GEOSS-AWCI in Asia-Pacific

Water Issues, Malaysian Scenario Tokyo 12 January 2017

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Content of presentation

- Introduction
- Observation
- Data related issues
- Conclusion

Introduction Water Resources In Malaysia Water cycle Annual Rainfall Evapo- transpiration 2940 mm 413 bill. m3 (971 billion m3) (42.5%) 494 bill. m3 Groundwater (50.9%) 64 bill. m3 (6.6%)Kolam Perkhidmatar Service Reserv an by UKOM BHSA 2004 Based on Review of National Water Resource Study 2000-2050 Kolam Imbangan Rumah Pam alancina Reservoir -Penapisan Pasi ki Air Bersi Discharge to septic tank / drain ?

Water Security Challenges



Climate change, Recent extreme hydrological events

Lack of proper facilities, poor governance structure to stop negative spiral wrt water related disasters

- Increased hydrological runoff from development and climate change
- Existing water infrastructure inadequate to cope with increased flows
- Shortcomings in legislation and institutional setups
 - Poor planning and policies wrt water related disasters

NEW STRAITS TIMES

Master plan for river basins Monitoring land use for development

By Jaswinder Kaur

news@nstp.com.my

KINABATANGAN, Mon. The Drainage and Irrigation Depart-

environment

ment will for on land NWRC (29th July 2003) \rightarrow River Basin Master The ma basis for Plans to be the Basis for Development within a monitor the count He said sary as " was part tivities ha Keizrul nessing dustry A

Mannan

Sungai 1

in Sukau

About 40 people representing government agencies, non-governmental organisations, students and members of the media participated in the expedition which was organ-

River Basin to achieve the objectives;

sufficient, clean, reduce flood risk and

"DID sees rivers as a heritage we should care for. Rivers provide 98 per cent of our drinking water while the remaining two per cent is from underground water." Keiz-

> ree of proi provides tion," he

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Observation





Defining Water Security



Water Security : quantities of water, of acceptable quality, to ensure human and ecosystem health. »





Asian Water Cycle Initiative (AWCI) in Asia - Pacific Too much or too little water – management issues



Development on floodplain zone!!!

New development areas



Existing development areas





Climate change effect

Temperature:

 Increase in mean surface temperature: 0.6°C to 1.2°C, 1969-2009 (MMD)

Rainfall

- Increased rainfall intensity -> 1-hour rainfall intensity (2000-2007) increase by 17% compared to 1970s values (NAHRIM)
- "Above average" rainfall cause flood losses RM 1.5 billion
 - In 2007: Massive floods in Batu Pahat, Johor Baru, Kluang, Kota Tinggi, Mersing, Muar, and Segamat ->Typhoon Utor
 - In 2014: Massive floods in Kuantan, Pahang and Kelantan

Sea Level Rise

4.6 cm to 11.9 cm, satellite altimetry data (1993-2010)



Area (km²)

		ANNUAL AVERAGE DAMAGE, AAD (RM Million)							
NO.	STATE	KTA 2002 Study (berdasarkan kadar pada 2002)	KTA 2002 Study (inflation rate 24.6% dari 2002 sehingga 2012)	DNA 2012 Study (berdasarkan kadar pada 2012)	Perbezaan antara KTA 2012 dan DNA 2012 (%)				
1	Perlis	2.75	3.43	48.342	1309.39				
2	Kedah	30.20	37.63	126.795	236.95				
3	Pulau Pinang	44.52	55.47	34.233	-38.29				
4	Perak	22.64	28.21	58.929	108.89				
5	Selangor	75.76	94.40	55.870	-40.82				
6	Wilayah Persekutuan	99.33	123.76	33.363	-73.04				
7	Negeri Sembilan	3.96	4.94	14.237	188.19				
8	Melaka	2.29	2.85	15.096	429.67				
9	Johor	64.00	79.75	333.541	318.23				
10	Pahang	76.15	94.88	37.317	-60.67				
11	Terengganu	101.58	126.57	83.283	-34.20				
12	Kelantan	93.32	116.28	146.733	26.19				
13	Sabah	ah 140.96		82.819	-52.85				
14	Sarawak	157.66	196.44	80.501	-59.02				
		915.12	1,140.25	1,151.057	0.95				

- 100					.uuy (2	2002)	- 0	NA SU	uuy (2	012)						
12,000	Total Flood Affected Area; KTA Study (as of yr. 2000) KTA Study (remeasured)				<u>ea;</u>))	= 29,799 km ² = 32.801 km ²			(Berdasarkan keluasan yang sama cuma menggunakan GIS, perisian							
10,000						,				in riaco.	///D/)					
- 60	DI	NA Stud	ly (as of	yr. 2010)	= 33,29	<u>8 km²</u>									
8,000	Pertambahan kawasan banjir adalah seluas 497 km² (31 RBMU baru dikenalpasti mengalami ++															
6,000		jaulan banjir ualahi kajian														
4,000									-++			++				
2,000		++		++	ï				1		Ī					
	++		++				++	++			_		_			
-	Perlis	Kedah	Penang	Perak	Selango r	K Lumpur	Negeri Sembila n	Melaka	Johor	Pahang	Terengg anu	Kelanta n	Sabah	Sarawak		
KTA Study (2002)	27	209	207	663	1,789	13	129	81	2,367	6,272	2,223	1,640	3,284	10,896		
DNA Study (2012)	375	1,028	298	1,402	569		165	235	3,912	6,394	2,202	2,839	3,922	9,951		

3,922

9,951





Floods getting more intense and frequent

"My loss is all thought of shift

the roof vesterday

Water Demand in Malaysia



Planning

Asian Water Cycle Initiative (AWCI) in Asia - Pacific

- Water resources as national agenda; development and investment
- Water security and build climate resilience
- In managing water resources, require data integrity (sustainable, reliable and sufficient)
- Data management framework require enterprise architecture;
 ✓ Water resources management system gateway
- Data collection and management for decision process;
 - Water resources data; online and manual from designated station
 Application system;
 - flood forecasting and warning (40 river basins, RM550mill, 2015 2022, 7days forecasting and 2 days warning)
 - national water balance (phase 1, 5 river basins, RM45mill, 2016 2020; phase 2, 9 river basins, RM100mill; phase 3, 19 river basins, RM190mill)
 - Utilisation of flood water; not to discharge and waste
 - Data sharing; interagency from provider to user with protocol

Development

- Solving for the future; implementation and operation
 - ✓ New approaches, integrate water related project
 - More innovative solution including science based
- Basin management is extremely complex; conflict resolution
- Management of basins in growing development
- River basin study to develop management plan;
 ✓ access the present scenario and plan for the future (25 plan, 2016 2020)
 - Providing sufficient budget to execute the action plan



Guiding principle

- National Water Resources Policy, thrust;
 - Water for people
 - Water for food and rural development
 - Water for economic development
 - Key Area, focus area;
 - Water resources security
 - Water resources sustainability
 - Partnership
 - Capacity building and awareness



Legislation

- Water Resources Bills, covers;
 - Water resources usage
 - Planning
 - Protection of water resources area
 - Water hazard control
 - Activity control
 - Licensing
 - Enforcement
 - Offences and penalties
 - Repeal and savings

Asian Water Cycle Initiative (AWCI) in Asia - Pacific



SUNDAY STAR, 12 JUNE 2016

Conclusion

22 interview with

ZULKEFUL HASDAN



hours to pack up and move. Our job is to

they have such a short window period to

evacuate the victims. I want to give them

accurate, early warning - at least two days

documents and belongings can be salvaged. We can do it with Prab. Simply put, Prab allows evacuation by lorry, when the land's

ing if the DID has to find out about floods when people call us and we're caught una-

before it starts to flood, so that important

I feel bad for the uniformed forces because

By CHRISTINA CHIN gchris@thestar.com.m Photos by IZZRAFIQ ALIAS

DATUK Zulkefli Hassan has been busy meeting DID officers nationwide since his appoint-ment on March 21.

The 59-year-old Perakian, who rose up the ranks from junior engineer more than three decades ago to Drainage and Irrigation Department (DID) director-general, wanted to know what challenges his men faced. Zulkefli, a father of three, also wanted to drive home the importance of integrity and explain to them his personal KPI. The youthful-looking grandfather keeps healthy jogging but with retirement just a

year away, he has his work cut out for him Recalling how his 91-year-old policeman father always stressed on education - and regular haircuts – the third of four siblings jokes about his cropped army look and shares his plans to keep floods and droughts

What's your main water management concern?

Water security because it concerns national security. Food, health, energy, industry and domestic sectors all need water. DID was formed in 1932.

In the early days, the focus was on rice, crops, farming and the rivers. Today, our function includes flood mitigation, urban drainage, coastal zones, hydrology and water resources. But it's only now that we're focussing on water resources because with climate change, we must. Take food for example - we import almost

30% of rice from countries like Thailand Myanmar and India but these countries face done, we'll hand over our 4.8ha land in the same weather problems as us.

In 2014, taps were dry in the Klang Valley. Without water security, who'll want to invest in our country? Right now it doesn't make sense – floods for a month, no water the next. oper will be picked soon. At least once I've signed on the dotted line, the project will

Tell us your personal KPI. Making sure that our move from KL to

Putrajaya is on track. Implementing the National Flood Forecasting and Warning Programme, or Program Ramalan dan Amaran Banjir Negara (Prab), and National Water Balance Management System (Nawahs)

Why's having a new building in Putrajaya

So important? Our offices are scattered all over the place right now – the DID divisions are located in different buildings and locations. Our headquarters in KL is very crammed. Imagine having to call for an emergency meeting. How can I wait for everyone to

come when time is of the essence? We need a building that can house all the divisions under one roof. We've been planing this for years. It's long overdue Securing a site and allocation was a problem.

We cannot just ask money from the Government. But we're seeing the light at the end of the tunnel. We're getting a building which is more than 30 storeys high with rainfall harvesting facilities in Putrajaya and a training centre in Ipoh, thanks to a land swap dea

The DID headquarters will also be upgradplace and linked up, we can give early alerts. We're starting with Kelantan, Terengg ed. It'll house the Federal Territories office

when we move out After construction is Pahang Perak and Sarawak, because these states are the ones worst effected by mon-Ampang to the developer. The deal is now being handled by the Public Private Partnership Unit (Ukas). Hopefully, a develsoon floods.

And the National Water Balance

Management System (Nawabs)? It's related to Prab. The infrastructure officially be on. This will really motivate our monitoring systems and devices for both are about the same but Nawabs is focussed on linkages between the water sources. Nawabs What's the National Flood Forecasting and is the "brain" that tells us where to get the Warning Programme (Prab) about? All this while, during floods, we evacuated water from and how to distribute it. It tells us where sources like ponds, groundwater, victims by boat. Warnings issued to them are very late – which means they have barely six dams, and lakes are and how much water there is.

With Nawabs, we can give early drought warnings and prevent dry taps. For example, we will be able to tell if in two weeks. Selangor will be dry and we can plan to get water from another state (inter-basin) or from alternative water sources within the state (intra-basin). But sourcing via inter-basin can only happen if there's a protocol between the states because water and land are under the state purview.

We have so many states and all are inde-pendent so there must be an agreement to still dry. No need for boats. Now, we rely on sirens and the warning is only sounded hours before the water rises. It's embarrassensure easy access to the water source if and when needed. We must look at water management in terms of resource and usage holistically.

ware. Our warning system needs to be bet-ter. And, it'll be with Prab. Inter-basin water sharing is the key to Nawabs' success. The Natural Resources and We'll work closely with the Meteorological Department. Detailed information on the topography is needed. Radars, rainfall and Environment Ministry is selling the idea to the individual states and response has been good so far. Hopefully, the first reading of the Water Resources Bill, which covers this water level stations must be increased for better forecast. With all warning systems in will take place by the end of the year or early next year

When is Nawahs kicking off We're starting with Sungai M Kedah, Sungai Bernam, Sungai Sungai Klang because these are stressed urban areas. Not forge areas, we're also going to Saray

many living in the hinterlands ter harvesting and groundwate sources. Must we resort to treating wa Singapore's NEWater? We're only collecting about 1 annual rainfall. If we can get at

be enough for sure but our rair tered. We have lots of water bu we going to store it? With infrastructure – more d ing the capacity of existing dam in urban areas, tapping into gro the rural areas and rainfall har

retain more water, and an inter col between the states in place be anymore dry taps. Treating wastewater is the ex can get water from dams, pond

ter and rainfall. Eventually, we' gate barrages like Singapore. Al very expensive, we can use bar fresh water, prevent salt water in from the sea, and during the excess water into the sea.

> Malaysia faces heavy rains and yearly yet we haven't figured out how to solve our flooding woes. Why? We're very urban-centric. We talk about

flash floods in the city while the villagers suffer in silence. We've already got small pro

issue

but what about the small towns in states like

have to follow it but allocation for them, is an age works. Once done, Kelantan will be safe. In Pahang, Kuantan and Pekan are always States like Selangor, Penang and Johor are the worst hit. In Sabah and Sarawak okay because their assessment rates are high Kuching in particular - the Minister (Dr Wan

Junaidi) pushed very hard to secure alloca

focus 23 Water security for future generations

anthe shy super

Waterman on a mission

Flood-fighting mission is also making water security his priority

Director General DID Malaysia

probably in Ipoh - I'll finally get to do that with my wife. I'd like to visit New Zealand. For now, I'm content watching TLC on Astro I like exotic locations like Peru and the

