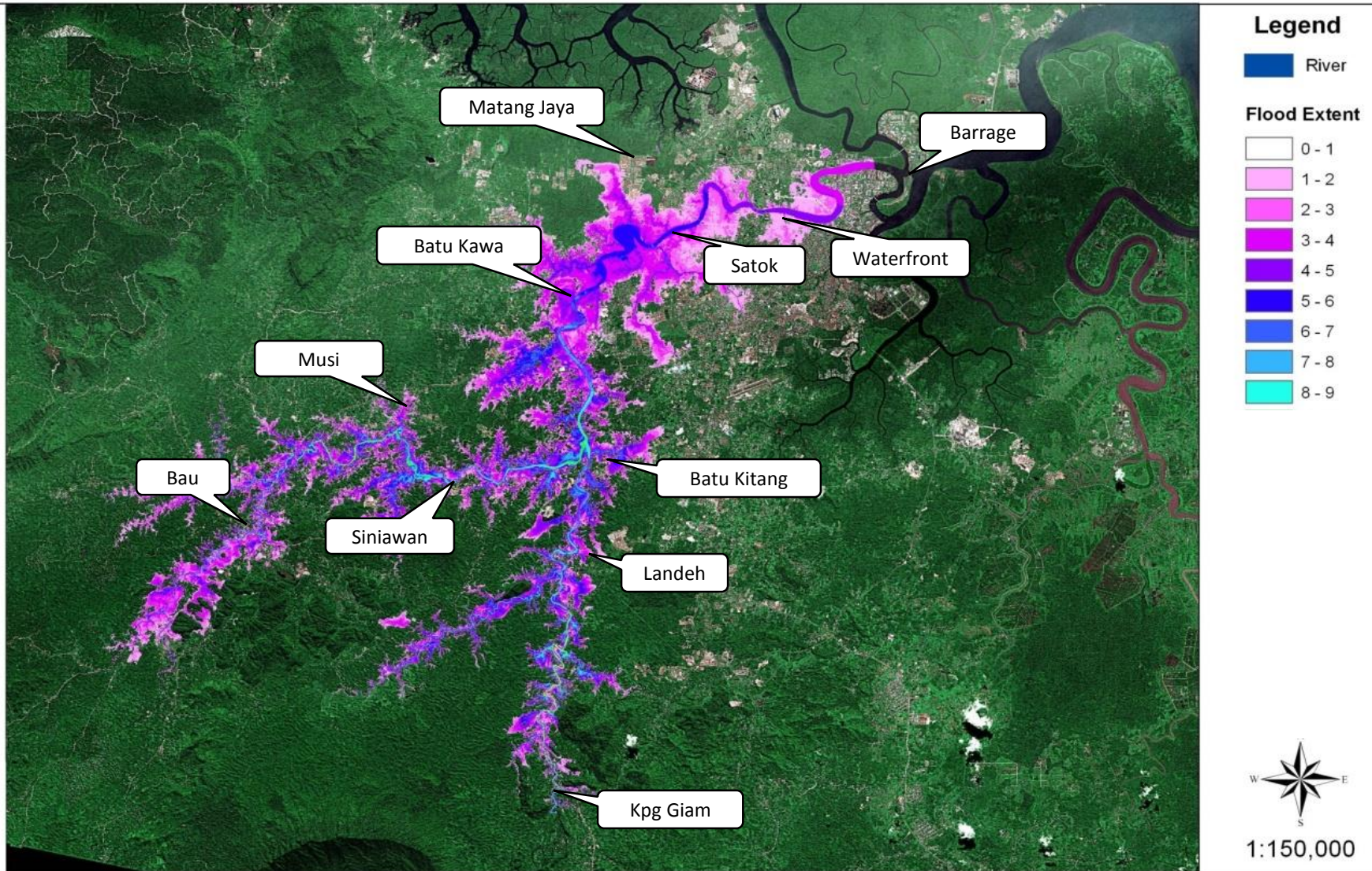


Constructed in 1997

Five radial gates and one shiplock of 25m width and a 435 m long road bridge.

Flood Map of Kuching

100 YR ARI FLOOD EXTENT - EXISTING BARRAGE ONLY



Flood Photographs Of Kuching 2004

Sg. Maong Hilir – 26/1/2004



Kg. Sinar Budi, Batu Kawa – 26/1/2004



BADLY AFFECTED ... a bird's eye view of Kampung Sinar Budi, Batu Kawa.

Floods force SK Landeh, SK Wira to close temporarily from today; authorities monitor other schools

By Alexius Barieng

KUCHING Two primary schools here will be closed indefinitely from today because of the flood situation, the State Education Department said in a statement yesterday.

The two schools, badly affected by floods since the past two days, are SK Landeh and SK Wira, located at Penrissen. State Education director Dr Adi Bachdaman Tash confirmed that the two schools will be closed temporarily.

He also said that other schools facing similar flood hazards could be closed temporarily upon the directive of the principals.

• More reports on Pages 2, 3

Dr Adi advised pupils of schools that were temporarily closed to stay at home.

Meanwhile, State Natural Disaster Relief Committee chairman Tan Sri Datuk Amar Dr George Chan said the committee had contacted the

Education Department on the closure of schools affected by the floods.

"We have given them a list of schools that will most likely be affected and we will request that they be closed temporarily," said

Dr Chan, adding that the schools to be closed would be those that were actually flooded or the access roads to the schools had been cut off by flood waters. He told a press conference at the Flood Operations Room at Wisma Bapa Malaysia here that SK Landeh had been identified

for closure today as it was under two feet of water yesterday.

The Deputy Chief Minister also revealed that all indications showed that the flood situation this year might be worse compared to last year.

"The report does not look too good, because of the rains on Saturday night and also yesterday morning. The water level continued to rise yesterday in a lot of areas," he said, adding that on Saturday the water level overflowing the river banks was about four feet above sea

level, while yesterday it was at around five-and-a-half feet.

"We just hope that it will not be as heavy as the last few days," he said, adding that if it was as heavy, the conditions in the affected areas would continue to be bad.

He also appealed to residents living along river banks and low-lying areas not to use rivers for transport and other purposes due to swift currents. Dr Chan said the current had reached ten knots, which was very fast for a river.

"If you have small boats, you will

not be able to control it as the currents would just sweep you away," he said, adding that the people should not use boats unless it was absolutely necessary.

Boat owners should also make sure that their boats were properly tied, because otherwise they would just float away, while parents should also make sure that their children did not go near the river because of the strong currents, he said.

• See Page 2, Col. 1



FAR FROM LOVELY ... curious onlookers join Batu Kawa residents of Taman Lovelyland in Kuching in the safety of high ground as they look at the half submerged houses in the housing estate. The houses came under four feet of flood waters. • Turn to Page 3 for the story

Sungai Maong Hilir – January 2004



Taman Lovelyland – 25/1/2004

Flood Photographs Of Kuching 2009



Kuching Waterfront @ 12.01.2009



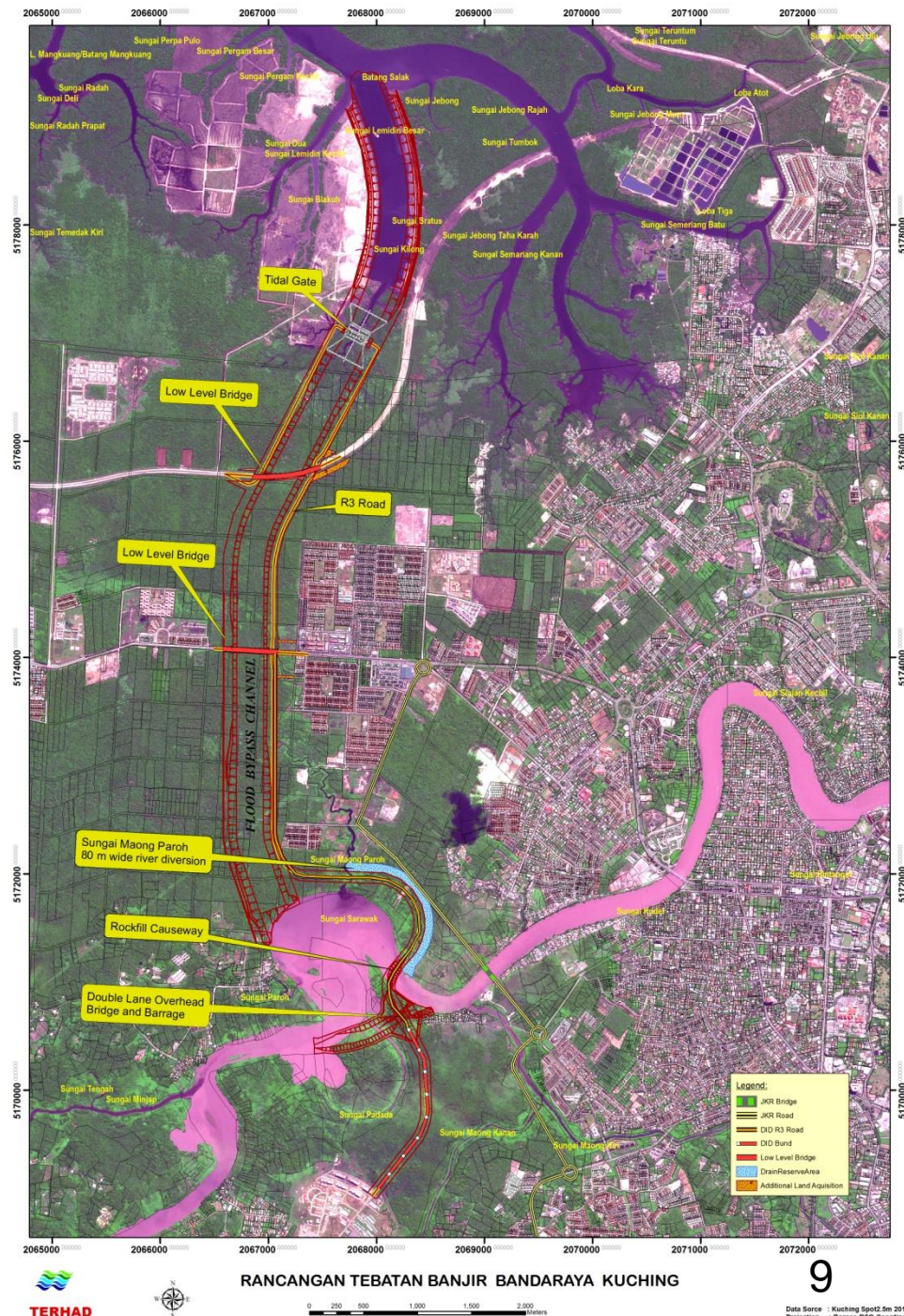
Batu Kawa New Shop @ 12.01.2009



Taman Lovely Land @ 12.01.2009



Jalan Tung Wei Tat @ 11.01.2009





Kuching City : Flash Flood Events

Flood Event at Sarawak General Hospital on 13.03.2019



Flood Event at Jalan P.Ramlee on 22.11.2018



Flood Event at Jalan Laksamana Cheng Ho on 19.09.2016



Flood Event at Jalan Rock on 19.09.2016



Kuching City : Flash Flood Event

Risking his life to save and

by Gary Kiat, reporters@theborneopost.com. Posted on Jan 06, 2012



Jalan Batu Lintang 05.01.2012

Shop owners badly hit

Traders along India Street, Gambier Street salvaging items

KUCHING: Shop owners along India Street and Gambier Street here, badly hit by floods since Sunday, were seen trying to salvage items and clean-up yesterday.

Many shop houses along the two streets were closed, while other owners tried to reinforce their shops with planks and sand bags to prevent further damage. A textile merchant, who wished to be identified as Yong, said this was the worst flood to hit the area since he started his business 60 years ago.

"The water rushed in like rapids at around 4pm on Sunday. My shop got a direct hit because it is a corner shop, right in the way of the 'rapids'," he said while pointing to the five-footway outside his premises.

He told The Borneo Post

The water rushed in like rapids at around 4pm on Sunday. My shop got a direct hit because it is a corner shop, right in the way of the 'rapids'.

Yong, textile merchant

that the water level was knee-high and all the textiles placed on the floor were ruined.

"I could only save what is still dry and kept everything on the second floor. The damaged ones I have no choice, but to discard," said Yong.

Fellow textile merchant Habib Abdul Kadir agreed that the flood was the worst since he started business in India Street.

"The water was knee-high and every piece of textile placed on the floor was ruined. All I can do now is salvage what is left and store

them on the second floor. Estimated loss I would say is about RM10,000," said Habib.

He added that his shop will be closed for a clean-up and until the situation got better.

Clothing store owner Tan Meng Hong said he had never seen such damage in his 11 years of business.

"I would say that my loss is minimal, more or less RM2,000 worth of school uniforms, shoes, and other school essentials. I sympathise with the neighbouring shops who lost more," he said.

Tan said as a preventive measure, all items had been moved to the second floor and flood affected items might be sold at a cheaper price.

Teo Hui Meng said he only discovered the devastation at his family's Gambier Street sundry shop yesterday morning.

"The shop was closed for the weekend and I only got to see the damage this morning as I was opening the shop," he said.

Teo said it is too early to estimate losses as he and other shop assistants were still busy cleaning up and salvaging what was left.

"There was a flood back in 2004 but it was not this bad. From the damage now, I would say that the water level was knee deep all the way to the back of the shop," said Teo.

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Two missing in Kuching flash floods

NATION

Friday, 06 Jan 2012

By VANES DEVINDRAN and YU JI



KUCHING: A student and her would-be rescuer are missing after both fell into a monsoon drain during massive flash floods that left the city crippled.

Kho Ying Oi, 19, and Herman Sihes, a 29-year-old petrol station employee, have yet to be found at press time yesterday.

Kho slipped and fell into the drain while walking to a bus stop to wait for her mother after her car stalled in the floodwaters.

"Herman then jumped in to save her but was swept away by the heavy current.

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Saving the planet each step



Recommended Reading

ENTERTAINMENT

'Enter The Fat Dragon', & 7 More Action-Packed August Films

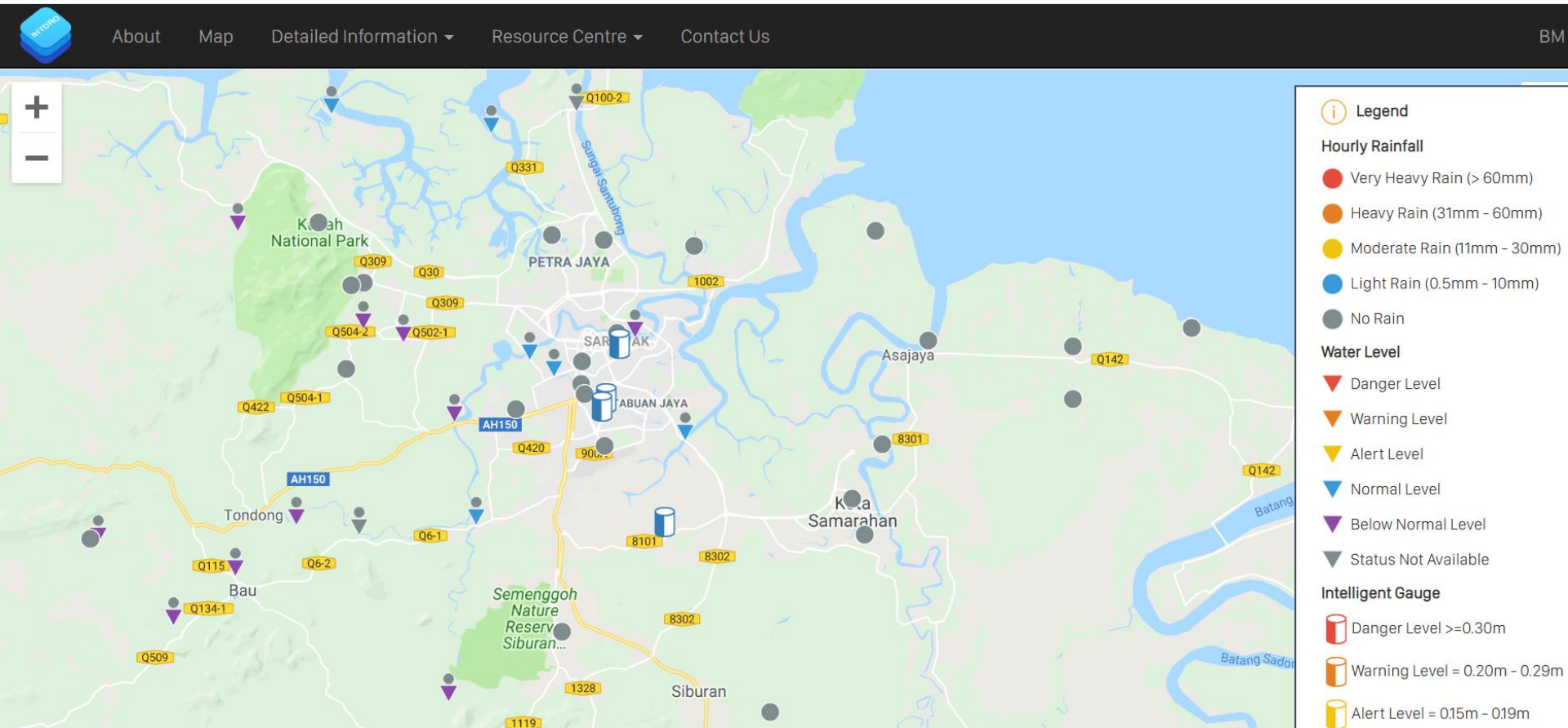
CULTURE

8 Theatre And Performing Arts Shows To Catch In August

PEOPLE



Telemetry System – Rainfall, Water level and Intelligent Gauge(IG) for flood monitoring in Kuching City



**Four(4) nos of Intelligent Gauge(IG) have been installed
in flood prone area in Kuching City**



IG Mendu
1°32'36.70"N
110°21'39.35"E



Happy Valley
1°30'50.15"N
110°21'13.23"E



IG SK Jalan Muara Tuang
Latitude : 1°26'46.26"N
Longitude : 110°23'8.21"E

IG Federal Quaters
1°30'33.59"N
110°21'5.34"E



Current Effort : Intelligent Gauge (IG)

A flood detection and warning system which measures the water level and provides **early flood warning both in audio and visual** to resident living nearby can be installed around the city.

The system will be triggered when the water level reached alert level and provide early flood warning in both audio and visual via siren and strobe light. The data will be sent via text messages(SMS) to DID Officer's mobile phones.



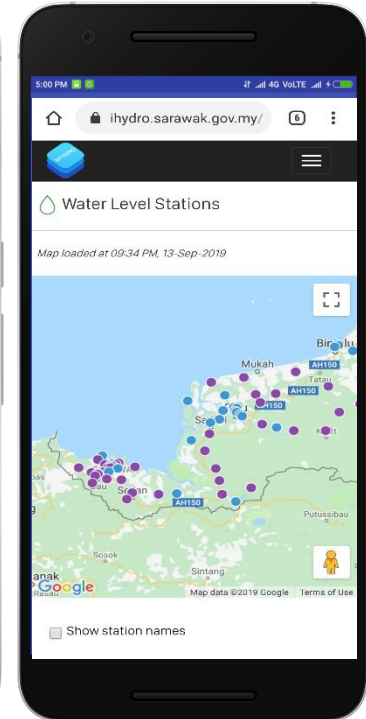
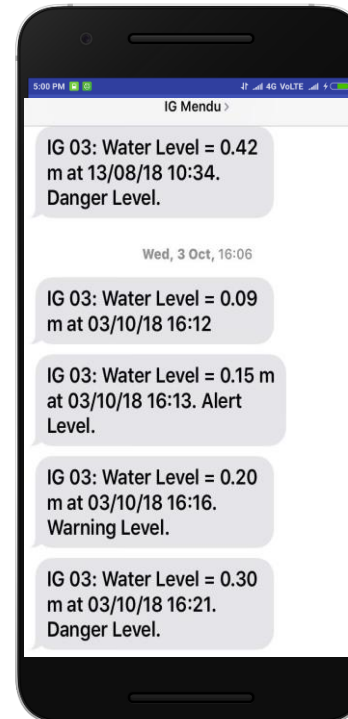
**Alert Level
(0.15 m)**



**Warning Level
(0.2 m)**

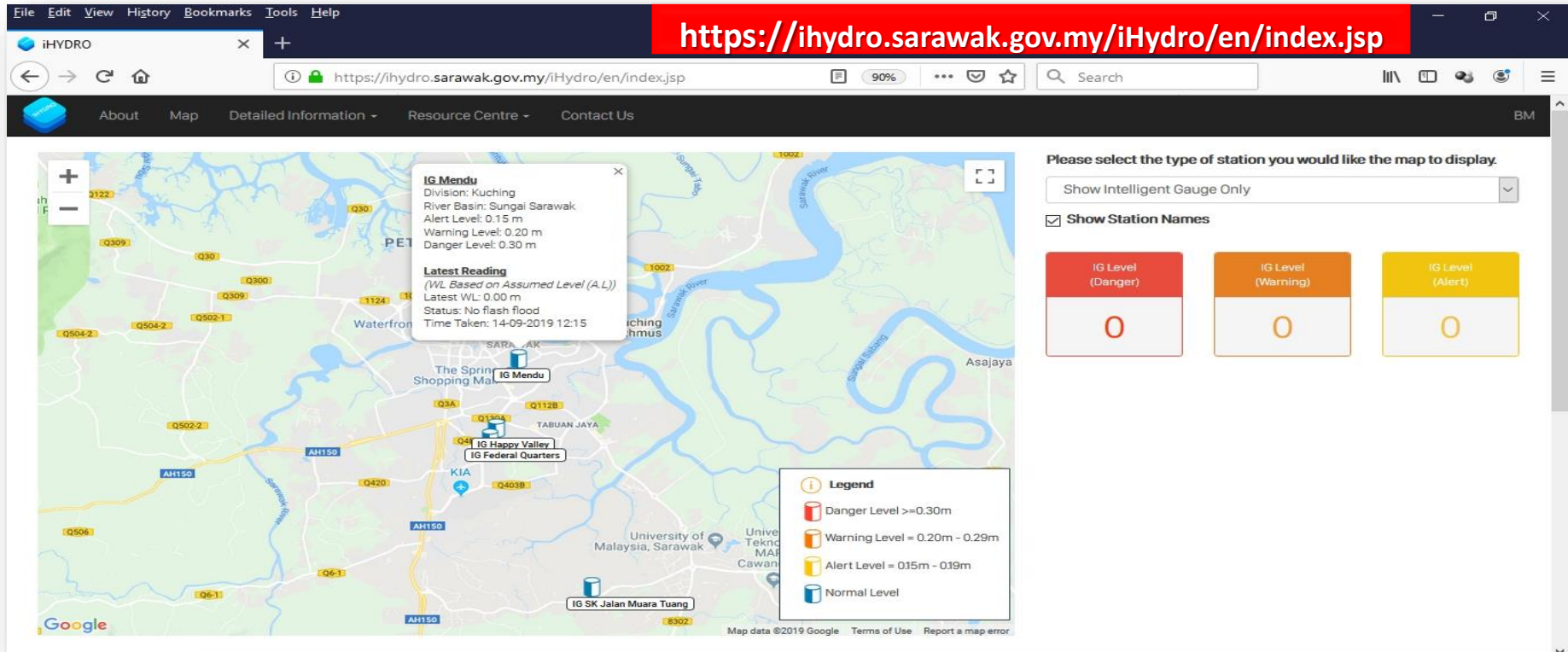


**Danger Level
(0.3 m)**



Current Effort

The existing IG data is displayed in iHydro website for flood monitoring



Latest IG Level

Table generated at 12:04 PM, 14-Sep-2019

Description

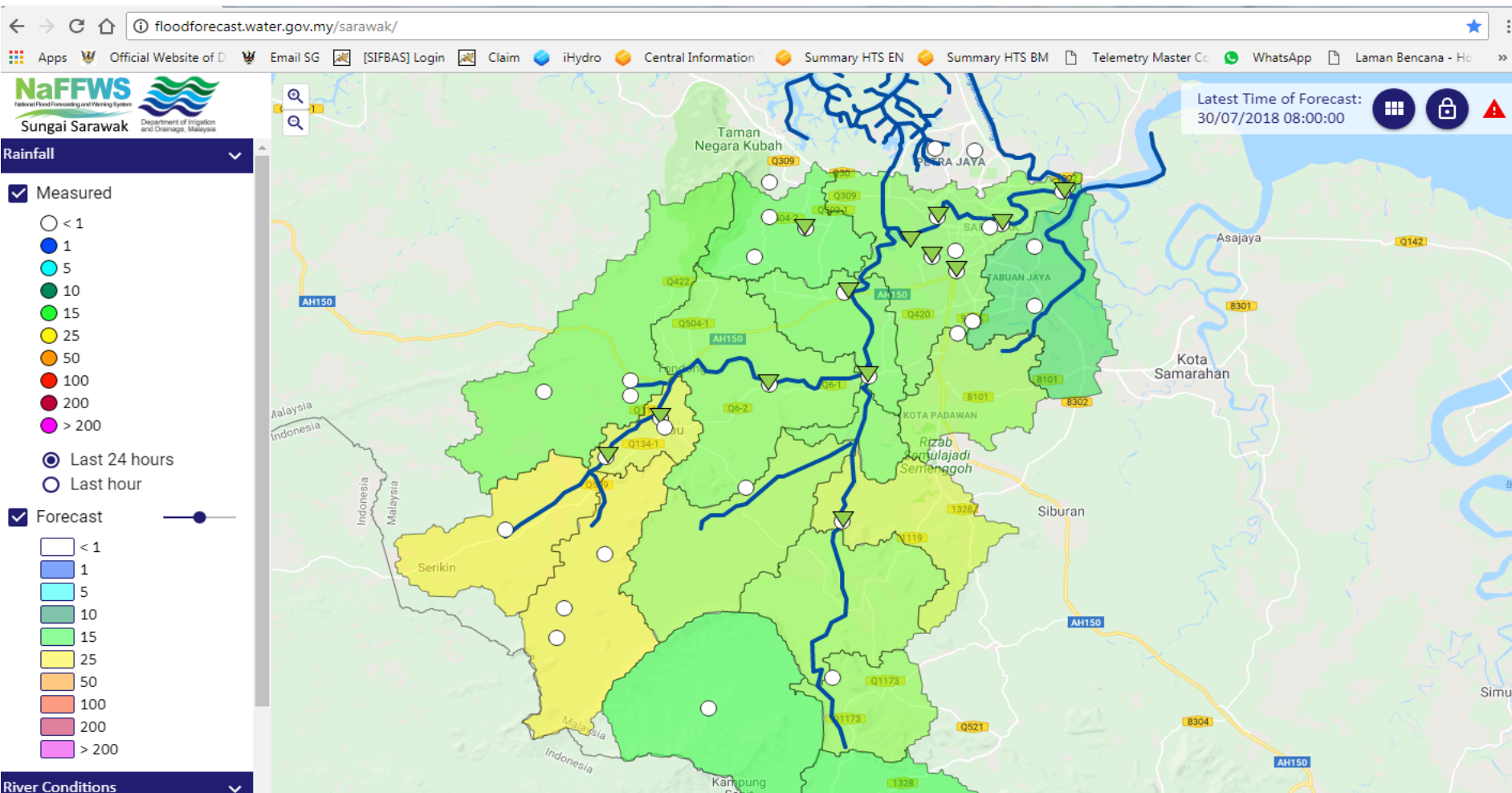
Explanation

IG Level: Normal, Alert (0.15m), Warning (0.20m), Danger (0.30m)

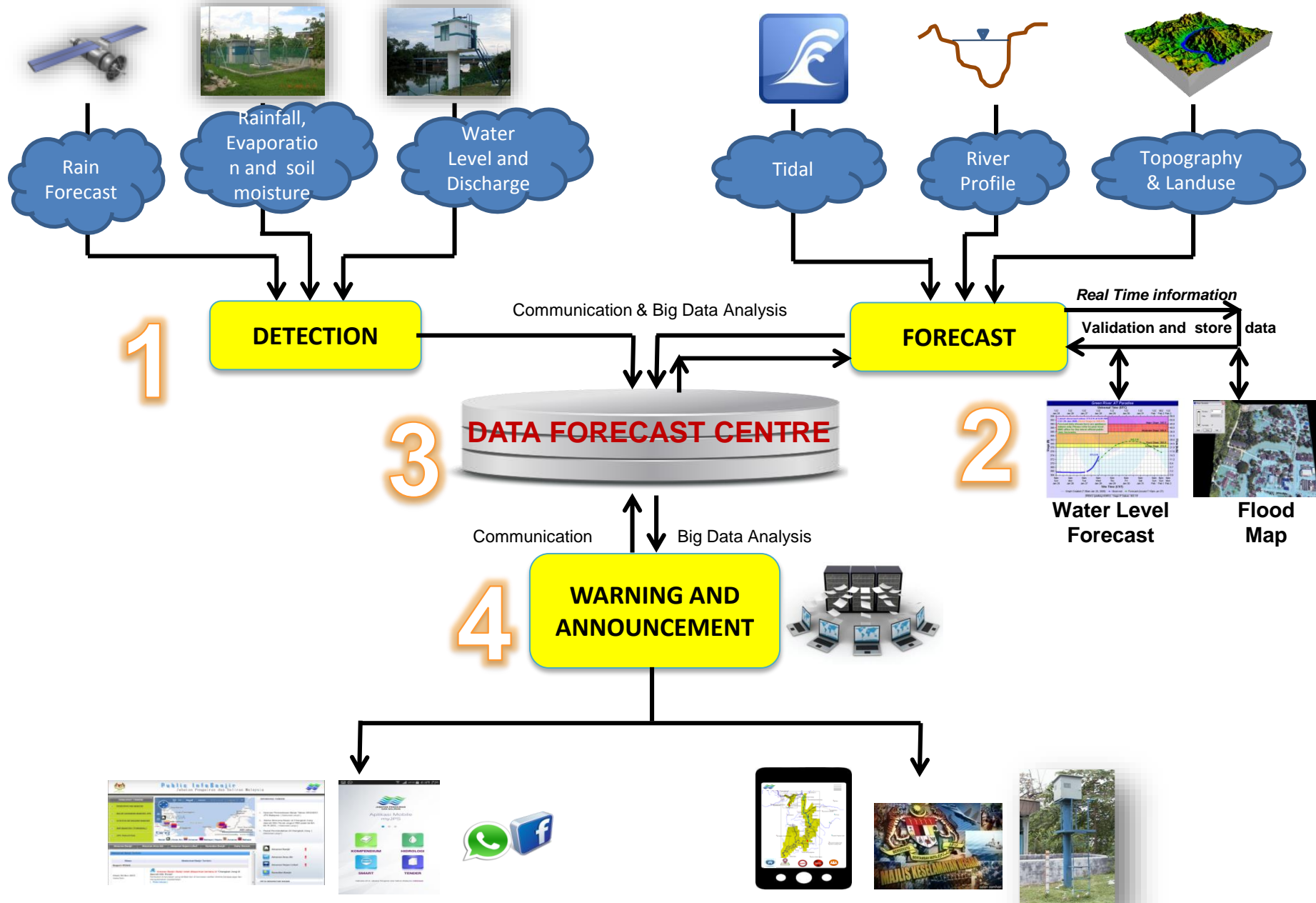
No.	IG Name	Division	Last Update Time	IG Level (m)
1.	IG Federal Quarters	Kuching	14-09-2019 12:15	0.00
2.	IG Happy Valley	Kuching	14-09-2019 12:15	0.00
3.	IG Mendu	Kuching	14-09-2019 12:15	0.00
4.	IG SK Jalan Muara Tuang	Kuching	14-09-2019 12:15	0.00

National Flood Forecasting and Warning System (NaFFWS) Sungai Sarawak

- Developed by DID Malaysia in April 2014 and currently in the process to upgrade and enhance the system.
- NaFFWS located at BPSAH, DID Malaysia and the output of forecasting is available in website <http://floodforecast.water.gov.my/sarawak/>



FLOOD FORECASTING AND WARNING SYSTEM - SUNGAI SARAWAK



Proposal

- SCADA system – existing and future structures
- Hydrological Telemetry system
- Flood Sensors – Rivers and main drains
- CCTVs – structures and flood prone areas
- Public Information system
- Online and Apps
- Internet of Things (IoT)
- command center – GIS



PROJECT COST

Flash Flood Detection System, Display TV/Billboard, Monitoring Device, Audio & Visual System, Flood Modelling, Digital Elevation Model (DEM)/River & Channel Profile Survey and Development of application (Hardware/Software).



THANK YOU



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