Malaysia Water Resources Management (MyWRM) Forum 2014
New approaches in Flood Warning System in Malaysia

By;
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Department of Irrigation and Drainage Malaysia
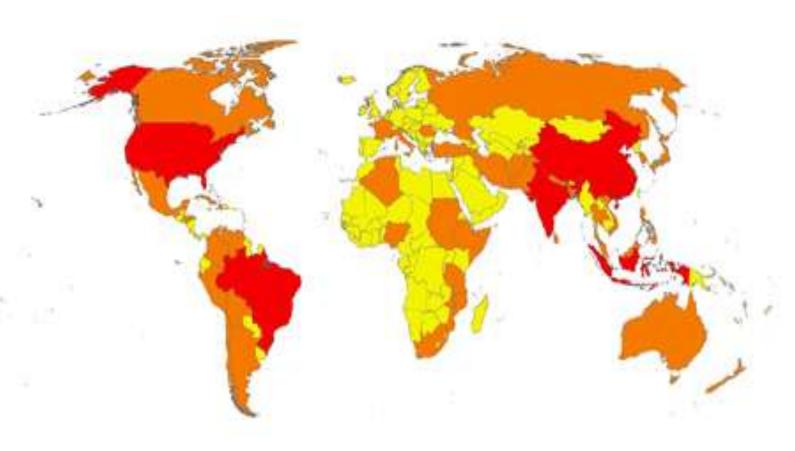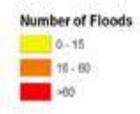*June 9th, 2014*
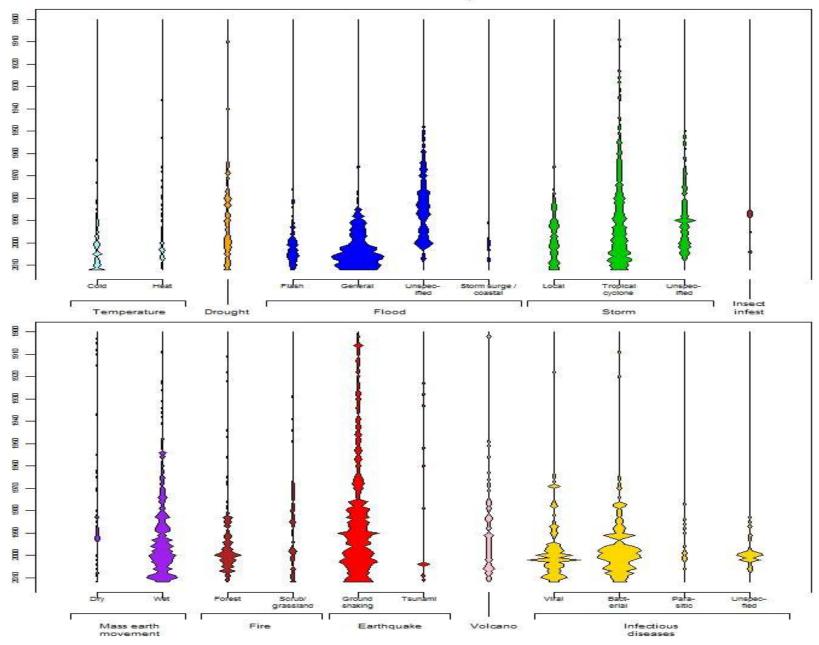
Picture Source : Google

Presentation Outline

- Introduction

- Flood Warning Systems

- Way Forward

- Conclusion

Number of Occurrences of Flood Disasters by Country: 1974-2003
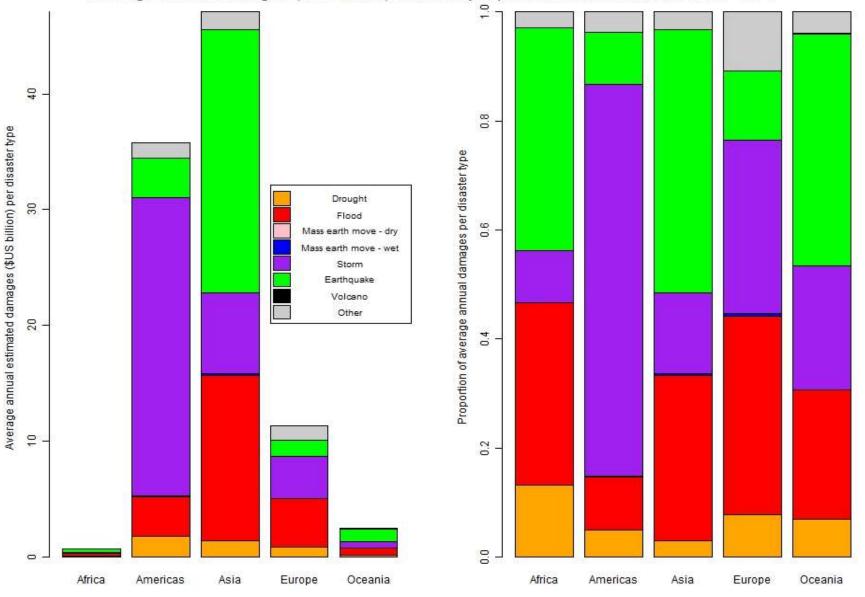
Number of Floods
- 0 - 15
- 16 - 60
- >60

Number of natural disasters reported 1900 - 2012

Average annual damages ($US billion) caused by reported natural disasters 1990 - 2012

Legend:
- Drought
- Flood
- Mass earth move - dry
- Mass earth move - wet
- Storm
- Earthquake
- Volcano
- Other

Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters

UNISDR — The United Nations Office for Disaster Risk Reduction

Priority Action 1: Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation.

- Countries that develop policy, legislative and institutional frameworks for disaster risk reduction and that are able to develop and track progress through specific and measurable indicators have greater capacity to manage risks and to achieve widespread consensus for, engagement in and compliance with disaster risk reduction measures across all sectors of society

Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning.

- The starting point for reducing disaster risk and for promoting a culture of disaster resilience lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities to disasters that most societies face, and of the ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge.

Priority Action 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels.

- Disasters can be substantially reduced if people are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerabilities and capacities.

Priority Action 4: Reduce the underlying risk factors.

- Disaster risks related to changing social, economic, environmental conditions and land use, and the impact of hazards associated with geological events, weather, water, climate variability and climate change, are addressed in sector development planning and programmes as well as in post-disaster situations.

Priority Action 5: Strengthen disaster preparedness for effective response at all levels.

- At times of disaster, impacts and losses can be substantially reduced if authorities, individuals and communities in hazard-prone areas are well prepared and ready to act and are equipped with the knowledge and capacities for effective disaster management.

It was endorsed by the UN General Assembly in the Resolution A/RES/60/195 following the 2005 World Disaster Reduction Conference

Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters

UNISDR
The United Nations Office for Disaster Risk Reduction
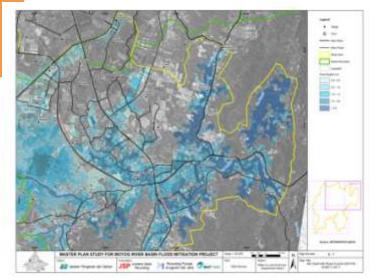
Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning.

Key activities
- ➤ **National and local risk assessments**
- ➤ **Early warning**
- ➤ **Capacity**
- ➤ **Regional and emerging risks**

Source: Google

Kota Tinggi, Johor, Jan 15: Police officers from the Kota Tinggi IPD on their rounds at crime-prone areas in the town. NST pix by Ahmad Othman.

Kota Tinggi, Johor, Jan 14: The tomb of the famous Laksamana Bentan is also flooded. NST pix by Zain Ahmed.

Source: DID –Sg. Moyog Flood Mitigation Master Plan Study

Hyogo Framework
for Action 2005-2015:
Building the Resilience of Nations
and Communities to Disasters

UNISDR
The United Nations Office for Disaster Risk Reduction

Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning.
Key Activities: Early warning

a)   Develop early warning systems that are people centered, in particular systems whose warnings are <u>timely and understandable to those at risk</u>, which take into account the demographic, gender, cultural and livelihood characteristics of the target audiences, including guidance on how to act upon warnings, and that support effective operations by disaster managers and other decision makers.

b)   Establish, periodically review, and <u>maintain information systems</u> as part of early warning systems with a view to ensuring that rapid and coordinated action is taken in cases of alert/emergency.

c)   Establish institutional capacities to ensure that early warning systems are well <u>integrated into governmental policy and decision-making processes and emergency management systems</u> at both the national and the local levels, and are subject to regular system testing and performance assessments.

d) Implement the outcome of the Second International Conference on Early Warning held in Bonn, Germany, in 2003, including through the <u>strengthening of coordination and cooperation among all relevant sectors</u> and actors in the early warning chain in order to achieve fully effective early warning systems.

e) Implement the outcome of the Mauritius Strategy for the further implementation of the Barbados Programme of Action for the sustainable development of small island developing States, including by establishing and strengthening effective early warning systems as well as other mitigation and response measures.

Losses : > RM200mil
No. of Casualties : 61

Flashback : Flood 1971
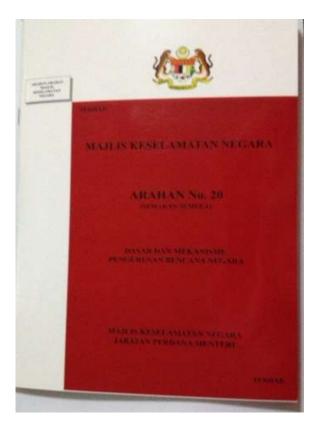
1971: Banjir Besar Melanda Kuala Lumpur

Flood Event 1971

BANGUNAN Sultan Abdul Samad ditenggelami air ketika banjir besar melanda Kuala Lumpur pada Januari 1971.

After the 1971 Flood Disaster, the Malaysian Government:-
1. Establish two (2) committees:-
    a. **The Permanent Flood Commission Committee** : to look into long term solutions to mitigate flood
    b. **The National Flood Relief Committee** : to reduce losses in the events of impending flood
2. Designation of Flood Mitigation as an additional function of DID:-
- Carrying out river basin studies
- Implementation of flood mitigation projects
- Implementation of flood forecasting and warning services

MAJLIS KESELAMATAN NEGARA – ARAHAN NO. 20 (NATIONAL SECURITY COUNCIL)

- First published on 11 May 1997
- Second revision on 30 March 2012:

➢Details out Policy and Mechanism for Disaster Management

➢ Explains roles and responsibilities of various agencies before, during and after floods

Source: Majlis Keselamatan Negara

Flood Warning System

Flood Warning Systems

Purpose
- enable people to take action to save lives and belongings
- help agencies carry out evacuation of population during floods

Warnings are effective when
- Warnings reached the at-risk community,
- Recipient are able to comprehend the information and advice contained in them
- Necessary actions are taken and losses are avoided

Development of flood warning services requires
- Information
- knowledge sharing
- effective communication

Flood Warning Systems
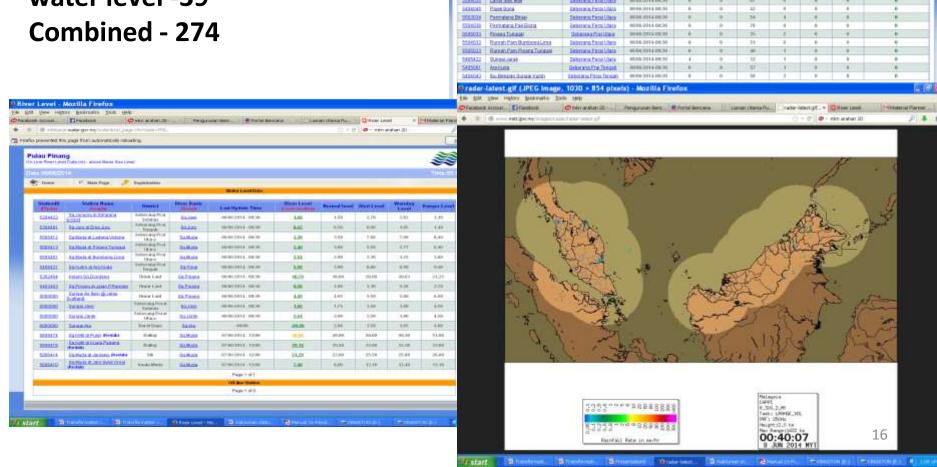
Components of flood warning system

•*monitoring of rainfall and river flows that may lead to flooding,*
• *prediction of flood severity and the time of onset of particular levels of flooding,*
• *interpretation of the prediction to determine the likely flood impacts on the community,*
• *construction of warning messages describing what is happening and will happen, the expected*
impact and what actions should be taken,
• *dissemination of warning messages,*
• *response to the warnings by the agencies involved and community members, and*
• *review of the warning system after flood events.*

Source: Australian Government Flood warning, Manual 21

Flood Warning Systems

Monitoring of rainfall and river flows

No. of telemetry stations
rainfall – 140
water level -39
Combined - 274

16

Flood Warning Systems

Forecasting of flood levels and its interpretation

Early 1900's : River water level of Sungai Kelantan, at Bradley Steps, Kuala Krai is used to warn the people of Kota Bharu, downstream, in the event of flood .

The police will read and transmit the rainfall and water level information via VHF to the Flood Warning and Relief Committee in Kota Bharu.

Flood warning services were first provided for 1925 flood event along Sg Kinta, Perak, Sg Kelang, Sg Selangor and Sg Bernam in Selangor.

Evolution of flood forecasting

STAGE – CORRELATION MODEL
FOR THE RIVERS OF PAHANG, PERAK and GOLOK

State	Upstream Station	Forecasted Station	Stage-Correlation Model	Coeff. Of Correlation (R^2)	Lag Time, T (hours)
Perak	Jambatan Iskandar	Parit	$_dY_{t+T} = 0.0926_uX_t^2 - 5.113_uX_t + 86.569$	0.9790	12
	Parit	Kampung Gajah (M1)	$_dY_{t+T} = -0.147_uX_t^2 + 6.816_uX_t - 71.032$	0.9726	16
	Jambatan Iskandar	Kampung Gajah (M2)	$_dY_{t+T} = 0.0628_uX_t^2 - 3.1413_uX_t + 40.689$	0.9634	30
Pahang	Kg. Sg. Yap	Temerloh	$_TY_{t+T} = -0.141_uX_t^2 + 2.1038_uX_t - 39.379$	0.9880	24
	Temerloh	Lubok Paku (M1)	$_{LP}Y_{t+T} = -0.023_uX_t^2 + 2.2237_uX_t - 28.995$	0.9879	24
	Kg. Sg. Yap	Lubok Paku (M2)	$_{LP}Y_{t+T} = -0.023_TY_t^2 + 2.2237_TY_t - 28.995$	-	60
Kelantan	Jenob	Rantau Panjang	$_dY_{t+T} = -0.14_uX_t^2 + 6.915_uX_t - 75.348$	0.8043	8

Evolution of flood forecasting

Flood forecasting and warning system was reviewed

Findings :-
1. Major deficiencies - inadequate rainfall and water level station networks for real-time data
2. More accurate flood forecasting techniques to replace empirical river stage correlation
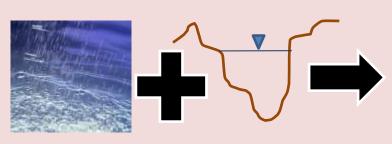
Based on the findings..
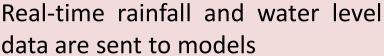
Actions taken :-
1. Telemetric stations were established for real-time data transmission to flood operation centres
2. Mathematical models are used to replace empirical river stage correlation

19
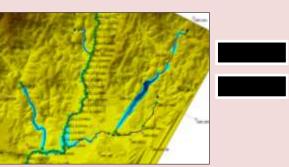
A Shift in Forecasting Flood

Water level at upstream

Rainfall at upstream

Then

Flood is anticipated at downstream when upstream water level reach certain level

Real-time rainfall and water level data are sent to models

Now

Flood map
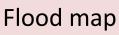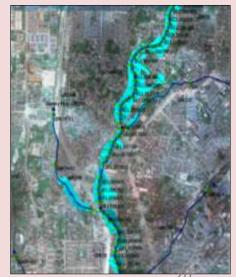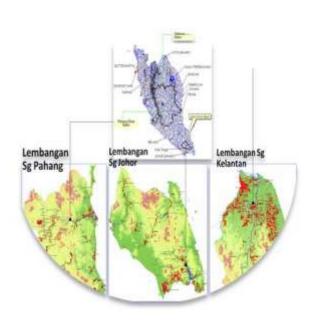
Latest approach by DID is to utilize the power of real-time data(hydrology and meteorology), coupled with hydrodynamic models and GIS tools in providing earliest forecast possible to affected area.

DID is also working closely with other relevant agencies, e.g. MetMalaysia in utilizing MetMalaysia weather forecast to predict flood.

Our Latest Flood Forecasting System

Flood Forecasting Model in Malaysia

Atmospheric Model Based Rainfall and Flood Forecasting (AMRFF)

Lembangan Sg Pahang

Lembangan Sg Johor

Lembangan Sg Kelantan

Developed for three (3) river basins – Pahang river, Kelantan river and Johor river (East Coast Region)
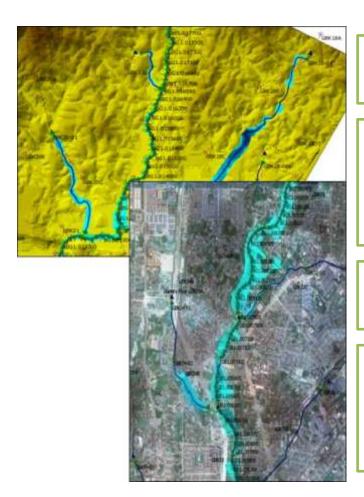
Objective : To **forecast** flood **every six (6) hours** for the three basins separately, **three (3) days ahead** to allow early warning to be issued

Data input : Numerical Weather Prediction (NWP) from Global Forecast System (GFS)

Model used :
- Hydrological Analysis : Watershed Environmental Hydrology (WEHY)
- Hydrodynamic Analysis : HEC-RAS

Flood Forecasting Model in Malaysia

Integrated Flood Forecasting and River Monitoring (iFFRM) for Klang Valley

Developed for Klang Valley – the most important suburb in Malaysia.
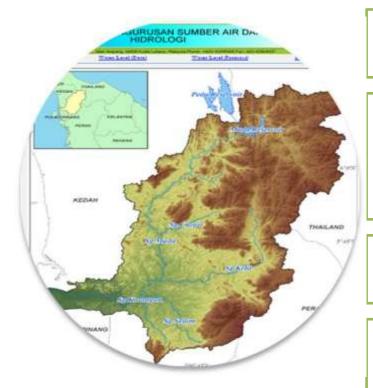
Objective : To **forecast water level** and **flood area** in Klang Valley with **lead time of 1 – 4 hours**

Data input : Numerical Weather Prediction & Real time telemetry data

Model used :
- Hydrological and Hydrodynamic Analysis :Infoworks RS
- Flood monitoring & forecast : FloodWorks

Flood Forecasting Model in Malaysia

Integrated Flood Forecasting and Warning System for Muda River Basin

Developed for Muda River Basin (North Coast Region) – interstate river basin

Objective : To **forecast** flood **every six (6) hours** for the Muda River Basin, **three (3) days ahead** to allow early warning to be issued

Data input : Radar data from MMD, Real time telemetry data

Model used :
- Hydrological and Hydrodynamic Analysis :MIKE 11
- Flood monitoring & forecast : FloodWatch

Flood Forecasting Model in Malaysia

Integrated Flood Forecasting and Warning System Based on Real Time Radar Rainfall for Padas River Basin

Developed for Padas River Basin, 2nd largest river basin in Sabah, East Malaysia

Objective : To **forecast** flood **every six (6) hours** for the Padas river basin, **two (2) days ahead** to allow early warning to be issued

Data input : Radar data from MMD, Real time telemetry data

Model used :
- Hydrological and Hydrodynamic Analysis :MIKE 11
- Flood monitoring & forecast : FloodWatch

Flood Forecasting Model in Malaysia

Integrated Atmospheric and Radar Satellite Model Based Rainfall and Flood Forecasting for Sarawak River Basin

Developed for Sarawak River Basin (Sarawak, East Malaysia)

Objective : To **forecast** flood **every six (6) hours** for Sarawak River Basin, **two (2) days ahead** to allow early warning to be issued
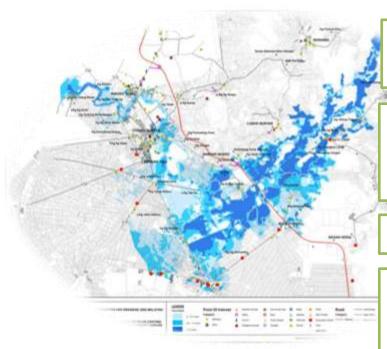
Data input : NWP, Radar data from MMD, Real time telemetry data

Model used :
- Hydrological and Hydrodynamic Analysis :MIKE 11
- Flood monitoring & forecast : FloodWatch

Flood Forecasting Model *in Progress*

Integrated Flood Forecasting and River Monitoring with Decision Making Support System for Kerian River Basin

Developed for Kerian River Basin (inter state river, North region of Malaysia)

Project Period : 17 months
Project Start Date : 31 July 2013
Project Completion : 30 December 2014
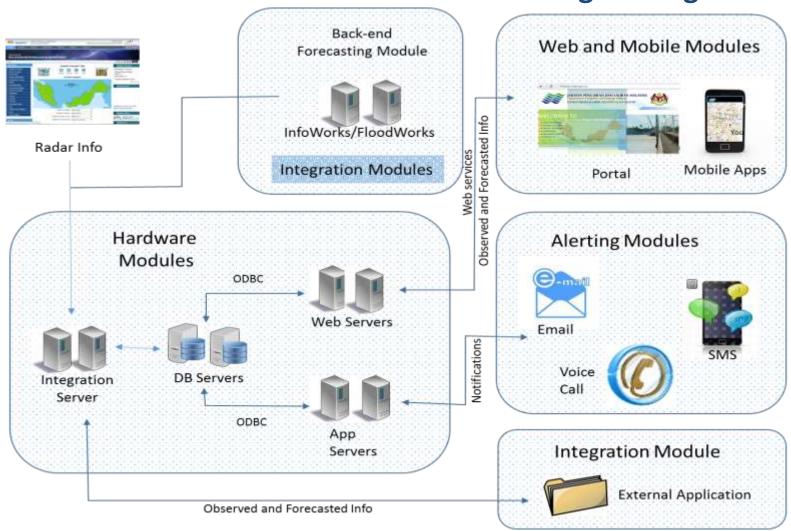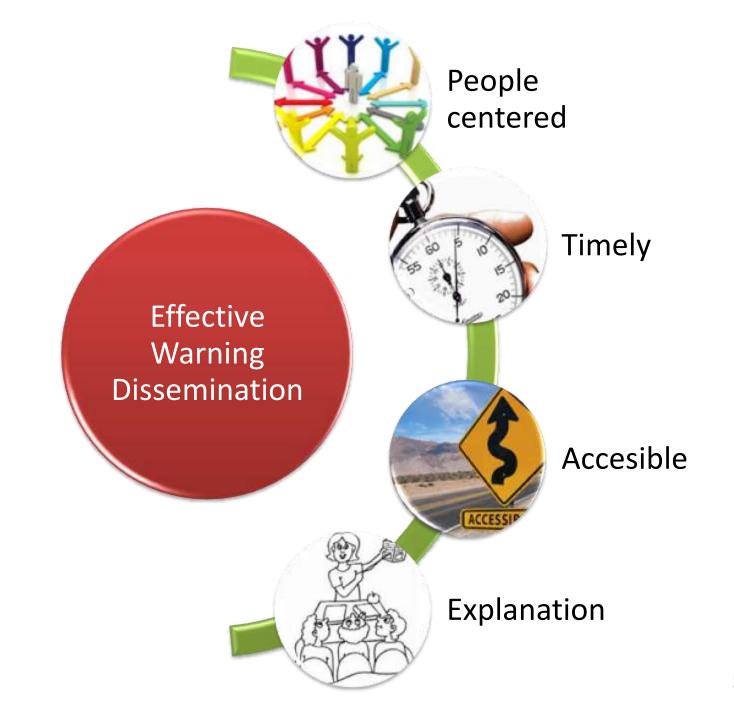
Data input : Real time telemetry data
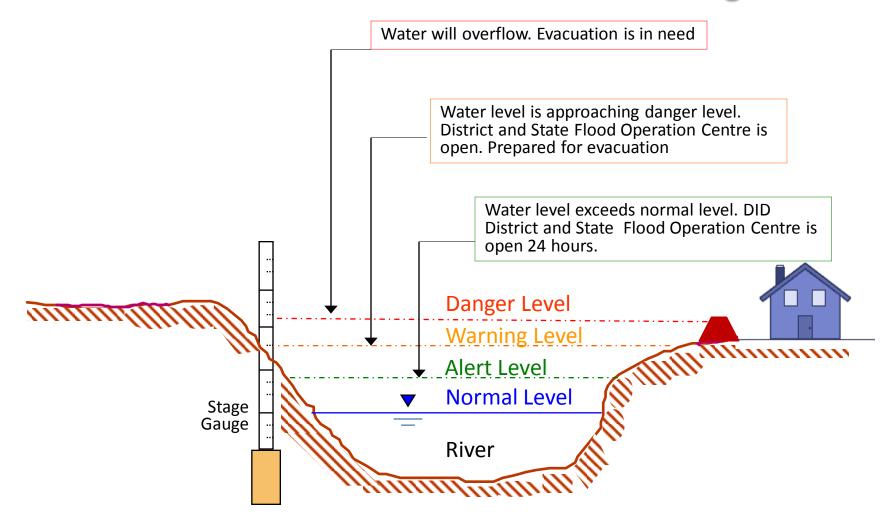
Model used :
- Hydrological and Hydrodynamic Analysis :Infoworks
- Flood monitoring & forecast : FloodWorks

Flood Warning Systems

Construction and dissemination of warning messages

People centered

Effective Warning Dissemination

Timely

Accesible

Explanation

Water Level Classification at Flood Warning Centre

Water will overflow. Evacuation is in need

Water level is approaching danger level. District and State Flood Operation Centre is open. Prepared for evacuation

Water level exceeds normal level. DID District and State Flood Operation Centre is open 24 hours.

Danger Level

Warning Level

Alert Level

Normal Level

Stage Gauge

River

Flood Warning Dissemination System

Through

Siren

www.publicinfobanjir.water.gov.my

www.facebook.com/pages/PublicInfoBanjir

Siren Station Inventory
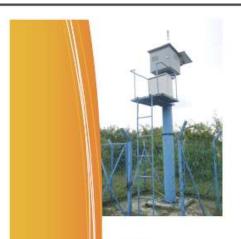
Region	No. of Sirens
North	93
West	110
East Coast	112
East Malaysia	121
TOTAL	**436**

Dual tone system:-

First siren – when WL reach warning level
Second siren – when WL exceed danger level

SIREN BERANGKAI RFID

SIREN BERANGKAI RFID

OBJEKTIF

- Memberi Amaran Awal Banjir yang mudah difahami secara menyeluruh kepada penduduk setempat menerusi siren berangkai RFID.
- Memaparkan aras air semasa, amaran dan bahaya melalui Papan Amaran Banjir yang diletakkan di tempat strategik serta mudah dilihat oleh orang awam.
- Menyediakan kemudahan pemantauan online kepada pegawai JPS dan sebaran SMS Amaran Banjir.

Teknologi Siren Banjir Ditambahbaik

INOVASI SELESAIKAN MASALAH KAMI

Sistem siren telah digunakan secara meluas sebagai sistem amaran banjir di Malaysia. Akan tetapi lokasi dimana siren ini ditempatkan berhampiran tebing sungai yang mudah ditenggelami air tidaklah begitu strategik bagi penduduk yang berjauhan daripada sistem siren ini yang berisiko dinaiki air. Ini kerana bunyi siren tidak akan didengari oleh penduduk tersebut.

Bagi penduduk yang berdekatan dengan siren ini pula, bunyinya terlalu kuat. Maka untuk mengatasi masalah ini, teknologi Radio Frequency indentification (RFID) diperkenalkan.

Sebaran amaran awal banjir kini diperluas

CARA-CARA RFID BERFUNGSI

Data yang tersimpan di dalam mikrocip RFID tag menunggu untuk dibaca.Tag Antena menerima tenaga electromagnet daripada antena pembaca RFID. Dengan menggunakan kuasa bateri atau kuasa daripada medan electromagnet, tag ini menghantar gelombang radio kembali kepada pembaca. Pembaca mengambil gelombang radio daripada tag dan mentafsir frekuensi sebagai data yang bermakna.

KONSEP SIREN BERANGKAI RFID

Dengan menggunakan RFID, liputan sebaran amaran banjir diperluas mengikut keperluan.

KONFIGURASI SISTEM SIREN BERANGKAI RFID

RFID UNTUK SIREN AMARAN BANJIR

Terdiri daripada Stesen Master, Sub Siren dan Papan Amaran Banjir yang dipasang di kawasan berisiko banjir. Dengan menggunakan RFID, data yang dicerap oleh Stesen Master akan dihantar ke Sub-Sub Stesen. Sub stesen boleh diperluas dalam lingkungan 10km dari Stesen Master.

Sebelum Inovasi

Selepas Inovasi

AMARAN SUARA

Memberikan amaran bunyi yang mudah difahami.
Aras Amaran: "Amaran, amaran. Sila jauhi kawasan sungai."
Aras Bahaya: "Bahaya, bahaya.Sila berpindah ke tempat selamat."

INDIKATOR VISUAL

Memaparkan aras melalui indikator warna.
Aras Normal: HIJAU
Aras Amaran: KUNING
Aras Bahaya: MERAH

ARAS AIR SEMASA

Memaparkan aras air semasa sungai berhampiran.

PEMANTAUAN ADMIN

Pemantauan admin secara online.

SEBARAN SMS

Sebaran SMS Amaran Banjir kepada pegawai JPS dan penduduk terlibat.

JABATAN PENGAIRAN DAN SALIRAN MALAYSIA
STESEN SIREN AMARAN AWAL BANJIR

STESEN ID :

LAT : N02.57564

LONG : E102.61515

BAHAGIAN PENGURUSAN SUMBER AIR DAN HIDROLOGI
NO. TEL : 03-42895400

JABATAN PENGAIRAN DAN SALIRAN NEGERI SEMBILAN
NO. TEL : 06-7625957

STATUS SEMASA

NORMAL

AMARAN (Paras :   Meter)

BAHAYA (Paras :   Meter)

PARAS SEMASA

2 00   METER

S AMARAN = Aras sungai menghampiri Aras Banjir (1-2m) dan Bilik Operasi Banjir JPS Daerah (DO) d
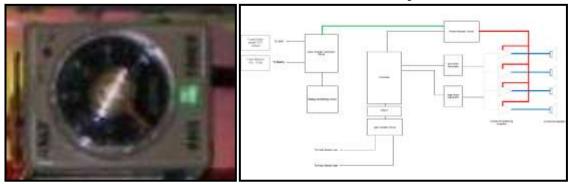JPS Negeri (SUK) dibuka. Bersedia untuk perpindahan.

BAHAYA = Aras sungai melimpah dan boleh menyebabkan banjir. Perpindahan perlu dilaksanakan.

JPS CARELINE : 1-300-80-1010

Continuous Siren System Enhancement

- Improved Power Management – incorporate self timer to enable standby mode

- Robust and low maintenance sensor

Belon beri amaran banjir

» Teknologi baru diperkenal JPS, DBKL kesan paras air sungai

Oleh Halina Mohd Noor
halina_mdnoor@bh.com.my

► Kuala Lumpur

Malaysia melangkah setapak lagi dalam kemajuan teknologi apabila memperkenalkan teknologi belon untuk digunakan sebagai alat awal amaran banjir.

Bagi tujuan itu, Sungai Batu di Kampung Kasipillay, Jalan Ipoh di sini, menjadi sungai pertama di negara ini dan di dunia, menggunakan teknologi belon gergasi sebagai amaran banjir.

Teknologi dengan kos RM120,000 itu diperkenalkan Dewan Bandaraya Kuala Lumpur (DBKL) dengan kerjasama Jabatan Pengairan dan Saliran Malaysia (JPS) bagi memberi amaran awal sebelum berlaku banjir kilat yang sering melanda kampung itu.

Pengesan yang dipasang oleh JPS dan diletakkan di tebing sungai mampu mengesan kenaikan paras air pada paras bahaya sebelum siren amaran berbunyi.

Belon yang diletakkan di tebing sungai akan naik ke udara setinggi 50 meter pada paras bahaya dan terus naik sehingga 70 meter apabila paras air mencapai tahap kritikal.

Sebar amaran lebih cepat

Datuk Bandar Kuala Lumpur, Datuk Seri Ahmad Phesal Talib, berkata teknologi itu akan diselaraskan dengan bilik gerakan banjir DBKL yang akan bertindak dalam tempoh setengah jam selepas amaran diterima.

"DBKL dan JPS yakin belon amaran banjir ini dapat membantu penduduk sekitar mengenai banjir dengan lebih cepat dan merangkumi semua kawasan sasaran.

"Selain bunyi siren, belon gergasi ini juga dilengkapi lampu dan papan papan LED amaran banjir yang berkelip bagi memudahkan penduduk melihat dari jauh dan pada waktu malam," katanya selepas melancarkan belon berkenaan di sini, semalam.

> **DBKL dan JPS yakin belon amaran banjir ini dapat membantu penduduk sekitar mengenai banjir dengan lebih cepat dan merangkumi semua kawasan sasaran"**
>
> **Ahmad Phesal Talib,**
> *Datuk Bandar Kuala Lumpur*

Hadir sama, Ketua Pengarah Pengairan dan Saliran Malaysia, Datuk Ir Ahmad Husaini Sulaiman.

Guna di kawasan berisiko

Ahmad Phesal berkata teknologi yang dicipta oleh Kumpulan Inovatif dan Kreatif (KIK) Pilot DBKL yang memenangi Anugerah Idea Inovasi 2012 itu juga akan digunakan di kawasan lain yang sering dilanda banjir.

Antara kawasan terbabit adalah di Sungai Bunus, Jalan Tun Razak dan di Segambut Bahagia.

Beliau berkata, DBKL juga sudah membuat permohonan untuk pendaftaran paten teknologi itu kepada Perbadanan Harta Intelek.

Sementara itu, Ahmad Husaini berkata pihaknya menjalankan kerja pengorekan pasir mendap dalam sungai berkenaan secara berterusan bagi mengelak banjir di kawasan sekitarnya.

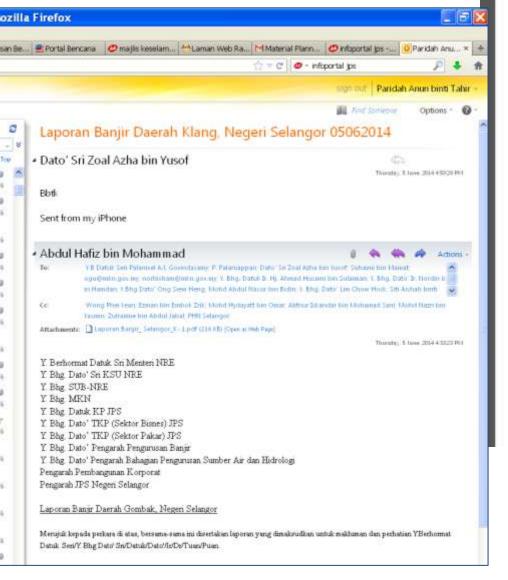"JPS akan bekerjasama dengan DBKL untuk menjalankan kerja penyelenggaraan secara berjadual bagi memastikan sistem amaran ini sentiasa berada dalam keadaan baik," katanya.

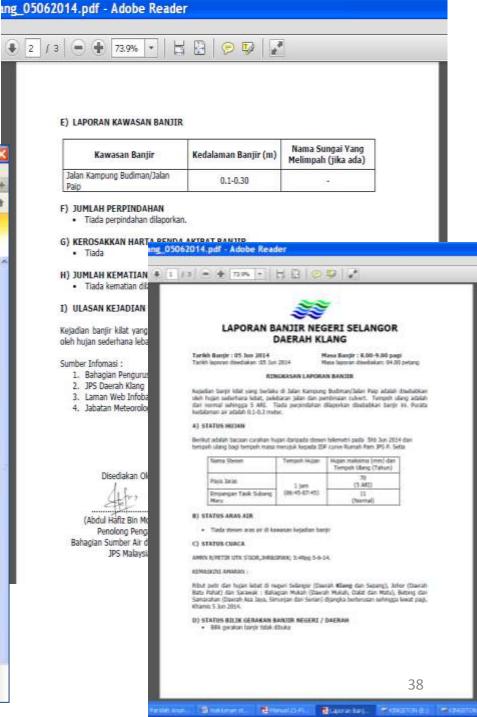*Ahmad Phesal (dua dari kanan) bersama Ahmad Husaini (kanan) ketika melancarkan Belon Amaran Banjir di Kampung Kasipillay, semalam.* [FOTO ABDULLAH YUSOF/BH]

Belon amaran banjir untuk Kampung Kasipilay

DBKL lancar belo...

Tarikh Pelancaran 13/12/2013

Flood Report

ang_05062014.pdf - Adobe Reader

2 / 3   73.9%

E) LAPORAN KAWASAN BANJIR

Kawasan Banjir	Kedalaman Banjir (m)	Nama Sungai Yang Melimpah (jika ada)
Jalan Kampung Budiman/Jalan Paip	0.1-0.30	-

F) JUMLAH PERPINDAHAN
- Tiada perpindahan dilaporkan.

G) KEROSAKKAN HARTA BENDA AKIBAT BANJIR
- Tiada

H) JUMLAH KEMATIAN
- Tiada kematian di

I) ULASAN KEJADIAN

Kejadian banjir kilat yang
oleh hujan sederhana leba

Sumber Infomasi :
1. Bahagian Pengurus
2. JPS Daerah Klang
3. Laman Web Infoba
4. Jabatan Meteorolo

Disediakan Ol

(Abdul Hafiz Bin Mo
Penolong Peng
Bahagian Sumber Air d
JPS Malaysi

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ozilla Firefox

san Be... Portal Bencana | majlis keselam... | Laman Web Ra... | Material Plann... | infoportal jps -... | Paridah Anu... x +

infoportal jps

sign out | Paridah Anun binti Tahir

Find Someone | Options

Laporan Banjir Daerah Klang, Negeri Selangor 05062014

- Dato' Sri Zoal Azha bin Yusof

Thursday, 5 June 2014 4:59:29 PM

Bbtk

Sent from my iPhone

- Abdul Hafiz bin Mohammad

Actions

To: Y.B Datuk Seri Palanivel A.L Govindasamy; P. Palaniappan; Dato' Sri Zoal Azha bin Yusof; Suhaimi bin Hamat; agu@win.gov.my; nordiniham@win.gov.my; Y. Bhg. Datuk Ir. Hj. Ahmad Husaini bin Sulaiman; Y. Bhg. Dato' Ir. Nordin b in Hamdan; t.Bhg Dato' Ong Siew Heng; Mohd Abdul Nasar bin Bidin; Y. Bhg. Dato' Lim Chow Hock; Siti Aishah binti

Cc: Wong Phee Yean; Ezman bin Embok Zin; Mohd Hydayatt bin Omar; Akhmar Iskandar bin Mohamad Sani; Mohd Nazri bin Yasmin; Zulraimie bin Abdul Jabat; PHRI Selangor

Attachments: Laporan Banjir_Selangor_E - 1.pdf (216 KB) [Open as Web Page]

Thursday, 5 June 2014 4:53:23 PM

Y. Berhormat Datuk Sri Menteri NRE
Y. Bhg. Dato' Sri KSU NRE
Y. Bhg. SUB-NRE
Y. Bhg. MKN
Y. Bhg. Datuk KP JPS
Y. Bhg. Dato' TKP (Sektor Bisnes) JPS
Y. Bhg. Dato' TKP (Sektor Pakar) JPS
Y. Bhg. Dato' Pengarah Pengurusan Banjir
Y. Bhg. Dato' Pengarah Bahagian Pengurusan Sumber Air dan Hidrologi
Pengarah Pembangunan Korporat
Pengarah JPS Negeri Selangor

Laporan Banjir Daerah Gombak, Negeri Selangor

Merujuk kepada perkara di atas, bersama-sama ini disertakan laporan yang dimaksudkan untuk makluman dan pechatian YBerhormat Datuk Seri/Y. Bhg Dato' Sri/Datuk/Dato'/Ir/Dr/Tuan/Puan.

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ang_05062014.pdf - Adobe Reader

1 / 3   73%

LAPORAN BANJIR NEGERI SELANGOR
DAERAH KLANG

Tarikh Banjir : 05 Jun 2014
Tarikh laporan disediakan :05 Jun 2014

Masa Banjir : 8.00-9.00 pagi
Masa laporan disediakan: 04.00 petang

RINGKASAN LAPORAN BANJIR

Kejadian banjir kilat yang berlaku di Jalan Kampung Budiman/Jalan Paip adalah disebabkan oleh hujan sederhana lebat, pelebaran jalan dan pembinaan culvert. Tempoh ulang adalah dari normal sehingga 5 ARI. Tiada perpindahan dilaporkan disebabkan banjir ini. Purata kedalaman air adalah 0.1-0.3 meter.

A) STATUS HUJAN

Berikut adalah bacaan curahan hujan daripada stesen telemetri pada 5th Jun 2014 dan tempoh ulang bagi tempoh masa merujuk kepada IDF curve Rumah Pam JPS-P. Serta

Nama Stesen	Tempoh Hujan	Hujan maksima (mm) dan Tempoh Ulang (Tahun)
Paya Jaras	1 jam (06:45-07:45)	78 (5 ARI)
Empangan Tasik Subang Mewa		11 (Normal)

B) STATUS ARAS AIR
- Tiada stesen aras air di kawasan kejadian banjir

C) STATUS CUACA

AMRN R/PETIR UTA S'GOR,SHRI&SRWK; 5:49pg 5-6-14.

KEMASKINI AMARAN :

Ribut petir dan hujan lebat di negeri Selangor (Daerah Klang dan Sepang), Johor (Daerah Batu Pahat) dan Sarawak : Bahagian Mukah (Daerah Mukah, Dalat dan Matu), Betong dan Samarahan (Daerah Asa Jaya, Simunjan dan Serian) dijangka berterusan sehingga lewat pagi, Khamis 5 Jun 2014.

D) STATUS BILIK GERAKAN BANJIR NEGERI / DAERAH
- BBK gerakan banjir tidak dibuka

38

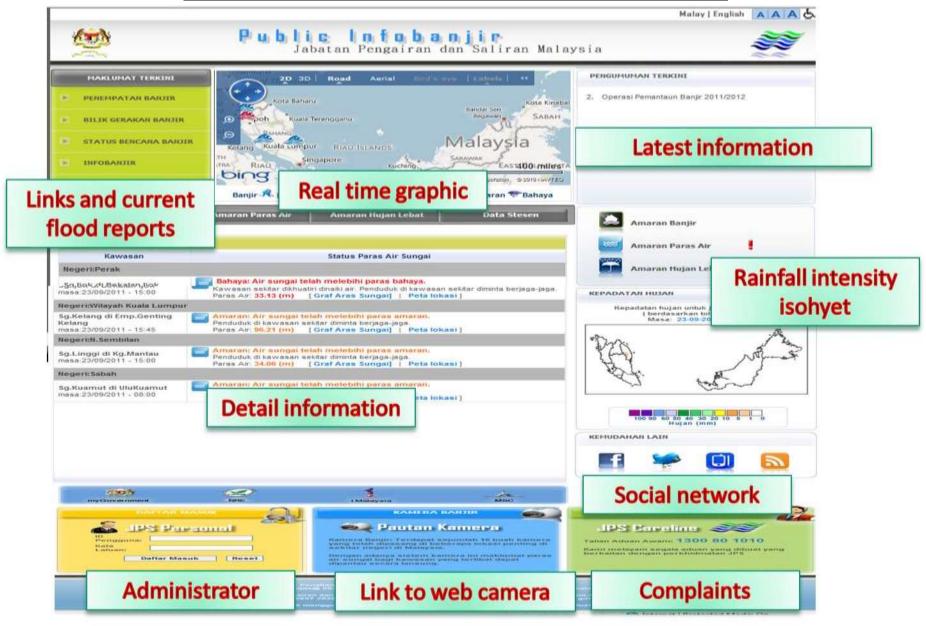Paridah Anun... | Dokumen of... | Manual 2S-FL... | Laporan Banj... | KINGSTON (E:) | KINGSTON
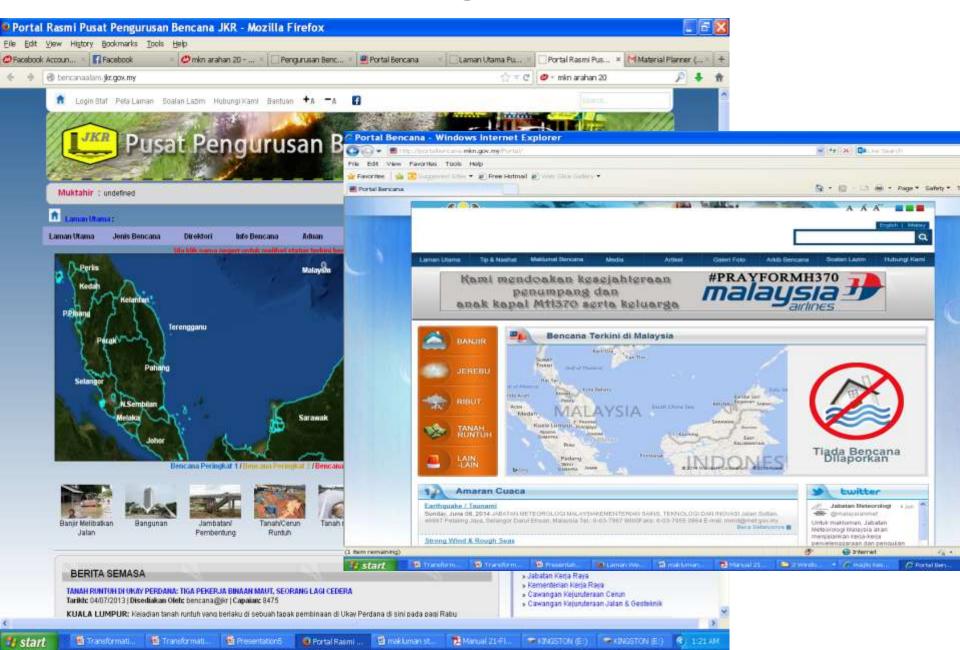
Homepage for the public - 'Infobanjir Awam'
http://publicinfobanjir.water.gov.my

Flood Warning Portals

Social network - facebook page 'PublicInfoBanjir'
http://www.facebook.com/pages/PublicInfoBanjir

Social network - facebook page 'PublicInfoBanjir'
http://www.facebook.com/pages/PublicInfoBanjir

Starting 2012, DID has committed to update river water level in flooding areas to RTM four (4) times daily, during flood events in the interest to deliver the flood status to the public. The river water level is displayed during prime time news.

The way forward - Integration of Flood dissemination systems

Web Portal

- Rainfall and Water Level over google map
- Tabular Rainfall and Water Level display
- Hydrograph and hyetograph
- Database query (historical)

Alerting System

- SMS
  - Automatic and manual notification
  - Group notification
  - Ad-hoc notification
  - Notification configuration
- E-mail
  - Automatic and manual notification
  - Group and ad-hoc notification
  - Admin verification
  - Notification configuration
- Voice
  - Text-to-speech conversion
  - Auto call out
  - Play the warning message/s

DMSS

Mobile Apps

- Android and iOS
- Google map integration
- Warning
- Location based warning
- SOS notification / panic button
- Social media

Integration

- Accept raw data from forecasting system
- Design integration to external system
- Prepare data for external system use
- Provide data for external system use

1. Real-time meteorological and hydrological data are extremely important in improving flood forecasting and warning system in Malaysia. Close coordination between DID and MetMalaysia is crucial for data sharing.
2. Coupling of NWP and hydrodynamic models to improve lead time in warning dissemination.
3. Improve warning dissemination to the public via mobile applications.

Flood Forecasters' Nightmare

River flood unlikely..

But flooding has occurred!

Thank you

By;
Paridah Anun bt Tahir
Department of Irrigation and Drainage
Malaysia
June 9th, 2014

Picture Source : Google

Human And Economic Impact By Disaster Types
(2013 versus average 2003-2012)

Flood

	2013	2003-2012
Occurrence	145	172
Killed	9 545	5 689
Affected	95 349 145	106 139 202
Damage (in US$ billion)	115.87	25.35

Total

	2013	2003-2012
Occurrence	315	373
Killed	22 279	106 597
Affected	95 349 145	190 980 943
Damage (in US$ billion)	115.87	141.77

* TOTAL DISASTER INCLUDE –

Flood, Storm, Earthquake, Extreme Temperature, Mass Movement Wet, Drought, Wild Fires, Volcano, and Mass Movement Dry

Source of data: EM-DAT (March 2014) : The OFDA/CRED - International Disaster Database www.emdat.be Université **catholique de Louvain Brussels - Belgium**

Evolution of flood forecasting- After 1971

- **Sacramento Model (1973)**

- **Sugawara's Tank Model (1981 to date)**

- **Linear Transfer Function Model (1986)**

- **Flash-Flood Forecasting Model (1979 - 1985)**

- **Hydrodynamic Models (2001 to date)**