

Scratching beneath the surface

As DBKL works towards constructing a high-capacity groundwater storage structure under Kuala Lumpur to prevent flash floods, *StarMetro* finds out what specialists in the field think about this multibillion-ringgit project and gets their perspective on viable options to the long-standing issue. >2&3



ASSESSMENT PAYMENT

For the month of February, Kuala Lumpur City Hall will have its mobile counter beside the JPJ office in Jalan Permaisuri 8, Bandar Seri Permaisuri, Cheras and in front of Wisma Central building at Jalan Ampang, from Monday to Friday, 9am to 4pm. Ratepayers can settle their assessment bill at the counter.

MOVING OFFICES

The Kota Kinabalu Inland Revenue Board (LHDN) service counters at the ground floor and mezzanine level of Menara Hasil Kota Kinabalu will be relocated temporarily to Dewan Menara Hasil Kota Kinabalu from today (Feb 6). For details, call 03-8911 1000 (local) or 03-8911 1100 (overseas).

HERITAGE SEMINAR

Johor Baru City Council (MBJB) via Perpustakaan Sultan Ismail, is collaborating with Persatuan Sejarah Lisan Malaysia to organise a seminar on the city's heritage in conjunction with the city council's 29th anniversary. The seminar will be held virtually on MBJB's official Facebook page on Feb 7 from 9.30am to 12.30pm. Participation is free. Register at <http://bit.ly/SWJB2023>

PUBLIC OPINION

The public can share ideas for the Shah Alam sports complex development until Feb 10, from 10am to 10pm at Atrium SACC Mall Shah Alam. The engagement session is organised by the Selangor Menteri Besar Incorporated (MBI). Feedback can also be given at kssa.maklumbalas@gmail.com

REUNION LAUGHTER PARTY

The World Women Entrepreneur and Charity Association is organising a Chinese New Year Reunion Laughter Party in aid of Little Yellow Flower Foundation on Feb 11 from 9.30am to 12.30pm at Maju Link, Kuala Lumpur. The event is to raise awareness of underprivileged children's need for education, support, assistance and empowerment. There will be laughter yoga and lion dance. For details, call 017-401 1777 (Venice).

FREE WEBINAR

Listen to cancer survivors share their stories of triumph over cancer. The 'Cancer Chronicles: My Personal Journey' webinar will take place on Feb 18, from 8am to 5.30pm. To register, visit <https://tinyurl.com/4455hsy4>.

Experts: Floodwater facility may not be ideal for KL

They weigh in on its suitability, suggest alternative solutions

(6 FEBRUARY 2023), THE STAR, P2, P3

Stories by **BAVANI M**
bavanim@thestar.com.my

KUALA Lumpur City Hall's (DBKL) feasibility study on building an underground storage system to mitigate flooding should be nearing its completion date.

The idea for the system was first mooted by former Federal Territories minister Datuk Seri Shahiddan Kassim in June last year.

Shahiddan had said DBKL would work with Drainage and Irrigation Department (DID) to build a high capacity groundwater storage facility to prevent flash floods in Kuala Lumpur.

This project is separate from mayor Datuk Seri Mahadi Che Ngah's request last month for RM500mil from the Federal Government for infrastructure projects such as building water retention ponds and flood walls to prepare for future floods.

The Statistics Department revealed last month that in Kuala Lumpur alone, the December 2021 floods caused an estimated damage of RM32.4bil.

In a recent interview with Mahadi on the progress of the consultants hired for the study, he said at least six months was needed to study the viability of the project and come up with findings.

"Our consultants are studying the specifications of the groundwater storage tunnel and they need to collect data from the lowest point to channel water via gravity.

"It is cheaper to rely on gravity rather than build pumps. "And then there is slope analysis, terrains and the topography as well as calculating rainwater intensity in all areas," he explained.

Mahadi added that this project would cost a lot of money and because it would be borne by taxpayers, it was crucial that all the data was collected before going forward with the project.



The Taman Wahyu flood retention pond which has been alienated for development in Batu, Kuala Lumpur. — YAP CHEE HONG/The Star

Underground storage

The study will determine the viability of building underground chambers to hold floodwaters during a flood before releasing it into the river during low tide.

Kuala Lumpur currently has a similar system in place which is the Stormwater Management and Road Tunnel (SMART Tunnel).

A 9.7km bypass tunnel, its function is to divert excess floodwater at the confluence of Sungai Klang and Sungai Ampang into the SMART Tunnel system.

Since it was opened in May 2007, the tunnel has diverted floodwaters 40 times and averted about RM1.4bil in public damage.

The SMART tunnel only covers flooding around locations such as Masjid Jamek, Jalan Tun Perak, Leboh Ampang, Jalan Melaka and nearby areas, sending water into the Taman Desa catchment area.

However, flash floods also occur around Jalan Tun Razak, Kampung Baru, Jalan Gurney, Jalan Semarak and Kampung Kasipillay, which involve other rivers.

And because of the excessive rainfall brought on by extreme weather conditions and global warming, experts predict that things are only going to get worse.

As such, drastic long-term measures are required, but is building a multibillion ringgit underground tunnel the solution?

Tokyo's plan in KL

"In Tokyo, due to space constraints, the city had to go underground and it works because that's the Japanese way.

"They are disciplined and it fits with their culture.

"Do we have that culture?" asked former DID engineer Balachandran Naicker, 68.

Balachandran reminded that Kuala Lumpur's flood mitigation plans carried out in the 1970s and 1980s did very little to solve the problem.

Following big floods in 1971, DID targeted three key areas to alleviate floods in the city, and the first one was restructuring the three main rivers of Sungai Batu, Sungai Gombak and Sungai Klang, as well as deepening and widening the tributaries.

Other strategies included creating flood retention ponds to prevent low-lying areas from flooding as well as the construction of three main dams at each river.

"When the SMART Tunnel was mooted and built in the early 2000s, it was probably the most significant move carried out to solve the perennial problem that has been plaguing the city for decades.

"While it did the job of moving water from open surface drains into

'Basement car parks can be used to store rainwater'

(6 FEBRUARY) THE STAR, P2

FLOODS in Kuala Lumpur tend to happen fast and end just as quickly, but the after-effects are usually devastating.

The federal capital has three main rivers, Sungai Batu as well as Sungai Klang and Sungai Gombak, which meet at Masjid Jamek.

Throughout the years, the water volume of these rivers has been increasing because of global warming, which results in intense rainfall.

The condition is further exacerbated by unsupervised land development with decreasing trees and soil to capture rainwater.

While Kuala Lumpur is usually hit by a big flood once or twice a year now, it may become more frequent if nothing is done.

According to former Drainage and Irrigation Department director-general Datuk Dr Keizrul Abdullah, floods will become a regular occurrence in the future.

"In the past, we built the Batu Dam and raised the height of the



Keizrul says floods will become a regular occurrence in the future.

Klang Gate Dam and then, we had the SMART Tunnel, which was also built to divert extra water from Sungai Klang for flood mitigation.

"We also have retention ponds to temporarily store water, though

this method can only store a limited amount.

"With so much rainwater these days, poor drainage systems and overdevelopment, it can be very challenging to find ways to store excess water," Keizrul said.

On building underground storage chambers for flood prevention, he said it was doable but a very expensive option.

He elaborated that Japan, Australia and France had buildings with underground storage systems for floods.

"In Australia and France, they have buildings such as sports stadiums, which are built with underground storage facilities that can be used to store water.

"In Japan, a lot of their buildings have basements with built-in water storage systems.

"Just imagine in Kuala Lumpur if all the buildings turned their level 1 and level 2 basement car parks into underground storage, we could have a huge amount of

storage space," Keizrul added.

"It would be difficult for older buildings to do so as it would be costly, but this is something to consider for new developments," he added.

He explained that in 2000, DID came out with its Urban Stormwater Management Manual (MSMA), representing a shift in management of stormwater in the country.

"It is basically about controlling stormwater run-off and sediment control during the earthwork stage at source," Keizrul said.

The Cabinet-approved manual made it mandatory for developers building new townships to follow its guidelines, which reduces floods in urban areas.

Developers are required to construct water absorption areas around houses instead of drains and replace concrete drains along highways with grass-filled canals that have in-built water retention tanks.

"The manual sets out to solve part of the stormwater problem faced when new developments are being constructed.

"It was supposed to solve this problem at source and the government was advised to ensure that new developments retrofit underground storage tanks for their projects.

"Of course, many developers said this cannot be done," he said.

He added that it was crucial for developers to follow the manual as it was common to see older neighbourhoods, which never experienced flooding before to suddenly be inundated with floodwaters.

"When we investigate, there is always a new development being built nearby that was the reason for the flooding.

"With more green space and trees taken over by development, there is nothing to capture the rainwater that runs off soil and into the rivers, raising the water level," Keizrul said.

Flood retention ponds in Kuala Lumpur

NAME	SIZE (HECTARE)	AGENCY IN CHARGE	ALIENATED FOR DEVELOPMENT
KAMPUNG BENTENG	6.6	DID Director	
TAMAN SRI SEGAMPUT	4.2	DID Director	
BATU	71.6	FT Ministry Sec-Gen	
NANYANG	20.1	DID Director	Flood mitigation project
DELIMA	8.1	DID Director	Mixed development
TAMAN WAHYU	25.4	DID Director	Mixed development
KAMPUNG PUAH	2.3	DID Director	
BATU 4 ½	0.9	DID Director	Project cancelled
MIDAH	17.5	DID Director	
FLAT SRI JOHOR	24.8	FT Ministry Sec-Gen	
TAMAN DESA	17.6	Federal Territory Land Exco	Project cancelled
TAMAN BEREMBANG	13.4	DID Director	
SETAPAK JAYA	4.5	Federal Territory Land Exco	
BOYAN	8.9	Federal Territory Land Exco	
BOHOL	37.8	DBKL Mayor	

Source: DID

TheStar graphics



The SMART Tunnel closed to traffic following a downpour to divert stormwater. – Filepic



According to the Statistics Department, the December 2021 floods caused an estimated damage of RM32.4bil in Kuala Lumpur alone. – Filepic

downstream well enough, it did not, however, solve flooding in areas outside its reach," he said.

So while some may believe that building another tunnel is a possible solution, are we looking at the right model?

In multiple media reports, Shahidan mentions Tokyo's underground tunnelling system as an example, after visiting the city with Mahadi last year.

But is Tokyo's system the right fit for Kuala Lumpur?

Balachandran does not think so.

"Tokyo's climate and geography is challenging, with a monsoon season that brings with it torrential rain and typhoons, and the city is also prone to earthquakes.

"About 100sq km of the city is below sea level and rapid urbanisation has only made the city sink further.

"Moreover, most of the consumable space is hard, so when the rains pour there are surface run-offs and little room to build discharge channels and water overflows," he

added.

Balachandran feels that perhaps a more suitable system for Kuala Lumpur is the one in Hong Kong.

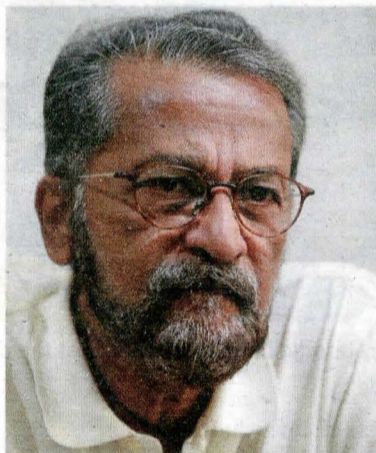
Sponge city concept

"In Hong Kong, underground space has been used for flood mitigation whereby the city can function like a sponge and the stormwater can be absorbed, stored and cleaned on rainy days, and later, released and reused when needed," he said.

Basically, a sponge city is an urban space that has been designed to cope with excess rainfall using different techniques.

Instead of having to deal with flash floods and surface run-off from rivers bursting its banks and overflowing drains, sponge city design can mitigate or prevent it from happening by naturally absorbing the water.

Its measures include having rooftop green spaces, storage to harvest rainwater, creating more lakes and



Balachandran says retention ponds should never be touched for development.

ponds to hold excess water, planting more trees and building roads with porous surface materials.

Balachandran also feels that the current SMART tunnel system can be extended to include other areas.

SMART's first chief operating officer Mohd Fuad Kamal Ariffin said MMC-Gamuda, which constructed the SMART tunnel and the MRT, had the expertise and experience to do it.

"The technology of their tunnel boring machines has improved and can easily handle Kuala Lumpur's highly-weathered limestone," he said.

Keep retention ponds

Additionally, Balachandran and Mohd Fuad reiterated the need for the government to gazette flood retention ponds in Kuala Lumpur.

"If flood retention ponds are alienated for development, it will affect the storage capacity (of the pond) and this will affect the surrounding area as well as SMART Tunnel operations.

"Building tunnels costs a lot of money, hence it is always better to maintain our retention ponds," Mohd Fuad said.



Mohd Fuad says the government should gazette flood retention ponds.

"Retention ponds should never be touched for development and regular maintenance of the pond is also crucial," added Balachandran.

"The pond's reserved buffer zones should only be touched for maintenance work," he stressed.

Based on the 2019 Auditor General's Report, Kuala Lumpur MPs highlighted that six retention ponds used for flood mitigation had been approved and alienated for development.

The six ponds were Kolam Batu, Kolam Nanyang, Kolam Delima, Kolam Taman Wahyu, Kolam Batu 4 ½ and Kolam Taman Desa.

However, this was later clarified in Parliament by the then deputy Federal Territories Minister Datuk Seri Jalaluddin Alias, who said only two flood retention ponds had been alienated for development. Jalaluddin said only the ponds in Taman Wahyu and Delima in Kepong had been approved on Jan 18, 2018.

No approval was given for the other four ponds.

Nanyang pond is included in the Sungai Jinjang Flood Mitigation Plan.

However, it should be noted that parts of the Taman Desa flood



Mahadi is seeking RM500mil from the government to undertake more flood mitigation projects.

retention pond were alienated for development despite it being a threat to the SMART Tunnel's operations.

But part of the government's conditions was that the company must guarantee that the development would not reduce the capacity of the pond.

As the developer was unable to do so, the deal was eventually cancelled by the government.

A similar situation also happened with Kolam Batu in Jalan Kelang Lama, whereby a development order was cancelled because the company was not able to fulfil several conditions.

Sources within DID told *StarMetro* then that the alienation of Taman Desa pond posed a threat to SMART Tunnel operations.

"Although the project was cancelled, there is no guarantee that in the future, someone else may want to develop it," said a source.

"DID can only advise the government.

"The decision to take into consideration our comments depends entirely on those with power," he said, adding that it was better to gazette the ponds to guarantee that it was protected in perpetuity.



A file photo of the SMART Tunnel showing a flood gate that channels water to the Taman Desa holding pond.