



**Second UN Special Thematic
Session on Water and Disasters
November 18, 2015**

High Level Panel Discussion

**Water and Disasters :
*Experiences and Lessons from Asia &
Actions needed to address the Challenges***

**Ir. (Dr.) Keizrul bin Abdullah
Chairperson,**

Network of Asian River Basin Organizations (NARBO)



**Network of Asian
River Basin
Organisations**



**Establishment of NARBO on Feb 2004
at Batu, East Java, Indonesia**

NARBO's Charter

i. Goal :

- **To help achieve IWRM in river basins throughout Asia**

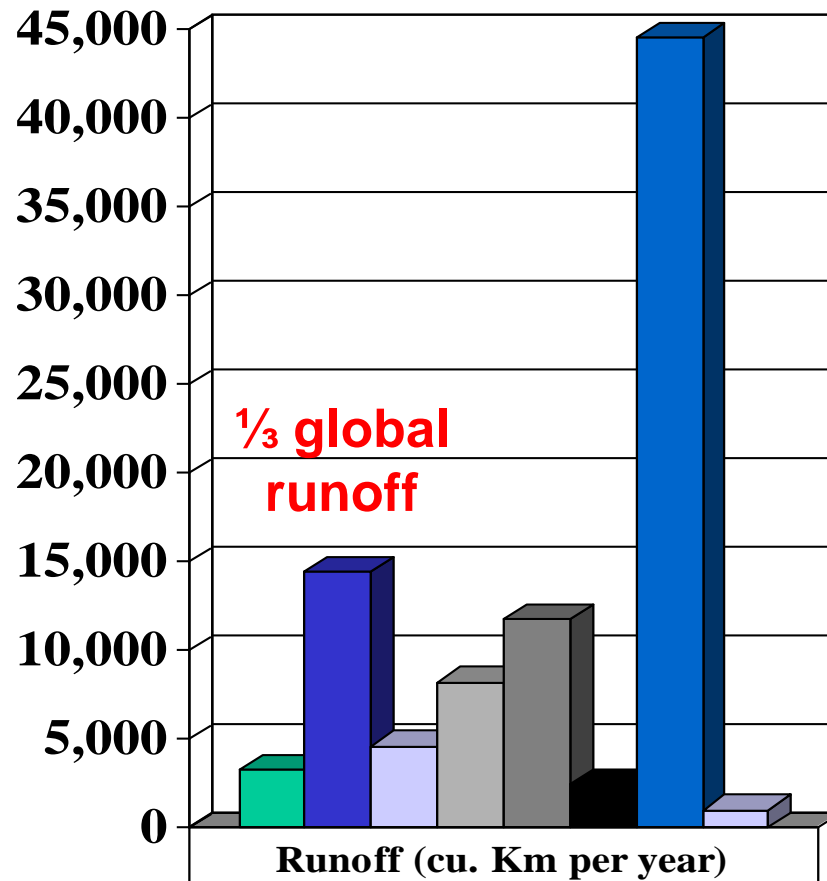
NARBO's Charter

ii. Objectives :

- To enhance the capacity in IWRM**
- To ensure equitable and sustainable use of WR among various stakeholders**
- Capacity building of RBOs, Policy Makers, Line Departments in IWRM**
- Exchange info, knowledge, lessons learned in managing WR and in conflict resolution**

Experiences from Asia and the Pacific

Asia is the Wettest Continent

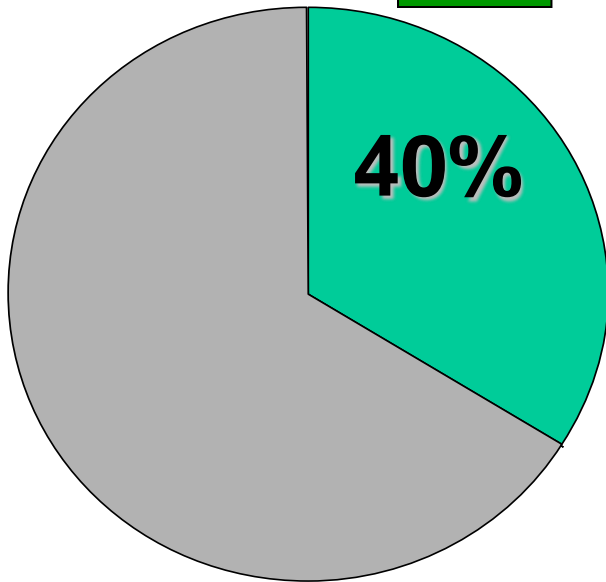


Runoff (cu. Km per year)	
Europe	3,210
Asia	14,410
Africa	4,570
North America	8,200
South America	11,760
Oceania	2,388
World	44,540
Malaysia	990

Asia is the Wettest Continent

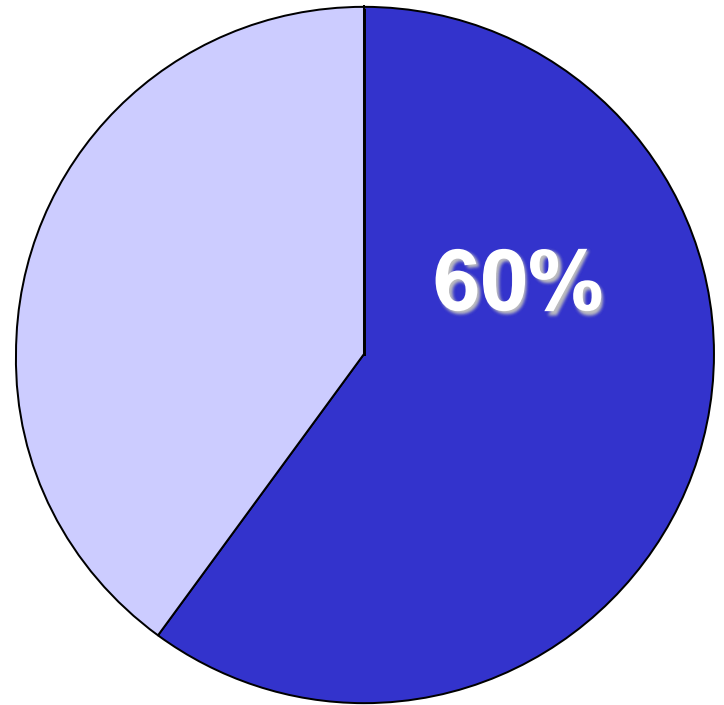
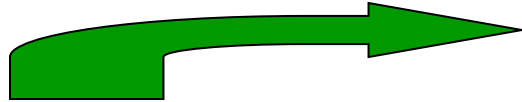


Highest Population density



World - Area

Asia



World - Population

Population of Asia

Asia is the Wettest Continent

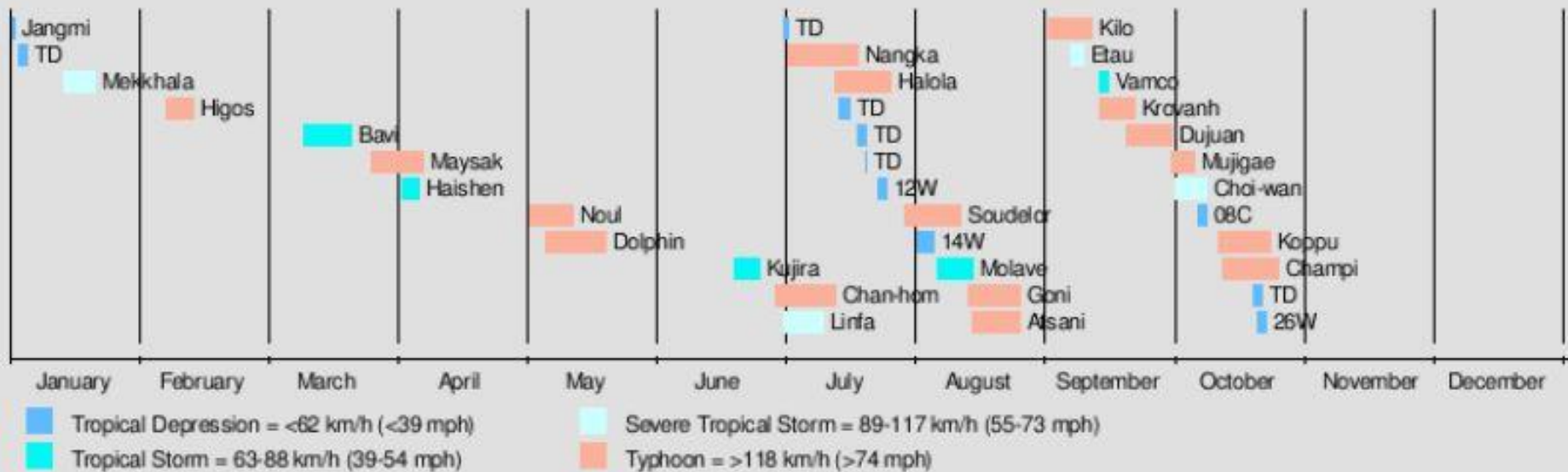


Highest Population density



**Frequently hit by Cyclones,
Typhoons, Super Typhoons**

Typhoons (in red) Jan-Oct 2015



Frequent Typhoons hit Asia and the Pacific

Asia is the Wettest Continent



Highest Population density

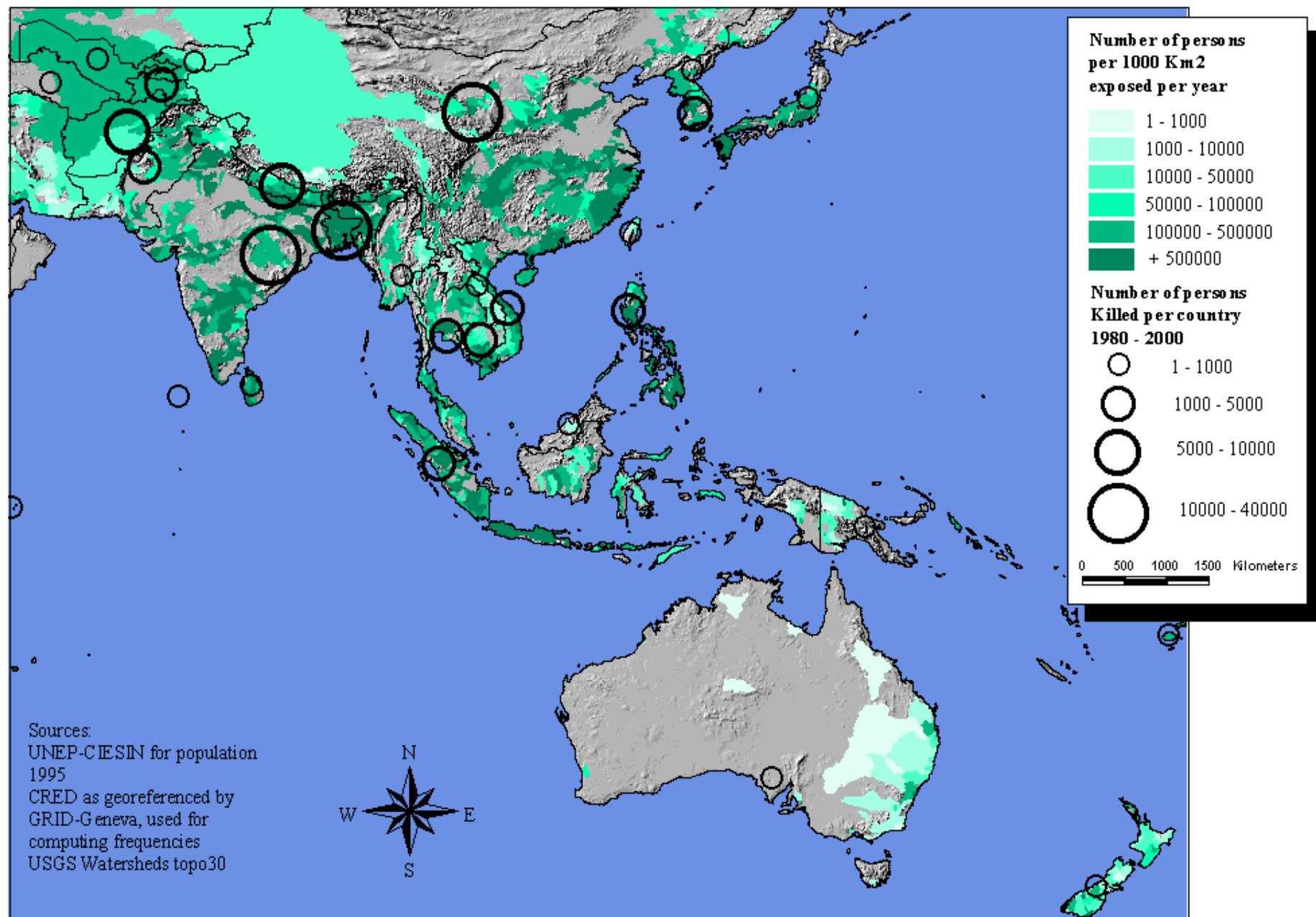


**Frequently hit by Cyclones,
Typhoons, Super Typhoons**



Water Disasters

Density of persons exposed to Flood in Asia and Pacific





Floods are an integral part of the landscape



**Floods & Typhoons
bring hardship**





..... destruction



..... deaths



Children Playing in Flood Waters

Lessons from Asia and the Pacific

Lessons from Asia and Pacific

- **Water disasters → incur huge cost to economy and loss of lives**

HotelTravel.com

Bangkok Hotels
Hong Kong Hotels
Singapore Hotels

GROUPON
Malaysia



Flight Ticket

*Example of an upcoming Deal.

NEWS

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TRAVEL

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Economy faces flood hit

World Bank estimates damage at B1.4 trillion

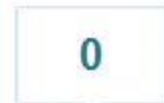
Published: [26/11/2011](#) at 12:00 AM

Newspaper section: [News](#)

US\$ 44.5 billion



Share



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+1

The devastating floods have caused 1.4 trillion baht in estimated damage and are likely to slash Thailand's economic growth to 2.4% this year, the World Bank says.

Huge cost to the Economy

About 1,000 people died in Southeast Asia floods: UN

[Video stylet& LCD](#)

No any learning curve, easy to use Compliance with any laryngoscope

www.medlume.com/



NEW YORK: Nearly 1,000 people died in Thailand, Cambodia, Vietnam and other Southeastern Asian countries in the past four months as a result of prolonged monsoon flooding, typhoons and storms, the United Nations Office for Coordination of Humanitarian Affairs (UNOCHA) said.

Its spokesman Martin Nesirky told reporters on Thursday that the torrential rains and overflowing rivers had affected an estimated nine million people, reported China's Xinhua news agency.

In Thailand, **Huge Loss of Lives** two others missing in the worst floods in more than five decades the Thai Disaster

16 December 2012 Last updated at 04:49 GMT

1.1K



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Typhoon Bopha: Philippines storm toll passes 1,000

The number of people killed after Typhoon Bopha struck the southern Philippines has risen to more than 1,000, officials say.

With nearly 850 people still missing, the toll is likely to rise further, Civil Defence chief Benito Ramos said.

The storm struck the Philippines on 4 December, with the southern islands



Huge Loss of Lives

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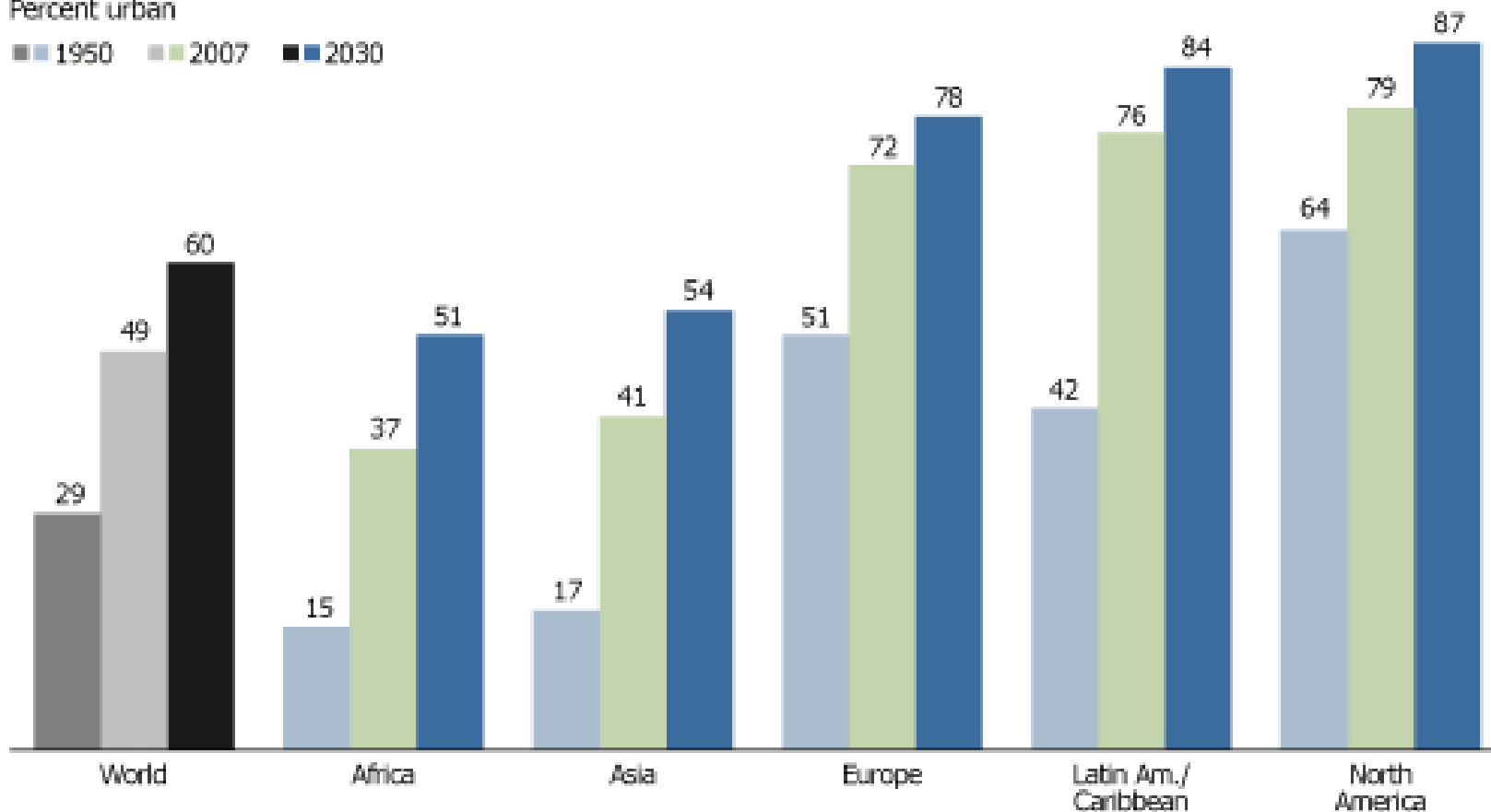
Lessons from Asia and Pacific

- **Water disasters → incur huge cost to economy and loss of lives**
- **Urbanization exacerbating situation**

Trends in Urbanization, by Region

Percent urban

■ 1950 ■ 2007 ■ 2030



Ref : UN World Urbanization Prospects 2005 Revision (2006)

The world's largest urban agglomerations

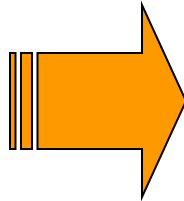
Most of them are in Asia, with Latin America a distant second.

City	Population (2005, millions)	Classification		
		1975	2005	2015
		✓✓ Megacity (10–20 million)		
		✓✓ Metacity (>20 million)		
Tokyo, Japan	35.2	✓✓	✓✓	✓✓
Mexico City, Mexico	19.4	✓	✓	✓✓
New York, United States	18.7	✓	✓	✓
São Paulo, Brazil	18.3		✓	✓✓
Mumbai, India	18.2		✓	✓✓
Delhi, India	15.0		✓	✓
Shanghai, China	14.5		✓	✓
Calcutta, India	14.3		✓	✓
Jakarta, Indonesia	13.2		✓	✓
Buenos Aires, Argentina	12.6		✓	✓
Dhaka, Bangladesh	12.4		✓	✓
Los Angeles, United States	12.3		✓	✓
Karachi, Pakistan	11.6		✓	✓
Rio de Janeiro, Brazil	11.5		✓	✓
Osaka-Kobe, Japan	11.3		✓	✓
Cairo, Egypt	11.1		✓	✓
Lagos, Nigeria	10.9		✓	✓
Beijing, China	10.7		✓	✓
Manila, Philippines	10.7		✓	✓
Moscow, Russia	10.7		✓	✓

Source: United Nations, Department of Economic and Social Affairs, Population Division, *World Urbanization Prospects: The 2005 Revision* (2006).

Effect of Urbanisation (Subang Jaya, Malaysia)

**Increase In
Development
Area**
0 → 40 %



Runoff Quantity
Q → Increase 190 %
Velocity
V → Increase 2x
Tc → 50 % decrease

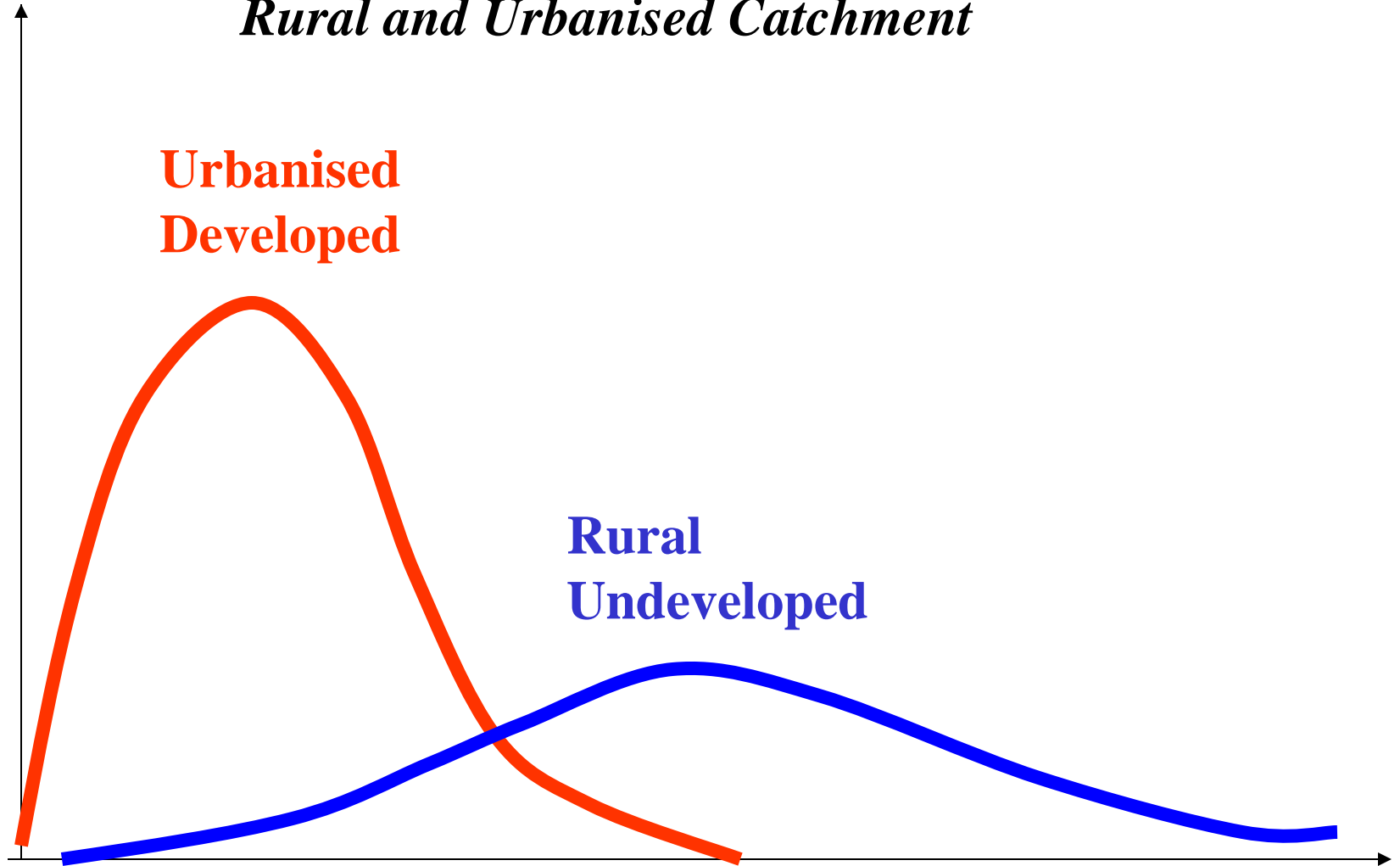
Flow

Flow Characteristics

Rural and Urbanised Catchment

**Urbanised
Developed**

**Rural
Undeveloped**



Time

Lessons from Asia and Pacific

- **Water disasters → incur huge cost to economy and loss of lives**
- **Urbanization exacerbating situation**
- **Urgent need for structural measures → infrastructure to protect, lessen impact**



Flood Levees to protect low lying areas



River Widening and Deepening to reduce impact



Flood Storage Dam

Lessons from Asia and Pacific

- **Water disasters → incur huge cost to economy and loss of lives**
- **Urbanization exacerbating situation**
- **Urgent need for structural measures → infrastructure to protect, lessen impact**
- **Cost can be prohibitive → can be difficult to make business case (eg protection against super typhoon) → PPP usually one-sided**
- **Cost of inaction also high → direct and indirect**
 - **In Malaysia → annual average flood damage of RM 980 million + RM 2 billion drag effect on growth**

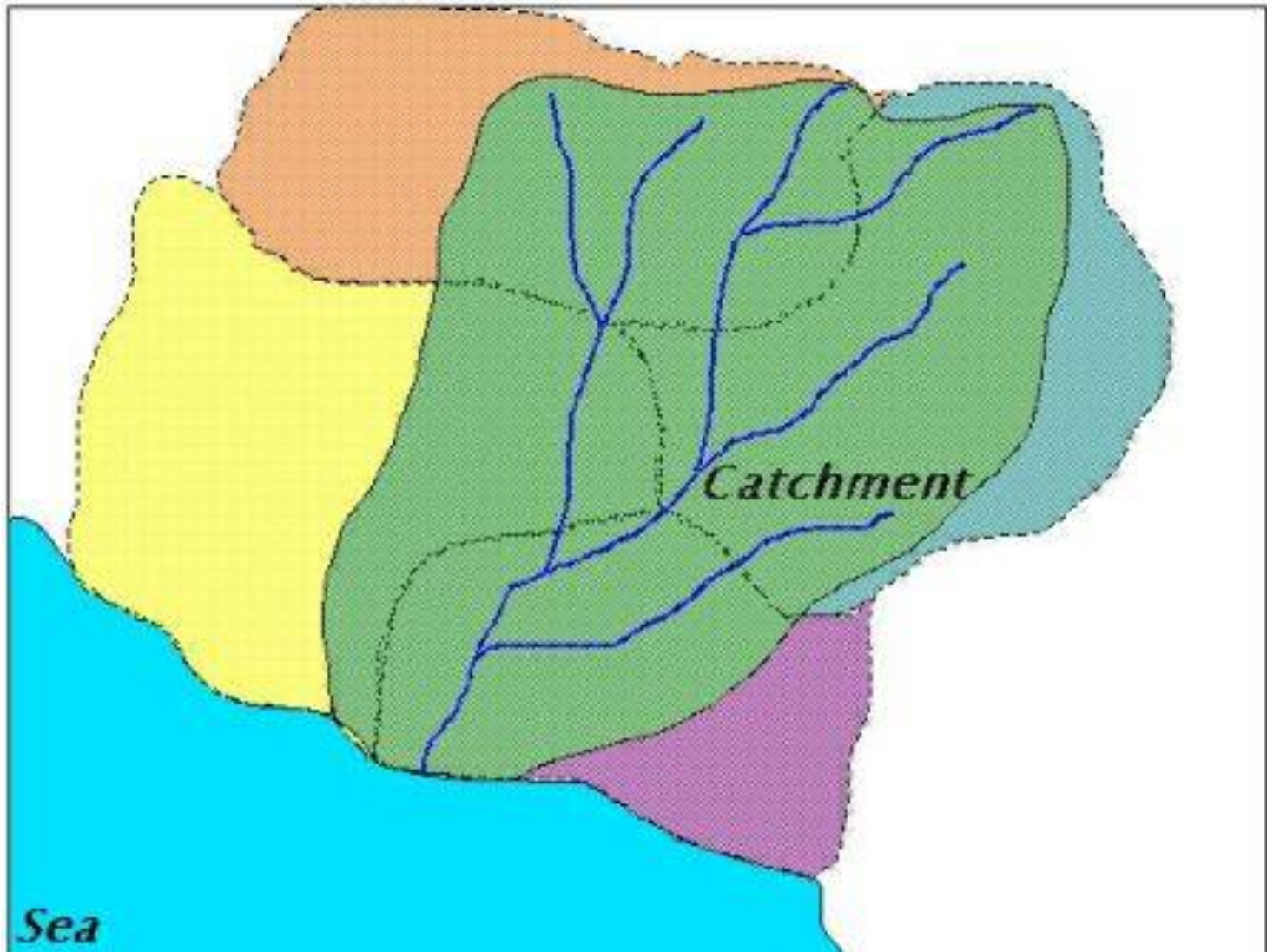
Lessons from Asia and Pacific

- **Need political will → high cost and long-term investment → benefits are in reducing losses vs. direct gain to economy**
- **Trend towards non-structural, preventive through good planning and legislation, more emphasis on reducing risk and increasing resilience, early warning, quick recovery**
- **Importance of River Basin approach**

River Basin

- Geographical area determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus

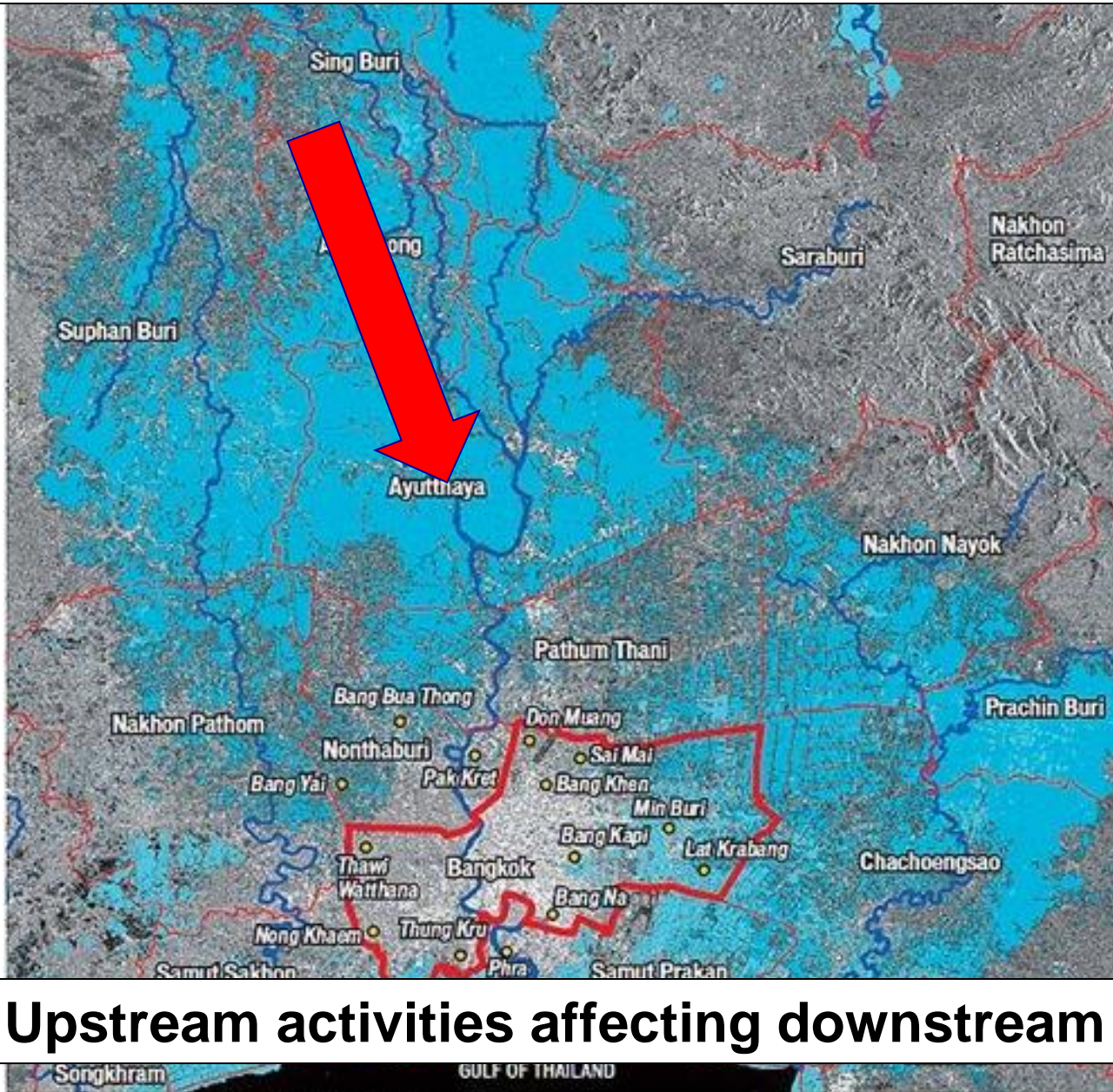




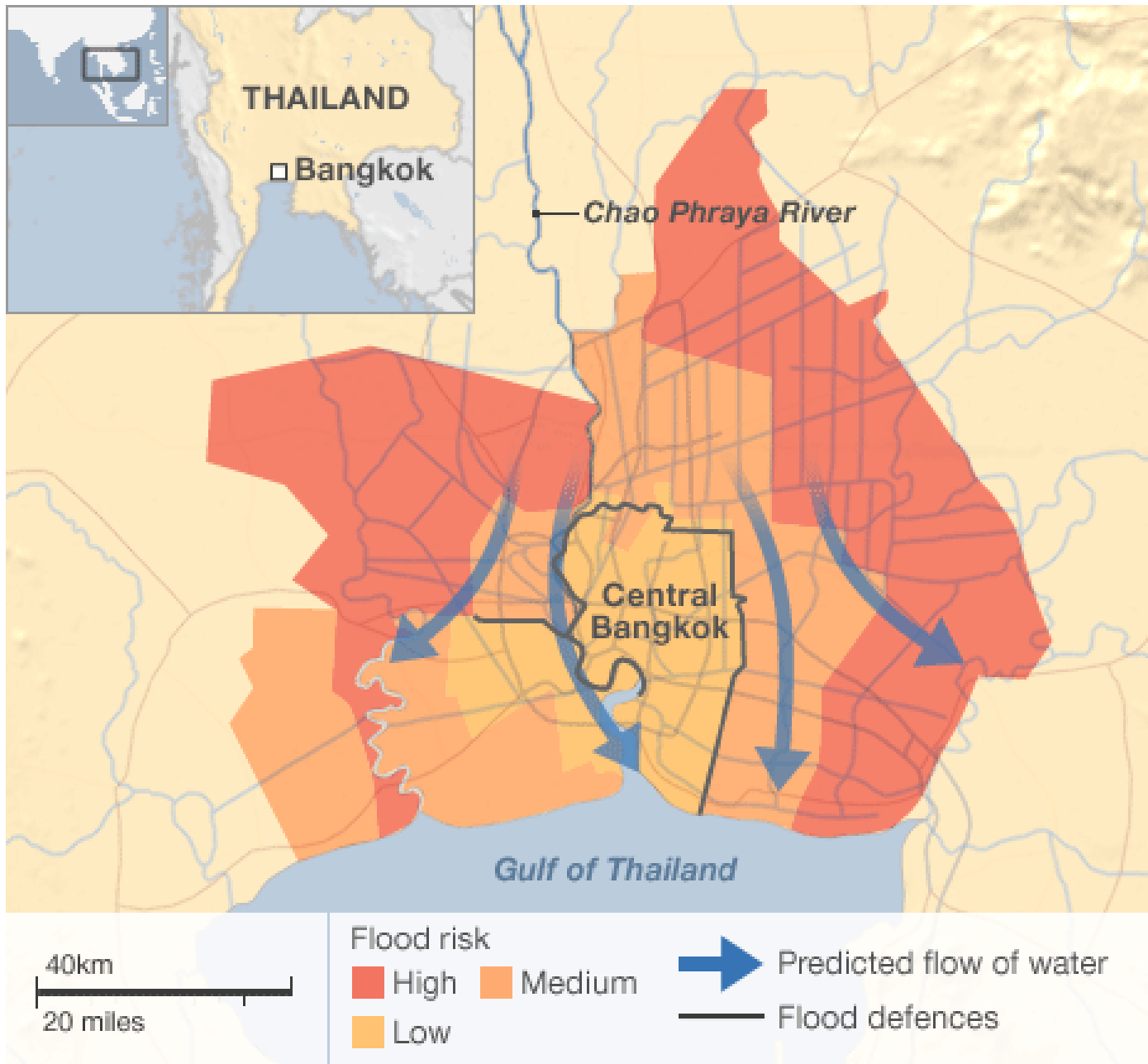
In a river basin → upstream activities can affect downstream areas and vice versa

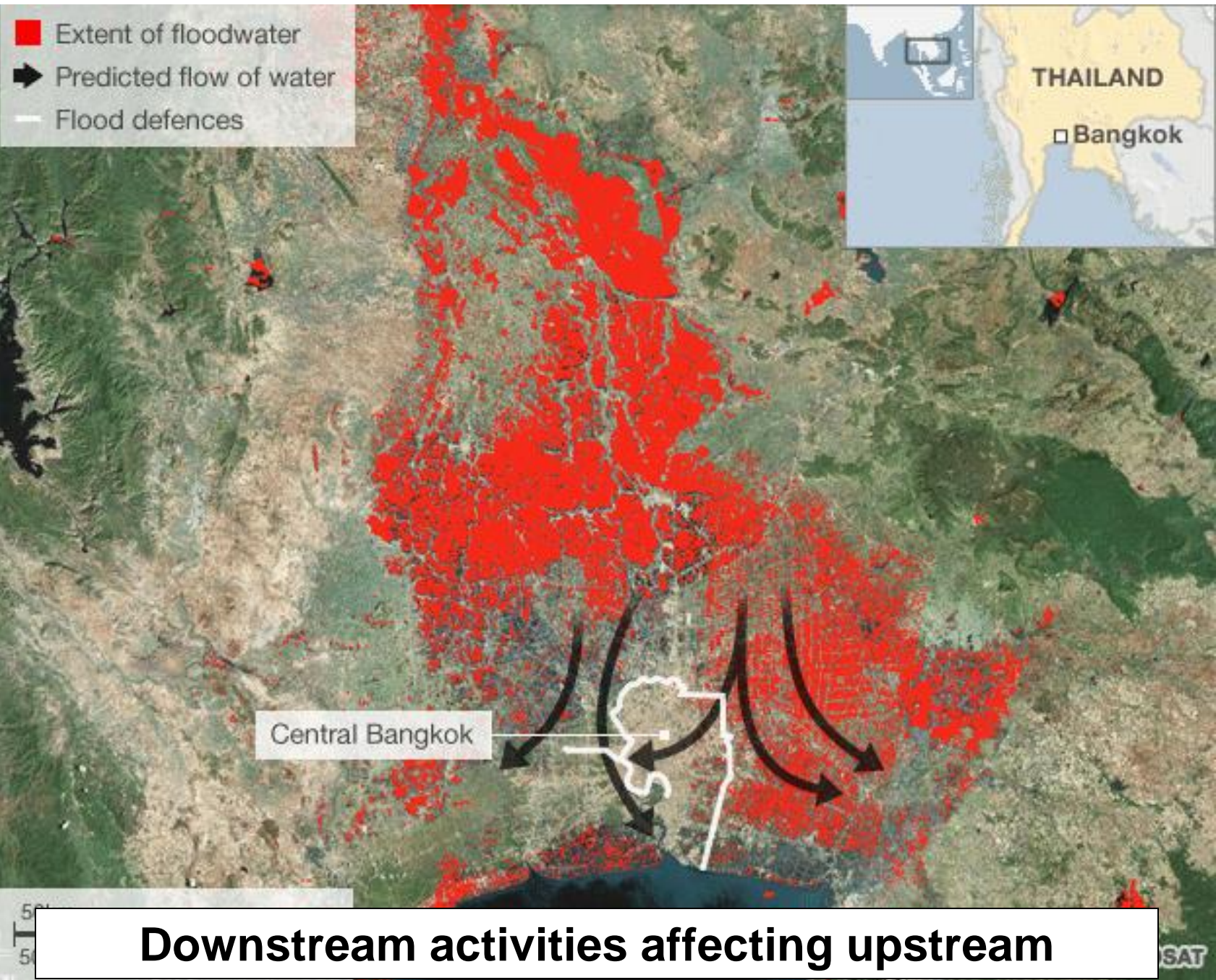
WATER WORLD: A satellite photo shows the extent of the flooding (in blue) around Bangkok.

Bangkok Floods



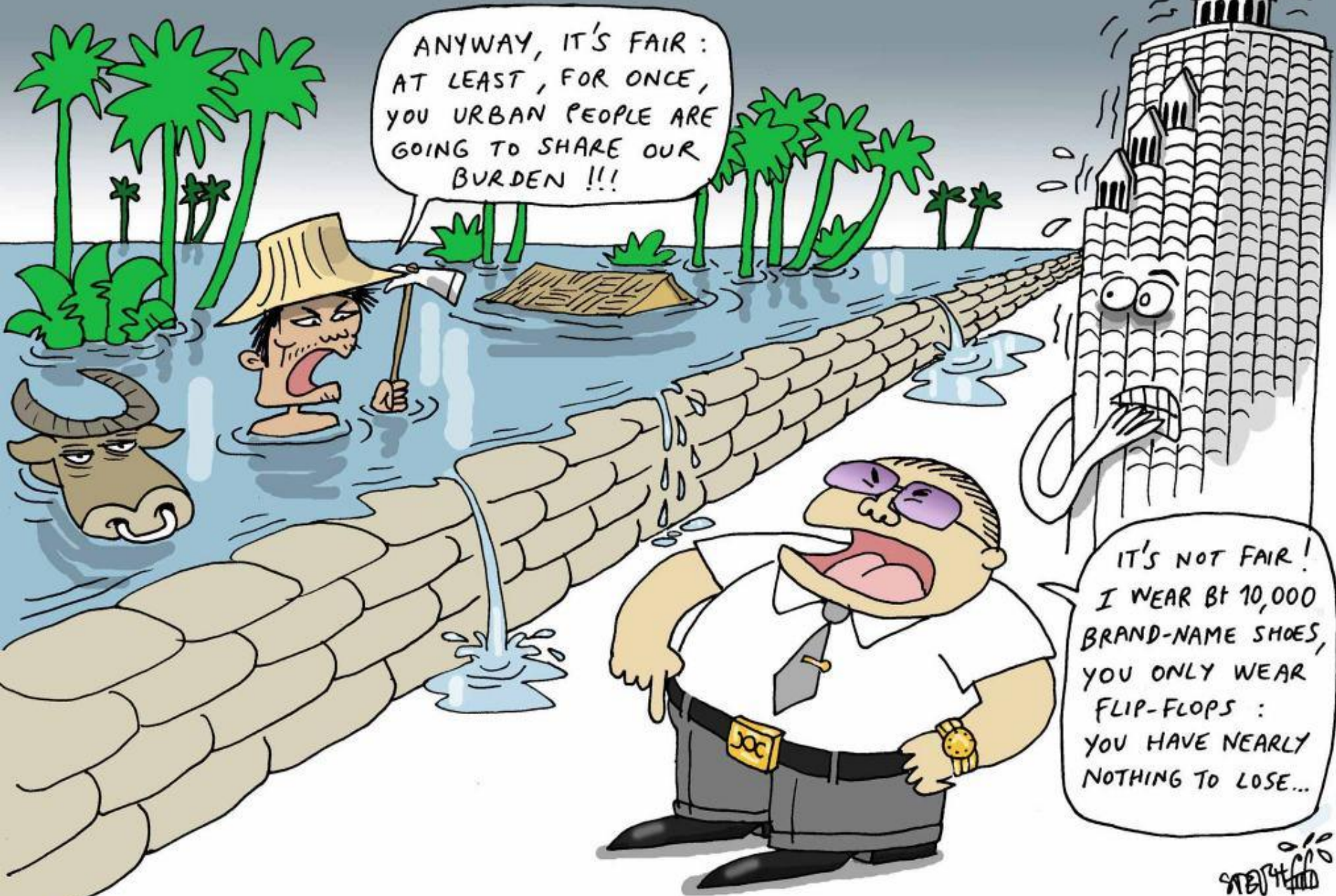
Upstream activities affecting downstream





Downstream activities affecting upstream

BANGKOK FACES WORST FLOODING IN MORE THAN 50 YEARS



ANYWAY, IT'S FAIR:
AT LEAST, FOR ONCE,
YOU URBAN PEOPLE ARE
GOING TO SHARE OUR
BURDEN !!!

IT'S NOT FAIR!
I WEAR BT 10,000
BRAND-NAME SHOES,
YOU ONLY WEAR
FLIP-FLOPS:
YOU HAVE NEARLY
NOTHING TO LOSE...

STREETART

Lessons from Asia and Pacific

- **Importance of River Basin approach**
 - **Best managed by River Basin Organizations (RBOs) → Front-liners**
 - **Disconnect between the different levels**
 - **Senior/policy level → good knowledge**
 - **Front-liners → lacking**
 - **Need to enhance capacity of RBOs → both staff and institution**

Lessons from Asia and Pacific

- **Importance of River Basin approach**
- **Global warming/climate change**
 - **The Abnormal is the new Normal**

Wednesday, December 05, 2012

Extreme weather is new normal, U.N.'s Ban tells climate talks

DOHA (Reuters) - Extreme weather is the new normal and poses a threat to the human race, U.N. Secretary-General Ban Ki-moon said on Tuesday as he sought to revive deadlocked global climate change talks.



U.N. Secretary-General Ban Ki-moon talks during the opening ceremony of the plenary session of the high-level segment of the 18th session of the Conference of Parties (COP18) of the United Nations Framework Convention on Climate Change (UNFCCC) in Doha December 4.

Ban's intervention came as efforts to agree a symbolic extension of the U.N. Kyoto Protocol, a treaty that obliges about 35 developed nations to cut their greenhouse gas emissions until the end of 2012, looked to be faltering.

In a speech to almost 200 nations meeting in Doha to try to get a breakthrough, Ban said a thaw in Arctic sea ice to record lows this year, super storms and rising sea levels were all signs of a crisis.

"The abnormal is the new normal," he told delegates at the November 26-December 7 talks. He said signs of change were apparent everywhere and "from the United States to India, from Ukraine to Brazil, drought (has) decimated essential global crops".

"No one is immune to climate change - rich or poor. It is an existential challenge for the whole human race - our way of life, our plans for the future," he said.

The failure to agree a Kyoto extension is blocking efforts to lay the foundations of a new global U.N. deal that is meant to be agreed in 2015 and to enter into force from 2020.

Worst flood experience yet

JOHOR BARU: Mohammad Abdul Hamid, 63, was feeling edgy as he watched the rain pouring down non-stop since Sunday.

He had seen many floods in the 26 years he had lived in Kampung Laut but he sensed that the incessant rain the last few days was a bad omen.

"I was watching television in the hall in the morning and suddenly water started rushing into the house from the kitchen," he said, adding that in 10 minutes the waters had reached almost to his waist.

Mohammad, a retiree, said he grabbed his personal documents, carried his youngest child and called out to his other three children and wife to get out of the house.

With the help of neighbours, he managed to move a television set and washing machine to higher ground.

From there they watched the water around their double-storey house rapidly rise. Within three hours, the waters had reached the roof.

Rescuers from the Fire and Rescue Department later arrived to take them to the relief centre at SRJK Pu Sze.

"There have been some severe floods in the past but never one as bad as this," Mohammad said.

"My loss is about the thought of shifting

retired and have financial constraints."

N. Appanaitu, 54, said the flood this time was more severe.

"My family and I went outstation the day before and when we got back we saw our house in flood waters.

"I lost about RM20,000 worth of items, including our computer and electrical appliances," said Appanaitu.

At Kampung Mahmoodiah, restaurateur Ahmad Ismail, 25, struggled to keep the water from entering his house but to no avail.

"We were all prepared for this rainy season but we never expected the rain to fall continuously for days," he said, adding that his house started flooding at 2.30am yesterday.

Odd job worker Masri Safwan, 34, said he was shocked when he saw a car floating away in the floodwaters while the vehicle owner was having a meal at a nearby stall.

His friend, Abdul Rahman Abu Bakar, 43, blamed the poorly kept drainage for the floods.

"I cannot understand why because we have complained many times and the media have highlighted it countless times," he said.

At the height of the flood, he



Floods getting more intense and frequent

on the roof yesterday.

seeks refuge

Published: Friday April 17, 2015 MYT 11:44:00 PM

Updated: Friday April 17, 2015 MYT 11:59:58 PM

Last month was hottest March worldwide since 1880

MIAMI: Rising temperatures across the planet have set more new records, as the US government announced Friday that the globe experienced its hottest month of March since record-keeping began in 1880.

The period of January to March was also the warmest on record, said the monthly report by the National Oceanic and Atmospheric Administration (NOAA).

The latest data, which takes into account global averages across land and sea surfaces, follows announcements from the same US government scientists that 2014 was the hottest year in modern history.

Scientists warn that fossil fuel burning is pushing more greenhouse gas into the atmosphere, leading to increased temperatures, melting of polar ice and glaciers, and rising seas.

For March, the average global temperature was 1.53 Fahrenheit (0.85 Celsius) above the 20th-century average.

"This was the highest for March in the 1880-2015 record, surpassing the previous record of 2010 by 0.09 F (0.05 C)," said the report.

Droughts are more pronounced

1 Fahrenheit (0.02 Celsius) above the 20th-century average.

Lessons from Asia and Pacific

- **Importance of River Basin approach**
- **Global warming/climate change**
 - **The Abnormal is the new Normal**
- **Impact of floods and droughts no longer localized → can impact outside river basin boundaries or even have trans-boundary impact**

Tuesday November 15, 2011

Floods drive computer prices up

By P. ARUNA and AUSTIN CAMOENS
newsdesk@thestar.com.my

PETALING JAYA: The

Two particularly hard hit sectors are the automobile and computer manufacturing industries. Two of the world's largest car manufacturers, Honda and Toyota, have had severe disruption to their manufacturing processes, not just in Thailand but worldwide, due to a lack of parts. Thailand is responsible for the manufacturing of about a quarter of all HDD drives produced for the global computing industry. This round of flooding has raised fears of a global supply shortage of hard disk drives in the run-up to the lucrative Christmas period; already prices of hard drives are reported to have increased by up to 180%.

...manufacturer of HDD, accounting for nearly ... needs. HDDs are the storage component of desktop computers and laptops.

A check with several IT outlets here showed that the price of external

Disruption to Global Supply Chain

sters : NARBO

Nov 2015

NARBO

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Prolonged drought in Indonesia

1 Fahrenheit (0.02 Celsius) above the 20th-century average.

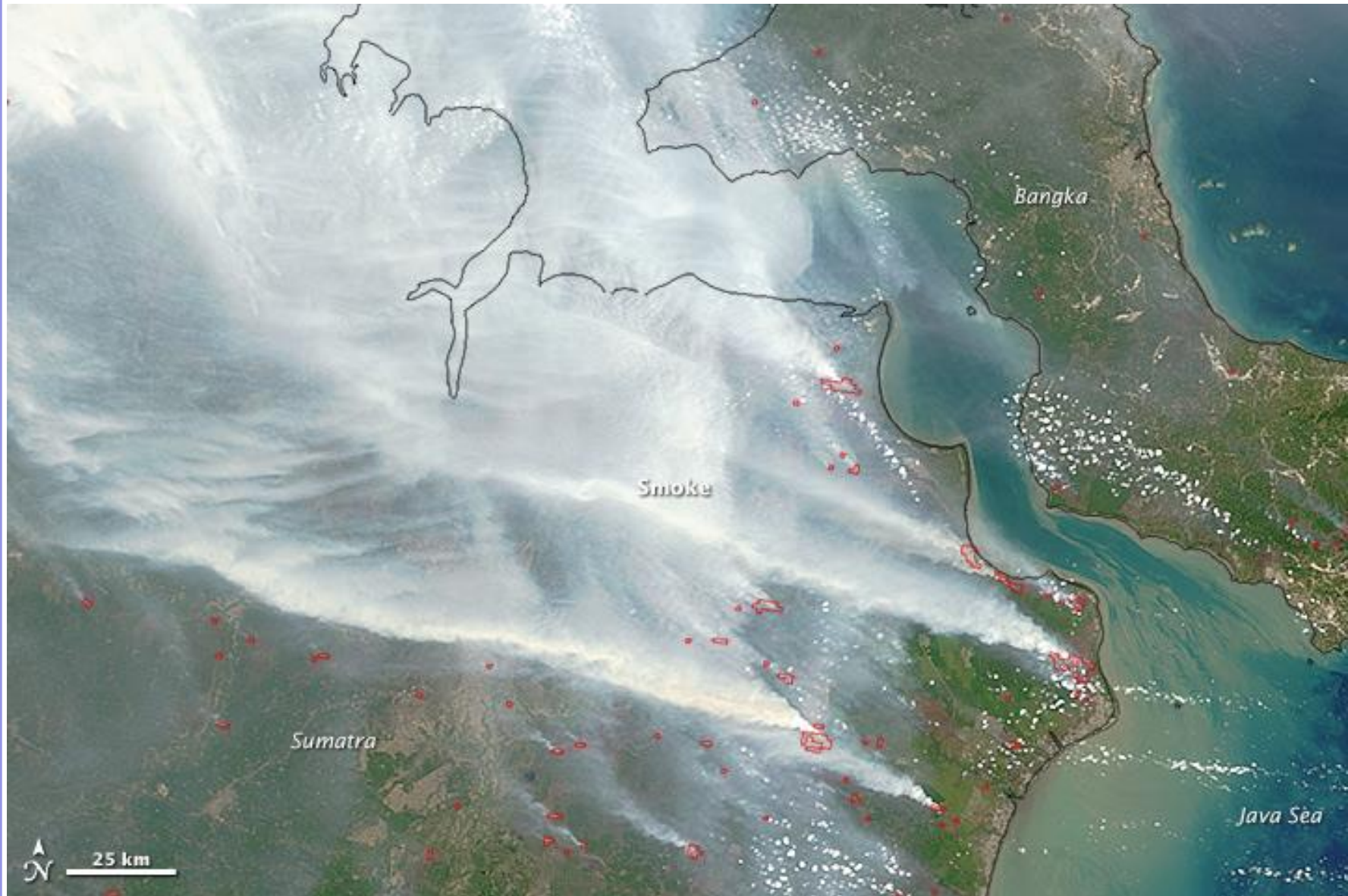
SOUTHEAST ASIA FOREST FIRES



SOURCE : NASA

DATA AS AT SEPTEMBER 14, 2015







Kuala Lumpur



Actions needed to Address the Challenges

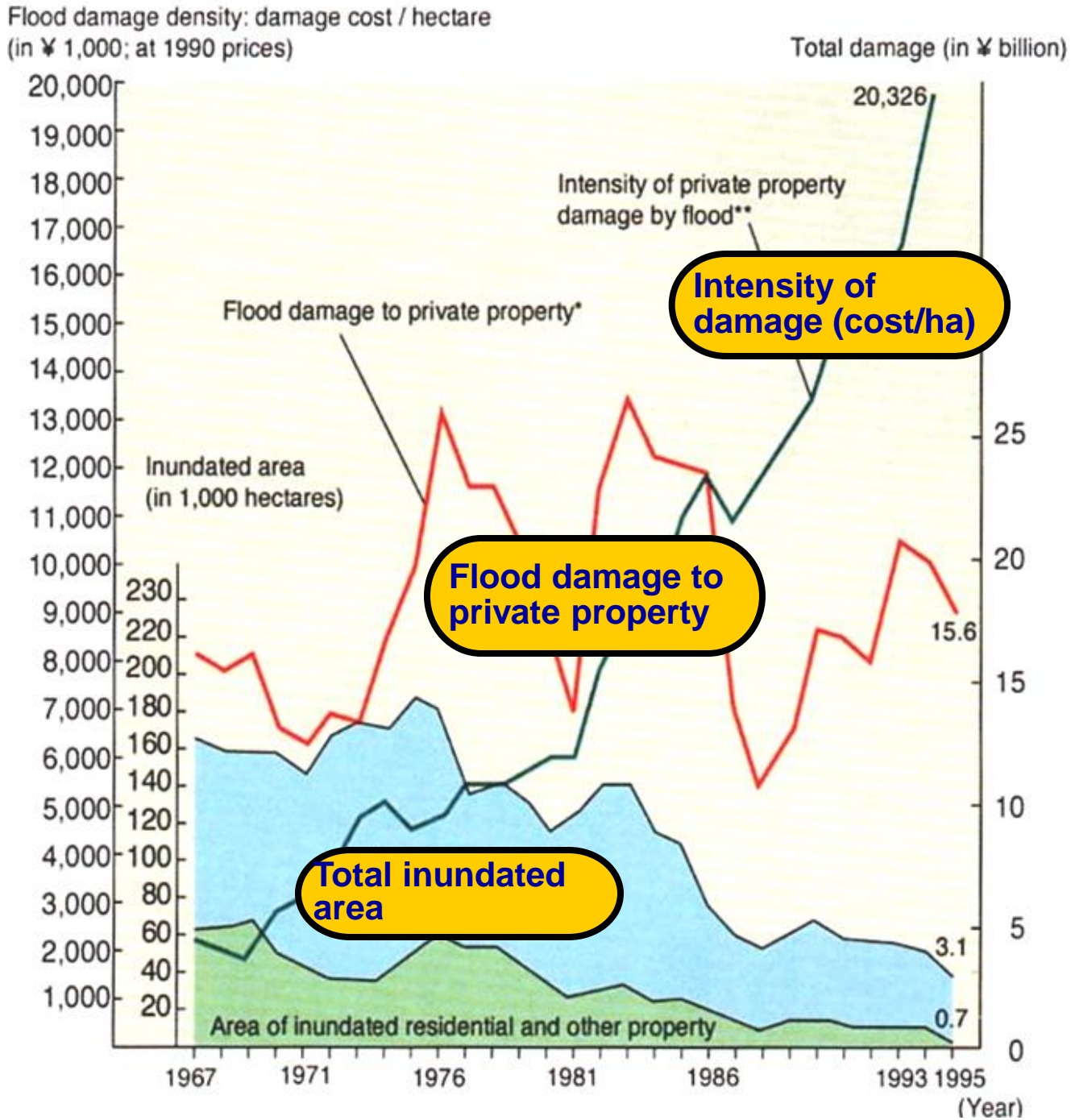
Actions to address Challenges

- **Achieve water security, economic security**
 - **Need structural measures**

Actions to address Challenges

- **Achieve water security, economic security**
- **Need continuous and sustained effort**

Flood damage (cost/hectare)



Flood damage (total cost)

Actions to address Challenges

- **Achieve water security, economic security**
- **Need continuous and sustained effort**
- **Need comprehensive and integrated approach**
 - **Address flood problem at source**
 - ❖ **Through better planning/coordination/
institutional and legislative control**

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. Calamities 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, participation of stream improvement projects helps to preserve regional environmental characteristics.

Resilient coastal resources
In addition to the installation of levees and the like to prevent extensive establishment of warning and evacuation systems, disaster distribution caused by disasters.

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

Slope failure prevention
Slope failure prevention measures protect area residents.

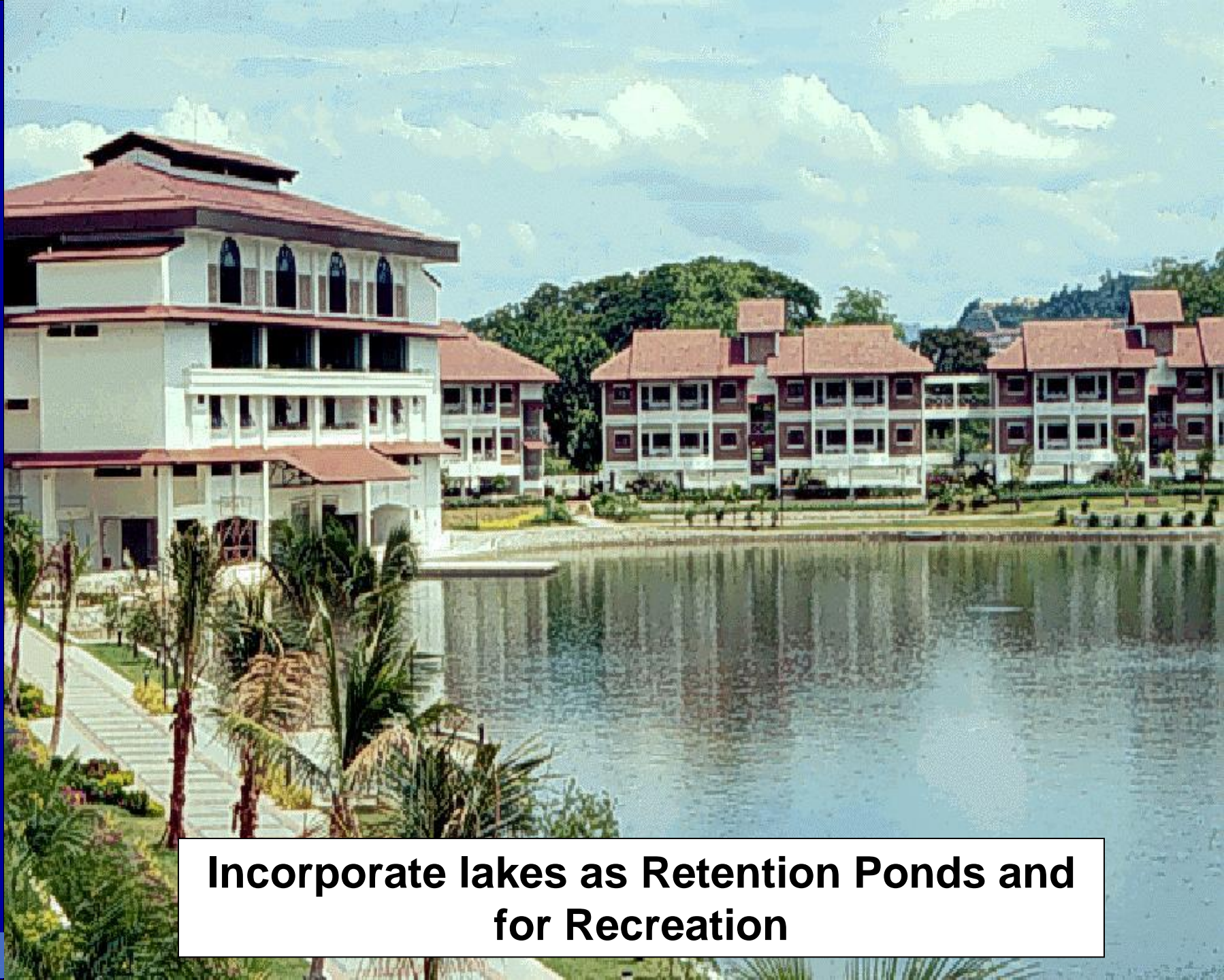
Maintenance of coastal environments
Creating promenades and playing fields on coastlines, artificial reefs, and coastal development provides space for marine sports.



River Basin Master Plans provide overall framework for development in a river basin

Actions to address Challenges

- Achieve water security, economic security
- Need continuous and sustained effort
- Need comprehensive and integrated approach
 - Address flood problem at source
 - ❖ Through better planning/coordination/institutional and legislative control
 - ❖ Control at source → aka Low Impact Development (LID) → aka Water Sensitive Cities



**Incorporate lakes as Retention Ponds and
for Recreation**



Rainfall Harvesting



Pervious Pavements

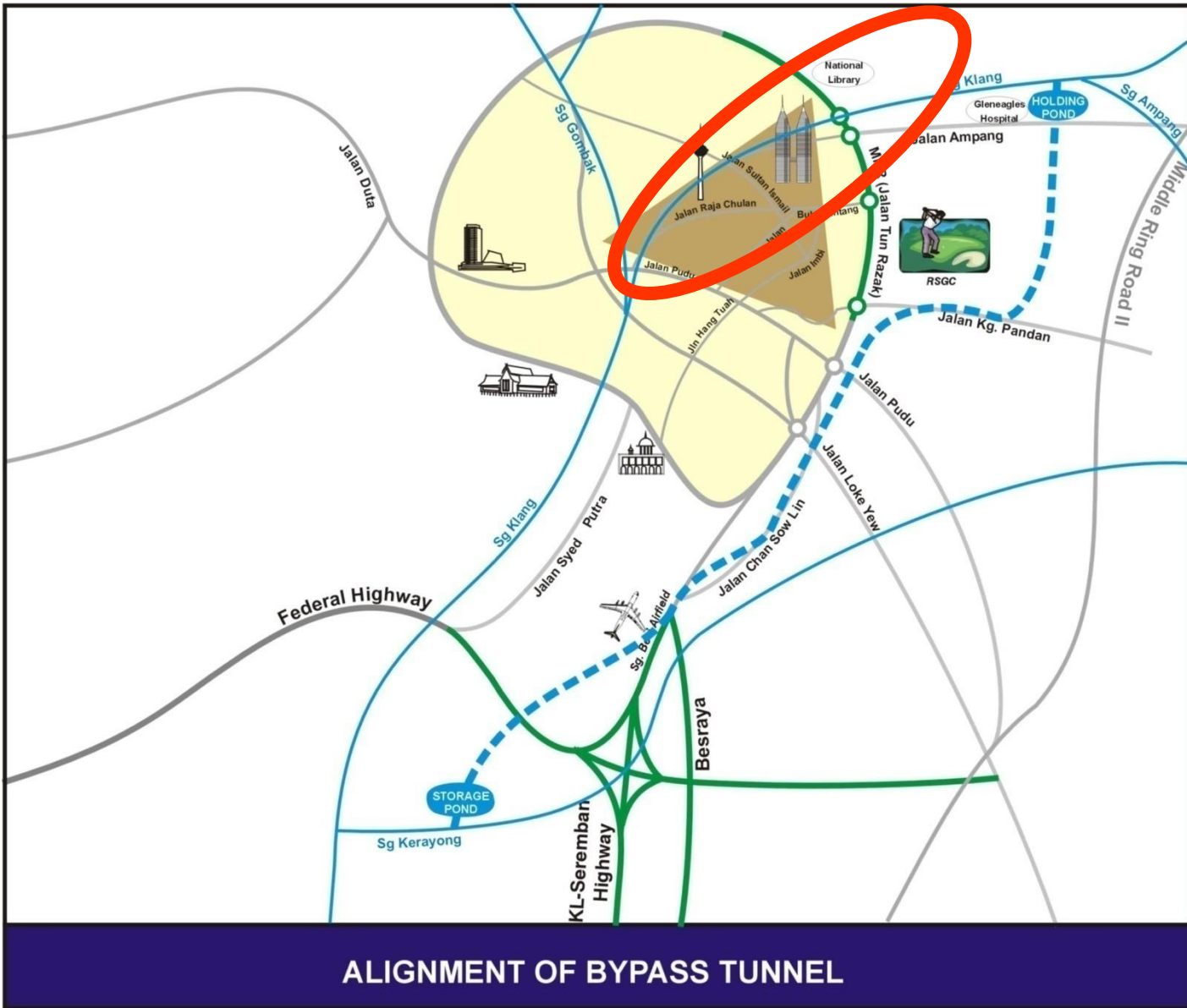
Actions to address Challenges

- **Achieve water security, economic security**
- **Need continuous and sustained effort**
- **Need comprehensive and integrated approach**
- **Need innovative solutions**
 - **SMART Tunnel in Kuala Lumpur**

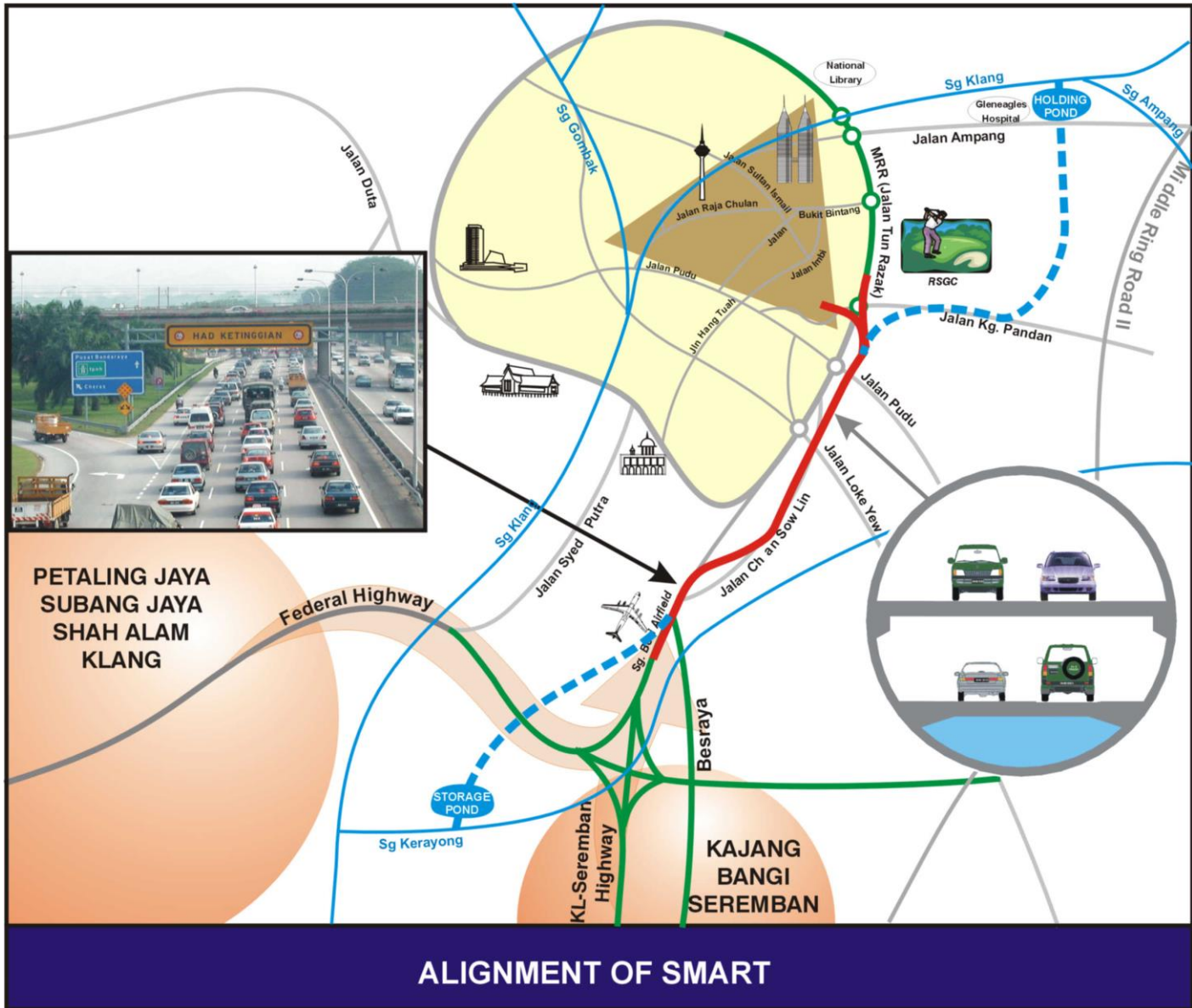


Kuala Lumpur City Centre

Flood Bypass to cater for excessive flows



Dual Function Flood Bypass Tunnel





SMART Tunnel

Actions to address Challenges

- **Achieve water security, economic security**
- **Need continuous and sustained effort**
- **Need comprehensive and integrated approach**
- **Need innovative solutions**
- **Uncertain future → need adaptation/flexible solutions**
- **Adopt River Basin approach**
- **More focus on building resilience and reducing risk**
- **Share knowledge and experiences**

