

ASEAN IWRM PERFORMANCE REPORTS & MONITORING INDICATORS

Singapore 2013 Report (Flood Management)

Outcome Indicators

IWRM Issue 4 - Flood Management (15 indicators)			
Indicator Types	Indicators	Progress	Description
Outcome Indicators	1. Total area affected by flood (target reduction in flooded area)	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.
	3. Annual cost of flood damages	No quantification of damages	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\$241.6mil	-
	5. Percentage of flood-prone areas in the country covered by early flood warning systems	100%	PUB is updated by meteorological agency on heavy rainfall. PUB uses a network of 171 water level sensors island-wide. 49 CCTVs are also available for public viewing
	6. Percentage of flood-prone areas in the country covered by real-time flood monitoring system	100%	PUB is updated by meteorological agency on heavy rainfall. PUB uses a network of 171 water level sensors island-wide. 49 CCTVs are also available for public viewing

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Enabling Environment Indicators

EE Indicators	1. Any "Policy" on flood management and river conservation	Yes	<p>PUB adopts the 3key strategies:-</p> <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 raising low-lying roads
	2. Any "Legislation/Regulations" on flood management and river conservation	Yes	The Sewerage & Drainage Act empowers PUB to ensure that proper drainage systems are designed for the purposes of flood protection

Institutional Set-up Indicators

IS Indicators	1. Any flood management regulatory agencies	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

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Management Tools Indicators

MT Indicators	1. Any implementation of Integrated Flood Management (IFM) approaches involving the use of structural and non-structural flood mitigation measures	Yes	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 raising low-lying roads
	2. Any program to develop flood hazard and flood risk maps	Yes	Flood maps are developed for major canals
	3. Any river basin flood zoning and land use planning	Yes	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	Yes	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	Yes	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.