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INDONESIA

Climate Change Adaptation in Urban WASH Project

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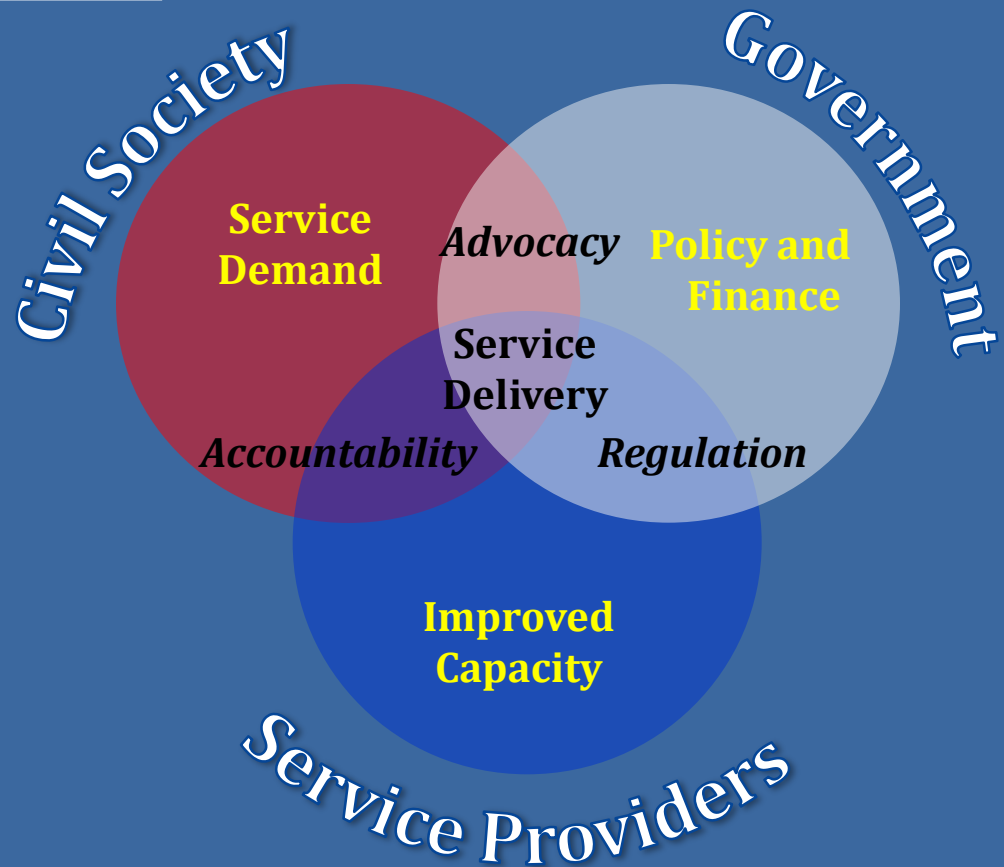
Water Resources concerns in Indonesia:

- Land use change: urbanization, deforestation, disasters all affect source abundance
- Waste contamination decreasing the raw water quality
- >50% of Indonesia's demand is being met by groundwater from subsurface aquifers
- **Indonesia's water resources will be exacerbated by the climate change: shorter/more intense wet season, longer dry season, rising temperatures, SLR: drought, flooding, intrusion, landslides.**



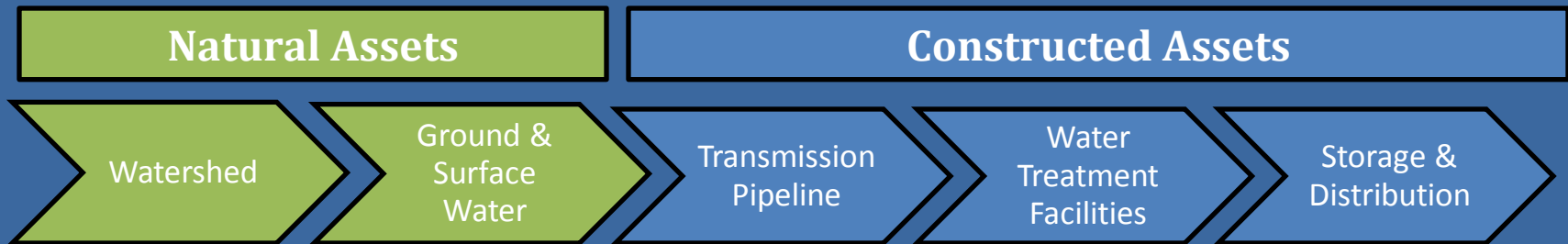
IUWASH Project Components

- Mobilizing demand for improved services
- Improving service delivery capabilities
- Developing supportive political and financial systems
- 54 cities in 7 provinces, want 20 govt s using CCA measures



MANDATE: Help GOI in reaching MDG targets on increasing access to safe water supply and improved sanitation services

IUWASH Adaptation Planning Principles



1. Climate change must be addressed in an integrated manner
2. Bottom-up more appropriate: more is known, less costly
3. Constructed assets and natural resources considered
 - a. Supply and demand assessed
 - b. Current conditions and climate change assessed
4. Begin with a Vulnerability Assessment (VA) which is about learning, collaboration, capacity building in community
5. VAs and adaptation plans must be iterative

Vulnerability Assessment Process

Natural Assets



Constructed Assets



Climate Predictions



1. Baseline Natural and Physical Assets
 - a. community assessment + data from national disaster management agency
2. Baseline Supply and Demand Analysis:
 - a. simple models based on past use, structural assets, population growth
3. Climate Change Scenario:
 - a. 5 GCMs, A2 scenario in medium term (-2050), regional projections
 - b. Modeled impact on natural and physical assets

Adaptation Planning



Information from vulnerability assessment



Stakeholder consultations to identify “hotspots” and potential adaptive actions



Discussion with local water authority and government to discuss costs and benefits, use criteria to develop short list, and prioritize options

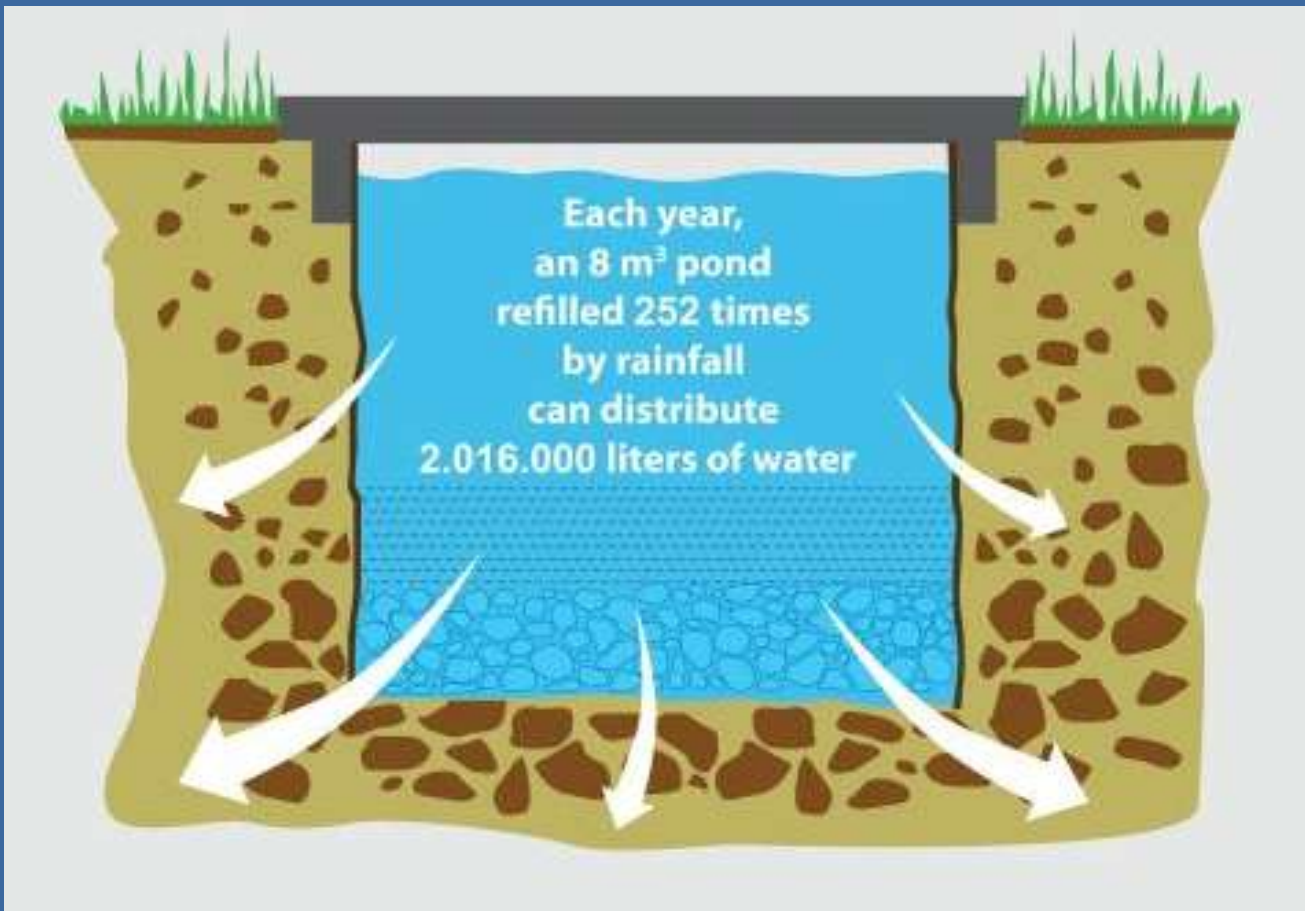


Adaptation Classifications	Specific Responses
Source Water Protection	Watershed Protection: Establishment of protected zones critical for water recharge or spring protection
	Aquifer recharge programs
	Farmer extension programs aimed at reducing soil erosion
	Improved waste collection and treatment Payment for Environmental Services
Water Efficiency and Demand Management	Non-Revenue Water Reduction
	Water meter maintenance and replacement
	Efficient water pricing (i.e. increasing block tariffs)
	Social marketing for consumer behavior change
	Consumer incentive programs (i.e. low-flow devices) Wastewater reuse for agriculture and industry
Infrastructure Options	Enhance/expand storage capacity through construction of new reservoirs
	Diversify water resources through construction of deep wells, new surface water intakes, and inter-basin transfers
	Check dams to slow runoff and facilitate aquifer recharge
	Increase access to improved urban sanitation systems to reduce pollution of upstream water sources and local groundwater
	Expanded wastewater treatment for water reuse in agriculture and industry
	Expand/upgrade urban drainage systems
	Construction of birms, dikes, or sea walls Relocation / strengthening water infrastructure subject to flooding
Information Management	Water Allocation Decision-Support Systems
	Hydrological / Meteorological Monitoring Stations
	GIS-Enables Asset Management Systems
	Computerized Billing and Accounting

Adaptation Actions: Mojokerto

1. Increasing water supply: infiltration ponds
2. Local government initiated other adaptation activities
 - a. Tree planting, further ponds
3. Communities agreed to create forums
 - a. Information campaigns
 - b. Funds collection
 - c. Assistance to neighboring communities
4. Robust data collection in water utilities to create baseline **data**

Action #1: Water Recharge Infiltration Ponds



Impact Assumptions

Days of Rain : 120

Total Number : 650 Infiltration Ponds

Measurement: $2 \times 2 \times 2 \text{ m} = 8 \text{ M}^3$

Recharge: $1.5 \times$ / Day of rain



$$120 \times 1.5 \times 8 \text{ M}^3 = 1,440 \text{ M}^3 / \text{yr} / \text{pond} =$$
$$936,000 \text{ M}^3 / \text{year} / 650 \text{ infiltration ponds}$$

936,000 M³ /year additional water for 22,500 people during the dry season (6 months)

Confirming with upcoming Impact Assessment



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Thank you!

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Questions?
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