A scenic view of a mountain river with rapids, surrounded by rocky terrain and green vegetation. The river flows through a valley, with water splashing over rocks and creating white foam. The surrounding landscape is rugged, with steep, rocky slopes and patches of green moss and small plants. The sky is blue with some light clouds.

Integrated Water Resource Management Plan, 2016

*Tenzin Wangmo
Water Resource Coordination Division
National Environment Commission
February 24, 2017*



Presentation outline



1. Brief overview of water resources
2. National Integrated Water Resource Management Plan, 2016
 - ✓ Key issues and challenges
 - ✓ Water management coordination framework
3. Way forward
4. Expectation of NARBO



1. Brief overview of water resources

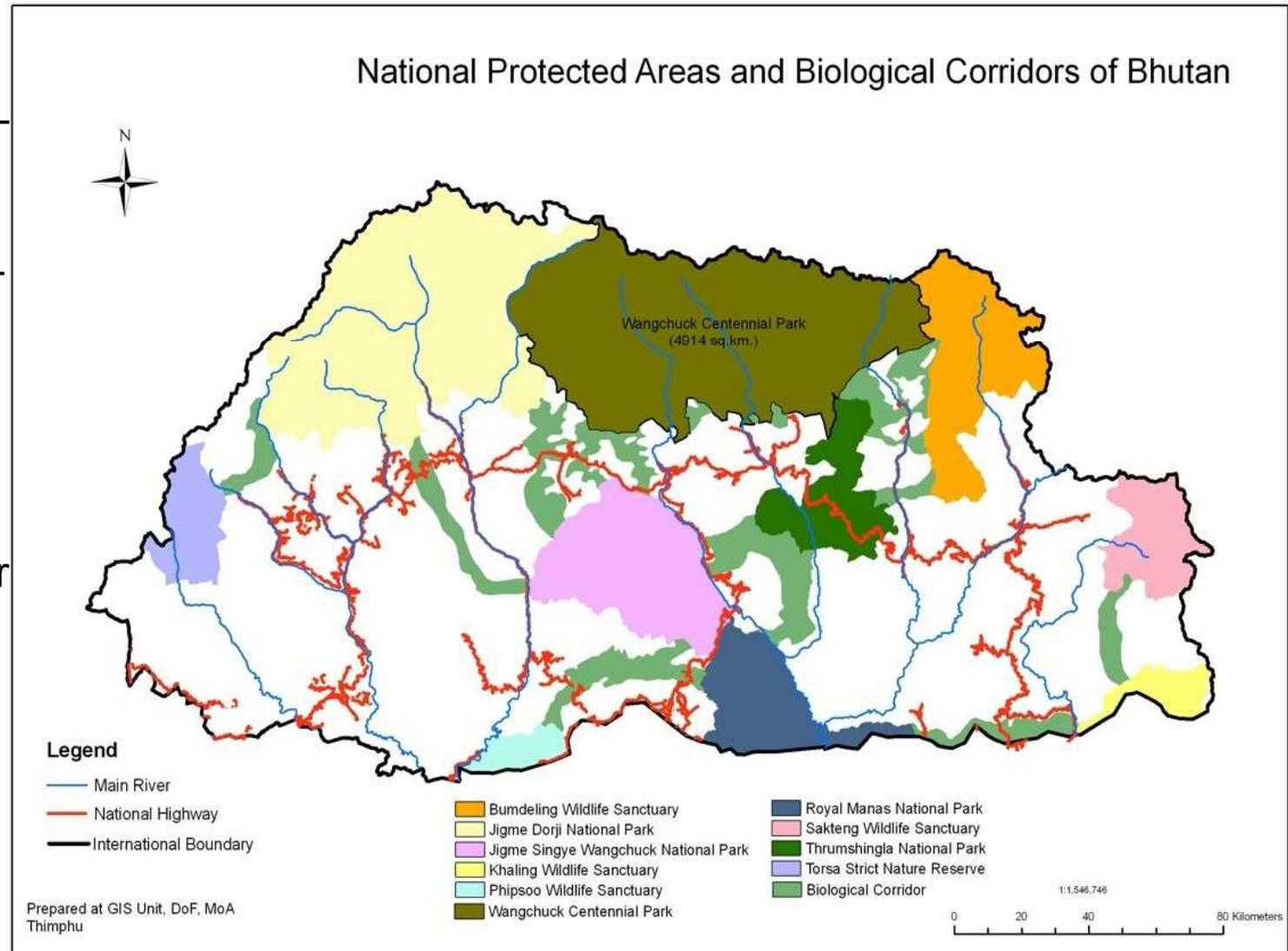


Bhutan: total area – 38,394 sq.km, population- 768,577.

Forest coverage –
70.46%

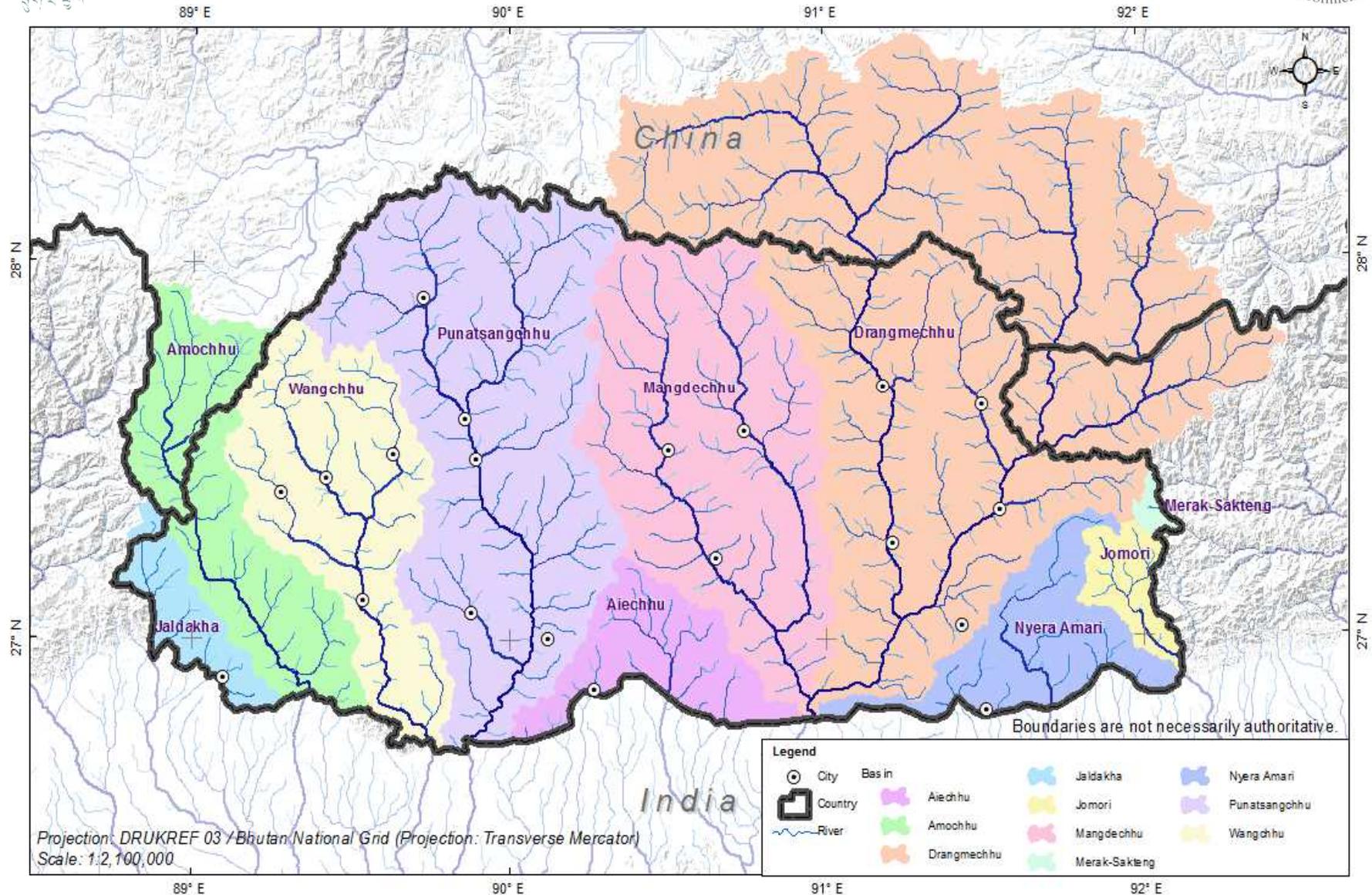
Protected Areas –
51.32%

Constitutional
mandate –
minimum 60%
under forest cover
for all times to
come





Brief overview - hydrological basins





Brief overview- river basins, area & flow



River Basins	Basin Management	Area (km2)	Annual flow (MCM)
Jaldakha		942	
Amochhu	Amochhu	2310	9,375
Wangchhu	Wangchhu	4596	5,209
Punatsangchhu		9645	19,129
Aiechhu	Punatsangchhu	1937	6,989
Mangdechhu	Mangdechhu	7380	11,797
Drangmechhu		8457	13,569
Nyera Amachhu	Drangmechhu	2348	
Jomori		642	
Merak-Sakteng		137	4,506
10	5	38,394	70,576 MCM
	Population		746,773
	Per capita water available		94,508 m3/yr
	Flow		2,238 m3/s



Brief overview - Legislations



- **Constitution of the Kingdom of Bhutan, 2008**
 - Article 5 (2a-d) – “The RG shall: protect, conserve and improve the pristine environment and safeguard the biodiversity of the country; prevent pollution and ecological degradation; ensure safe and healthy environment ”.

Water Act of Bhutan 2011

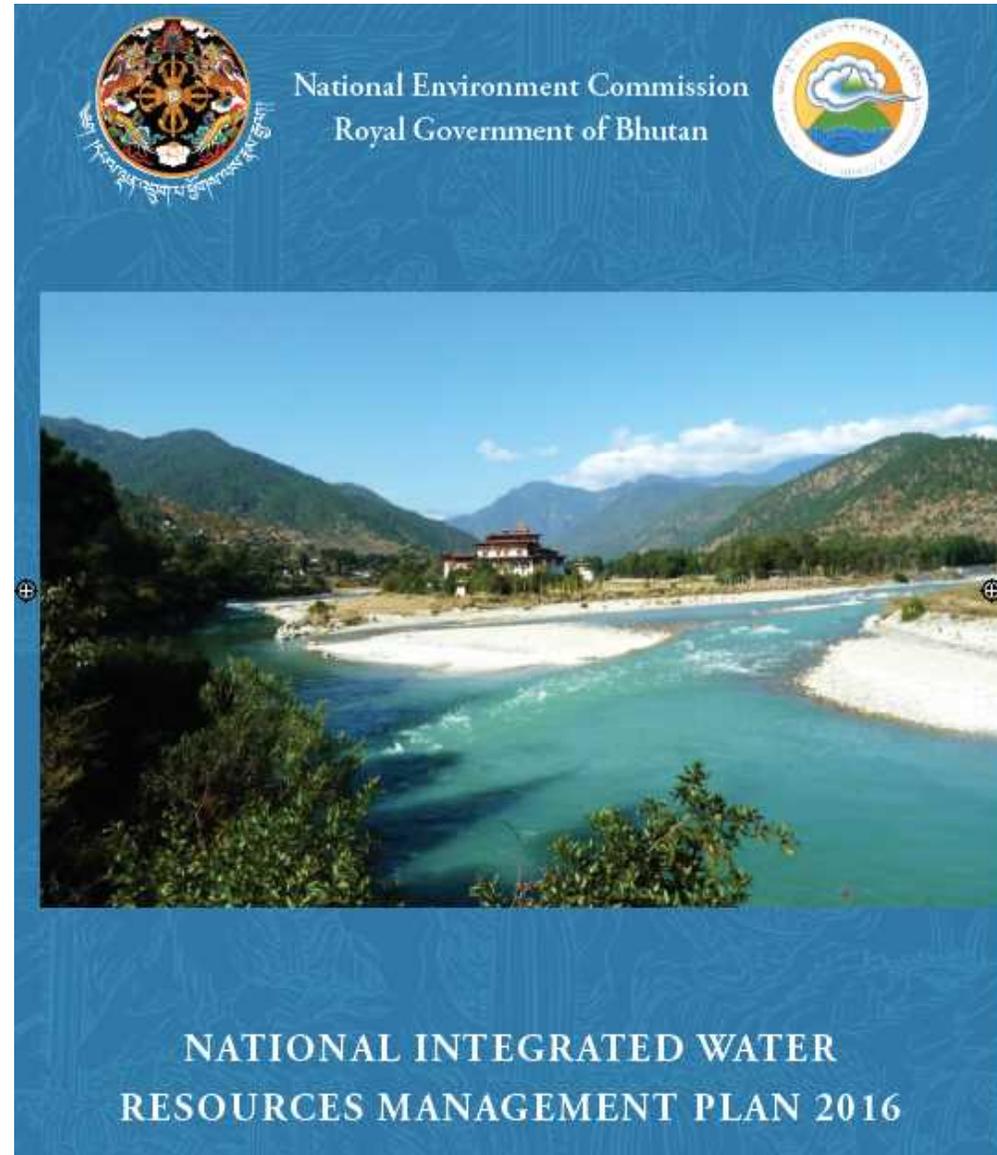
- To ensure that water resources are protected, conserved and/or managed in an economically efficient , socially equitable and environmentally sustainable manner.
 - Mandates National Environment Commission to prepare National Integrated Water Resource Management Plan
 - Mandates National Environment Commission to establish River Basin Committee for the purpose of proper management of water resources.
- **Water Regulation of Bhutan 2014**
 - **Other Related Laws**
 - NEPA of Bhutan, 2007; EA Act, 2000; Waste Management Act, 2009; FNC Act, 2006.



2. National Integrated Water Resource Management Plan (NIWRMP)



- Emanated from Water Act, 2011
- 11th five year plan target
- For coordinated development, management, conservation and efficient use of water resources





NIWRMP 2016 contents



- ✓ Executive Summary
- ✓ Introduction and Objectives
- ✓ Context (country, hydrology, present and projected climate)
- ✓ Water-related issues
- ✓ Governance framework (policies, laws, institutions)
- ✓ Bhutan Water Security Index
- ✓ IWRM at basin level (basin delineation, RBC, RBMP)
- ✓ Priorities in the IWRM 2016 program



Key issues and challenges



Physiographic
reality





Key issues and challenges



Scarcity

Average



Plenty



Key issues and challenges



- ✓ Availability – High
- ✓ Accessibility - Low
- ✓ High cost of interventions
- ✓ Dispersed low density population
- ✓ High per capita cost
- ✓ Impacts from climate change
 - Too much and too little
- ✓ Weak coordination



Interagency Coordination Framework



WATER SECURITY DIMENSION





For each dimension, specify KRAs, KPIs & strategies



For example, on the **urban water security** dimension:

KEY RESULT AREAS	KEY PERFORMANCE INDICATORS	INTERVENTION STRATEGIES
Improved and protected urban drinking water supply	<ul style="list-style-type: none"> Percentage of urban population having potable piped water supply Percentage of urban water supply loss (un-accounted for water) 	<ul style="list-style-type: none"> Improve access to alternative drinking water sources (water harvesting, groundwater development) Improve design, maintenance and management of urban water supply systems (strengthen responsible agencies)
Improved coverage and effectiveness of urban sanitation and drainage	<ul style="list-style-type: none"> Percentage of urban population with improved sanitation Percentage of urban population with (at-least weekly) waste collection and disposal service Reduction in damage from urban flooding 	<ul style="list-style-type: none"> Improve condition of catchment areas and water sources (reforestation and conservation measures) Water metering and pricing Improve urban drainage systems Relocate settlements from flood-prone areas Improve solid waste collection and disposal services



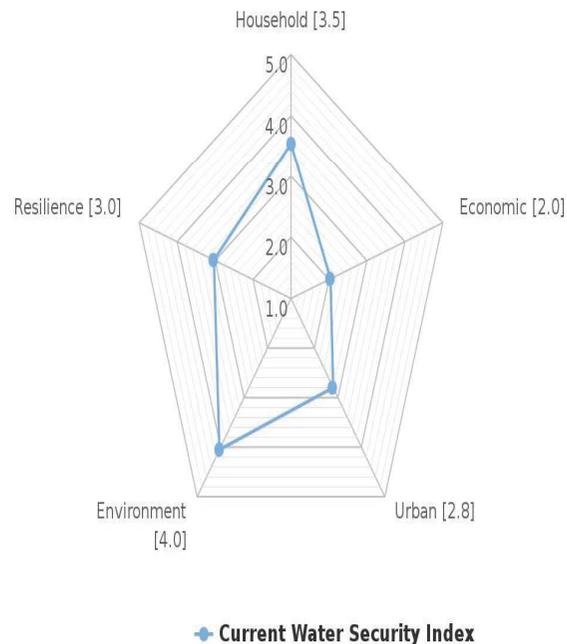
How is overall Water Security Measured ?



BHUTAN WATER SECURITY INDEX (BWSI) SYSTEM

A scoring system derived from indicators of physical water availability & variability, KPIs of action taken across 5 management dimensions

BHUTAN WATER SECURITY INDEX : 2015



Index	Stage
5	Model
4	Effective
3	Capable
2	Engaged
1	Hazardous

	Water Security Status	Criteria
5	Model	Sustainable financing for water security, environmental protection and management already established
4	Effective	Water security given high priority in the national agenda; appropriate public investment in water security; effective regulation and enforcement; public awareness and ongoing behavioral changes apparent
3	Capable	Increasing levels of investment and strength of regulation and enforcement; water security and environment recognized as priorities in the national development agenda; improving technical and financial capacities in addressing water-related issues
2	Engaged	Need to invest in water security recognized, including investment in capacity-building programs; ongoing institutional development and strengthening; improving policy environment in which water-related issues are addressed
1	Hazardous	Inadequate levels of investment in water-related infrastructure and poor-quality regulation and enforcement result in hazardous levels of water security



Way forward Ensuring WATER SECURITY

- Established pilot River Basin Organization - “Wangchhu Basin Committee” in 2016.
 - Past ADBTA 8623 supported formation of Wangchhu Basin Committee
 - Current ADBTA 9095 supporting operationalization of Wangchhu Basin Committee
 - Piloting Water Security Index in Wangchhu Basin
- 12th Five Year Development Planning Cycle
 - mainstreaming water security index in the 12th five year development plans as a national key result areas to be achieved
 - National Environment Commission given the mandate to lead preparation of flagship program for water management and development in the 12th five year plan.

**THANK YOU
&
TASHI DELEK**

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