

MALAYSIA WATER RESOURCES MANAGEMENT FORUM 2012

“Time for Solutions”

26 & 27 NOVEMBER 2012

Living with Flood

by :

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contents

- Background
- Living with Floods – what is it, why and what is being done
- conclusion



Flooding

- Our landscape has been formed over thousand of years by natural processes such as floods
- Flooding - rare event, not always possible to predict when, where or how big next flood will be
- Flood plains are flood ROW encroached by man



Flood Events in Malaysia



RECENT FLOODS: 2006/7

(JOHOR, KELANTAN, PAHANG, SABAH)



PITAS, SABAH, JAN 15: The village mosque in Pitas, the interiors of Sabah, is also affected by the flood.



PITAS, SABAH, JAN 15: Flood situation in Pitas, one of the poorest districts in the interior of Sabah.



Kuantan, Pahang, Jan 15: Deputy Prime Minister Datuk Seri Najib Razak surveying the situation in Kampung Kurnia in Rompin. Most areas in Rompin are now under water. NST pix by Nordin Abdullah.



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.



Kluang, Johor, Jan 15: The access road to Kampung Seri Cahaya has collapsed due to the continuous rain. NST pix by Amran Hamid.



Kota Tinggi, Johor, Jan 14: These houses in Taman Kota Jaya are not spared by the floodwaters. NST pix by Zain Ahmed.



Kota Tinggi, Johor, Jan 14: Sekolah Kebangsaan Bandar is one of the five schools in the district submerged by floodwaters. NST pix by Ahmad Bahri



Kota Tinggi, Johor, Jan 14: The half-visible bridge over Sungai Johor in the middle of the town leads to the Kota Tinggi Hospital. NST pix Ahmad Bahri Mardi.



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

RECENT FLOODS: 2010 (KEDAH, PERLIS)

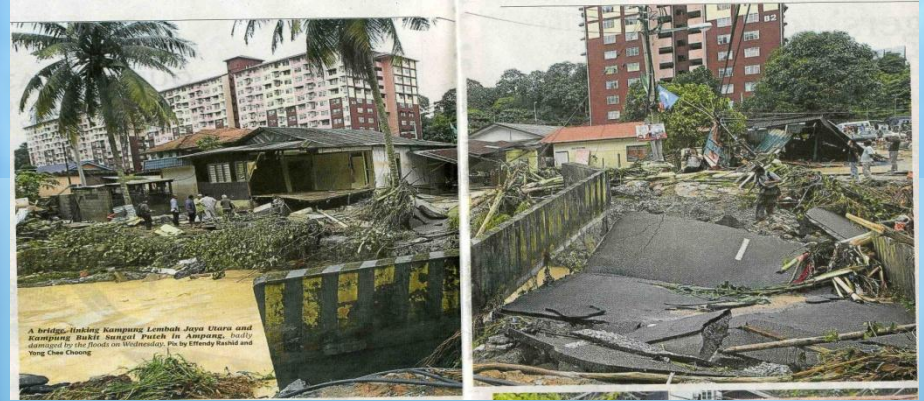


RECENT FLOODS: 2012 (Klang Valley)



07.03.2012 21.50

Jalan Dang Wangi



A bridge-linking Kampong Lembah Jaya Utara and Kampong Bahru, Ampang, Kuala Lumpur, was damaged for the floods on Wednesday. Pic by Effendy Rashid and Yong Chee Cheong

Lembah Jaya Utara, Ampang



07.03.2012 21.41

Sg. Klang di Jalan Tun Perak



08/03/2012 16:22

Flood Mark at Kg Lembah Jaya Utara, Ampang

Floods - the big picture

- **The good**

- Fertilise the soil
- Rejuvenates ecosystem
- recharge groundwater and aquifers

- **The bad**

- Risk to lives, cause human trauma
- Financial/ Economic loss/damage
- Disrupt services
- Billions of RM spent on flood control



Flood Statistics 2005-2011

Year Detail	2005	2006	2007*	2008*	2009*	2010	2011
STATE	SABAH PERLIS KEDAH PERAK KELANTAN TR'GANU PAHANG	JOHOR MELAKA N.SEMBILAN SELANGOR PAHANG TR'GANU KELANTAN SABAH SARAWAK	JOHOR PAHANG KELANTAN N.SEMBILAN KEDAH TR'GANU PERAK SARAWAK	PAHANG KELANTAN TR'GANU MELAKA JOHOR KEDAH PERAK SARAWAK	PERLIS KEDAH PERAK KELANTAN TR'GANU PAHANG JOHOR SABAH SARAWAK	PERLIS KEDAH KELANTAN TR'GANU JOHOR MELAKA NEGERI SEMBILAN PAHANG SABAH SARAWAK	PERLIS PERAK SELANGOR MELAKA JOHOR KELANTAN TR'GANU PAHANG SABAH SARAWAK
EVACUATION CENTER	N/A	687	616	365	773	906	307
FAMILY	26,300	32,129	21,451	8216	18,321	57,094	7,782
VICTIMS	100,815	148,868	91,575	37,421	80,036	231,377	33,876
CASUALTIES	17	18	33	7	4	21	8

* Source: Social and Welfare Department (JKM)

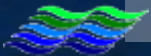
Flood Mitigation Projects

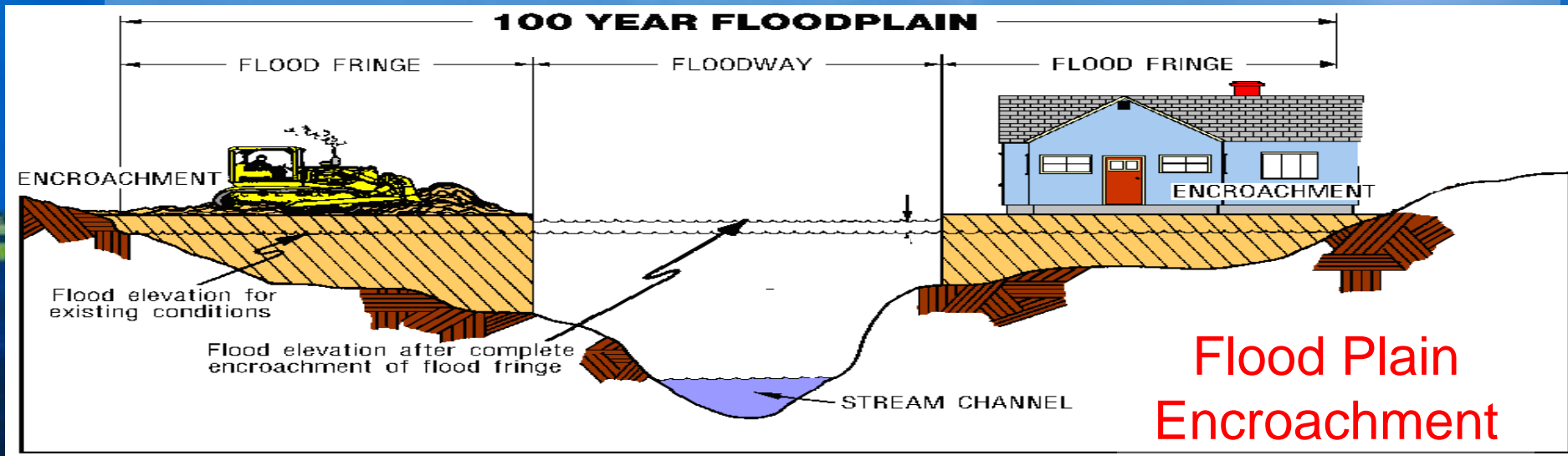
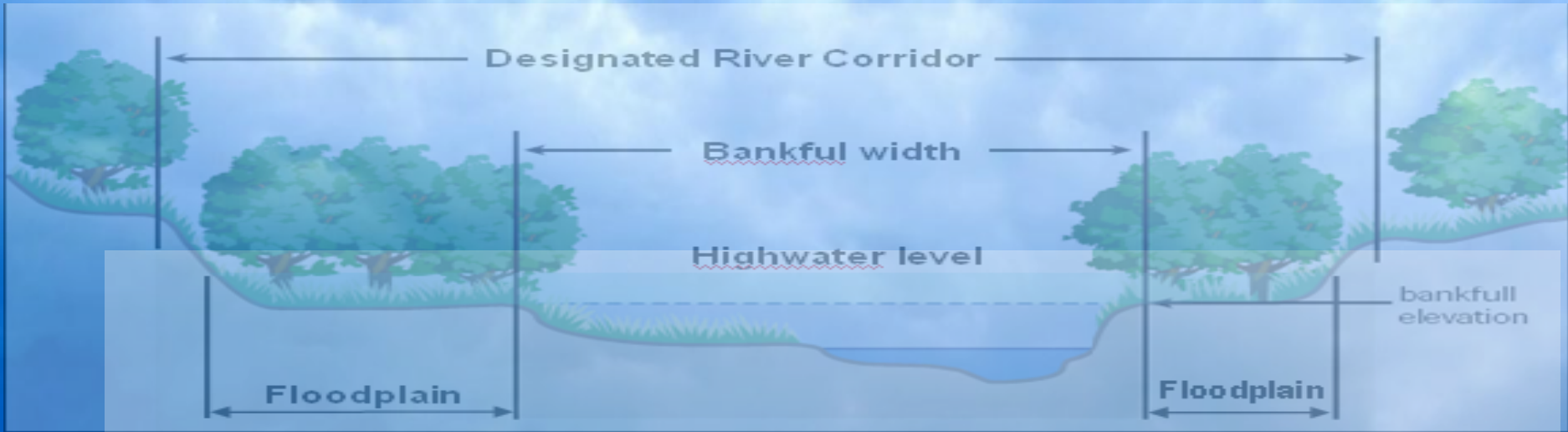
- **Malaysia Plan 2-8** **RM4.30 billion**
- **Malaysia Plan 9** **RM7.60 billion**
- **Malaysia Plan 10** **RM2.10 billion**
(2011&2012)



Human interventions have worsen flooding situations

- **Human activity influences the frequency and severity of floods.**
- **Extensive land clearing for agriculture**
- **Loss of flood plain/wetlands**
- **Encroachment into flood plains**





**Flood Plain
Encroachment**

‘Living with floods’

- recognizes that it is **not** possible to **completely eliminate** floods
 - Climate change
 - Design limitations
- their negative impacts can be **reduced** through an understanding of flood risks and by working towards modifying this risk-generation process in a holistic manner
- Presented to MSAN 2011

Integrated Flood Management (IFM) - a holistic, risk-based approach to flood management

- Aims at reducing the human and socio-economic losses
- Integrates land and water resources development
- Includes the institutional components of flood management and
- Recognizes the stakeholder participation and cultural diversity.



'Living with floods'

- Flood Mapping and Risk Assessment
- Policy and guidelines
- Improve public awareness and preparedness
 - Warning and forecasting
 - Capacity building and awareness programmes
- Preserve wetlands/water bodies

FLOOD MAPPING



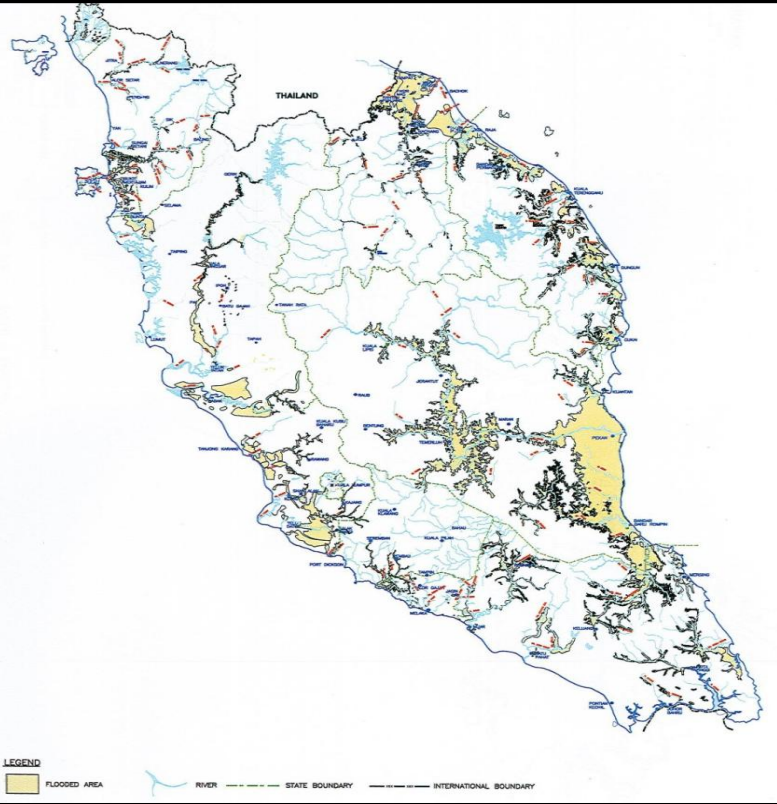
- i. *Inundation Map (historical events)*
- ii. *Flood Hazard Map (modelling, extent, depth)*
- iii. *Flood Risk Map (high, medium or low; dependant on input)*

>>> National Flood Maps

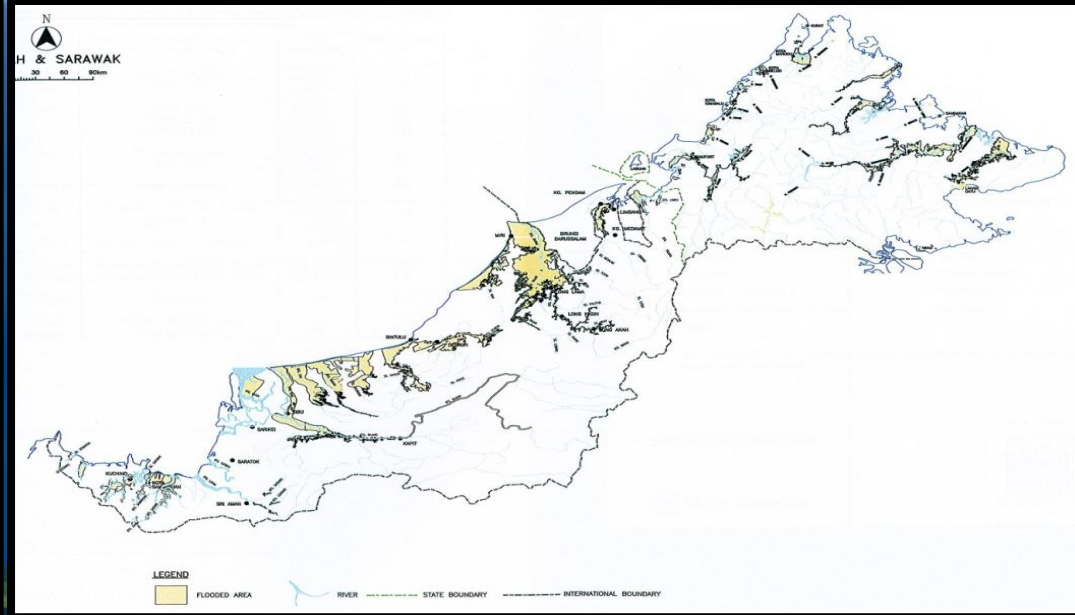


INUNDATION MAP

- Reported flood-affected areas in Malaysia up to the year 2000



Peninsular Malaysia

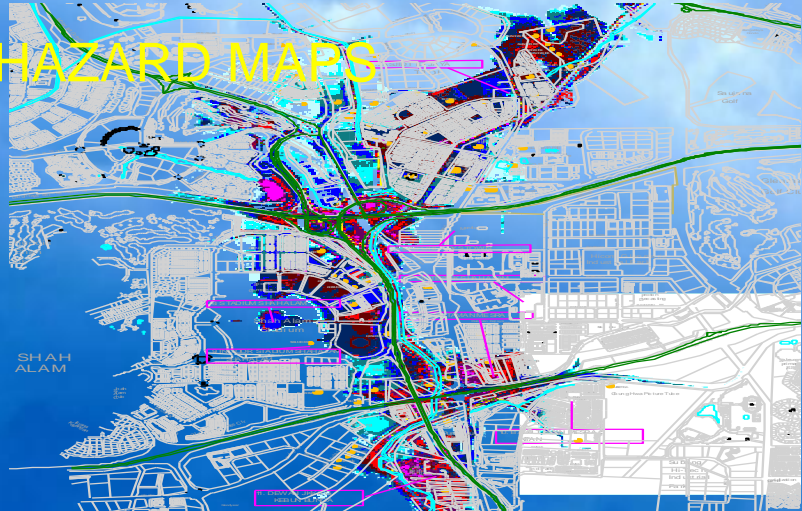


Sabah and Sarawak

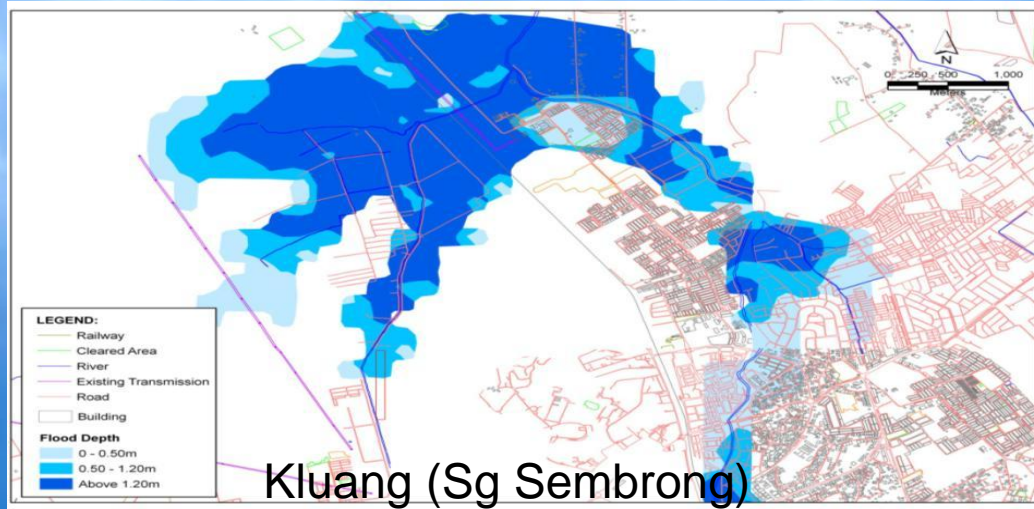
- Total Flood-affected area : 29,799 km² (9%)
- No of people affected : 4.819 million ~ 22% of the total 22.2 million population in Malaysia

(Source: National Register of River Basin., 2003)

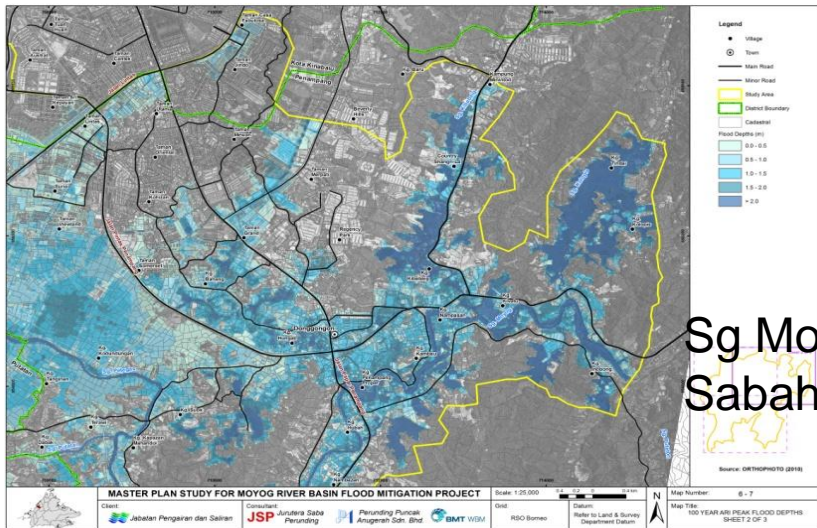
HAZARD MAPS



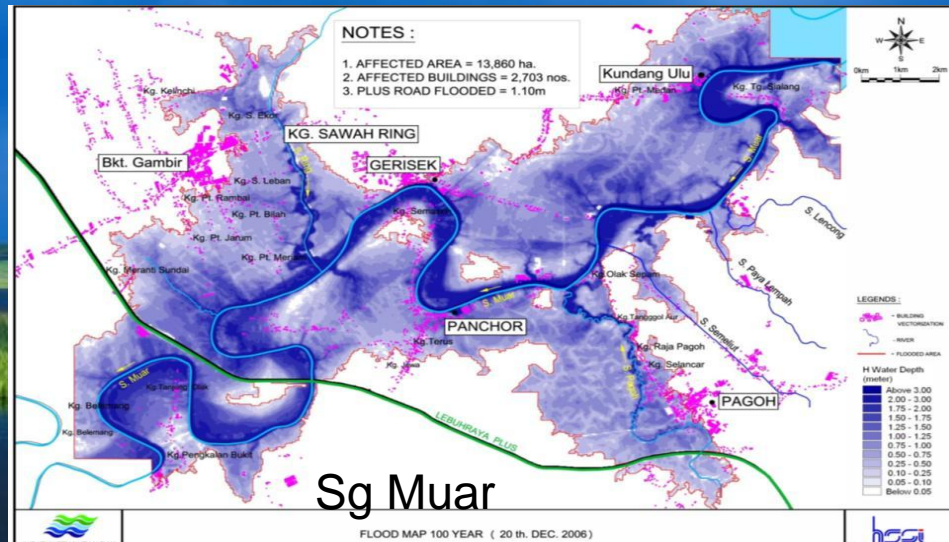
Shah Alam (Sg Damansara)



Kluang (Sg Sembrong)



Sg Moyog Sabah



Sg Muar

Usage

- Flood Risk Management Strategies
 - Planning of management measures
 - Delineation of storage zones
 - Evaluation
- Land-use planning
 - Allocation of lands for development
- Planning of public infrastructures
- Emergency planning
 - Planning of evacuation centres
 - Evacuation / access routes
 - Road closures
- Public awareness
 - Local information
- Private sector
 - insurance

FLOOD EVACUATION PLAN (SUNGAI JOHOR)

KG. TENGAH

KLUANG

PUSAT PENEMPATAN BANJIR

DAERAH KLUANG

FH ID	NAMA	JENIS
L1	SJK(C) Chin Chiang, Jln Hj Siraj, Renggam	Sekolah
L2	Sek. Keb Pekan Layang-layang	Sekolah
L3	SMK Layang-layang	Sekolah
L4	SJK(C) Thorburn, Ldg Ulu Remis, Layang-layang	Sekolah
L5	SJK(C) Sayong, Kg Baru, Sayong	Sekolah
L6	Balai Polis Renggam	Balai Polis
L7	Balai Polis Layang-Layang	Balai Polis

DAERAH KOTA TINGGI

FH ID	NAMA	JENIS
K1	Sek Keb Sg Telor, Kg Sg Telor	Sekolah
K2	Sek Men Agama Bandar Tenggara, Bandar Tenggara	Sekolah
K3	Sek Agama Bandar Tenggara, Bandar Tenggara	Sekolah
K4	SMK Bandar Tenggara, Bandar Tenggara	Sekolah
K5	Sek Men Sains Kota Tinggi	Sekolah
K6	Sek Men Keb Agama Bandar Penawar	Sekolah
K7	Sek Men Keb Bandar Penawar	Sekolah
K8	Surau Kg Baru Sg Mas	Surau
K9	Surau Kg Semanggar Luar, Kg Semanggar	Surau
K10	Dewan Teratai BT4, Kg Sepak Hulu	Dewan
K11	Klinik Desa Kg. Semangar	Klinik
K12	Poliklinik Komuniti Bandar Tenggara	Klinik
K13	Poliklinik Komuniti Bandar Mas	Klinik
K14	Klinik Desa Sg. Sayong	Klinik

DAERAH JOHOR BAHRU

FH ID	NAMA	JENIS
J1	Balairaya REM, Kg Sg Berangan	Balairaya
J2	Sek Keb Nam Heng, Kg Sg Serai, Sg Tiram	Sekolah
J3	Dewan Raya Sg Tiram, Kg Sg Tiram	Dewan
J4	Balairaya Kg Paya Sg Redan, Kg Paya	Balairaya
J5	Balairaya Sg. Berangan, Kg Sg Berangan	Balairaya

Refer Figure Evacuation Map for Kota Tinggi Town

AGENSI BERKAITAN DAERAH JOHOR BAHRU

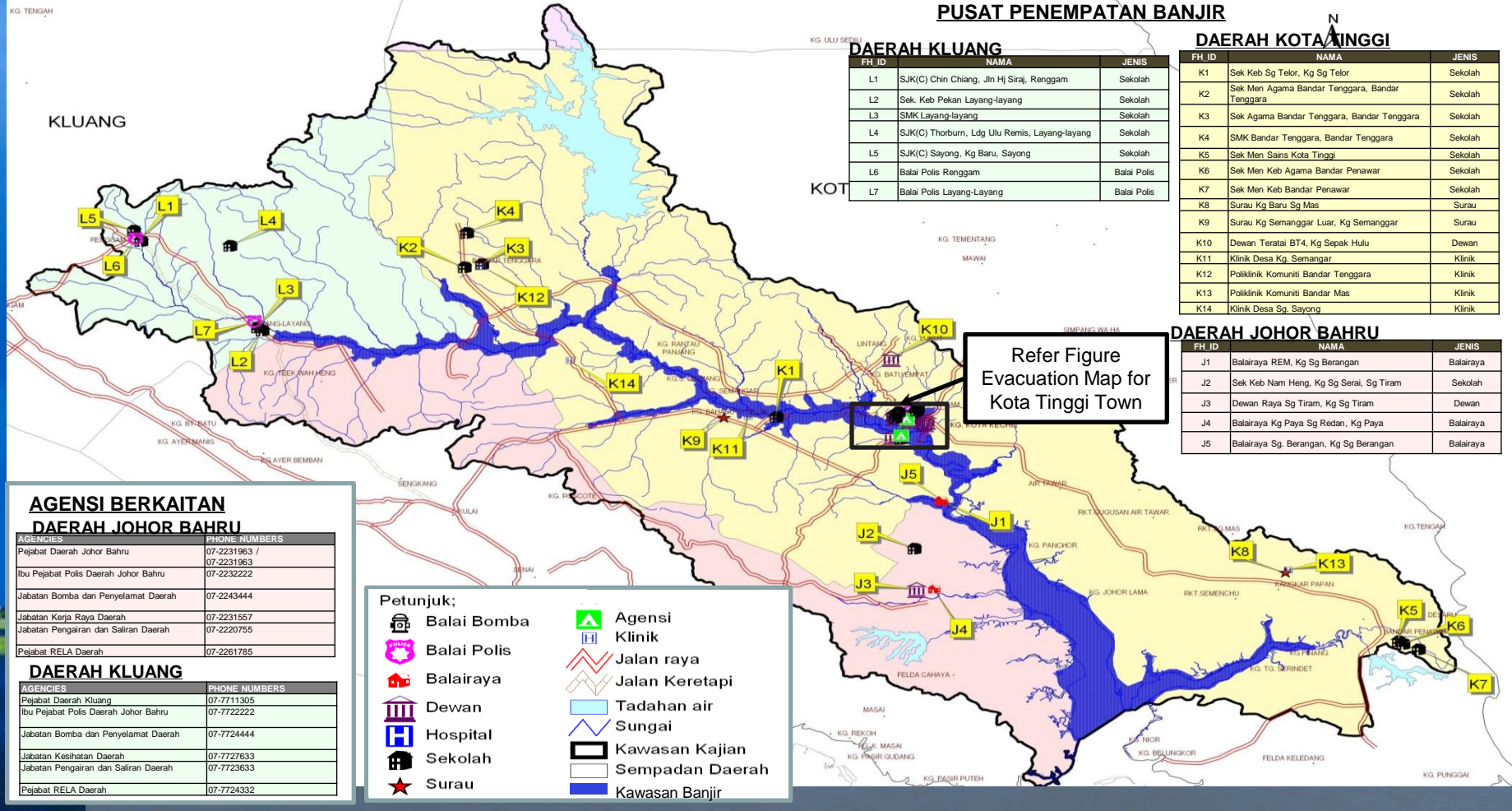
AGENSIS	PHONE NUMBERS
Pejabat Daerah Johor Bahru	07-2231963 / 07-2231963
Ibu Pejabat Polis Daerah Johor Bahru	07-2232222
Jabatan Bomba dan Penyelamat Daerah	07-2243444
Jabatan Kerja Raya Daerah	07-2231557
Jabatan Pengairan dan Saliran Daerah	07-2220755
Pejabat RELA Daerah	07-2261785

DAERAH KLUANG

AGENSIS	PHONE NUMBERS
Pejabat Daerah Kluang	07-7711305
Ibu Pejabat Polis Daerah Johor Bahru	07-7722222
Jabatan Bomba dan Penyelamat Daerah	07-7724444
Jabatan Kesihatan Daerah	07-7727633
Jabatan Pengairan dan Saliran Daerah	07-7723633
Pejabat RELA Daerah	07-7724332

Petunjuk;

-  Balai Bomba
-  Balai Polis
-  Balairaya
-  Dewan
-  Hospital
-  Sekolah
-  Surau
-  Agensi
-  Klinik
-  Jalan raya
-  Jalan Keretapi
-  Tadahan air
-  Sungai
-  Kawasan Kajian
-  Sempadan Daerah
-  Kawasan Banjir



FLOOD EVACUATION PLAN FOR KOTA TINGGI



Legend

- Fire Station
- Police Station
- Community Hall
- Hospital
- School
- Mosque
- Agency
- Clinic
- Road
- Railway

Water height Elevation Range

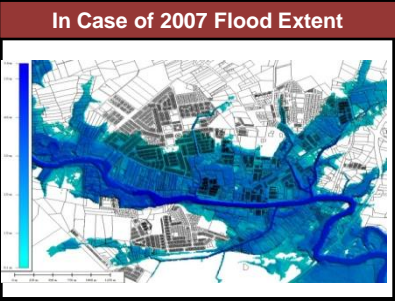
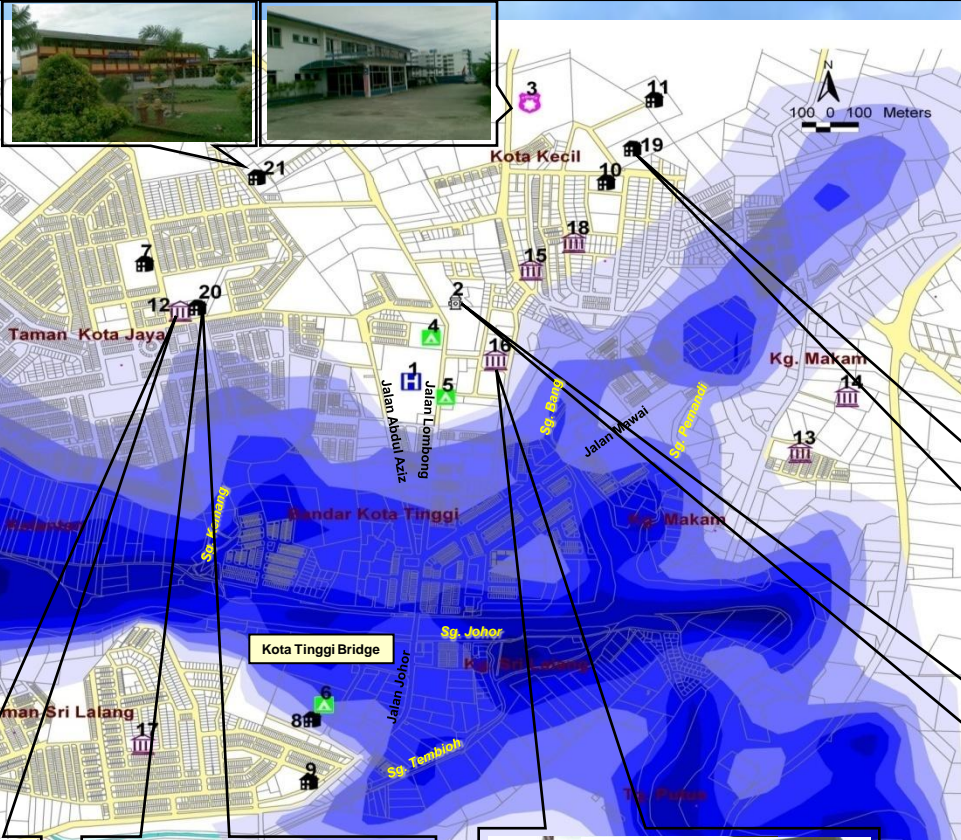
- 0.01 - 0.5
- 0.5 - 1.0
- 1 - 1.5
- 1.5 - 2.0
- 2 - 2.5
- 2.5 - 3.0
- More than 3.0m

Ketua Kampung

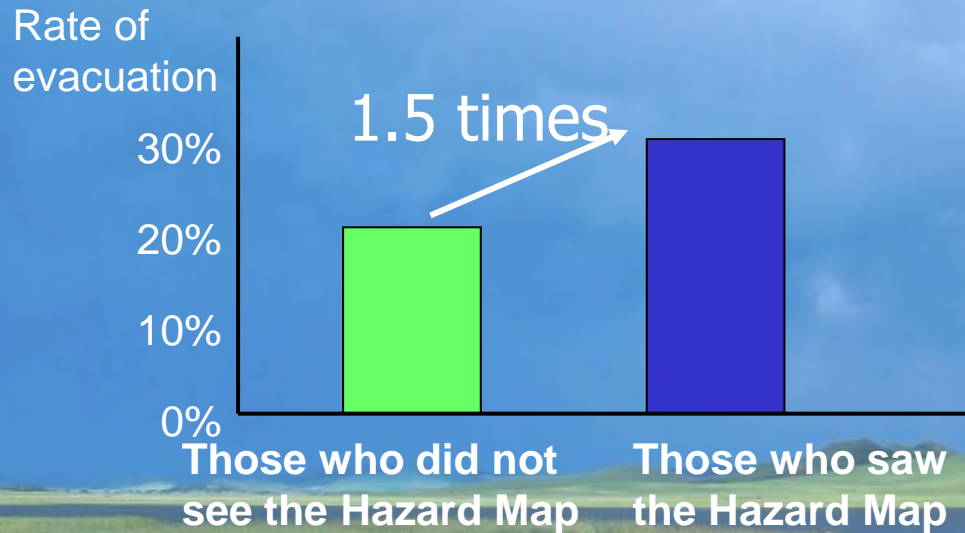
Your Evacuation Centre

Contact in Emergency

Fire Station	07-8831444
Police Station	07-8831222 07-8831223 07-8836733 07-8831221
Hospital	07-8831320
Disaster Operation Centre	
Flood Command Centre	07-8893122 07-8893123 07-8893124 07-8893125
Disaster Coordinating Council	
District Social Welfare Office	07-8835536



Rate of evacuation six hours after advice to evacuate



Source: "Survey Report on Local Residents' Reactions in the Rainstorm in Koriyama at the End of August 1998" Katada Laboratory, Faculty of Engineering, Gunma Univ.

Improved Flood Forecasting and warning

Atmospheric Model-Based Rainfall and Flood Forecasting (AMRFF)

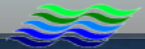
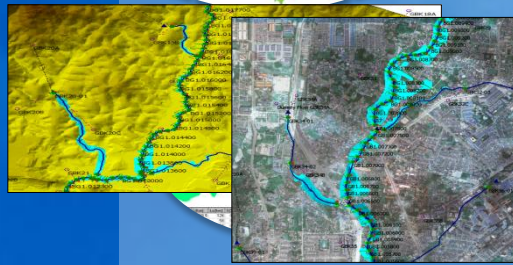
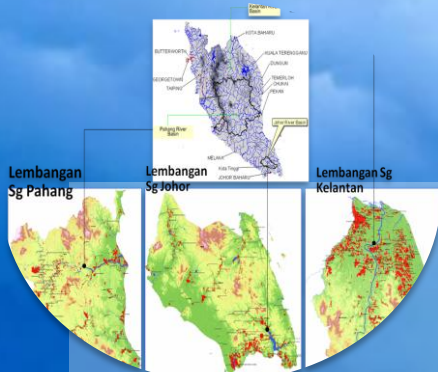
- 3 River Basins-> Pahang, Kelantan dan Johor
- **Objective:** to provide flood flow forecasting every 6 hours, with a 3 days lead-time, at hourly time increments.

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

- **Objective:** to give forecast for Klang River Basin 1 to 4 hours lead time.

Integrated Flood Forecasting and Warning System for Muda River Basin

- **Objective:** to provide flood flow forecasting every 6 hours, for Sg. Muda with a 2 days lead-time, at hourly time increments.



AWARENESS leads to BETTER PREPAREDNESS



Public InfoBanjir

Jabatan Pengairan dan Saliran Malaysia



MAKLUMAT TERKINI

- ▶ PENEMPATAN BANJIR
- ▶ BILIK GERAKAN BANJIR JPS
- ▶ STATUS KEJADIAN BANJIR
- ▶ INFOBANJIR (TEKNIKAL)
- ▶ JPS MALAYSIA



Banjir | Aras Air: Amaran | Bahaya | Hujan: Amaran | Bahaya

INFORMASI TERKINI

Jasin negeri MLK pada tarikh 05-11-2012.
[Maklumat Lanjut]

Amaran Banjir

Amaran Aras Air

Amaran Hujan Lebat

Ramalan Banjir

Data Stesen

Maklumat Banjir Terkini

Masa	Maklumat Banjir Terkini
Negeri: MELAKA	
Isnin, 05-Nov-2012 masa:10am	Amaran Banjir: Banjir telah dilaporkan berlaku di 'Kesang Barat di daerah Jasin' Penduduk di kawasan yang terlibat dan di kawasan sekitar diminta berjaga-jaga dan mengutamakan keselamatan.



Amaran Banjir



Amaran Aras Air



Amaran Hujan Lebat



Ramalan Banjir

PETA KEAMATAN HUJAN

-Manuals and Guidelines

Basement Car Parks

Item	Description	Alternative 1 (100-Yrs ARI Flood Level)	Alternative 2 (200-Yrs ARI Flood Level)
1	FPE Adopted At The Entrance /Exit Point of Basement Carpark	$FPE = CFL + 1m$	$FPE = CFL + 0.5m$
2	Allowable Maximum Flood Depth For Flood Proofing Measures for a new building	< 1m	< 1.5m
3	Allowable Maximum Flood Depth For Flood Proofing Measures for an existing building	Full Flood Depth Computed	Full Flood Depth Computed

Note : CFL - Computed Flood Level at the entrance / exit point of the basement carpark

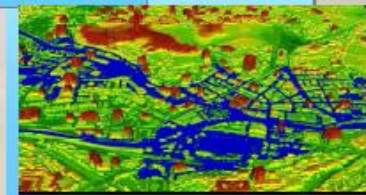


JABATAN PENGAIRAN DAN SALIRAN MALAYSIA



GUIDELINE ON FLOOD PREVENTION FOR BASEMENT CAR PARKS

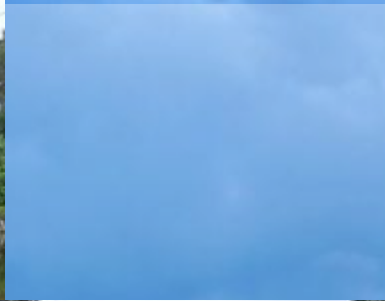
September 2006



-Manuals and Guidelines



Flood proofing



Houses on stilt

Flood proofing



Properties are built higher than flood level

Flood proofing



**Properties are built
higher than flood level**

Flood proofing



Properties are built higher than flood level

Flood proofing



Flood blocking panel

Flood awareness & preparedness

PROGRAM PENGURUSAN BANJIR BERSEPADU PERINGKAT KEBANGSAAN – PERANAN KOMUNITI



Organized by:



Jabatan Pengairan dan Saliran



Malaysian Water Partnership

Supported by:



Ministry of Health
Malaysia



Ministry of Education
Malaysia



Ministry of Natural Resources and Environmental Conservation
Malaysia



Ministry of Agriculture
Malaysia



Ministry of Home Affairs
Malaysia



Mercy Malaysia



SKM



ASPEC



Wetlands International

Emergency Kit Checklist	
	Portable radio <input type="checkbox"/>
	Flashlights <input type="checkbox"/>
	First-aid kit <input type="checkbox"/>
	Candles <input type="checkbox"/>
	Emergency food <input type="checkbox"/>
	Potable water <input type="checkbox"/>
	Cash and valuables <input type="checkbox"/>
	Ropes <input type="checkbox"/>

1. APABILA HUJAN LEBAT, SEGERA.....
 - a) DENGAR BERITA DI RADIO / TV
 - b) TENGOK HUJAN ITU LEBAT ATAU TIDAK
 - c) LARI KE BALAI POLIS, BALAI PENGHULU/UNTUK MENDAPATKAN BERITA SEBENAR

2. BILA MESTI PINDAH?
 - a) JAGA BERGILIR - GILIR 24 JAM.
 - b) PASANG RADIO / TV
 - c) KALAU SUDAH TERIMA BERITA BURUK, CEPAT BERTAHU! JIRAN DAN SAMA - SAMA PINDAH.





Preparedness

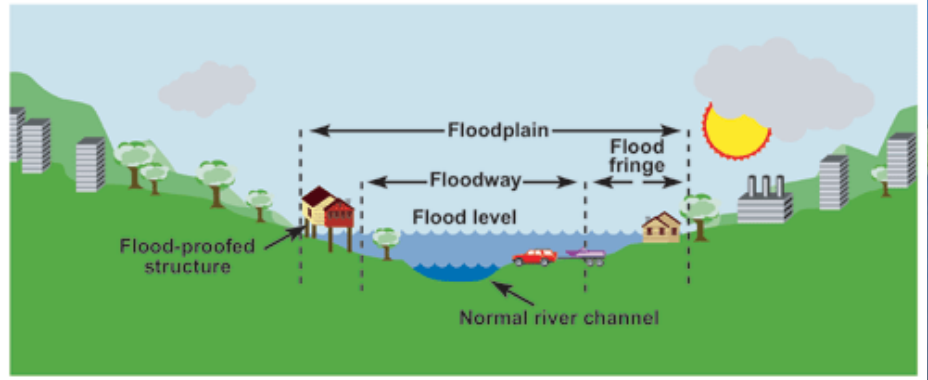


- Other Strategies

- limit redevelopment
- eliminate new development
- set aside specific water storage areas

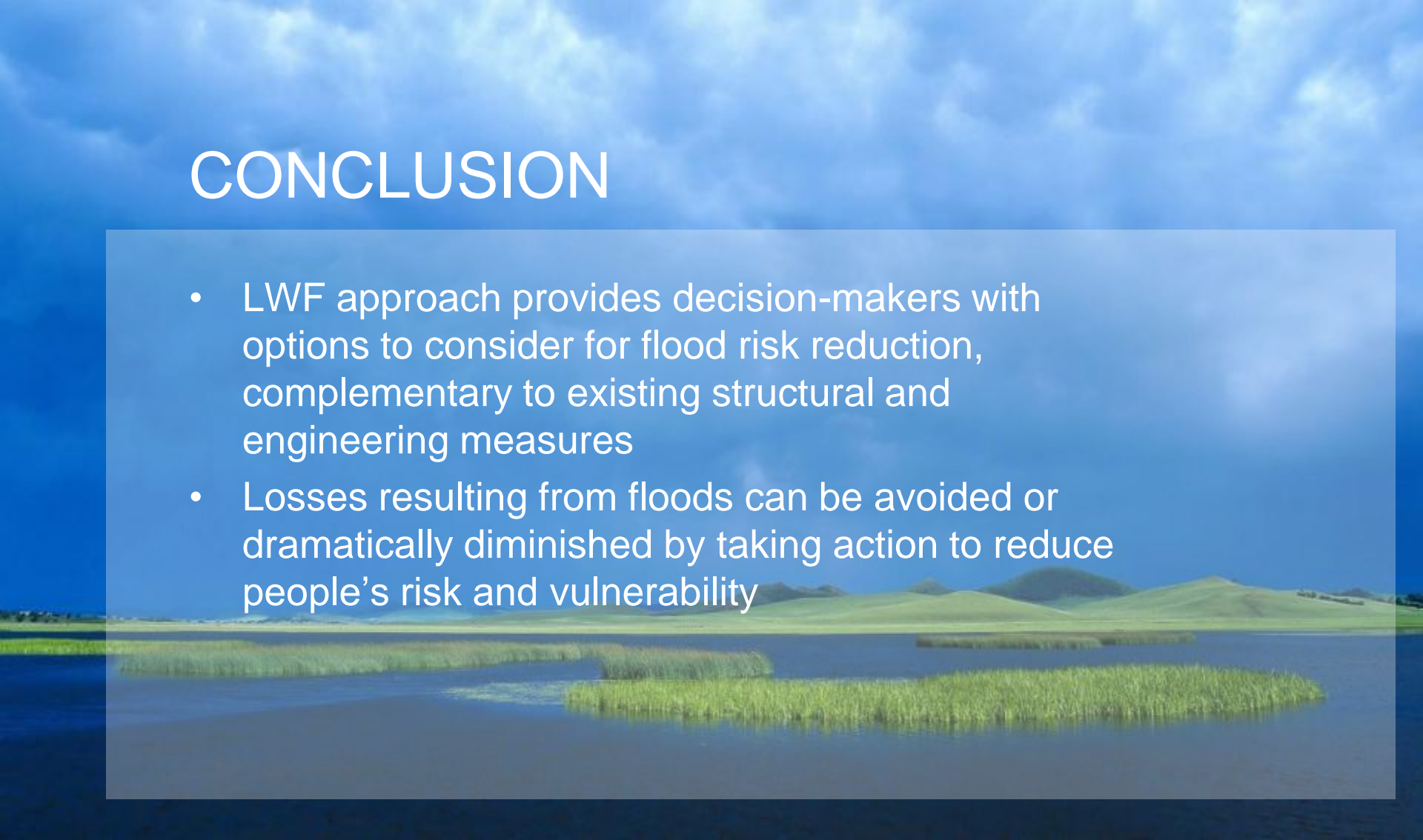


The floodplain



CONCLUSION

- LWF approach provides decision-makers with options to consider for flood risk reduction, complementary to existing structural and engineering measures
- Losses resulting from floods can be avoided or dramatically diminished by taking action to reduce people's risk and vulnerability



Thank You

