

ASEAN IWRM PERFORMANCE REPORTS & MONITORING INDICATORS

Singapore Summary Report (Flood Management)

IWRM Issue 4 - Flood Management (15 indicators)			
Indicator Types	Indicators	2010	2013
Outcome Indicators	1. Total area affected by flood (target reduction in flooded area)	56 ha	36 ha
	2. Total number of people affected by flood (target reduction in the number of people/households affected by flood)	0 flood casualty. Singapore experienced flash floods that are of short duration (typically less than 30min) and localized (1 or 2 lanes of a road). Hence, there is no flood casualty.	0 flood casualty. Singapore experienced flash floods that are of short duration (typically less than 30min) and localized (1 or 2 lanes of a road). Hence, there is no flood casualty.
	3. Annual cost of flood damages	No quantification of damages as there is no destruction of crop fields, houses or factories. Singapore experienced flash floods that are of short duration (typically less than 30min) and localized (1 or 2 lanes of a road).	No quantification of damages as there is no destruction of crop fields, houses or factories. Singapore experienced flash floods that are of short duration (typically less than 30min) and localized (1 or 2 lanes of a road).
	4. Percentage of annual national budget allocated to flood management	SG\$173.7mil	SG\$241.6mil
	5. Percentage of flood-prone areas in the country covered by early flood warning systems	100%	100%
	6. Percentage of flood-prone areas in the country covered by real-time flood monitoring system	100%	100%

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EE Indicators	1. Any “Policy” on flood management and river conservation	Yes	Yes
	2. Any “Legislation/Regulations” on flood management and river conservation	The Sewerage & Drainage Act empowers PUB to ensure that proper drainage systems are designed for the purposes of flood protection	The Sewerage & Drainage Act empowers PUB to ensure that proper drainage systems are designed for the purposes of flood protection
IS Indicators	1. Any flood management regulatory agencies	Yes. PUB is the flood management agency	Yes. PUB is the flood management agency
	2. Any institutional arrangements among related agencies to manage flood	Yes. In times of flash flood, PUB works closely with other agencies/ media to manage site conditions and update the public	Yes. In times of flash flood, PUB works closely with other agencies/ media to manage site conditions and update the public
MT Indicators	1. Any implementation of Integrated Flood Management (IFM) approaches involving the use of structural and non-structural flood mitigation measures	PUB adopts the 3key strategies:- <ul style="list-style-type: none"> • Providing adequate drainage infrastructure ahead of new developments • Implementing flood protection measures by stipulating requirements such as minimum platform levels and crest levels in the COP • Improving drainage in flood prone areas continually by widening or deepening drains and/or 	PUB adopts the 3key strategies:- <ul style="list-style-type: none"> • Providing adequate drainage infrastructure ahead of new developments • Implementing flood protection measures by stipulating requirements such as minimum platform levels and crest levels in the COP • Improving drainage in flood prone areas continually by widening or deepening drains and/or

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		raising low-lying roads	raising low-lying roads
	2. Any program to develop flood hazard and flood risk maps	Yes. Flood maps are developed for major canals	Yes. Flood maps are developed for major canals
	3. Any river basin flood zoning and land use planning	Drains are designed to cater to the land use designated by Singapore's landuse authority	Drains are designed to cater to the land use designated by Singapore's landuse authority
	4. Any program to control the loss of existing low-lying flood detention areas to development	Adequate drainage infrastructure will be provided ahead of new developments	Adequate drainage infrastructure will be provided ahead of new developments
	5. Any climate adaptation program to mitigate the potential impacts of extreme floods due to climate change	A nation-wide study is being conducted on the effects on climate change, including specific parameters relevant to flood management such as rainfall intensity & sea level rise.	While the impact of climate change is being studied, PUB has (since Nov 2011) designed drains to a higher design standard & require new developments to meet a higher platform level. When the study is finalized, appropriate additional measures will be taken.