

Regional Cooperation on Water: Opportunities for South Asia

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1. Introduction

Water is one of the principal drivers of the economy. The most important driver is probably energy.

Water is also an important raw material for power generation. India, Pakistan, Bhutan and Nepal are generating significant MW of hydropower. Have more potential.

SA countries are adequately endowed with water resources for different uses, stresses are now being increasingly visible.

2. Water Resources Availability

Country	Per Capita Renewable Water (m ³ /year)			Total Renewable Water (BCM/Year)
	2000	2005	2007	2007
Afghanistan	2986	2610	2395	165
Bangladesh	8809	8090	7630	1211
Bhutan	45564	40860	144271	95
India	1880	1750	1622	1897
Maldives	103	91	98	0
Nepal	9122	8170	7455	210
Pakistan	2961	1420	1374	225
Sri Lanka	1642	2600	2541	50

Source: FAO-AQUASTAT Database

3. Water provides security for

- Municipal and industrial water supply
- Food-cereals, vegetables, fruits, pulse are oil, seeds etc, fish, meat etc.
- Ecosystems
- Environment
- Biodiversity
- Navigation
- Health
- Livelihood

4. The region also suffers from water induced natural disasters like:

- Flood
- River Bank erosion
- Salt water intrusion
- Tidal surge from cyclonic storm

6. Regional Cooperation

Region has been striving for equitable sharing of water of the trans-boundary rives.

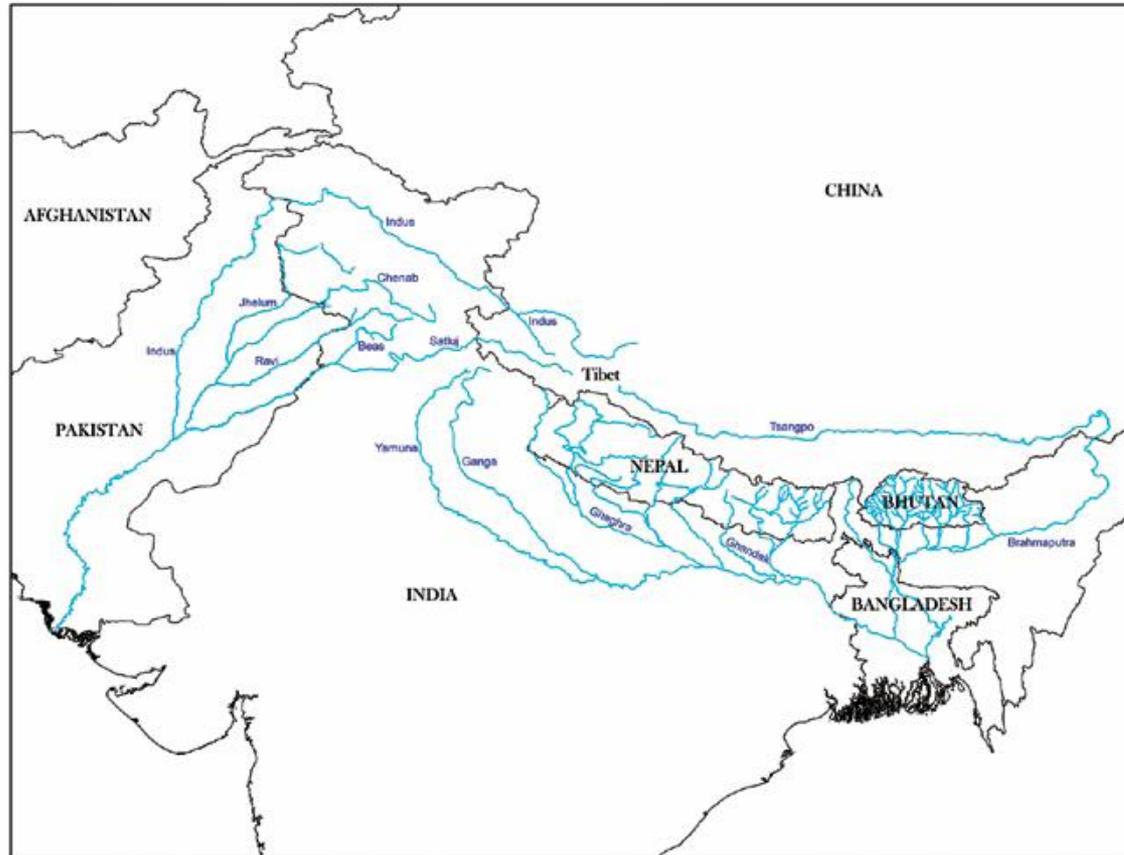
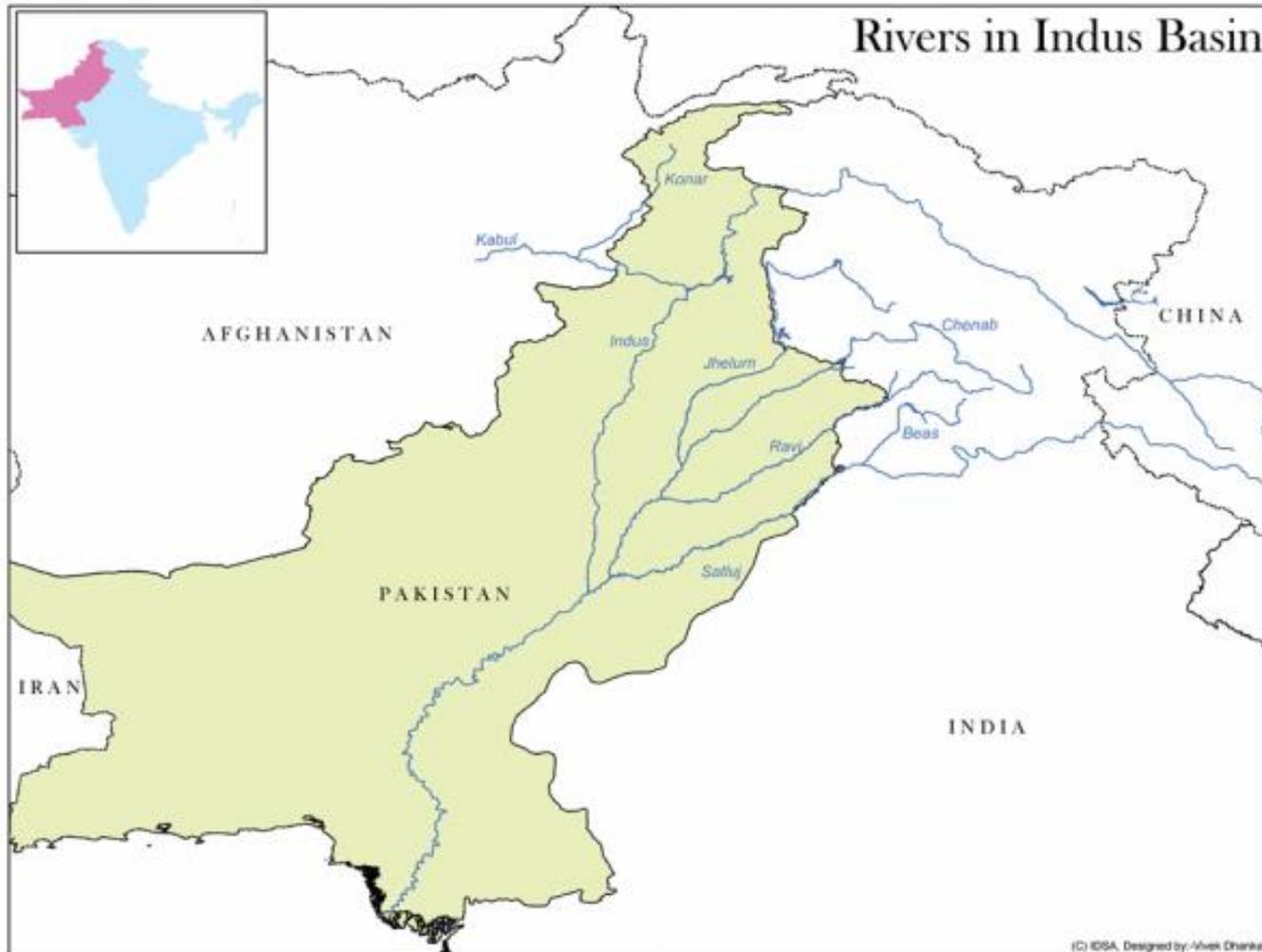


Fig: The shared rivers in South Asia

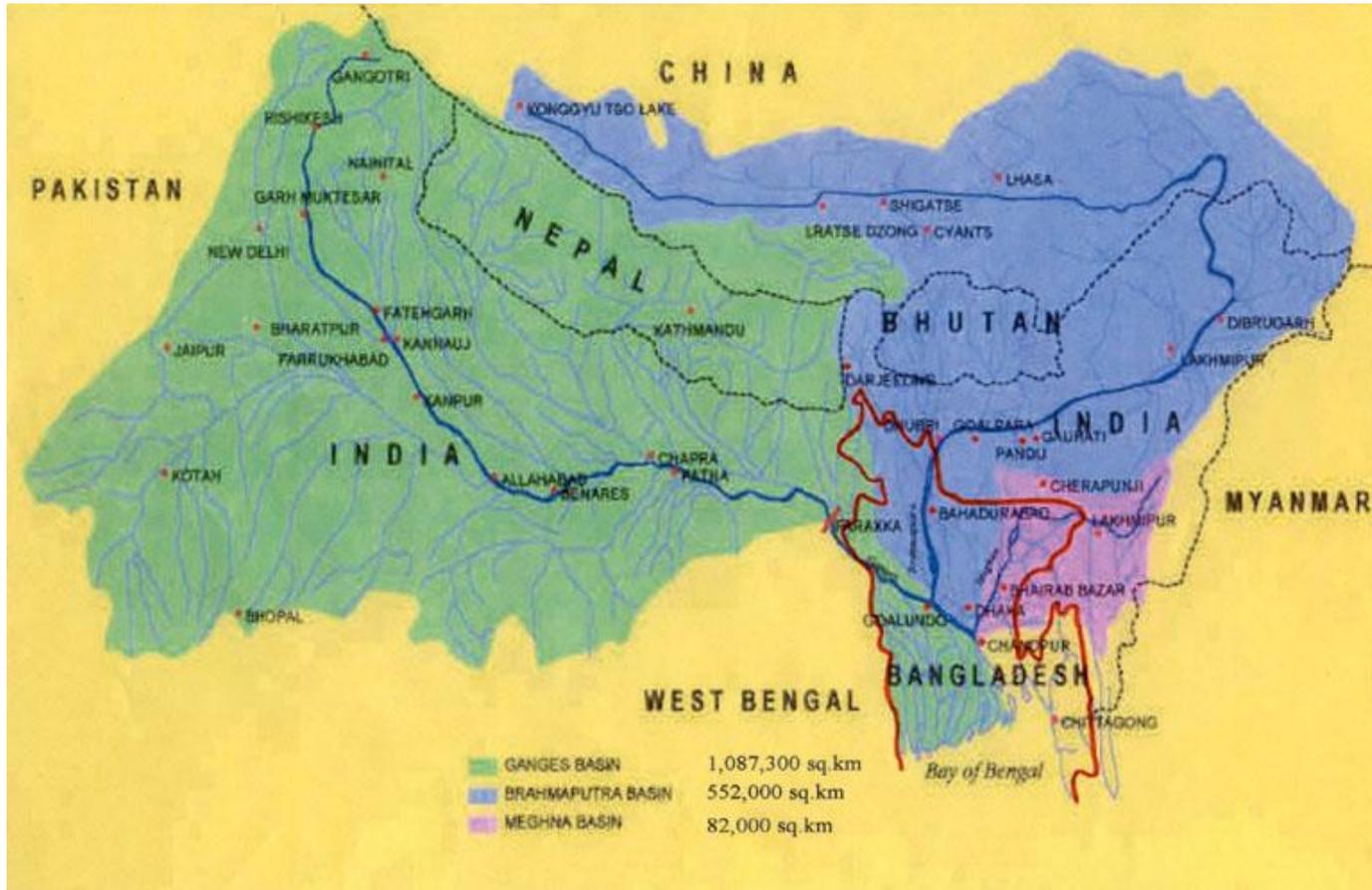
7. India-Pakistan



The Indus Treaty

- The Indus Waters Treaty (IWT) was signed in early 1960 between India and Pakistan. The treaty survived two Indo-Pakistani Wars.
- The IWT allocated exclusively use of three eastern rivers (Ravi, Sutlej and Beas) to India and three western rivers (Indus, Jhelum, Chenab) to Pakistan. Pakistan also received one-time financial compensation for the loss of water from the Eastern Rivers.

8. Bangladesh – India

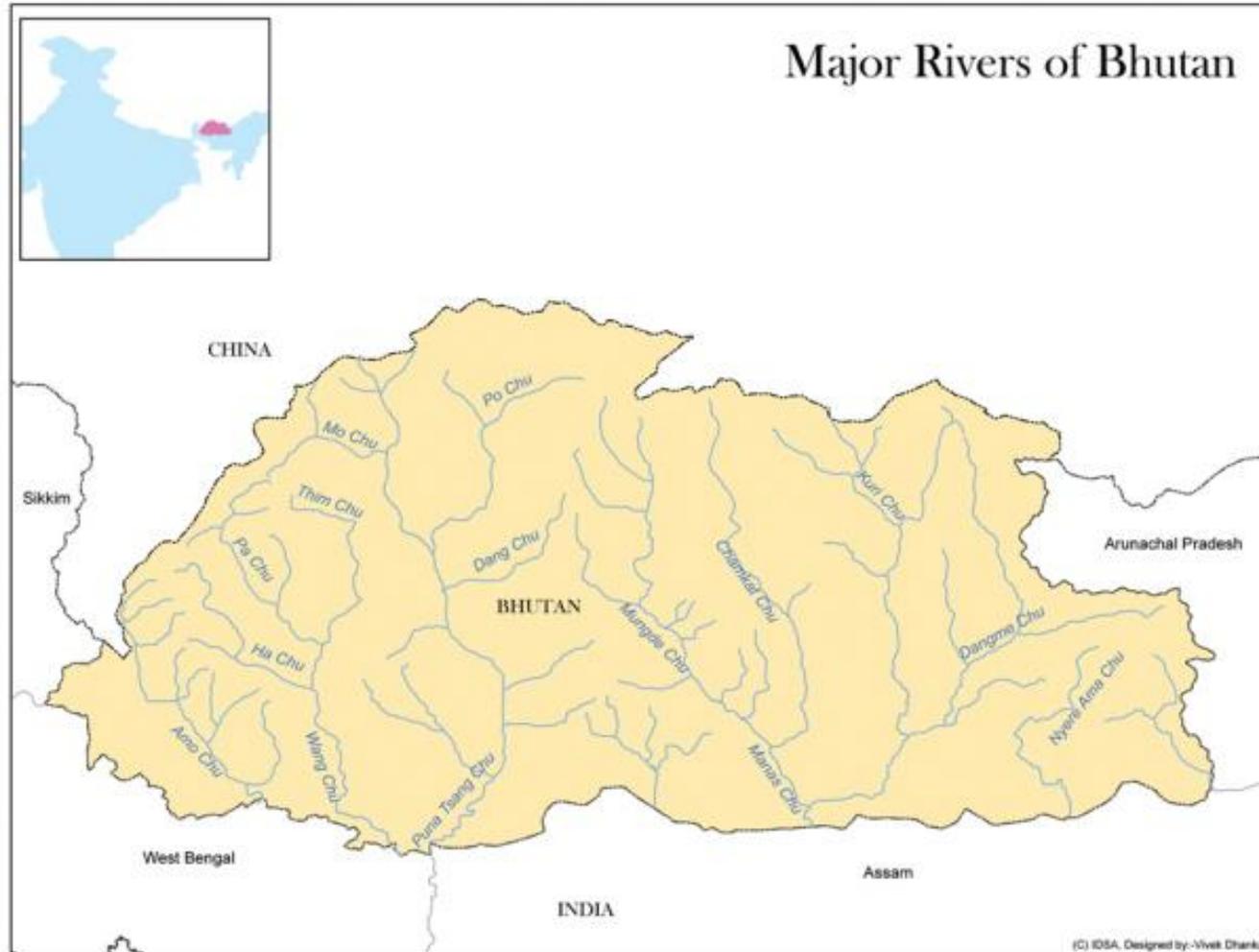


- Shares 54 trans-boundary rivers with India
- Treaty signed on Ganges River only
- Treaty on sharing of Teesta River water is expected to be signed very soon
- Limited agreement on sharing water of Feni River
- Treaty on other 50 Rivers needs to be accelerated

Multiple Treaties

- The Sharda treaty (1927), the Kosi treaty (1954, amended in 1966), the Gandak treaty (1959, amended in 1964) and the Tanakpur (1991).
- More recently, the Mahakali treaty of 1996

10. India and Bhutan



Bhutan-India Water Cooperation

- Agreement signed in 1961 for hydropower development
- Establishment of hydro meteorological and flood forecasting network on rivers common to India and Bhutan

11. Sri Lanka and Maldives being Island nations have no trans-boundary water issues

12. Addressing Non-contentious issues

❖ Flood Control

- **Data sharing on flood control**
- **Intervention through infrastructure development like control and regulating structures in the upper riparian countries**

❖ Prevention of river bank erosion

- **River training**
- **Construction of infrastructures in appropriate location of the riparian countries**
- **Proportionate joint investment by riparian countries may be explored for joint investment**

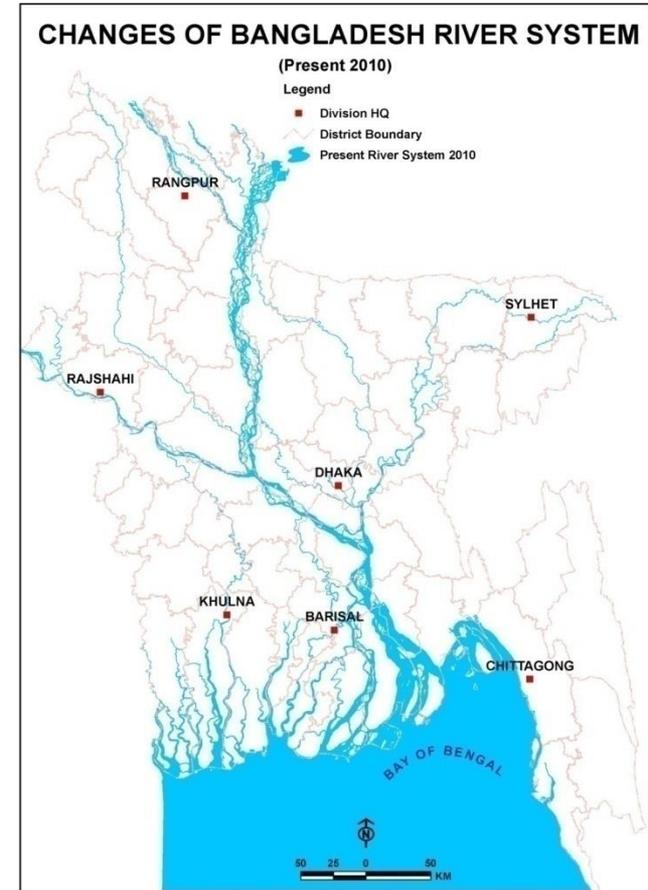
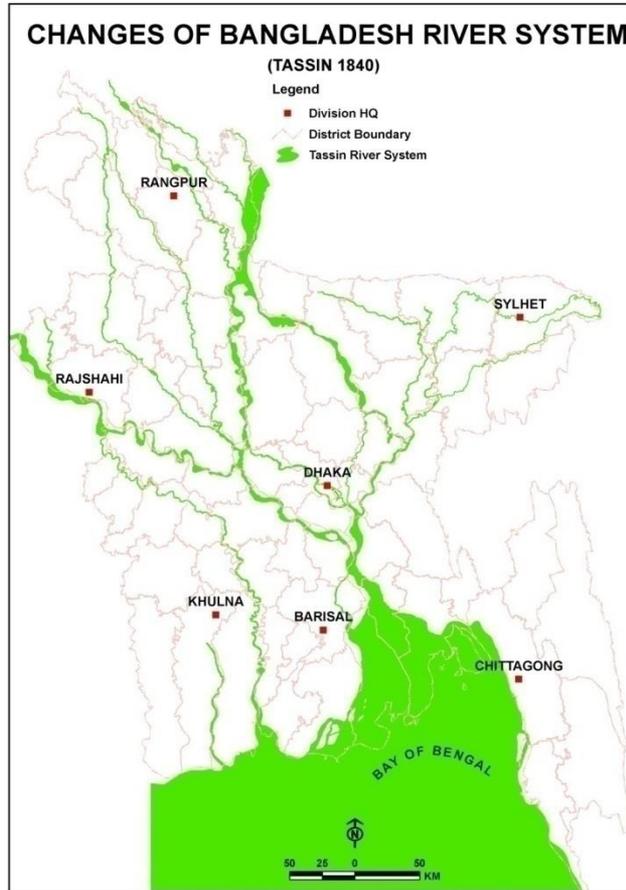
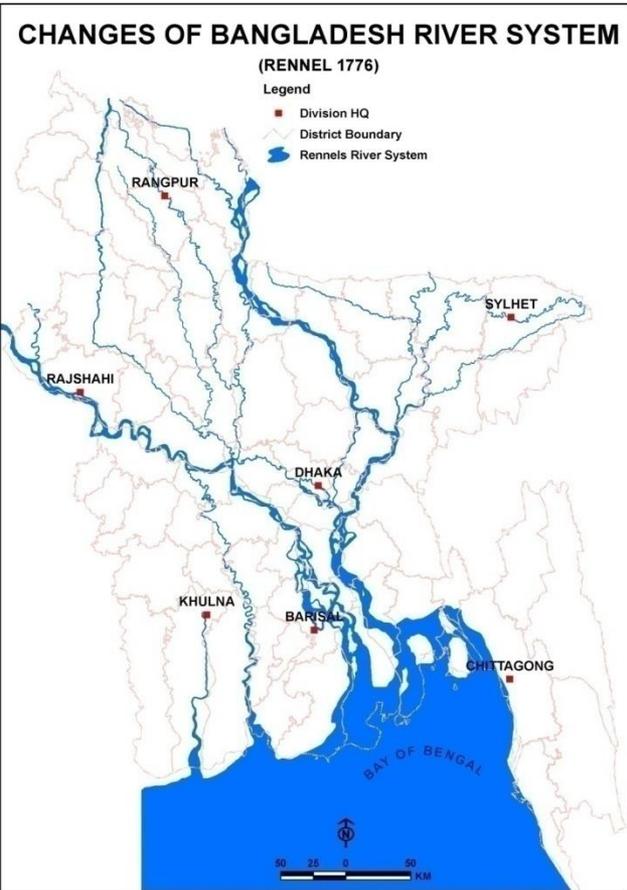
❖ Improving navigation

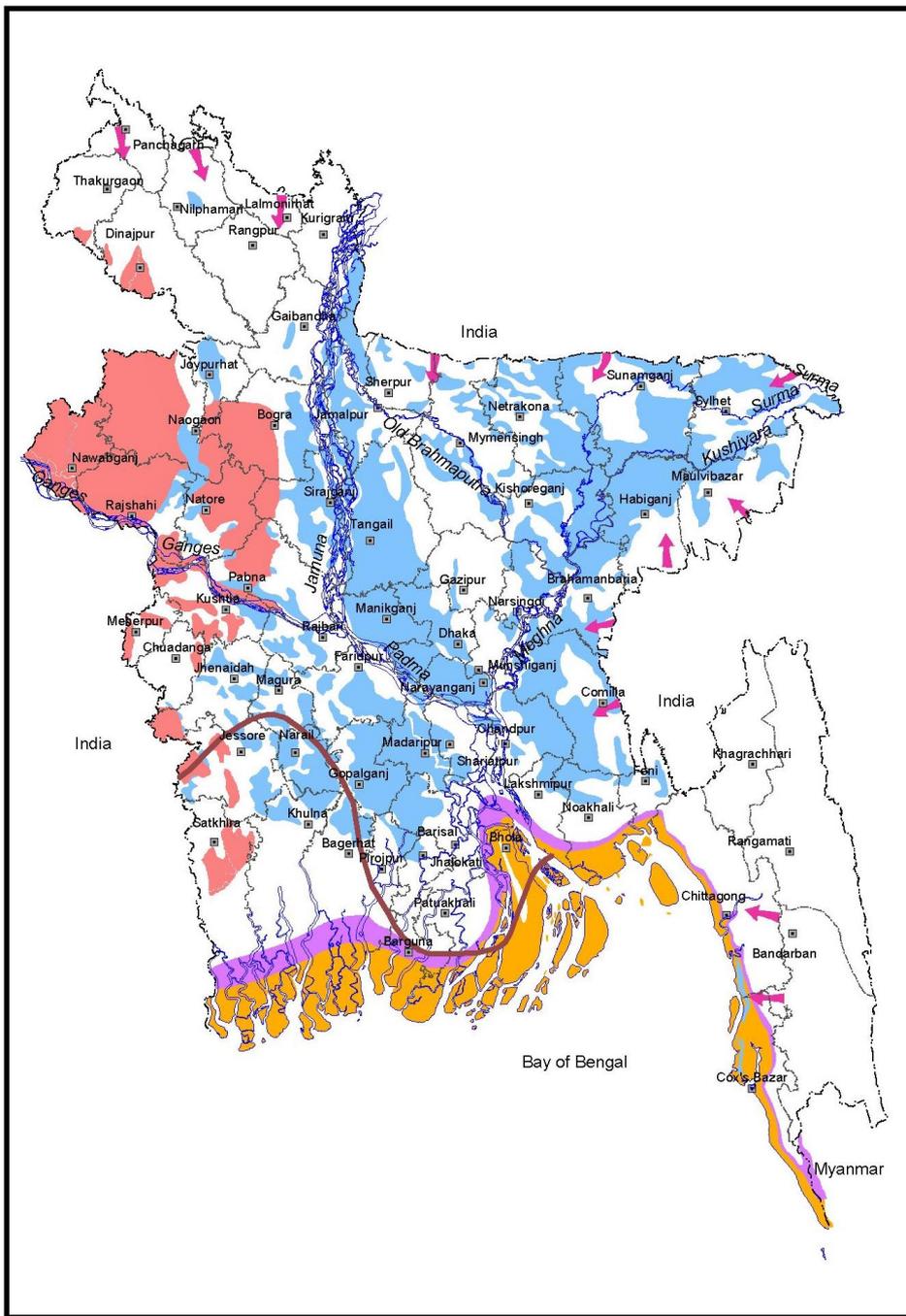
- Capital dredging of main rivers
- Prevention of shifting of the main channel of the rivers in the dry season through river training
- Due to reduction of flow in the dry season Calcutta port has silted up and this are one of the agreements provided for diverting water from Ganges River at Farakka to flash the Calcutta port

❖ Management of Silt

- A large volume of silt is carried by the trans-boundary rivers to the lower riparian countries especially to Bangladesh. It is estimated that nearly 1.5 billion tons of silt is transported to Bangladesh by rivers and deposited in the river-beds affecting navigation. Silt management can only be done through cooperation of all the riparian countries.

Delta Building and River Shifting





❖ Protection of ecosystem and environment

- Ensuring E-flows
- Ensuring adequate flow to prevent saline water intrusion

Legend

-- -- International boundary

----- District boundary

— Rivers

Normal Flood

Flash Flood

Severe drought prone area

Surge Height above 1 meter

Surge Height less than 1 meter

1 ppt salinity Isoline

❖ In Bangladesh, ecosystem of Sundarban, the largest natural mangrove forest in the world and a UNESCO designated world heritage site and home of the internationally famous Royal Bengal Tiger is seriously threatened by Salinity.

❖ **Prevention of Pollution of Water Resources:**

- Inter country pollution
- In country Pollution
- Effect on Ecology and aquatic resource
- Arsenic contamination of ground water (India, Bangladesh, Nepal , Pakistan)

12. Regional Co-operation in non-structural areas:

❖ Improving food security

- Increasing water productivity of major crops including cereals**

Yield and Water Productivity of Rice and Wheat in the Region

Country	Ave. Yield of RICE (t/ha)	Ave. Yield of Wheat (t/ha)	Water Productivity* kg/m ³	
			RICE	WHEAT
Bangladesh	3.50 ¹	2.00 ¹	0.30	0.34
Pakistan	3.05 ¹	2.38 ¹	0.25	0.40
India	2.98 ¹	2.84 ¹	0.25	0.48
Nepal	2.91 ²	1.98 ¹	0.24	0.32
Bhutan	2.11 ¹	1.14 ¹	0.17	0.18
Sri Lanka	3.37 ¹	N/A	0.28	N/A
Afganstan	1.79 ³	2.6 ⁴	0.15	0.44
Maldives	N/A	N/A	N/A	N/A

Source:

1. Food and Agricultural Organization Statistics (FAOSTA)-2003
2. International Rice Resource institute (IRRI) estimate 2010
3. FAO Rice information-2000
4. The Ministry of Agriculture Irrigation and Livestock, Afgan-2011

*FAO recommend Water Productivity for Rice and Wheat is 1kg/m³ of H₂O

- ❖ Agricultural sector's contribution in GDP is significant in the region but needs to be more efficient in using water.
- ❖ In the region agriculture sector uses nearly 80% of the water. Sector is blamed for inefficiency in water use. Regional effort needed for improved water management in agriculture.
- ❖ More crop per drop
- ❖ Basin wide management of major rivers has to be promoted for optimal use of water

GDP: Growth Rate, Per Capita, Contribution by Sector

Country	GDP Growth Rate (%)			GDP (Per capita) in US\$			GDP Composition by sector (%)		
	2011	2010	2009	2011	2010	2009	Agriculture	Industry	Service
Afghanistan	5.7	8.4	21	1000	900	900	35	25	40
Bangladesh	6.1	6.4	5.9	1700	1600	1600	18.4	28.6	53
Bhutan	5.9	10.6	6.7	6200	5900	5300	16.6	45.4	37.4
India	7.2	10.6	6.6	3700	3500	3200	17.2	26.4	56.4
Maldives	7.4	5.7	4.7	8800	8400	8100	5.6	16.9	77.5
Nepal	3.5	4.6	4.4	1300	1300	1300	34.9	15	50.1
Pakistan	2.4	3.8	1.7	2800	2800	2800	20.9	25.8	53.3
Sri Lanka	8.2	8	3.5	5700	5300	5000	13	29	57.4

Source: Central Intelligences Agency: The world Fact Book

Other Important Issues

a. Current challenges in water sector

- The region has limited land and water resources to support its huge population.
- Water scarcity in some countries already exist and some other countries are approaching limits of sustainable use due to increasing population and pollution.
- In India and Bangladesh difference between total annual water resources and internally renewable water resources is significant. In case of Bangladesh the difference result in a situation where the bulk of the water resources are not within the control of the country, hence high per capita water availability can be misleading.
- Climate change impacts may adversely affect availability of water resources in the long run.

b. National and regional initiative of managing water scarcity:

- ❖ There appears to be no effective program at the regional level.
- ❖ At the national level some initiative like growing rice without “ponded” irrigation has been successfully tested. But not widely adopted by the farmers.

C. Constraints to improve joint management of water

- ❖ Lack of will or interest among the riparian countries

d. Development of comprehensive basin wide management approach:

- ❖ Possible if there is a strong political will among the countries to do so.

e. Status of Track II efforts

- ❖ Productive discussion held, but no substantial progress in implementation of the recommendations.

f. Opportunities of Hydro-power generation

- ❖ Huge potential in Nepal and Bhutan
- ❖ <5% of Bhutan hydropower developed
- ❖ India and Pakistan also have good potential
- ❖ Hydropower can be developed by joint investment by the beneficiary countries
- ❖ Recently India has proposed that Bangladesh contribute about three billion US dollar to the Tipai Mukh hydropower project to share hydropower.

g. Need for new water sharing agreement

- ❖ New agreements are needed on the rivers for which agreements have not yet been signed.
- ❖ Signed agreement/treaties should be revisited to revise the treaties as per changed environment, if any.

j. Agenda on “win-win” water sharing

- ❖ At the moment prospects are not promising
- ❖ Can be done only if all the countries political leadership agree on a common agenda and can mobilize the public opinion on its. They shall also have to raise above petty national and political interest infavor of achieving a realistic regional cooperation for long term and sustainable water resources management in the SA region