the international water association

From catchment to consumer: Building climate resilience

OCTOBER 19TH, 2015

WATER AND DEVELOPMENT CONGRESS

inspiring change

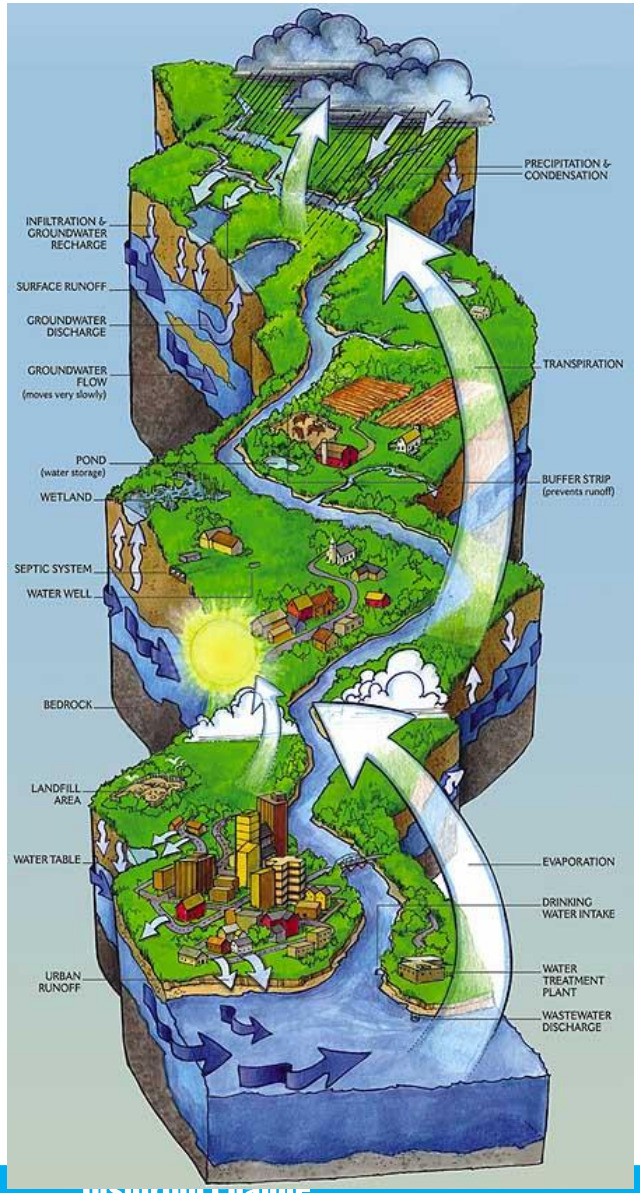
BASINS OF THE FUTURE

VISION: ***Restoring basins and their water bodies, while mitigating climate risks (flood and droughts) for urban and industrial areas through actions at the catchment level.***

LINKING CATCHMENTS AND URBAN UTILITIES

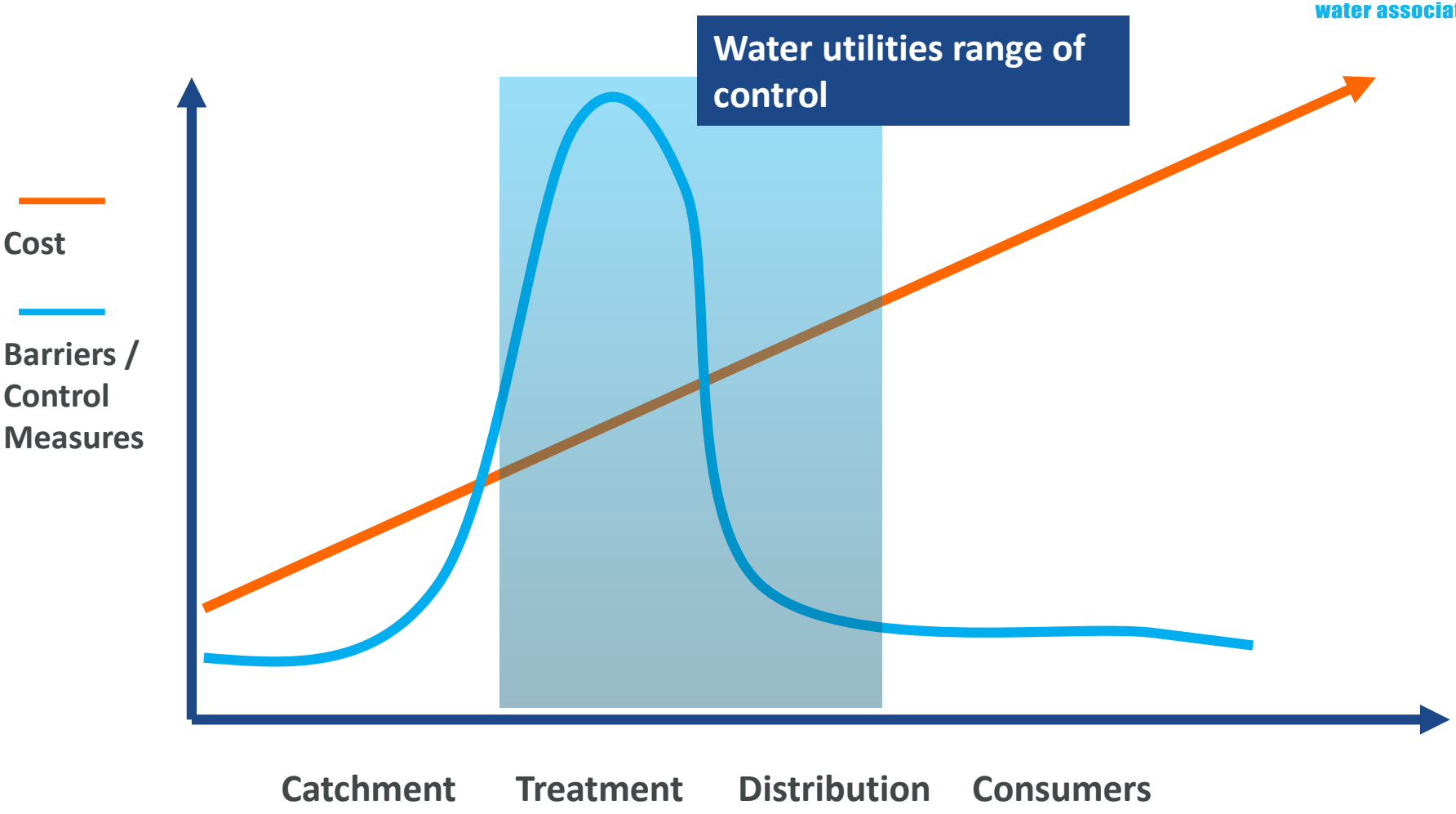
- Provide water supply to cities
  - E.g. Downstream users in Quito, Ecuador contribute towards a fund to protect the upstream watershed to secure water supply
- Sustain water quality for urban water supply, industries and recreation
  - E.g. Six U.S. cities have saved between $50 million and $6 billion by investing in sustainable watershed management, instead of new water treatment facilities
- Attenuation of floods
  - Forests and floodplains slow rain intensity, reduce soil erosion, and store water to reduce downstream flooding during heavy storms

LINKING CATCHMENTS AND URBAN UTILITIES



- Reduces reservoir sedimentation
  - To ensure sufficient storage capacity for water supply and hydropower production
- Provision of water to generate energy for cities
  - Water drives the turbines of hydroelectric power plants
  - Cooling in thermal and nuclear power plants requires clean, cool water
- Energy is needed for the abstraction, treatment and distribution of water supply for multiple uses across cities
  - Domestic supply
  - Industrial production
  - Pumping of water for agricultural production

EMPHASIS ON TREATMENT FOR WATER QUALITY



BETTER CATCHMENT MANAGEMENT

- Catchment management improves water supply downstream (quantity and quality)
  - Increase source water quality – OR – ensure source water quality does not deteriorate
  - Decrease intensity of treatment processes – reduce costs (chemicals, energy)
  - Decrease the necessity to seek new water resources (time and money)
  - Decrease water quality variance – more predictable quality

CLIMATE CHANGE

- Anticipated impacts of climate change
  - Dry regions and seasons become dryer
  - Wet regions and seasons become wetter
- Increased frequency/duration/intensity of floods & droughts
- Associated impact on quality & quantity of freshwater resources
- Understanding flood and drought hazards enables better planning for infrastructure investment (e.g. storage and networks), risk mitigation measures (e.g. urban storage and drainage)
- WSP process offers opportunities to manage climate risks at various steps in WSP planning cycle

IMPACTS OF CLIMATE CHANGE – FLOODS AND DROUGHTS

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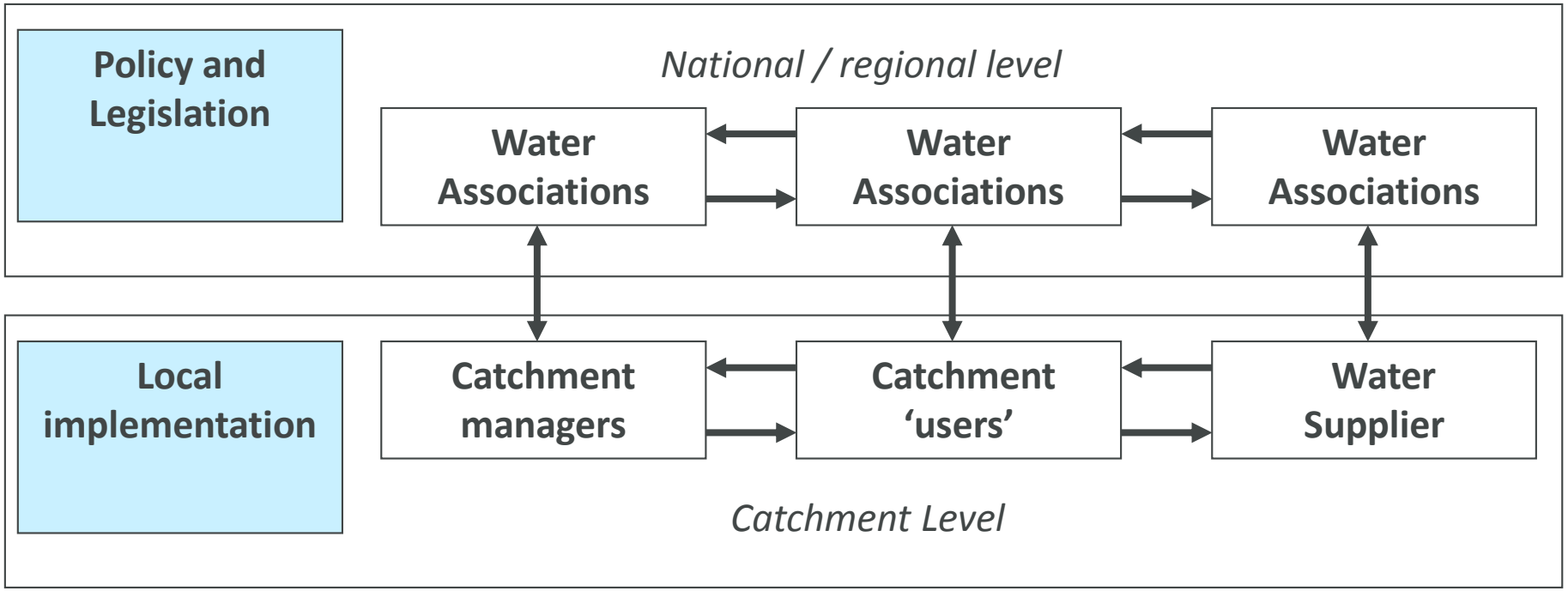
Floods	Droughts
Impact on quality of surface water through: - Erosion and instream turbulence - Pollutants from diffuse sources	Impact on quality of surface water: - Increased pollution concentration due to reduced dilution - Eutrophication caused by high temperatures (associated with drought) - Release of dissolved organic matter by soils under drought
Impact on water quantity includes threats to infrastructure - Damage; Reduce capacity; Overflow - Links back to quality	Impact on water quantity includes - Reduced quanitity of water
Impact on groundwater - Drives contaminated water into aquifers through wells	Impact on groundwater - Reduced recharge - Reduced dilution of contaminants due to reduced recharge

WSP AND CATCHMENT MANAGEMENT

- WSP process includes identifying hazards and assessing risk
  - Identify all hazardous events that could contaminate, compromise or interrupt supply
  - Identify all potential hazards in supply chain (from source to tap)
  - Evaluate the risks associated with each hazard/hazardous event
  - Temperature, precipitation & potential evaporation = main climatic factors influencing freshwater resources
- WSP process also includes identifying and implementing control measures
  - E.g. Minimising sediment loads from agriucltural and urban stormwater
  - E.g. Establishing wetlands in catchment locations to retain nutrients

CATCHMENT PARTNERSHIPS



SESSION AGENDA

Chair: Philip de Souza

Time	Item	Who
14:10-14:20	Overview – setting the scene	Katharine Cross, IWA
14:20-14:30	Building climate resilience into water safety planning	Jennifer de France, WHO
14:30-14:40	Investment in catchments – Environment perspective	Katharine Cross, IWA (for Rob MacDonald, TNC)
14:40-14:50	Investments in catchments– Health perspective	Hamed Bakir, WHO
14:50-15:25	Panel and audience discussion	• Dr. Sutat Weesakul, Hydro Agro Informatics Institute, Thailand • David Ogaram, National Water and Sewerage Company, Uganda • Eng. David Onyango, Kisumu Water and Sewerage Company Limited, Kenya • Ayman Rabi, RKNOW and IUCN
15:25-15:30	Closing remarks	Chair