

International Sustainability

Conference 2013

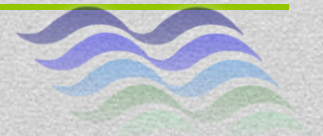
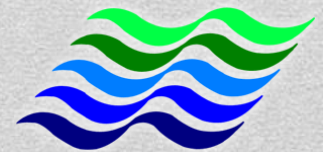
Vistana Hotel, Penang

29-30 October 2013

TOWARDS REALISING INTEGRATED RIVER MANAGEMENT IN MALAYSIA

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Malaysia



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2. Rivers – A Gift of God
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INTRODUCTION



Malaysia

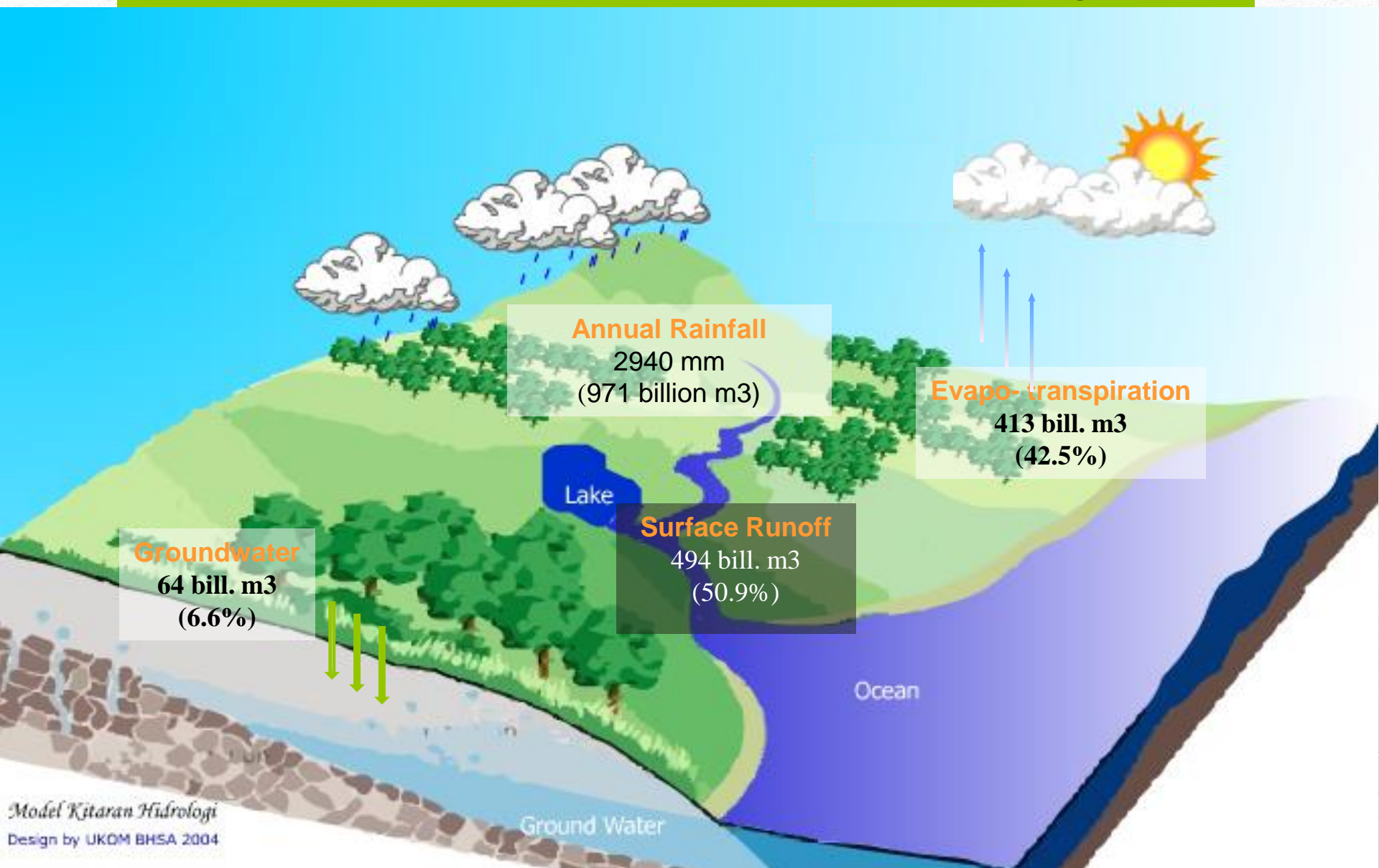


Malaysia – Information

- Comprises two distinct bodies of land
 - 3 Federal Territories and 13 States
- Total land area – 329,750 km²
- Population - 28 million (2010)
- A multi-racial, multi-cultural country
- Climate - warm and humid
- Annual average rainfall
 - Peninsular Malaysia 2,500 mm
 - Sabah 3,000 mm
 - Sarawak 3,500 mm



Water Resources In Malaysia

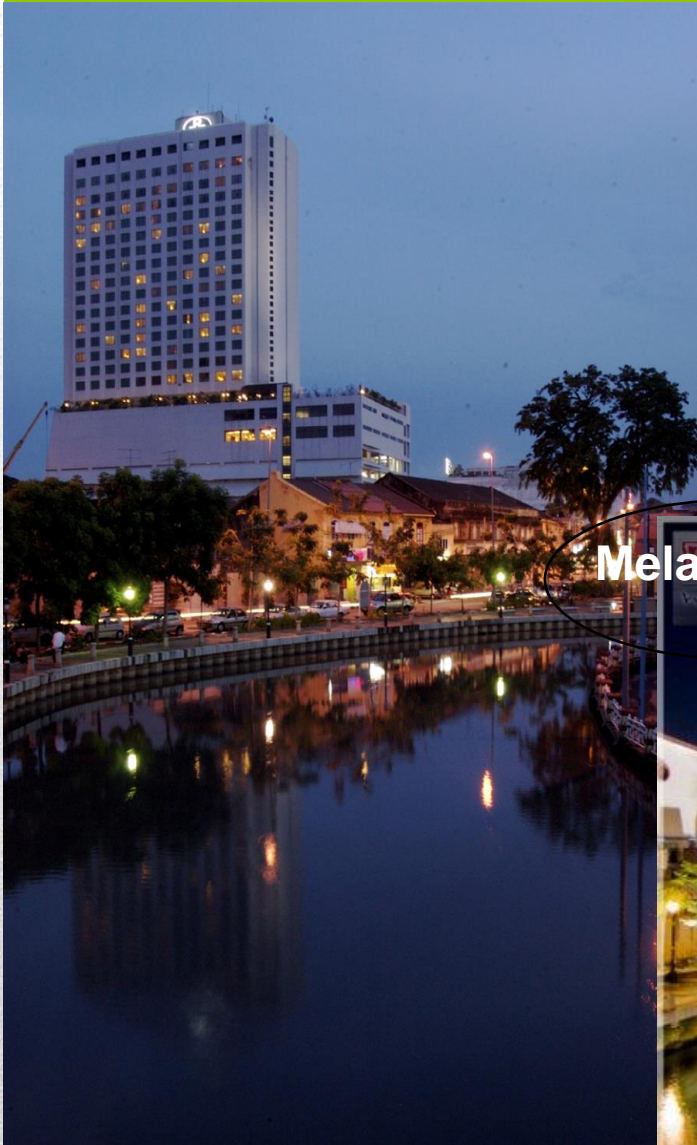


Based on Review of National Water Resource Study 2000-2050

RIVERS – A GIFT OF GOD



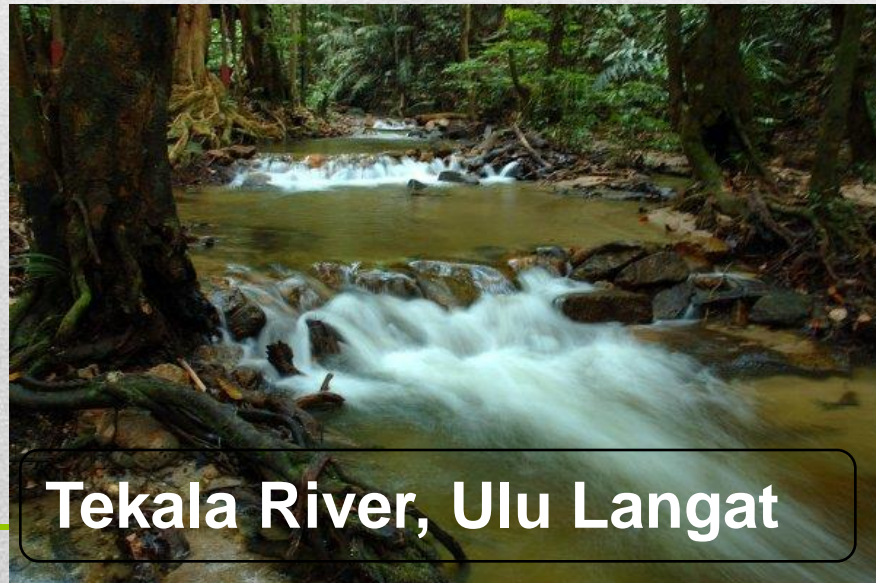
Beautiful River



Melaka River



Beautiful River



Beautiful River



03/15/2010 Pahang River



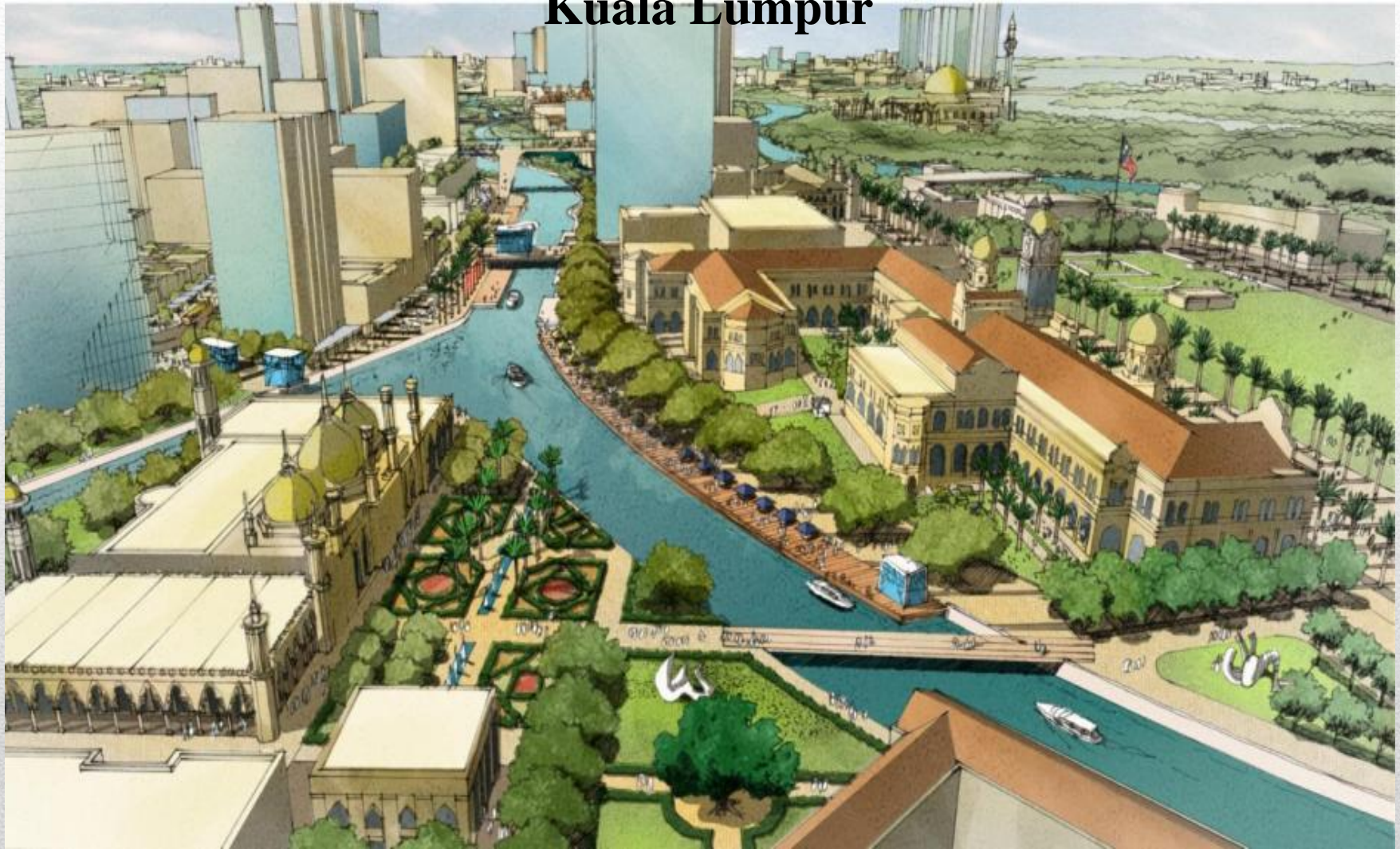
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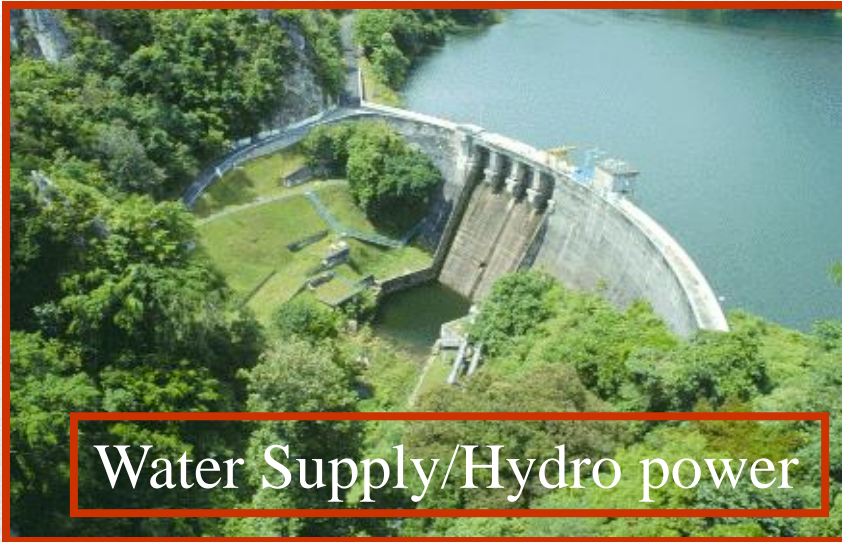
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Beginning of Civilisation

Kuala Lumpur



River Function



River Function



Aquaculture



Religion



Transportation



Culture



DEVELOPMENT AND RIVER ENVIRONMENT



Industry Sector In Malaysia

- Industry sector – going up to 46% of GDP, and
 - Agricultural sector – falling to 13%
-

Any kind of development has impact on river

Water management

Various types of projects contribute to conservation of land and preservation of scenic landscapes.

Natural disasters are common in Japan. Urbanization has created new types of disasters (disruption of river water, the triggering of landslides, etc.) and increased water demand. Droughts and sudden water shortages can paralyze cities and impact heavily on everyday and economic activities. We implement various projects to protect the land and people and to create safe and comfortable living environments within the active society.

Small dams for water supply

Water shortage has been a problem in mountainous regions where there are no major rivers to supply water. Building small dams to supply water has improved the living conditions in such places.

Mountain Rivers and Mountain Erosion Control Projects

As part of localized community development, rationalization of stream improvement projects helps to conserve regional environmental characteristics.

Artificial control measures

In addition to the installation of levees and the like to prevent sediment, establishment of warning and evacuation systems alleviates destruction caused by sediment.

Water-quality improvement

Improving water quality of rivers, lakes, and reservoirs protects water resources and aquatic environments.

Slope failure prevention

Slope failure prevention measures protect river residents.

Maintenance of coastal environments

Creating promenades and planting trees or creating artificial parks, and coastal development provides space for marine sports.

Coastal protection

Coastal protection measures prevent destruction by storm surges, tsunamis, and erosion by strong waves.

Improvement of dam structures

Improving dam structures promotes local nature settings and develops spaces for recreational use, contributing to revitalization of the community.

Dams

Dams store stormwater temporarily to regulate streamflow and prevent flooding. Dams also ensure a stable water supply.

Detection basins

Detection basins regulate or moderate sudden changes in river flow.

Underground basins

Underground water channels divert flood flow to protect other areas from floods.

High-standard levees ("super levees")

High-standard levees ("super levees"), which are much wider than conventional embankments, strongly resist sediment buildup and subsidence, about 1/30-1/50 the size of the embankment, provide a space that helps to integrate community with the river.

River machines

Construction of weeping facilities for small levees encourages use of them.

Sedimentation channels

Channels that transfer water from them to the sea secure a source of water for community use.

Landslide control measures

Prevention measures, such as surface and underground retaining and retaining sheet piling, prevent highly destructive, large-scale landslides that can be caused by groundwater or other geological influences.

Check dams

Regulating sediment runoff prevents sediment disasters.

Shooflooding

Strengthening and widening river channels helps prevent flooding by channeling high waters more directly down to the sea.

Control of volcanic flow

Implementing both structural and nonstructural measures helps to minimize damage caused by flow of mud, ash, and lava.

Creating dams that enable fish to migrate upstream

Various facilities enable anadromous fish to migrate back and forth.

Reinforced permeation intake

Filtering sandwater into the ground prevents overflowing of urban rivers and sewer outlets.

Dredging

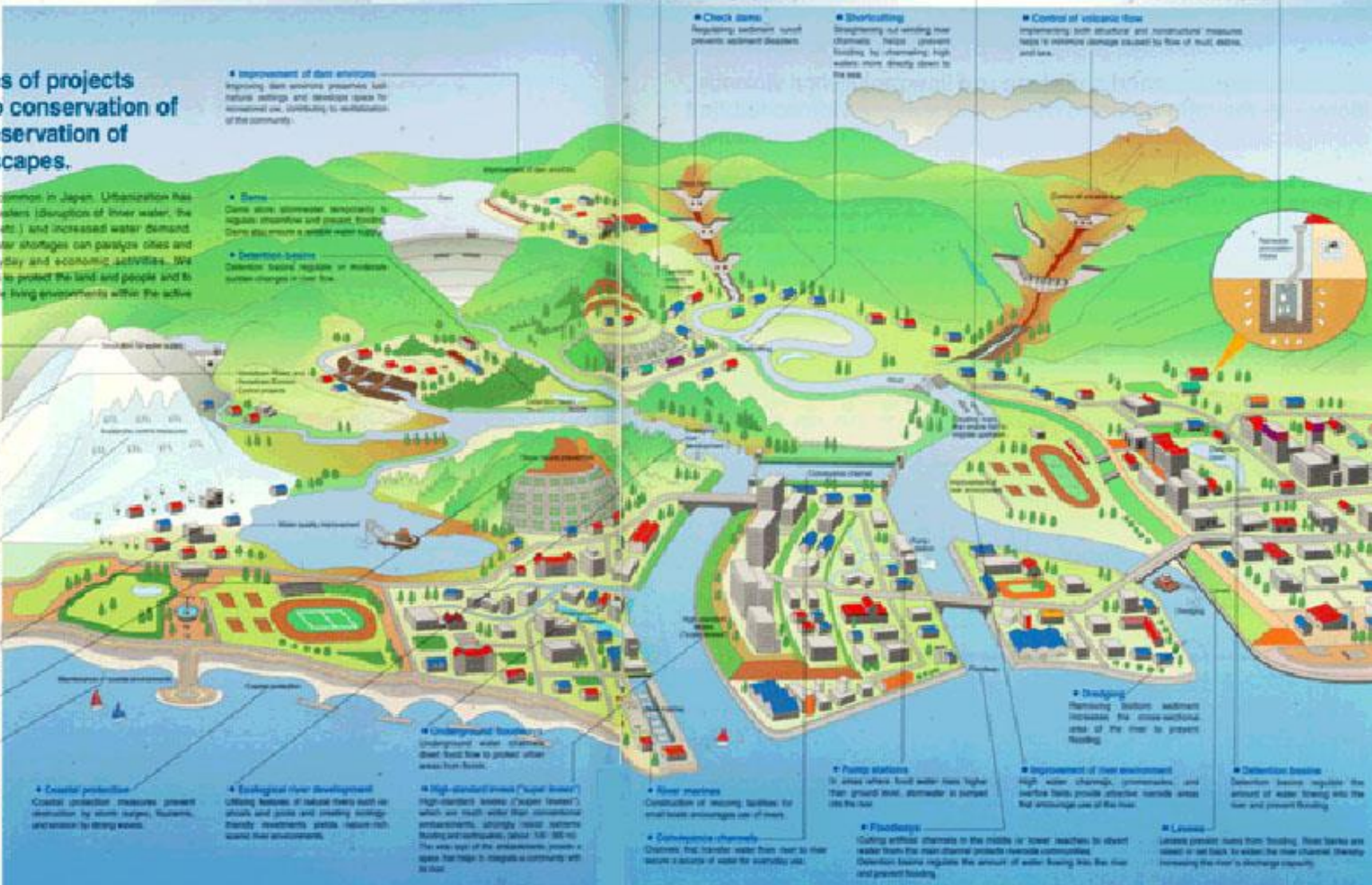
Dredging widens sediment deposition the cross-sectional area of the river to prevent flooding.

Improvement of river environment

High water channels, greenways, and water beds provide attractive leisure areas that encourage use of the river.

Levees

Levees prevent rivers from flooding. River banks are raised or set back to widen the river channel thereby increasing the river's discharge capacity.



Main Problem

newstraitstimes

Wednesday, May 05, 2010, 08.06 AM



Home News Blogs OP-ED Channels Emedia 7-Day News News Archive 1klas

WORLD NEWS Ash cloud set to close Scottish airspace - BBC News

Home » Local

Johor to ration water if dry spell continues

2010/02/16

KLUANG: Johor is bracing for the possibility of water rationing in the current dry spell continues.

Kluang is already hit as levels at water catchments and processing Timur and Barat are fast dropping.

As of yesterday, the water supply at Sungai Sembrong Timur reached millilitres per day (mlod), down from the normal level of 20mlod.



Dry spell 1998

Water Shortage



Drought

Main Problem

Water, water, water everywhere

NST pictures by Nushairi Nawi, Mokhsin Abidin, Syahrim Abidin and Amirudin Sahib



BOAT PEOPLE ... A City Hall rescue squad ferrying office workers who were stranded along Jalan Melaka, to safety.

Several hours of heavy rain and KL almost comes to a standstill

By Adrian David and V. Ramanan

KUALA LUMPUR, Mon. — In a near repeat of the incident in April this year, the city was again in chaos for several hours today, after a torrential downpour caused flash floods and traffic jams.

Gridlocks were caused by floods in major roads such as Jalan Ampang, Jalan Datuk Keramat, Jalan Tun Perak, Jalan Yap Kwan Seng, Jalan Melaka, Jalan Dang Wangi, Jalan Sultan Ismail, Jalan Tun H.S. Lee and Jalan Masjid India in the city and Jalan Gasing and the Federal Highway in Neelang Jaya.

The downpour, which began about 7pm and lasted for three hours, caused sections of the roads to be submerged, making them impassable to motor vehicles. Several cars were also stalled, while traffic lights went out at some of the junctions.

Water also entered the basements and several offices located on the ground floor of the low-rise buildings.

Sales executive Raymond Tan said he had gone to pick up a client near the Texas Instruments factory in Datuk Keramat to send him to the Concorde Hotel in Jalan Sultan Ismail when he encountered the jam along Jalan Ampang, he added.

While waiting to be picked up, volunteers were also seen sweeping away flood water at the entrance of the Our Lady of Fatima church opposite the school.

A regular church goer, Lucien Winters said it was quite normal for the church to get flooded when there was a heavy downpour.

"Whenever the Sungai Klang bank overflows, the church gets affected. We have been complaining about it for a long time now, but the authorities don't respond," he said.

Other low lying areas in the Federal capital were also flooded as the Sungai Klang overflowed its banks.

On the outskirts, the worst affected areas were notably the Jalan Chan Seng, Lim-Sungai Bui area near the Royal Malaysian Air Force station.

Following the downpour, hundreds of motorists were stranded on flooded roads.

City traffic police spokesman said more than 20 vehicles near the light-rail transit station in Jalan Tun Perak had submerged.

A spokesman added that the worst hit areas were Jalan Ampang and Jalan Sungai Besi.

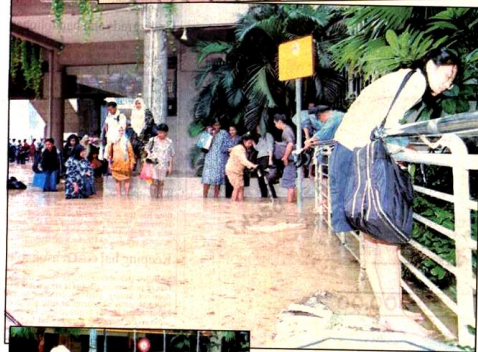
Meanwhile, City Hall's rescue squad were on standby with boats to assist office workers and others who were stranded after work.

In Taman Kosas, Ampang, 100 houses in Phase two and another

Flood Prone Area = 26,700 sq. km (8%)

Loss=RM1,815m (2007)

Flood



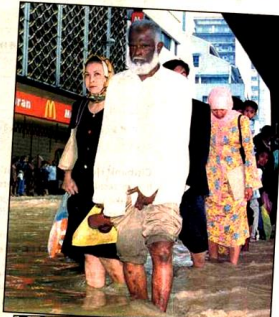
IN DISTRESS ... Office workers in Jalan Melaka had to wait hours for the flood waters to recede before being able to head home after work.



HELPING HANDS ... Two rescue team members escorting a woman across the flooded street along Jalan Ampang.



ALTOGETHER ... Members of City Hall's rescue squad and passers-by helping to push one of the many cars which were caught in the floods to higher grounds along Jalan Dang Wangi yesterday.



NOT SPARED ... Motorcycles parked along Jalan Tun H.S. Lee were nearly submerged. Note the garbage bags floating by.

KNEE DEEP ... Office workers waiting through the flood waters along Jalan Tun Perak.



Main Problem



Pollution



Water Quality Trend

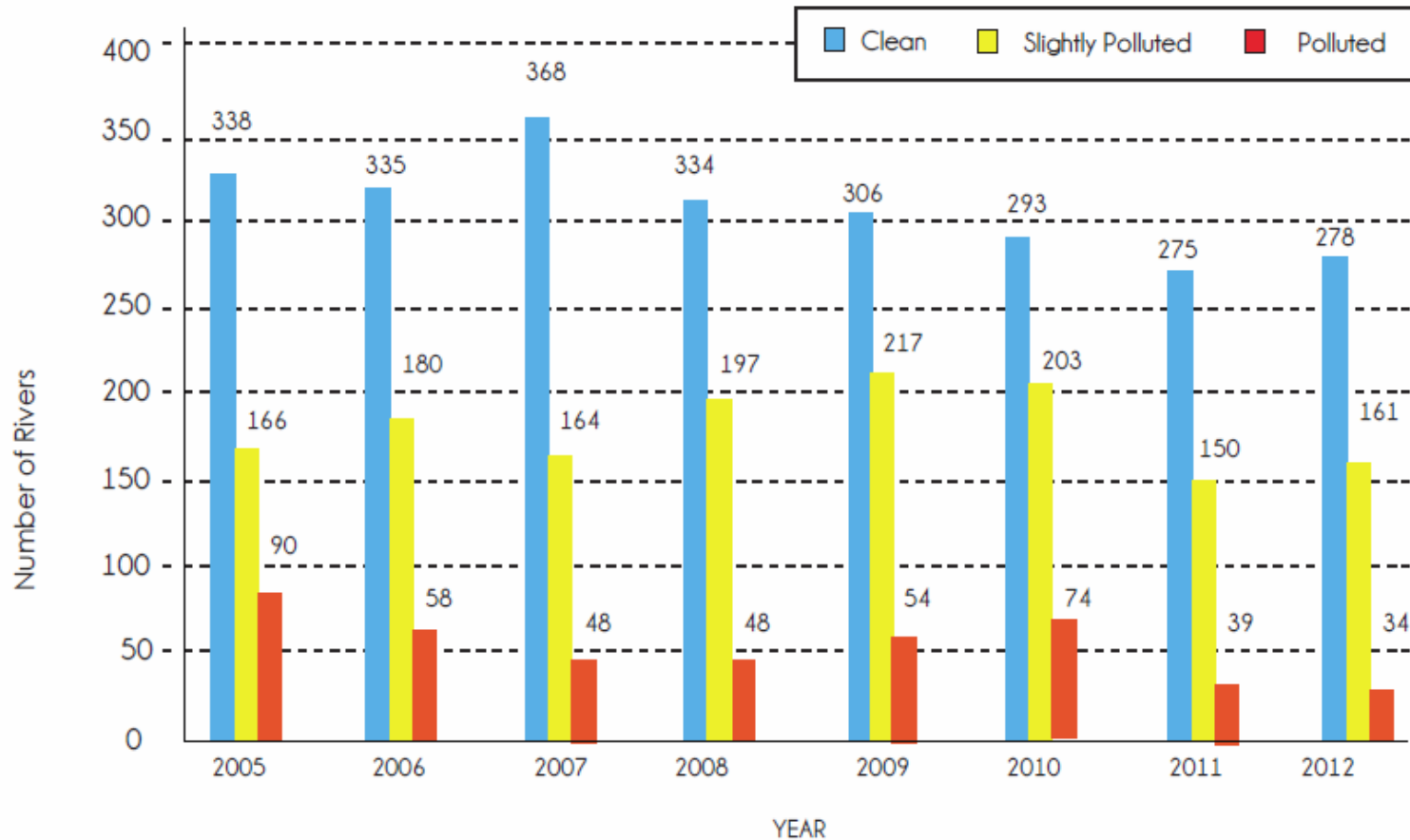


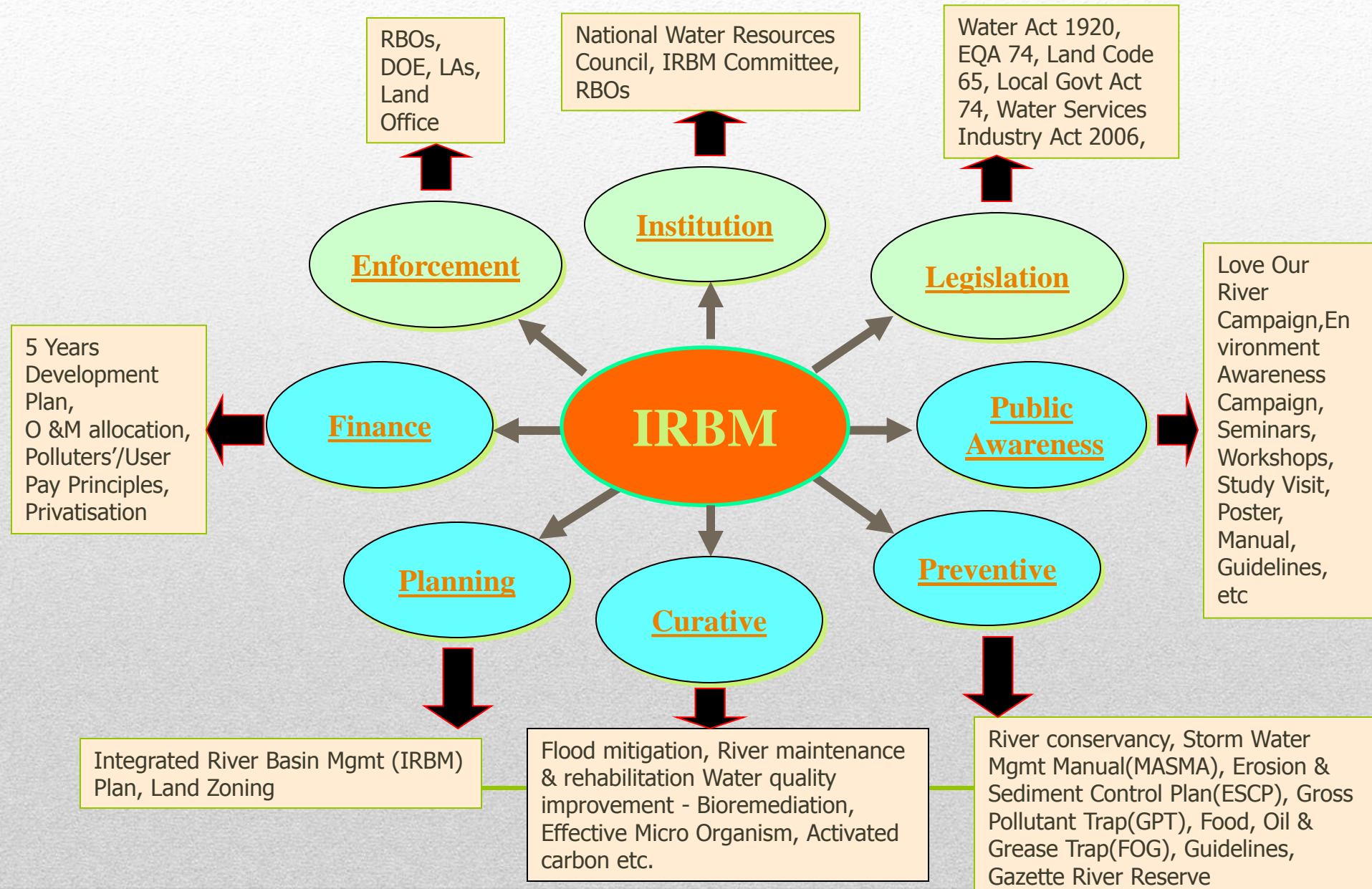
Figure 2.1 Malaysia : River Water Quality Trend (2005 - 2012)



BRINGING NATURE BACK TO RIVERS



IRBM Components



INTEGRATED RIVER BASIN MANAGEMENT (IRBM)



IRBM

“The process of **coordinating conservation, management and development of water, land and related resources** across sectors within **a given river basin**, in order to maximize the economic and social benefits derived from water resources in an **equitable manner** while preserving and, where necessary, restoring freshwater ecosystems.”

(Adapted from Integrated Water Resources Management, Global Water Partnership Technical, Advisory Committee Background Papers, No. 4, 2000)



Take stock and look back

- DID has been promoting IRBM since 1990's,
 - We take stock in 2008 and look back what has been done. DID is lacking of;
 - i. Number of river basin must have a clear river basin definition,
 - ii. National Water Resources Policy not available,
 - iii. Comprehensive Water Resources not ready,
 - iv. DID has the task to manage water resources but has not been given the mandate as an institution to manage water resources.
-

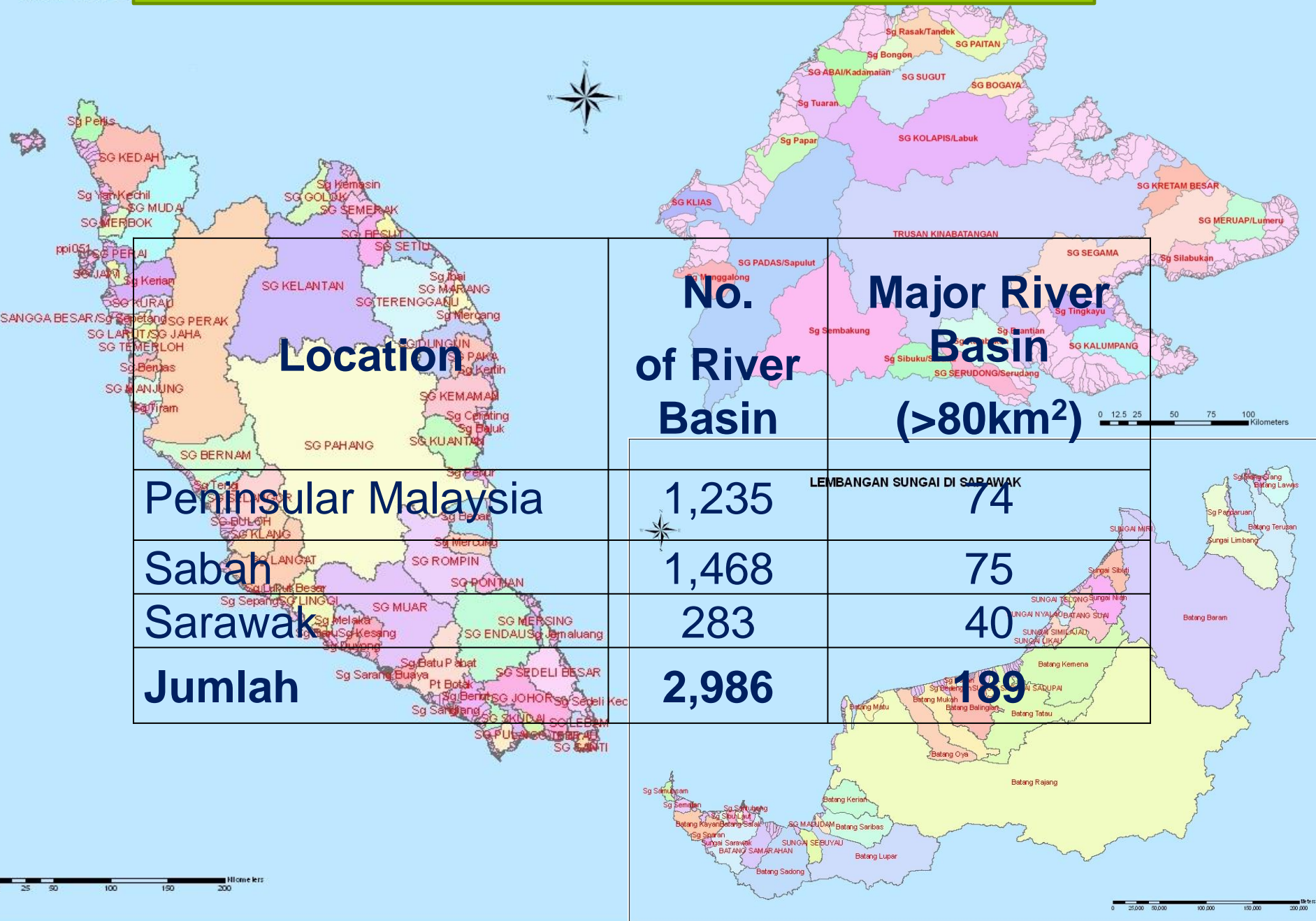
Definition of River Basin

- “River” means a body of inland water flowing for the most part on the surface of the land but which may flow underground for part of its course.
 - “River basin” means the area of land from which all surface runoff flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta (Adapted from EU Water Framework Directive 2000).
-

River Basin In Malaysia

Sungai di Sabah

LEMBANGA



No. of River Basin

Major River Basin (>80km²)

Peninsular Malaysia
Sabah
Sarawak
Jumlah

1,235
1,468
283
2,986

74
75
40
189

LEMBANGA SUNGAI DI SARAWAK

0 12.5 25 50 75 100 Kilometers

0 25 50 100 150 200 Kilometers

0 25,000 50,000 100,000 150,000 200,000 Kilometers

River Basin In Malaysia

Location	No. of River Basin	Major River Basin (>80km²)
Peninsular Malaysia	1,235	74
Sabah	1,468	75
Sarawak	283	40
Total	2,986	189

River Basin in Malaysia



Major river basin(189) – 95% of land area in Malaysia



Small river basin(2797) – 5% of land area in Malaysia



River Basin In Malaysia

- No of basin by category:
 - **Category 1** - river basin wholly within a state = 2,958
 - **Category 2** – river basin shared between states = 22
 - **Category 3** - river basin shared with other country = 6
-

IRBM Plan

NWRC (29th July 2003) → River Basin Management Plans to be the Basis for Development within a River Basin

NEW STRAITS TIMES

Master plan for river basin

Monitoring land use for development

By Jaswinder Kaur
news@nstp.com.my

KINABATANGAN, Mon. — The Drainage and Irrigation Department will formulate a master plan on land use at 150 river basins in the country, its director-general Datuk Keizrul Abdullah said.

The master plan would become a basis for all local authorities to use as it was impossible for the department's enforcement officers to monitor the almost 12,000 rivers in the country.

He said a master plan was necessary as "every inch" of the country was part of a river basin and all activities have an impact on rivers.

Keizrul was speaking after witnessing Agriculture and Food Industry Assistant Minister Datuk Mannan Jakasa close the two-day Sungai Kinabatangan Expedition in Sukau on Saturday.

About 40 people representing government agencies, non-governmental organisations, students and members of the media participated in the expedition which was organised by DID under the "Love Our River" campaign.

Keizrul said integrated plans would be made for major rivers like Sungai Klang and Sungai Langkat in Selangor first, while in Sabah, the plan would be for Sungai Kinabatangan which, at 560km, is the longest river in the State.

He said the department aimed to rehabilitate rivers back to Class Three and then down to Class Two.

(Class One refers to pristine rivers; Class Two for rivers which can be used as a drinking source with treatment; Class Three allows for contact sports; Class Four refers to rivers which do not allow body contact; while Class Five is for rivers with poor water quality.)

"DID sees rivers should care for per cent of while the remains from undergural said.

"Rivers are a tein in terms of recreation, eco tourism and t added.

Mannan, whoty Chief MiniUkin, said the committed in iters clean.

"In 1998, the passed the Watment to ensuragement of watthe benefits of r

"We want to, future generatiing rivers as s and for transpo

Time to manage our rivers better

A fresh approach is needed to arrest the damaging effects of development in river basins, but can it be done? asks IDROS ISMAIL.

If you look back, we know this river basin is not new. As development in the basin, we have been guilty of environmental mismanagement. Even in the recent general elections, we are still not aware of the grave of development. The uncontrolled abuse of rural basins is creating a huge risk to economic, social and environmental health.

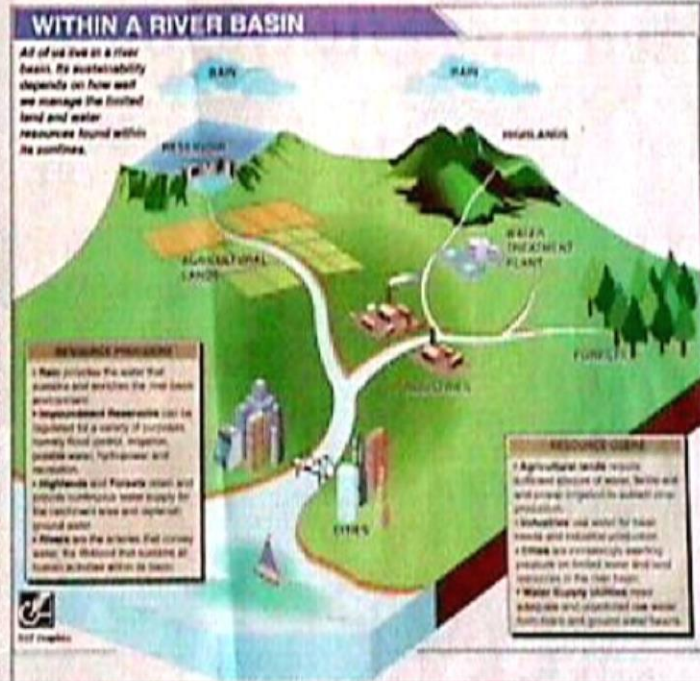
The larger regional and national governments are delayed in passing the environmental legislation, the focus needs to be on the river basin.

6 The longer remedial and preventive measures are delayed, the greater the environmental deterioration, the more costly the restoration.

As a result, the environmental impact is not being managed. In addition, land use planning and water resource management is not being done. This is because the focus is on the physical infrastructure but not on the social and economic aspects of river basin management.

There is a need for a holistic approach to river basin management. This is why the National Water Policy will be implemented in the next few years. It will provide the framework for water resource management and development in the country.

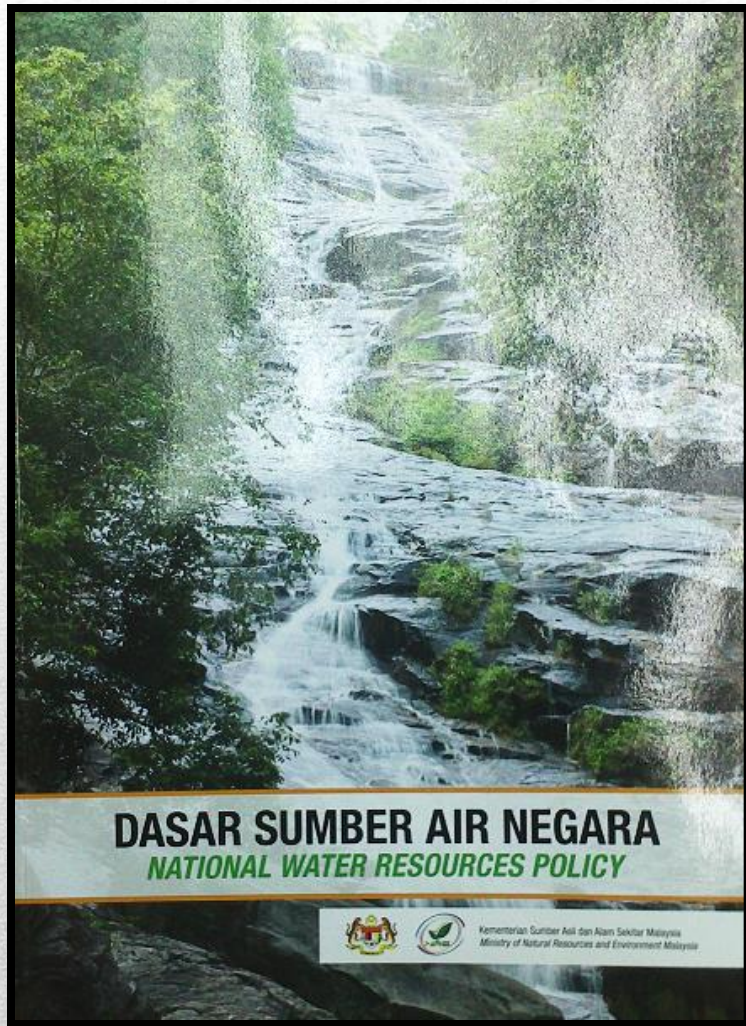
The implementation of the National Water Policy will be implemented in the next few years. It will provide the framework for water resource management and development in the country.



IRBM Plan

- Objective of IRBM Plan
 - Ensure Clean Water
 - Ensure Sufficient Water
 - Reduce Flood Risks
 - Enhance Environmental Conservation
-

National Water Resources Policy



□ ensuring that the demand for water for all user sectors is met in terms of quantity and quality for both man and nature.

□ clear directions and strategies in water resources management to ensure water security and sustainability.

□ serves as a platform in the streamlining of practices and approaches for the preparation of water resources conservation plan involving all the states of Malaysia.



State Legislation Related to Water Resources

State/FT	Legislation
Melaka, Perak, NSembilan, PPinang, FTKL	Act No 418 – Waters Act 1920(Rev 1989)
Perlis	Enct No 9 of 1357H(Perlis)
Terengganu	Enct No 2 of 1357H(Terengganu)
Kelantan	Enct No 18 of 1935
Johor	Enct No 66(Johor) 1921
FT Putrajaya, FT Labuan	None

State Legislation Related to Water Resources

State/FT	Legislation
Sarawak	Sarawak River Ordinance 1994
Sabah	Sabah Water Resources Enct 1998
Selangor	Selangor Waters Management Authority Enct No 2 of 1999
Kedah	Kedah Water Resources Enct 2007
Pahang	Pahang Water Resources Enct 2007

DID's Roles

- Under the **Ministerial Functions Act 1969 (Act 2)**, **Ministers of the Federal Government Order 2009 (P.U.(A) 222)**, the Minister of NRE shall be charged with the responsibility for the following subjects:
 - **Planning and development of flood and drought forecasting systems, management of hydrological data and information, and assessment and management of national water resources,**
 - **Planning and management of river basins,**
-

DID's Roles (cont'd)

- ❑ Planning and development of infrastructure as well as water management for crops and other agricultural needs.**
 - ❑ Planning and management of flood mitigation programmes,**
 - ❑ Development and management of coastal zones to reduce coastal erosion and sedimentation problems at river mouths,**
 - ❑ Managing and regulating the implementation of stormwater systems in town areas.**
-

DID's Roles (cont'd)

.....but no mandate given to DID

We are working on

- drafting comprehensive Water Resources Law,
 - Institutional set up
-

IRBM INITIATIVES



CINTAILAH SUNGAI KITA

*(LOVE OUR RIVERS
CAMPAIGN)*

1993-2003

10 Tahun
(10 YEARS)



Love Our River

1. Adopted river:

- Village category (*Kategori Jawatankuasa Kemajuan dan Keselamatan Kampong (JKKK)*)**
- School category**
- Tourist category**

2. River watch

3. River expedition

4. Education and talk

5. River beautification

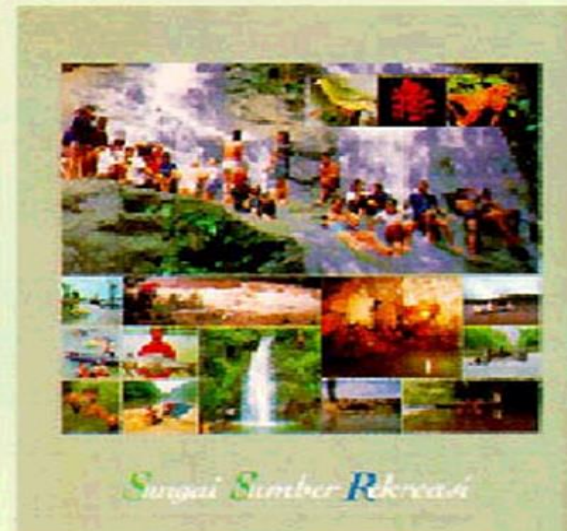
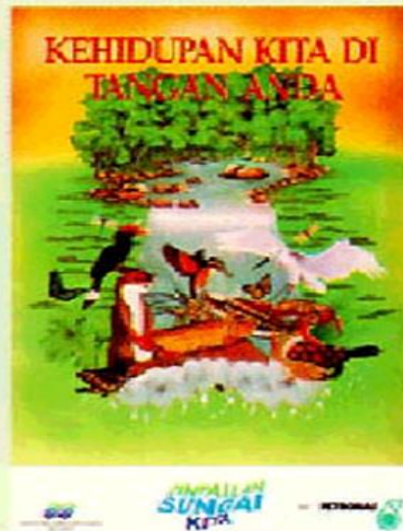
Supporting Programme

1. Symposium and seminar

2. River cleaning

3. River pollution treatment

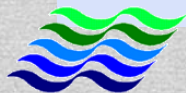
Love Our River



Campaign Materials



One State One River Program (1S1R)



1S1R is Mini IRBM

- **1 RIVER** – Start with 1 River and its catchment
- **1 PLAN** – Catchment Management Plan
- **1 MANAGEMENT** – 1 Steering Committee

Objectives

- To ensure clean, living and vibrant rivers – Class IIB by 2015,
- To turn rivers and their environment into natural recreation areas,
- To ensure rivers are free from solid waste and flooding.



River Water Quality

No	State	River	Length (km)	Water Quality Index(WQI)								
				2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Perak	Kinta	20	III	III	III	III	II	II	II	II	II
2	Kelantan	Pengkalan Chepa	10	II	III	III	II	II	II	III	III	III
3	Sabah	Papar	45	II	II	II	II	II	II	II	II	II
4	Johor	Skudai	52.8	III	III	III	III	III	III	III	III	III
5	Kedah	Petani	12	III	IV	IV	III	III	III	III	III	III
6	Melaka	Melaka	39	III	III	III	III	III	III	III	III	III
7	N. Sembilan	Temiang	9	II	III	III	II	III	III	III	III	III
8	Perlis	Perlis	9.5	III	III	III	III	III	III	III	III	III
9	P.Pinang	Pinang	3.1	IV	IV	IV	IV	III	III	III	III	III
10	Sarawak	Miri	60	III	III	III	III	III	III	III	III	III
11	Selangor	Penchala	12	IV	IV	IV	IV	IV	IV	III	III	III
12	Pahang	Galing	7	IV	IV	III	III	IV	IV	III	III	III
13	Terengganu*	Hiliran	5.5	-	-	-	-	IV	IV	III	III	III
14	W.P. K.Lumpur	Penchala	12	-	IV	IV	IV	IV	IV	-	-	-
15	Sarawak	Bintangor		-	-	-	-	-	-	III	III	III

Doing IWRM the DID way

It is a systematic, integrated, 'sub-basin' approach of solving 7 DID related problems in the whole district in a speedy, community friendly and effective way under the leadership of the District Engineer while receiving full support from DID State and DID Headquarters.



Strengthening the Management of River Basin Development



5 Basic Steps to 'jps@komuniti'

- 1 Divide district into several manageable sub-basins.
 - 2 Prioritize sub-basins based on need and importance.
 - 3 Assign TA/Technicians to be responsible for each sub-basin, accountable directly to the District Engineer.
-



5 Basic Steps to 'jps@komuniti'

- 4 Apply the DEEP (Describe, Explain, Elaborate, Prescribe) management tool for each sub-basin.
- 5 Implement the solution in 3 phases : short term (less than 6 months), medium term (6 months to 2 years) and long term (more than 2 years).



Output of this program

- 1 District Profile Report – information gathering.
- 2 Action Plan Report – for each sub-basin



Specific Projects



River Of Life (RoL) –Klang River



**River
Cleaning**

**River
Beautification**

**Land
Development**



RoL Project- Transforming Klang River into a vibrant and liveable waterfront with high economic value



River Cleaning

- Clean and improve the 110km stretch along the Klang River basin from current Class III-V to Class IIB by 2020.
- Covers the municipal areas of:
 - Selayang (MPS)
 - Ampang Jaya (MPAJ)
 - Kuala Lumpur (DBKL)



River Beautification

- Masterplanning and beautification works will be carried out along a 10.7km stretch along the Klang and Gombak river corridor
- Significant landmarks in the area include Dataran Merdeka, Bangunan Sultan Abdul Samad and Masjid Jamek



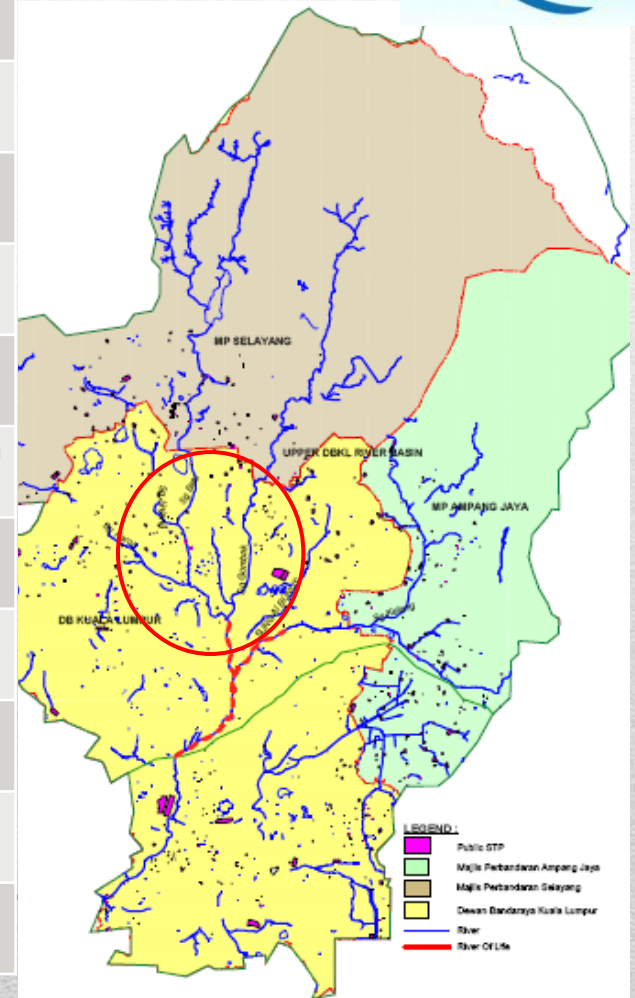
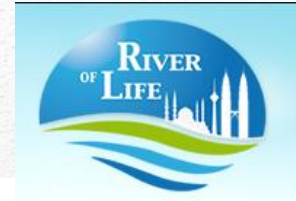
Land Development

- Cleaning and beautification works will spur economic investments into the areas immediately surrounding the river corridor
- Potential government land will be identified and tendered out to private developers through competitive bidding



12 Key Initiatives Are Identified To Effectively Address Pollution And Flooding of Klang River

Key Initiative	Description
1	Upgrading existing sewerage facilities is the most impactful and important initiative to reduce Klang river pollution
2	Existing regional sewage treatment plants must be expanded to cater for future growth
3	Wastewater treatment plants need to be installed at 5 wet markets to decrease rubbish and pollutants
4	Install additional gross pollutant traps will improve the river aesthetics and water quality
5	Utilise retention pond to remove pollutants ¹ from sewage and sullage
6	Relocation of squatters will significantly reduce sewage, sullage, and rubbish in the Klang river
7	Implement the Drainage and Stormwater Management Master Plan to upgrade drainage systems
8	Systematic hydrological study and rehabilitation of the river are needed for flow control
9	Promote, enforce, and manage river cleanliness and health – erosion from urban development
10	Promote, enforce, and manage river cleanliness and health – restaurants, workshops, and other commercial outlets
11	Promote, enforce, and manage river cleanliness and health – industries that generate wastewater/ effluent
12	Promote, enforce, and manage river cleanliness – general rubbish disposal



UPPER DBKL RIVER BASIN

Masterplanner 4



Masterplanner 5



Melaka River Cleaning and Beautification Project , Parcel 2



- River water quality improvement
- Beautifying and preserving the river corridor.
- Malacca River as one of the main tourism attraction.
- alternative public transport routes through the river (Water Taxi)

Melaka River– Clean And Beautiful

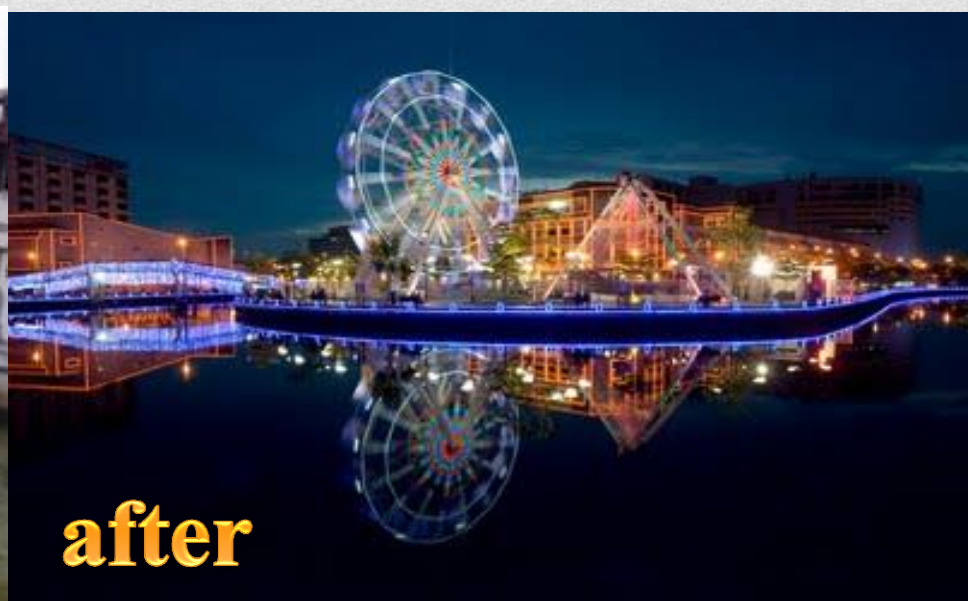
Before



After



Melaka River – Clean And Beautiful

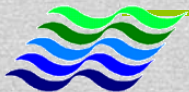


CONCLUSION



Conclusion

IRBM is essential to ensure sustainability of river and river environment.

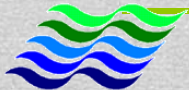


THANK YOU



Conclusion

With rapid urbanisation and industrialisation, problems and issues related to rivers and the river environment are expected to intensify. Integrated management is essential because users within the river basin are interdependent. Upstream activities will have some impact to the downstream inhabitants, the management of land will affect the water resources, and vice versa.



Conclusion

Besides integrating land and water issues, basin level management is critical in managing the relationships between quantity and quality between upstream and downstream interest. The relationship is due to the close connection between hydrological, ecological, and social processes. Corresponding institutional and legal changes are needed, coupled with an effective administrative framework. Above all, political will and commitment is vital to ensure success.
