



# China water security assessment at a provincial level: Applying the AWDO 2013 framework

**Dr. Fu Sun**

[sunfu@tsinghua.edu.cn](mailto:sunfu@tsinghua.edu.cn)

**Asia-Pacific Center for Water Security (APCWS)**

**Tsinghua University**

Funded by



Led by



In partnership with



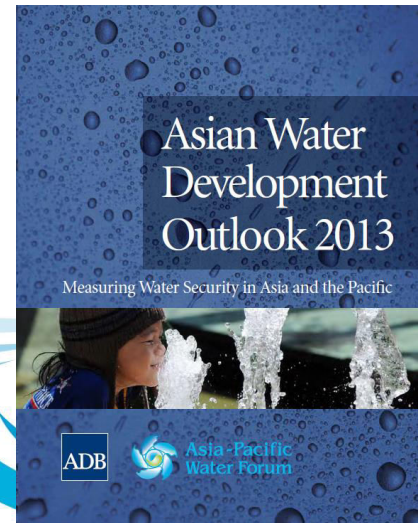
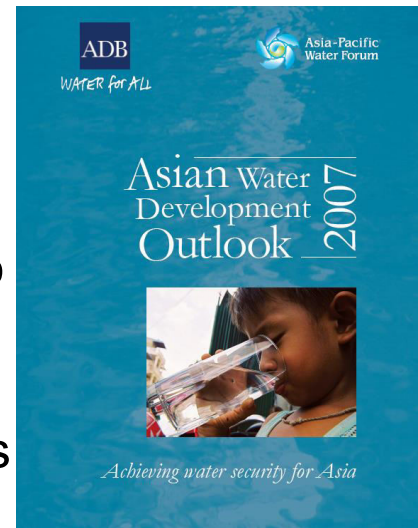
# OUTLINE

- About Asian Water Development Outlook (AWDO)
- Water Security Framework of AWDO 2013
- China Water Security Assessment



# About AWDO

- AWDO is one of the Asian Development Bank's initiatives, supported by the Asia-Pacific Water Forum, to assess the status of water security in the countries/regions of Asia and the Pacific, and provide decision-makers with recommendations on policy actions and guidance on investments.
- First edition in 2007
- AWDO 2013 provides the first quantitative and comprehensive view of water security in the Asia-Pacific region.
- The coming new version will follow the framework of AWDO 2013 and is expected to be released in 2016.



# Water Security Framework of AWDO 2013

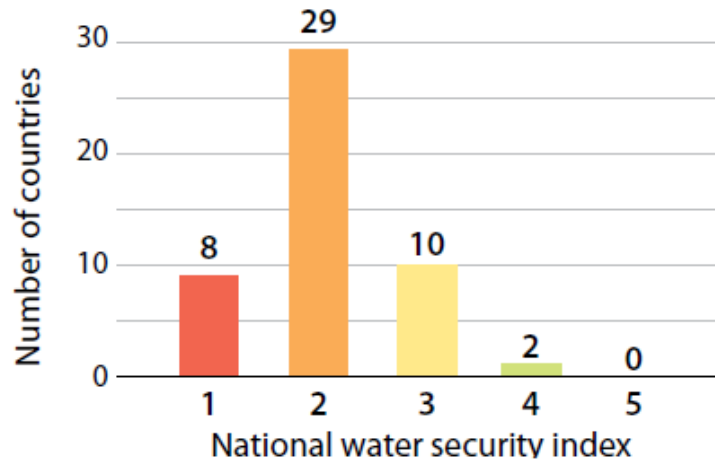
## Asian Water Development Outlook Framework for Assessing National Water Security

Key Dimension	Index	What the index measures
National Water Security	National water security	How far countries have progressed toward national water security. The index combines the five dimensions of water security, measured by key dimensions 1 to 5 (see Appendix 1).
Key Dimension 1	Household water security	To what extent countries are satisfying their household water and sanitation needs and improving hygiene for public health. The household water security index is a composite of three subindexes (see Appendix 2).
Key Dimension 2	Economic water security	The productive use of water to sustain economic growth in food production, industry, and energy. The index is a composite of three subindexes (see Appendix 3).
Key Dimension 3	Urban water security	Progress toward better urban water services and management to develop vibrant, livable cities and towns. The index is a composite of three subindexes (see Appendix 4).
Key Dimension 4	Environmental water security	How well river basins are being developed and managed to sustain ecosystem services. The index is determined by spatial analysis of four subindexes of river health (see Appendix 5).
Key Dimension 5	Resilience to water-related disasters	The capacity to cope with and recover from the impacts of water-related disasters. The index is a composite of three subindexes (see Appendix 6).



# Water Security Framework of AWDO 2013

## National Water Security in Asia and the Pacific



Datasets for AWDO 2013 are available at APCWS's website.

National Water Security Index	National Water Security Stage	Description
5	Model	Sustainable local agencies and services; sustained sources of public financing for water and environmental protection and management; sustainable levels of public water consumption; and government demonstrating new models of water governance, supporting advanced technology, supporting research and development, and initiating or leading international partnerships.
4	Effective	Water security initiatives built into key national, urban, basin, and rural development master plans; high priority on national development agenda; public investment reaching appropriate levels; effective regulation; and public awareness and behavioral change are a government priority.
3	Capable	Continuous capacity building; improving rates of public investment; stronger regulation and enforcement; national development agenda prioritizing water and environment; and focus shifting toward improving local technical and financial capacity.
2	Engaged	Legislation and policy supported by government capacity-building programs; institutional arrangements improving; and levels of public investment increasing (although these rates may still be inadequate).
1	Hazardous	Some legislation and policy on water and environment, and inadequate levels of public investment, regulations, and enforcement.



# Water Security Framework of AWDO 2013

- **Review comments of AWDO 2013**
  - An innovative, systematic and practical water security monitoring model at a country level in the Asia-Pacific region
  - Limitations of the indicator systems
  - Gaps in data/information



# Water Security Framework of AWDO 2013

Key Dimension	Indicator system	Data	Missing topics
<b>KD1 Household Water Security</b>	<ul style="list-style-type: none"> <li>Lack of indicators other than access to water and sanitation</li> </ul>	<ul style="list-style-type: none"> <li>Inadequacy and incomparability of data across member countries</li> </ul>	<ul style="list-style-type: none"> <li>Minimum water demand</li> <li>Minimum water quality</li> </ul>
<b>KD2 Economic Water Security</b>	<ul style="list-style-type: none"> <li>Focused only on hydropower</li> <li>Governance indicators missing considering water, food and energy sectors are very different in governance</li> </ul>		<ul style="list-style-type: none"> <li>Other water dependent sectors, such as transport, recreation and aquaculture</li> <li>Groundwater use</li> </ul>
<b>KD3 Urban Water Security</b>	<ul style="list-style-type: none"> <li>Lack of categorization of cities (e.g. megacities, smaller cities/towns);</li> <li>“Wastewater index” difficult to interpret</li> </ul>	<ul style="list-style-type: none"> <li>A lot of derived data rather than actual data used</li> </ul>	
<b>KD4 Environmental Water Security</b>	<ul style="list-style-type: none"> <li>The model is currently not available for use or validation.</li> <li>May need to include stratification of rivers and have management indicators to measure state of river</li> <li>How to deal with the small island states?</li> </ul>	<ul style="list-style-type: none"> <li>The model is too complex and has too many indicators which require good local data that may not exist.</li> <li>May consider data emphasis on the themes rather than on indicators</li> <li>May consider crowd sourcing and big-data analysis</li> </ul>	<ul style="list-style-type: none"> <li>Wetlands and groundwater not included</li> </ul>
<b>KD5 Resilience to Water Related Disasters</b>	<ul style="list-style-type: none"> <li>Drought needs to be discussed because it is different from floods.</li> <li>A standard scale for resilience was used and this may create questions such as whether it is fair to assume some countries can never reach the higher levels for KD5.</li> </ul>	<ul style="list-style-type: none"> <li>Information for proper response actions and raising awareness in public</li> </ul>	<ul style="list-style-type: none"> <li>Urban impact of disasters</li> </ul>

# Water Security Framework of AWDO 2013

- **Review comments of AWDO 2013**
  - An innovative, systematic and practical water security monitoring model at a country level in the Asia-Pacific region
  - Limitations of the indicator systems
  - Gaps in data/information
  - To be validated in various countries and downscaled to smaller scales





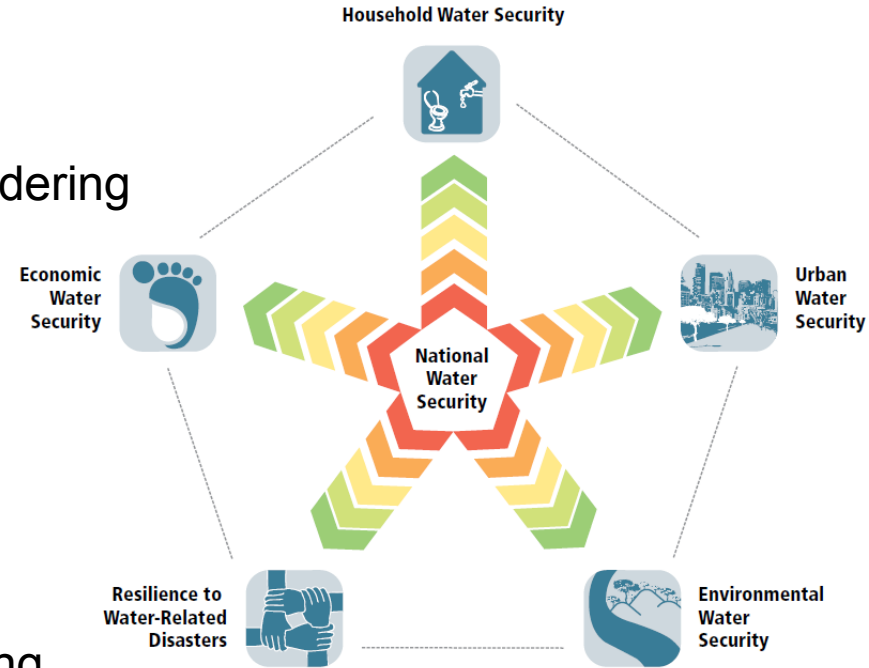
# China Water Security Assessment

- **Objectives**

- Validate AWDO 2013 framework
- Assess China's water security considering provincial disparity

- **Methods**

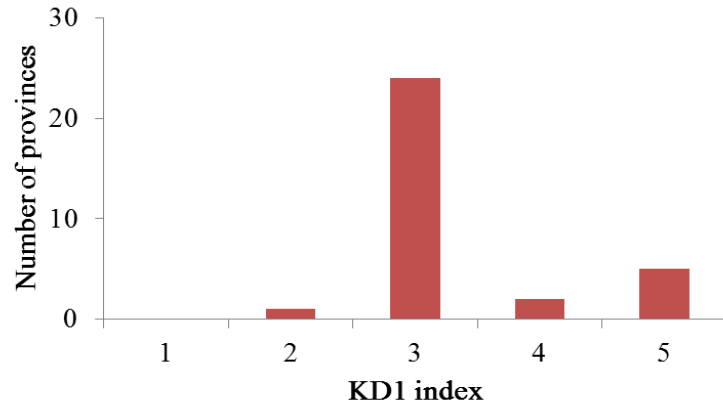
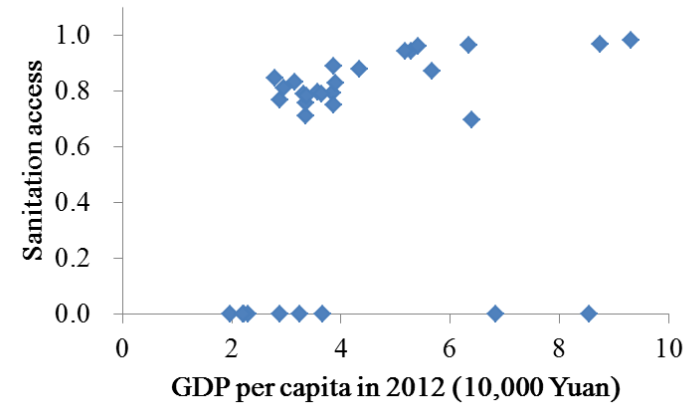
- AWDO 2013 framework
- At a provincial level in 2012
- Substitution of equivalent indicators
- Rescale of scoring systems
- Expert judgment when data is missing
- ...



# China Water Security Assessment

## An example: Household Water Security (KD1)

- Access to piped water supply (%)
- Access to improved sanitation (%)
- Hygiene (age-standardized disability-adjusted life years per 100,000 people for the incidence of diarrhea)



	This study	AWDO 2013
Piped Water Index	4	2
Sanitation Index	3	2
DALY Index	3	3
<b>KD1 Index (China)</b>	<b>3</b>	<b>3</b>

# Thanks for your attention!

[www.watersecuritynetwork.org](http://www.watersecuritynetwork.org)

[www.twitter.com/water\\_network](https://www.twitter.com/water_network)

## Acknowledgement

The International Water Security Network is funded by Lloyd's Register Foundation, a charitable foundation helping to protect life and property by supporting engineering-related education, public engagement and the application of research.

For more information, see: [www.lrfoundation.org.uk](http://www.lrfoundation.org.uk)

