

*Regional Conference on Risks and Solutions: Adaptation
Frameworks for Water Resources Planning,
Development and Management in South Asia*

Rafik Hirji, Team Leader, World Bank
Alan Nicol, Theme Leader, IWMI

July 12, 2016



South Asia Water Initiative (SAWI)

Supports countries to improve and deepen transboundary dialogue, enhance the basin and water resources knowledge base, strengthen water institutions, and support investments that lead to sustainable, fair and inclusive development.

Four principles:

- promotion of IWRM encompassing adaptation to climate change
- enhancing transboundary cooperation in water resources management
- engagement of the broadest possible range of perspectives both across disciplines and across diverse stakeholders
- focused debate to pose questions and guide analyses and to ensure transparency, legitimacy and accountability



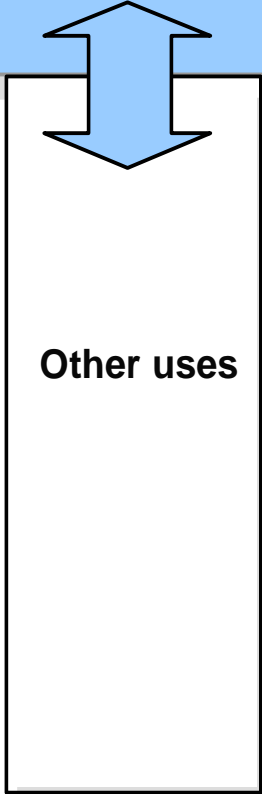
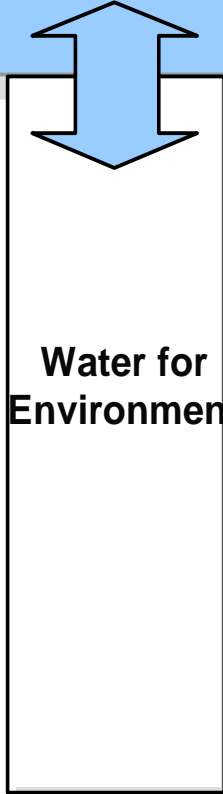
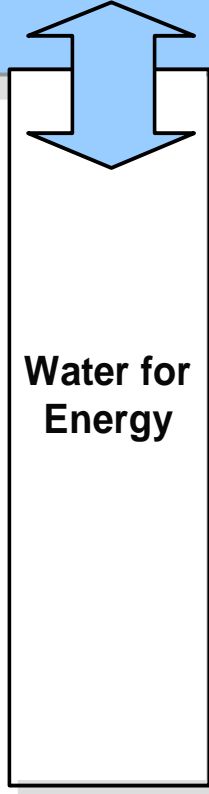
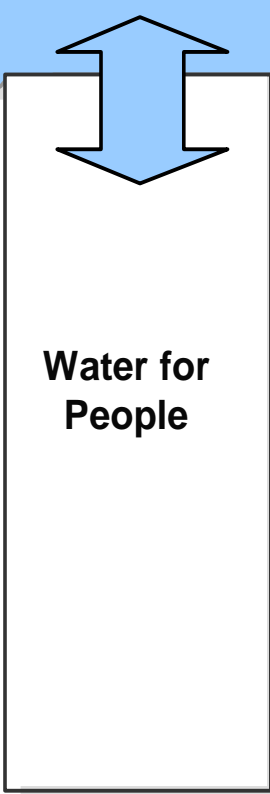
Integrated Water Resources Management

Infrastructure for management of floods and droughts, conjunctive use of surface and groundwater, multipurpose storage, water quality management and source protection

Policy/Institutional framework for supply side and demand management options

Management instruments

Political economy of water management

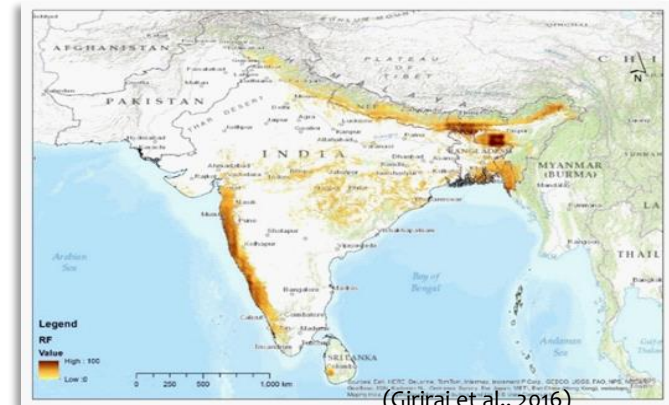


Water by usage

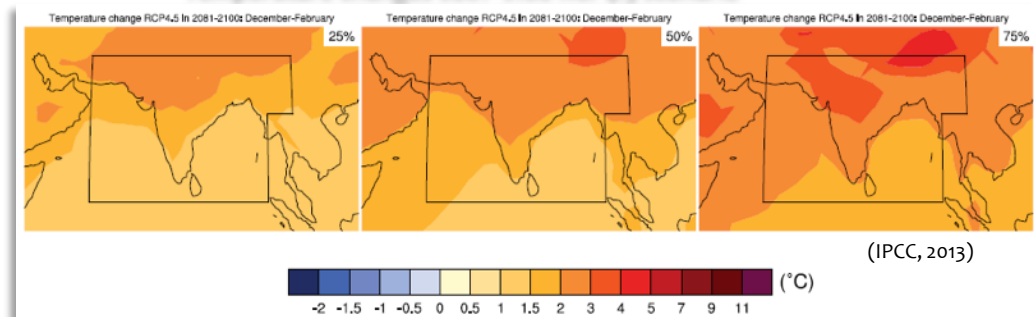
South Asia Climate Change Primary Effects

- Primary Effects
 - Changes in annual rainfall
 - Changes in monsoon seasonality
 - Increased variability
 - Increased temperatures
 - Sea level rise

Extreme rainfall hazard map



Temperature changes 2081–2100 RCP4.5 scenario



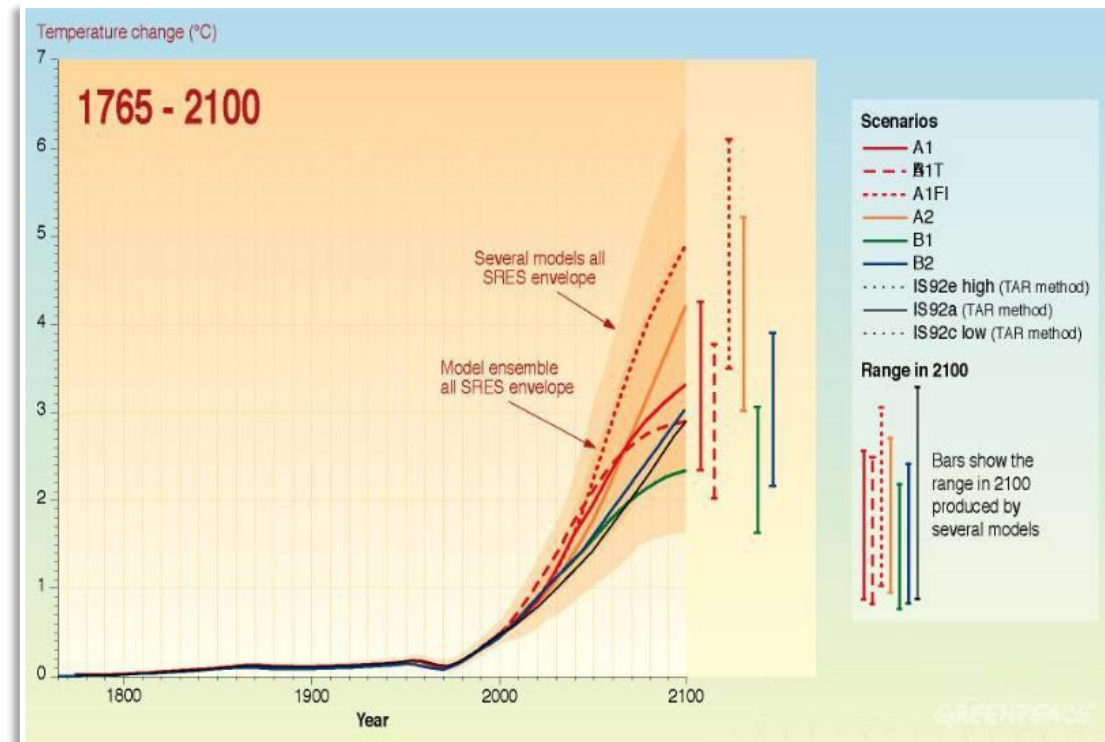
South Asia Climate Change Secondary Effects

- ❑ Increased evapotranspiration
- ❑ Changes in flow regimes
- ❑ Changes in recharge
- ❑ Changes in snow and glacial melt
- ❑ Saltwater intrusion in coastal aquifers and estuaries
- ❑ Increased risk of extreme events
 - ❑ Floods (regional, local, GLOF)
 - ❑ Droughts
 - ❑ Storms



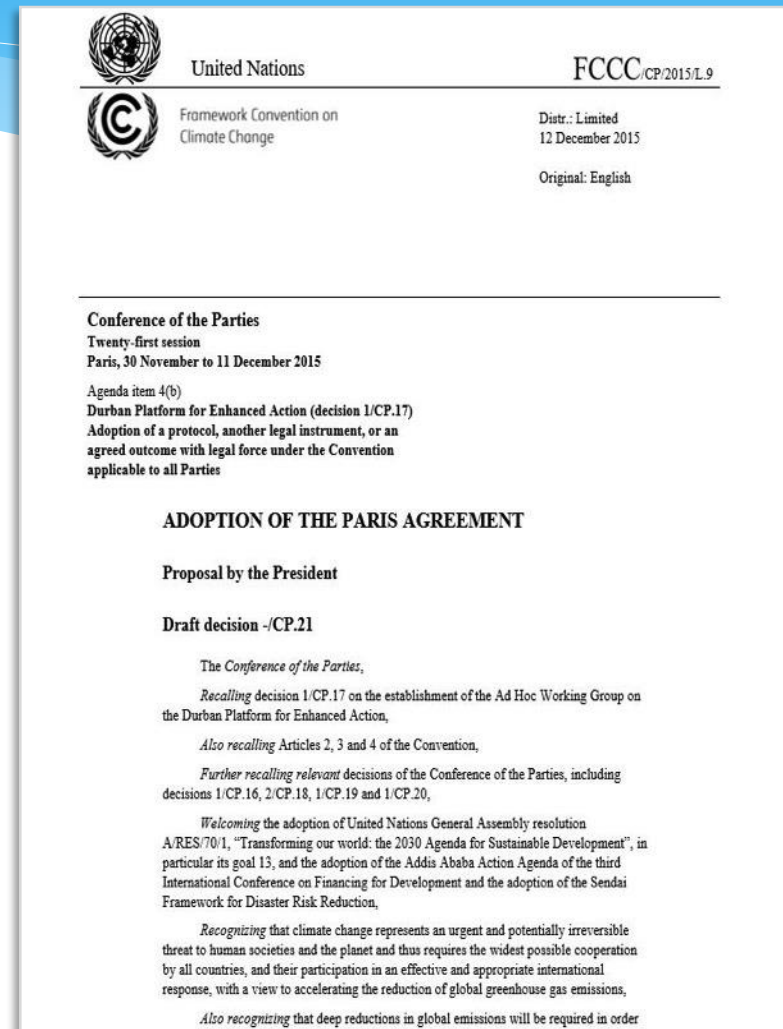
Stationarity Assumption

- Stationarity assumption
- Both long term average AND variability (extremes) will change



COP21 - Paris

- Water was highest adaptation priority across INDCs
- The Adaptation Fund has provided over US\$300 million in project-level support, with some 80 percent connected to water
- Water is likely to be central to COP22 in Marrakesh in December 2016



TA Objectives & Outcomes

South Asia Water Initiative aims to build knowledge, tools and capacity across South Asia to assist governments in adapting to emerging climate change challenges in the water sector

Development of effective policy frameworks as well as practical planning, development and management actions that highlight and address the need for adaptation

SAWI Technical Assistance: Climate Change & Water Resources Management

Phase 1

**Review current
knowledge, policy and
institutional/financing
environment**

Workshop



Phase 2

**In-depth analysis of the
major issues, areas of
analysis and case
studies identified under
Phase 1**

Climate Change and Water in South Asia

- Climate change adaptation does not call for a new way of management – just better management
- Existing issues will be accentuated, plus two new issues
 - Sea-level rise and coastal water contamination
 - Need to incorporate non-stationarity into modelling and management, including design standards
- Groundwater
 - Relatively neglected, poorly managed
 - But increasingly important with climate change



Climate Change and Water in South Asia

- **South Asia's climate impacts are very diverse**
 - From HKH glaciers to coastal areas
 - From major cities to poor rural areas
- **But, South Asia can draw on long adaptation experience**
 - Bangladesh floods and cyclones
 - India, Pakistan floods and droughts
 - Traditional irrigation systems in Afghanistan, Pakistan
 - Maheweli Basin Development, Sri Lanka



Workshop Outcomes

To bring together key decision makers from seven South Asian countries to (a) establish a Community of Practice (network of specialists) on Water and Adaptation in South Asia, (b) review the three diagnostic papers prepared under Phase 1, and to (c) seek guidance and support for the establishment of a second phase, focused on the development of adaptation frameworks in respective countries

Analytical Structure

Table 1. Climate-Related Risks to Water Resources and Potential Adaptation Actions

Climate Risks	Adaptation Dimensions				
	<i>Knowledge</i>	<i>Governance</i>	<i>Infrastructure</i>	<i>Planning/management</i>	<i>Communications / Education / Participation</i>
<i>1. Primary risks</i>					
a) Changes in precipitation (especially monsoon)	Research; weather monitoring	Coordination between meteorological, water and agriculture agencies	Dams; inter-basin transfers; groundwater recharge (including artificial options)	Flexible irrigation management systems; inter-sector responses to assist adaptation	WUAs and FOs involvement; capacity development; communication to farmers and other stakeholders
b) Sea-level rise	Monitoring; research	Coordination between water agencies, agriculture and other water using sectors, and coastal authorities	Embankments; sub-surface groundwater barriers, maintaining and restoring natural shorelines	Groundwater use plans; controls over groundwater use;	Involvement of coastal communities; capacity development
c) Temperature extremes	Research; monitoring	Coordination between water, energy and productive sectors	Soil and water conservation; improved water supply infrastructure	Mapping trends and designing for peak demands	Prevention of risk through public information and information sharing
<i>2. Secondary risks</i>					
a) Floods	Monitoring and early warning systems	Coordination (inter-agency, government-public)	Embankments; Dams; flood refuges	Flood management plans; restrict development on floodplains; flood mapping; flood insurance	Public awareness of flood risk areas; capacity strengthening
b) Droughts	Weather prediction and early warning communications; research; monitoring	Allocation priorities and planning mechanisms; coordination between agriculture / power / water resources / water supply; local institutional capacities to manage scarce water resources and improvise	Dams; inter-basin transfers; groundwater development	Water allocation plans; conjunctive use; demand management including pricing; water efficiency technologies; irrigation and urban water management; recycling and reuse	Involvement and sharing local solutions; capacity development
c) Reduction in groundwater recharge	Monitoring and characterization of aquifers; research into groundwater; database on groundwater-related information,	Coordination between agriculture, domestic water supply, industrial water use, water resources; public ownership of groundwater	Check dams, recharge ponds, managed aquifer recharge development	Groundwater use plans; controls over groundwater use including indirect regulation; artificial recharge; conjunctive use	Awareness of groundwater limitations; capacity development
c) Increased erosion, landslides and sedimentation	Research into soil management and protection	Coordination between land, water, energy and other agencies	Sedimentation dams	Land management; riparian management; soil conservation	Awareness of soil loss; participation and local solutions; capacity development
d) Reduced water quality (surface and groundwater)	Monitoring; research into water quality treatment	Coordination between water resource and industry / water supply and sanitation agencies	Wastewater treatment and pollution treatment plants	Water quality standards and enforcement; wastewater and pollution treatment including through incentives and disincentives; recycling and reuse	Awareness on pollution risks and prevention measures, polluter pays principle
e) Glacial Lake Outburst Floods (GLOF)	Research; monitoring and early-warning systems	Coordination between departments working on disaster management, geology, hydro-meteorology	Artificial lowering of lake levels	Hazard and risk management protocols, planning for natural disaster management	Public awareness of flood risk areas; opportunities to effectively participate in local infrastructure development and their O&M; capacity strengthening

Workshop Day 1

9.30-10.00	KeyNote 1. <i>Sustainable water resources management for climate change adaptation and implementation of the SDGs.</i> Prof. Mohan Munasinghe, Founder Chairman MIND
10.00-11.00	Country Perspectives
11.00-11.30	Break
12.00-12.30	<i>Navigating the complex mosaic of landscapes and change in South Asia</i> Facilitator: Dr Ajaya Dixit, ISET-Nepal
12.30-13.30	Lunch
13.30-14.30	Keynote 2. <i>An Operational Perspective: The Decision Tree Framework.</i> Dr Casey Brown, World Bank

Workshop Day 1

14.30-15.30	Paper 1. <i>Climate change science, knowledge and impacts on water resources in South Asia</i> . Dr G. Lacombe/Dr P. Chinnasamy (IWMI) and discussion
15.30-16.30	Paper 2. <i>Policy and Planning</i>. Dr R. Davis (Consultant, World Bank) and discussion
16.30-17.00	Break
17.00-18.00	Paper 3. <i>Economic and Institutional Landscape</i>. Dr D. Suhardiman / Mr Sanjiv de Silva (IWMI) & discussion
18.00-18.30	Summary and wrap-up
18.30-20.00	Reception

Workshop Day 2

9.00-9.15	Recap and introduction
9.15-9.45	Keynote 3. <i>Integrating climate change at basin scale – Rufuji example, Tanzania.</i> Prof. Aris Georgakakos, Georgia Water Resources Institute
9.45-10.15	Plenary discussion on presentations
10.15-10.45	Break
10.45-12.30	Group Work: Climate Risk Analysis
12.30-13.30	Lunch
13.30-14.00	Groups feedback
14.00-16.00	Group Work: Country adaptation frameworks
16.00-16.30	Break
16.30-17.00	Discussion on key points and next steps

Thank you