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DISASTER MANAGEMENT IN MALAYSIA



Content

- Introduction
- Challenges
- Landslides
- Flood
- SMART
- Conclusion

Introduction

- Malaysia is situated in South East Asia, neighbouring Thailand to the north, Singapore and Indonesia to the South and Philippines to the Northeast.
- Malaysia consists of Peninsular Malaysia and East Malaysia (part of Borneo) separated by South China Sea.
- Flag



Coat of Arms



Introduction (cont.)

- Home to the world's tallest twin building, The Petronas Towers and the seventh tallest telecommunication tower in the world, Kuala Lumpur Tower.



Introduction (cont.)

- National Security Council (NSC)
 - The lead agency in matters regarding national security (disaster, crisis, terrorism, public order, cyber attacks, etc)
 - Disaster Management Division.
 - Plan and enforce key policies on disaster management via NSC Directive No. 20.
 - Provide secretarial services to Disaster Management Committees in national, state and district levels.
 - Deploy the Special Malaysia Aid & Rescue Team (SMART) to affected areas.

Geographical Challenges

- The Pacific Ring of Fire extends about 40,000 km long stretching from New Zealand, along the eastern edge of Asia, north across the Aleutian Islands of Alaska, and south along the coast of North and South America.
- Fortunately, Malaysia is just outside the Pacific Ring of Fire. However, Malaysia still experiences effects from tsunamis and earthquakes. Tremors, mostly non-lethal can be felt in Malaysia, caused by earthquakes in Sumatra islands of Indonesia and the Philippines.



Geographical Challenges (cont.)

- The weather in Malaysia is characterised by two monsoon regimes, namely, the Southwest Monsoon from late May to September, and the Northeast Monsoon from November to March.
- The Northeast Monsoon brings heavy rainfall, particularly to the east coast states of Peninsular Malaysia and western part of East Malaysia, whereas the Southwest Monsoon normally signifies relatively drier weather. The transition period in between the monsoons is known as the intermonsoon period.
- During the Northeast Monsoon, heavy rain & improper drainage leads to flash flood in the middle of KL.

Geographical Challenges (cont.)

- Given Malaysia's geographical location, most floods that occur are a natural result of cyclical monsoons during the local tropical wet season that are characterised by heavy and regular rainfall from roughly October to March.
- It is made worse by the fact that most of these flood-prone areas are “water basins”, areas that are surrounded by higher level areas that also contain rivers.

Geographical Challenges (cont.)

- With 189 “water basins” in Malaysia and an average rainfall of over 2000mm per year, Malaysia is prone to flooding. There have been 15 instances of major flooding in Malaysia since 1926. Flooding has been a larger concern today due to rapid development in the river catchment area which increase the river runoff and decreasing the river capacity.
- The recent 2006 and 2007 flooding in southern Peninsular Malaysia has resulted in loss of RM1.5 billion (USD475m) and 18 lives in addition displacing 110,000 people temporarily. However, in this case, floods was believed due to recent global warming effect. This is because southern Peninsular Malaysia is not within the usual monsoon affected zone.
- Kuala Lumpur, the capital city, unfortunately also suffered from being one of the “water basins”.

Landslides in Malaysia

- Triggered by heavy rainfall during the monsoon season, improper construction works, bad drainage system, underground water movement etc.
- A serious problem but does not happen too often. (1-2 cases a year)
- Most important cases happened to houses built near hill slopes and/or water catchment areas.

Landslides in Malaysia







Flash Floods in Kuala Lumpur

- Triggered by heavy rainfall during the monsoon season, overflowing of rivers, improper construction works, bad drainage system, etc.
- Kuala Lumpur's location, on the meeting point of two major rivers.
- The current flood control drains are no longer sufficient to handle the massive amount of storm water.

Flash Floods in Kuala Lumpur



Challenges for Kuala Lumpur

- Eliminate or minimize massive flash floods.
- Building huge flood control drains are impossible due to lack of space in the city centre.
- Due to flash floods, massive traffic jams also occur throughout the city centre.
- Effects: economic issues, bad image for tourism, impact on small businesses and a nuisance to everyone.
- The government decided to tackle both problems in one solution.

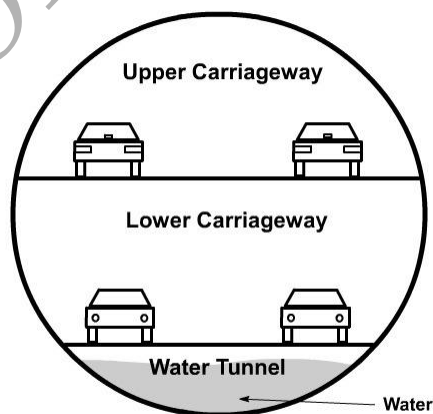
Stormwater Management And Road Tunnel (SMART)



SMART – Introduction.

- Stormwater Management And Road Tunnel (SMART)
- Building started in 2003, opened to public in 2007.
- Built directly underneath Kuala Lumpur's main roads.
- Primary function: to divert stormwater away from the city centre to south of the city, into a holding pond before released back into a river.
- Secondary function: to ease traffic along major roads in KL during peak hour.
- At 9.7 km (6 miles), SMART is the longest multi-purpose tunnel in the world.

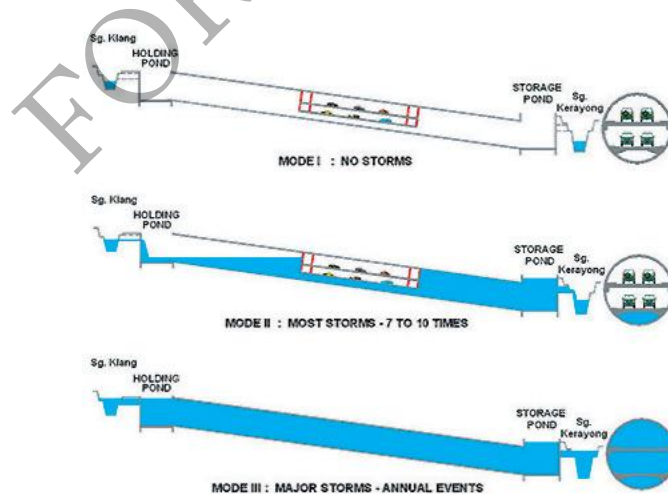
SMART – Cross Section



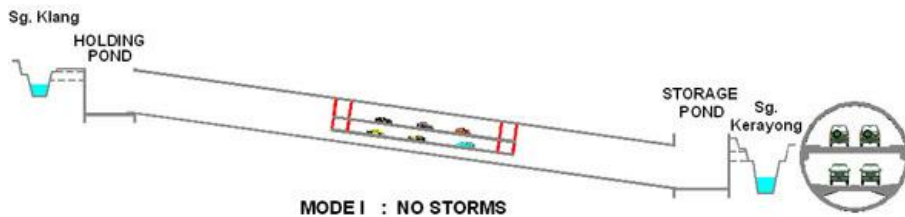
SMART - Components

- 9.7 km stormwater by-pass tunnel.
- 3 km double-deck motorway within stormwater tunnel.
- 11.5km inclusive of ingress and egress connections to the motorway tunnel linking the southern gateway to the city centre.
- Holding basin complete with diversion and tunnel intake structures.
- Storage reservoir and a twin-box culvert to release flood discharge.
- State-of-the-art operations control room equipped with the latest operations management, surveillance and maintenance systems.

SMART - Operational Modes

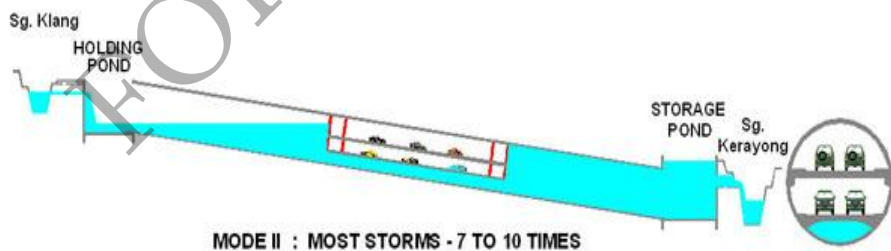


SMART – Mode I



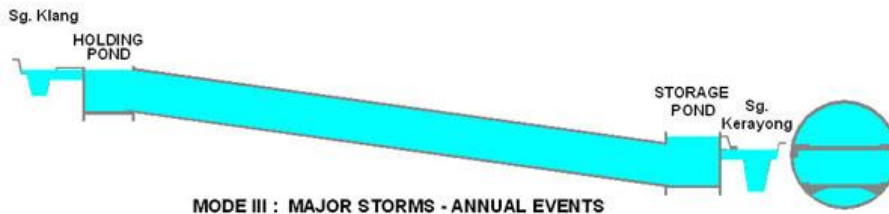
- No storm, no/little rain.
- Motorway operates as usual.

SMART – Mode II



- Moderate storm, excess rainwater will be diverted through the stormwater bypass tunnel, in the lower channel of the motorway tunnel.
- The motorway tunnel is still open to motorists.

SMART – Mode III



- Heavy storm, motorway closed to all vehicles.
- Automated water-tight gates are opened to allow floodwater to pass through to the storage pond and subsequently to Kerayong River.
- The motorway tunnel will be re-opened to traffic within 48 hours after closure.

Success

- SMART has proven to be a success in meeting its primary and secondary objectives. Because of this infrastructure, vital areas in Kuala Lumpur city centre such as Masjid Jamek area, Dataran Merdeka, Leboh Ampang and Jalan Melaka have witnessed no major flooding incidents since Smart opened in 2007.
- Mode III operation was activated to prevent potentially severe flooding of Kuala Lumpur city centre a total of seven times: two times each in 2007, 2008, and 2012 and once in 2011. Mode II operation, which does not affect use the road tunnel was activated dozens of time in the period.

Success

- In terms of its role in traffic relief, SMART has minimised the journey for cars into KL city centre from the southern gateway from the normal 30 minutes when using the federal road to only 8 minutes when using SMART. Around 38,000 vehicles use the double deck motorway each day.
- Putting a financial value these benefits, a Malaysian Department of Irrigation and Drainage survey concluded that, within three decades, SMART is expected to prevent USD\$1.58 billion of possible flood damage and up to USD\$1.26 billion savings from traffic congestion. The savings are likely to be significantly more, since these estimates are only for the duration of three decades—the tunnel has a design life of 100 years.

Conclusion

- SMART lived up to its name. A smart solution for two problems at the same time. It has proven itself a technological marvel that is vital in mitigating a disaster away from Malaysia's capital city of Kuala Lumpur.
- Kuala Lumpur city center no longer face the same major flood problems as it used to before 2007 particularly in SMART coverage areas.
- However, focus is now to other areas outside KL city centre. Among the steps taken to avoid major flooding in other areas are to further deepen major rivers and to build more flood control drains.



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