

## ASEAN IWRM PERFORMANCE REPORTS & MONITORING INDICATORS

### Singapore 2010 Report (Flood Management)

#### Outcome Indicators

<b>IWRM Issue 4 - Flood Management (15 indicators)</b>			
<b>Indicator Types</b>	<b>Indicators</b>	<b>Progress</b>	<b>Description</b>
<b>Outcome Indicators</b>	1. Total area affected by flood (target reduction in flooded area)	56 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\$173.7mil	-
	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 90 water level sensors island-wide.
	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 90 water level sensors island-wide.

## ASEAN IWRM PERFORMANCE REPORTS & MONITORING INDICATORS

### Enabling Environment Indicators

<b>EE Indicators</b>	1. Any "Policy" on flood management and river conservation	Yes	<p>PUB adopts the 3key strategies:-</p> <ul style="list-style-type: none"> <li>• Providing adequate drainage infrastructure ahead of new developments</li> <li>• Implementing flood protection measures by stipulating requirements such as minimum platform levels and crest levels in the COP</li> <li>• Improving drainage in flood prone areas continually by widening or deepening drains and/or raising low-lying roads</li> </ul>
	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

<b>IS Indicators</b>	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

### Management Tools Indicators

<b>MT Indicators</b>	1. Any implementation of Integrated Flood Management (IFM) approaches involving the use of structural and non-structural flood mitigation measures	Yes	<p>PUB adopts the 3key strategies:-</p> <ul style="list-style-type: none"> <li>• Providing adequate drainage infrastructure ahead of new developments</li> <li>• Implementing flood protection measures by stipulating requirements such as minimum platform</li> </ul>
----------------------	--	-----	---

## ASEAN IWRM PERFORMANCE REPORTS & MONITORING INDICATORS

			<p>levels and crest levels in the COP</p> <ul style="list-style-type: none"> <li>• Improving drainage in flood prone areas continually by widening or deepening drains and/or raising low-lying roads</li> </ul>
	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	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.