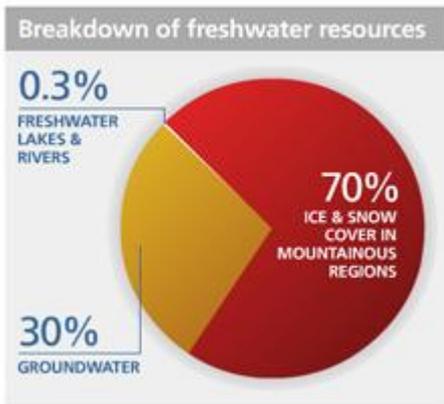
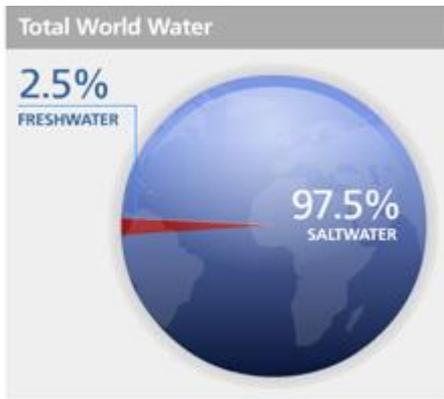


Non-Traditional Aspects of National Security

Uttam Sinha

Nehru Memorial Museum and
Library





Total World Water

1.4 billion km³

Total Freshwater

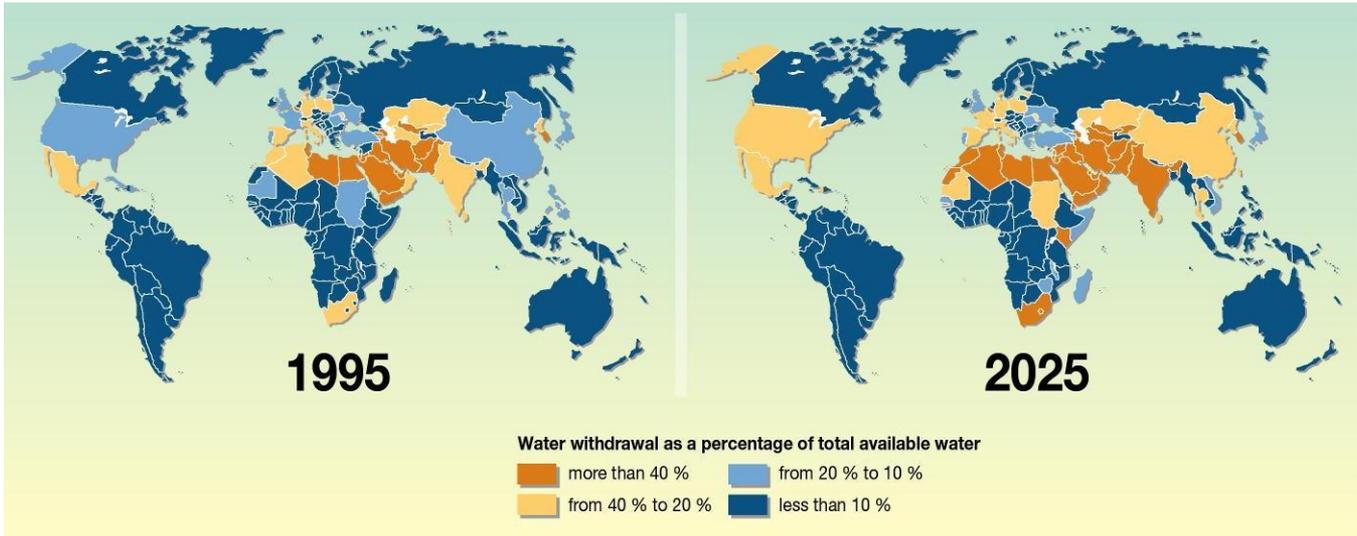
35 million km³

70 % = 24 million km³

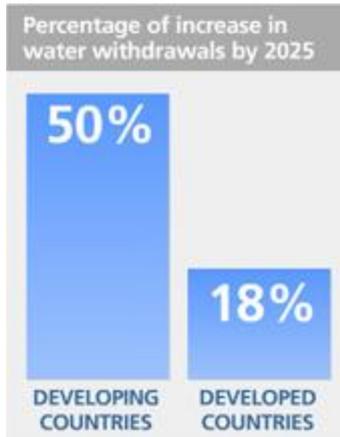
30 % = 11 million km³

Only 200,000 km³ is
actually usable

ONLY 1 %



Water Facts



- 145 nations have territory within a Transboundary Basin
- Over 1.4 billion people live in river basins where the use of water exceeds minimum recharge levels
- By 2030, 2 out of 3 people will live in water-stressed conditions
- By 2030 demand for water will be 40 per cent more and 50 per cent higher in most rapidly developing countries
- By 2030 world population is expected to increase to 7.5 billion (low estimate), the bulk of which will be in countries experiencing water shortage

Water Facts

- 276 transboundary river basins covering 45% of land surface with 40 per cent of world population
- 145 countries share river basins of which 13 basins shared between 5-8 countries; 5 basins shared between 9-11 countries. Danube is the most shared river basin (18)
- Over 1.4 billion people live in river basins where the use of water exceeds minimum recharge levels
- By 2030 demand for water will be 40 per cent more and 50 per cent higher in most rapidly developing countries
- By 2030 world population is expected to increase to 7.5 billion (low estimate), the bulk of which will be in countries experiencing water shortage

What does the water facts tell us?

First and foremost, water is indispensable and the ultimate renewable resource.

Second, water is being severely impacted by population increase and economic growth. Together they are extracting and polluting it faster than it can be replenished.

Third, the ever-expanding gap between demand (in terms of growing population and economy) and supply (in terms of availability) will potentially make water a contested issue.

Fourth, since disputes over water are inevitable understanding the processes of resolution and framing new mechanisms and approaches becomes a necessity.

Population of India

- Current population is 1.34 billion
- Projected 1.53 billion by 2030 @ population growth rate of 1.2%
- Demographic composition: 50% below the age of 25 and 65% below the age of 35
- 72.2% live in villages, 27.8 per cent in towns and urban centres
- Urban planning and resource distribution will be a great challenge

IPCC Assessment and Its Impact on India

- Temperature rise by 2.5 to 4.5 degrees Centigrade
- Food-Energy-Water pressure
- Agricultural productivity to shrink by 30 per cent
- Himalayan glaciers will shrink from 5000 sq km to 100,000 sq km
- Per capita water availability will shrink from 1,800 cubic meter to 1000. From water stress to water scarce

How does the vulnerability impact India

- Glacier melt in the Himalayas projected to increase flooding and then followed by decreased river flows as the glaciers recede
- Freshwater availability, particularly in large river basins projected to decrease which along with population growth and increasing demand could adversely affect more than a billion people by 2050
- Coastal areas, especially heavily-populated mega-delta regions will be vulnerable to increased flooding from the sea and from the rivers
- By 2030 India may need 70 million tonnes more of food grains than its current yield. Rising temperature and uneven distribution of rainfall will make India a major victim of climate change.

Impact on S.Asia`s Great River Systems

- **Increase in flow over the short term, followed by decline due to reduction in glacier melt;**
- **Specifically for Indian rivers:**
 - **Flow of Indus, which receives nearly 90% of its water from upper catchments, could decline by as much as 70% by 2080;**
 - **Ganges could lose two-thirds of its July-Sept. flow, causing water shortages for over 500 m people and one-third of India`s irrigated land area;**
 - **Flow of Brahmaputra could decline by 14-20% by 2050**

Disaster Risk Management

- More than 90% of disasters in India are related to hydro-meteorological phenomenon
- Estimate of disaster losses in India (Annual Average Losses) is at \$10 billion per year. Of these, the AAL for floods account for 70% of the total expected losses
- Climate change as well as increase in frequency and intensity of extreme events will pose new challenges in both the scientific realm as well as at the community level

- Long-term challenges include how to design and build disaster resilient infrastructure
- Over the next ten years, India will double its energy output, increase the length of national highways by 50%, and increase the length of metro lines by six times
- India will have to work with partner countries and other stakeholders to build a coalition for disaster resilient infrastructure.

Water Policies Documents

- “Integrated Water Resource Development: A Plan for Action”, published by the Ministry of Water Resources in 1997, provides a comprehensive summary of data, problems and policies.
- National Water Policy 2002
- National Action Plan of Climate Change (NAPCC), 2008
- National Water Policy 2012
- Water National Framework Bill 2016

It has a chapter on water security and conflict prevention

Draft National Water Framework Bill 2016

The bill aims to provide an overarching legal framework with principles for protection, conservation, regulation and management of water as a vital and stressed natural resource.

It will be circulated as a model bill to the states, to replace the existing draft law of 2013.

Chapter V Planning for Water Security

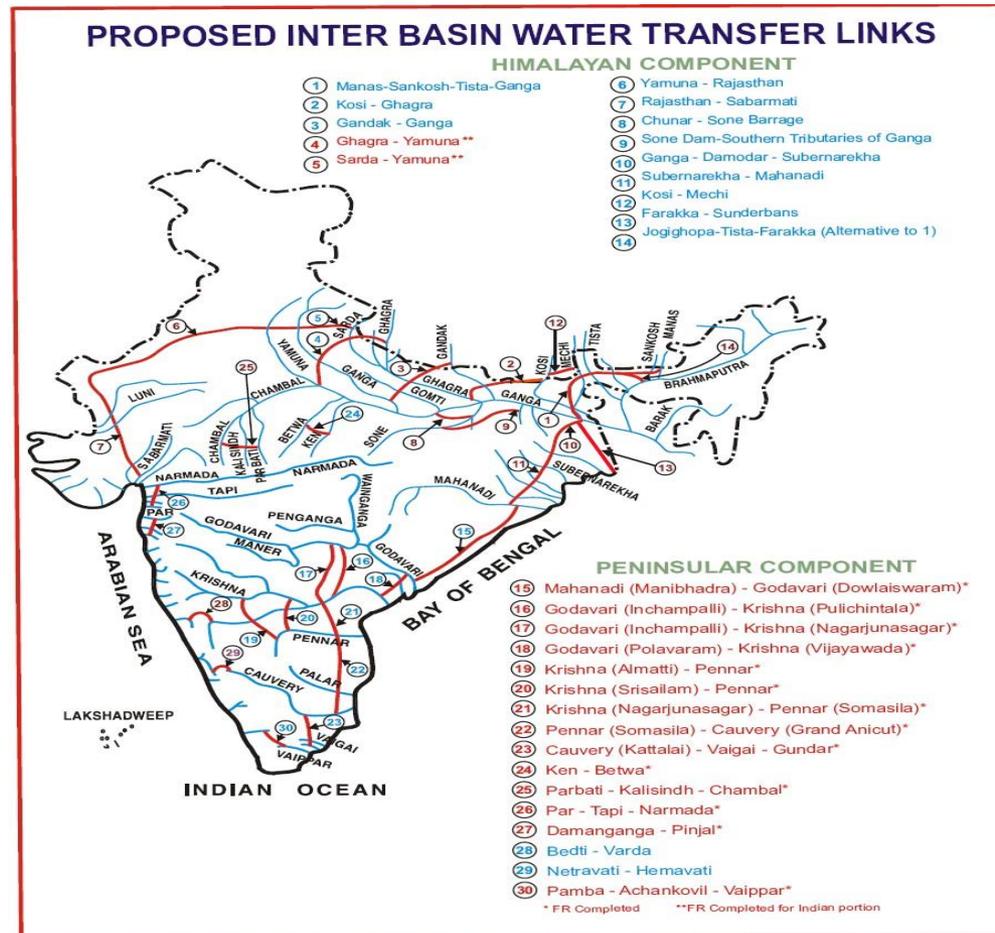
Water Security Plan for:

- (a) attainment of sufficient quantity of safe water for life and sustainable livelihoods by every person; and
- (b) ensuring water security even in times of emergencies like droughts and floods

How to ensure water security

- Shifting away from water-intensive crops
- Towards water efficient technologies
- Setting groundwater recharge structures
- Local tradition and practices
- Prevent wastage
- Watershed and basin attention
- Groundwater conservation and protection

Interlinking of Rivers

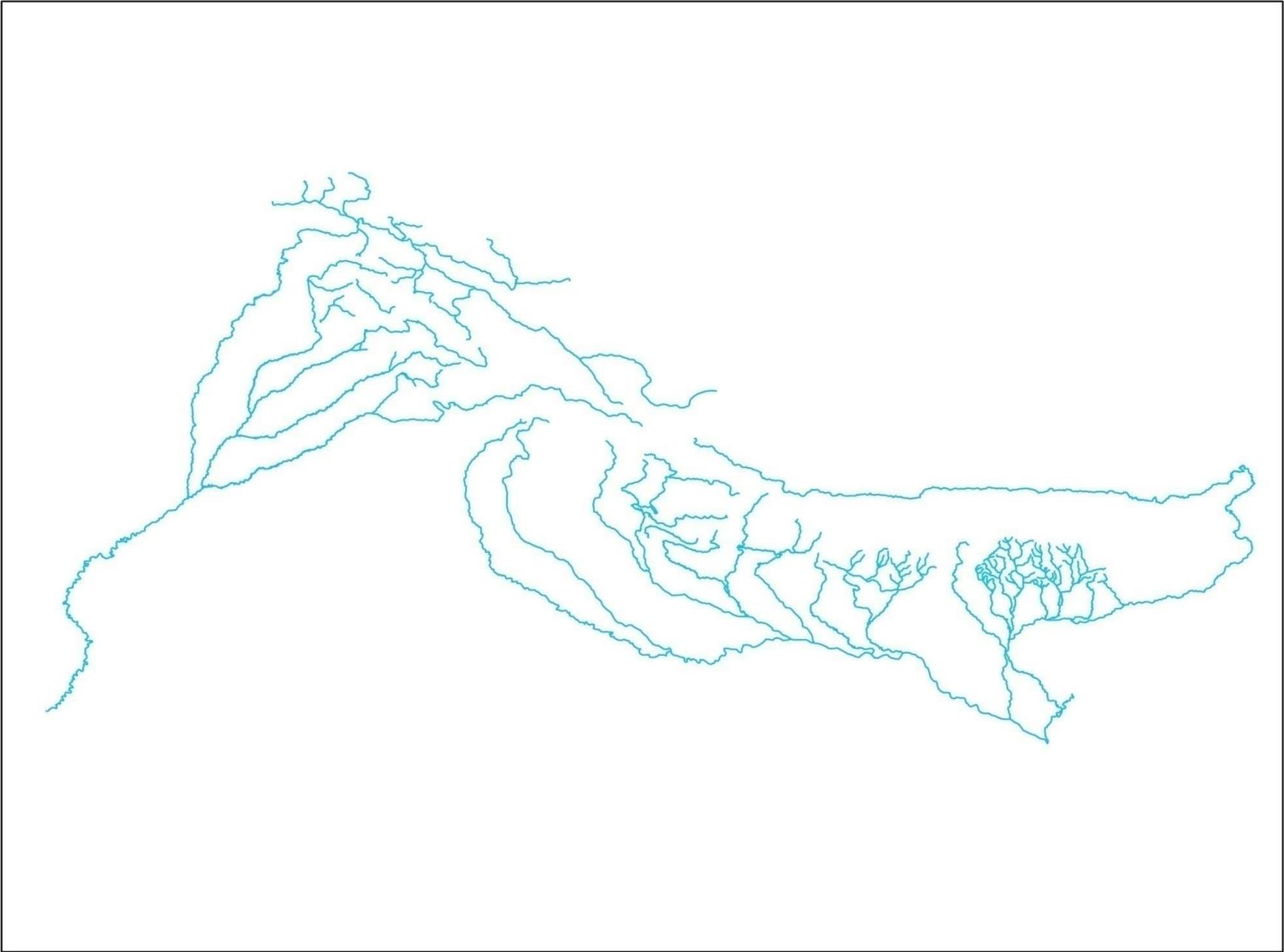


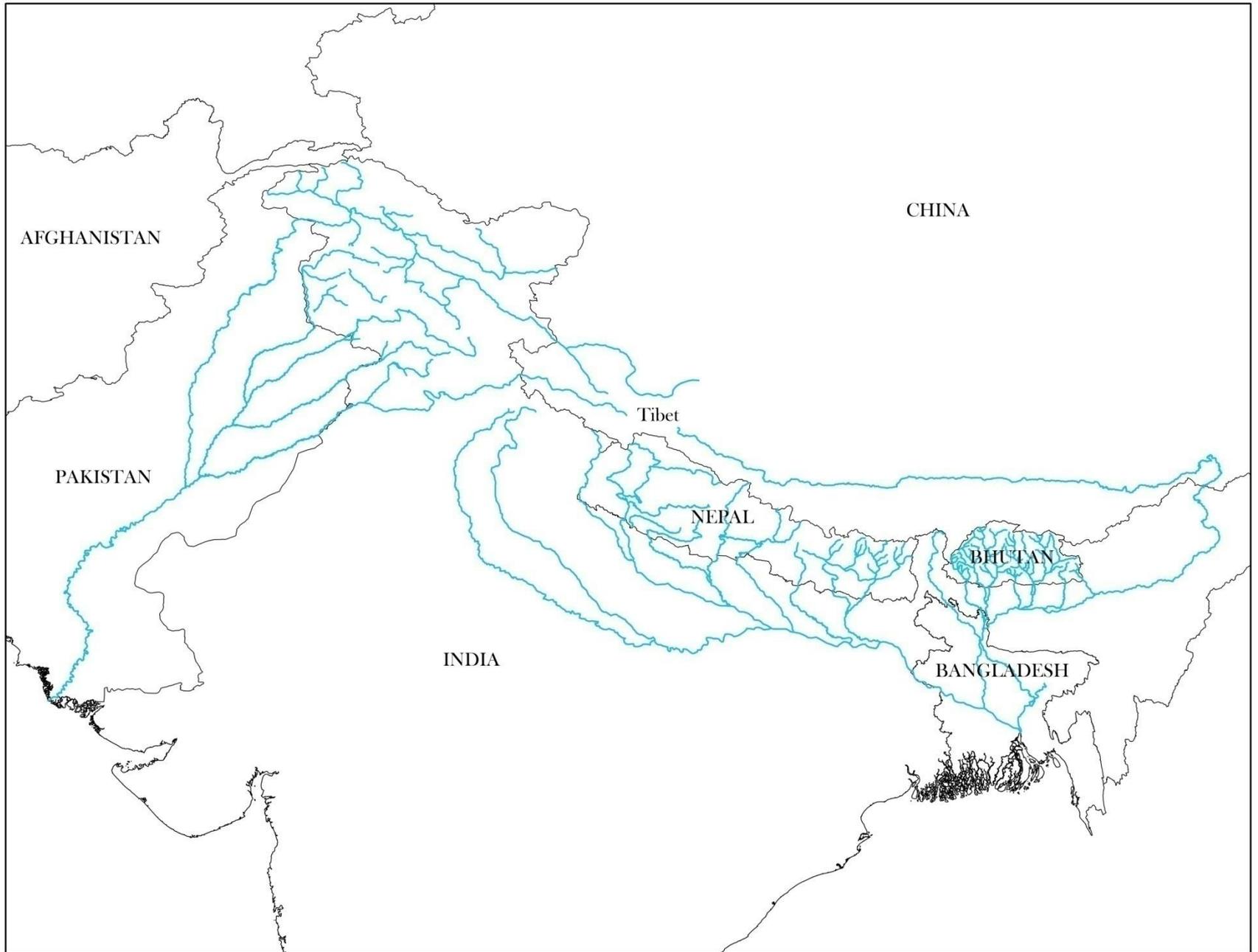
Interlinking of Rivers

- ILR is Government of India's proposal to link 37 rivers through 30 links (14 in Himalaya and 16 in Peninsular), dozens of large dams and thousands of miles of canals, making it the largest water project in the world
- To provide a permanent solution to the 'paradox of floods and drought'.
- 15000 km of canals will divert 174 trillion litres of water every year to different parts of the country at the cost of 560,000 cr
- Progress on linking Ken to Betwa; Par-Tapi with Narmada and the Damanganga with Pinjal.

Benefits

- Besides the vision of grandeur and the “solution” to floods and droughts, the project has certain specific stated claims:
- Irrigation of 87 million hectares of land
- Potable water for rural & urban areas and industrial water-supply
- 34 GW power generation through hydroelectric generators.
- Inland navigation through the network of rivers.
- Ecological upgradation and increased tree farming
- Sizeable employment generation
- National integration

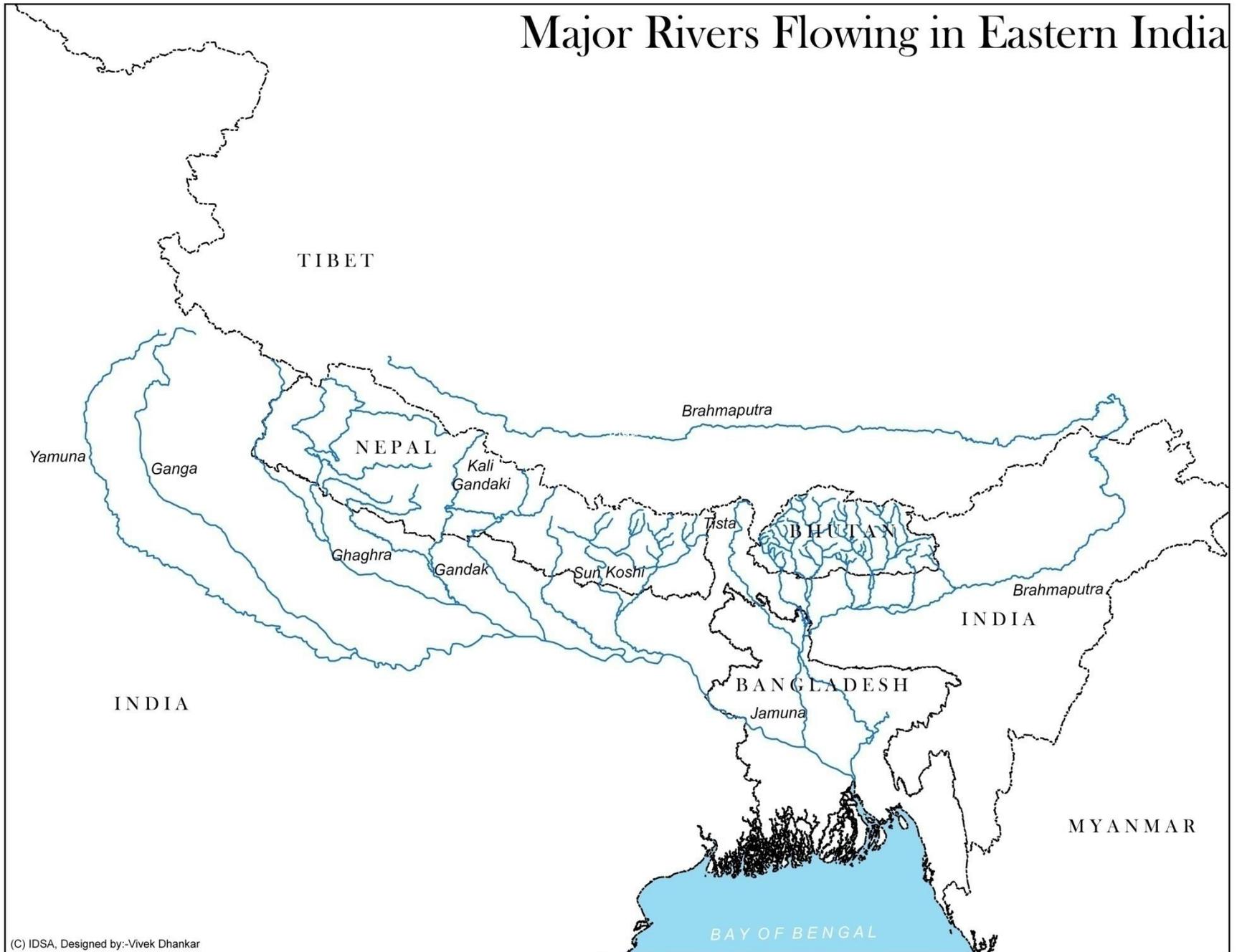


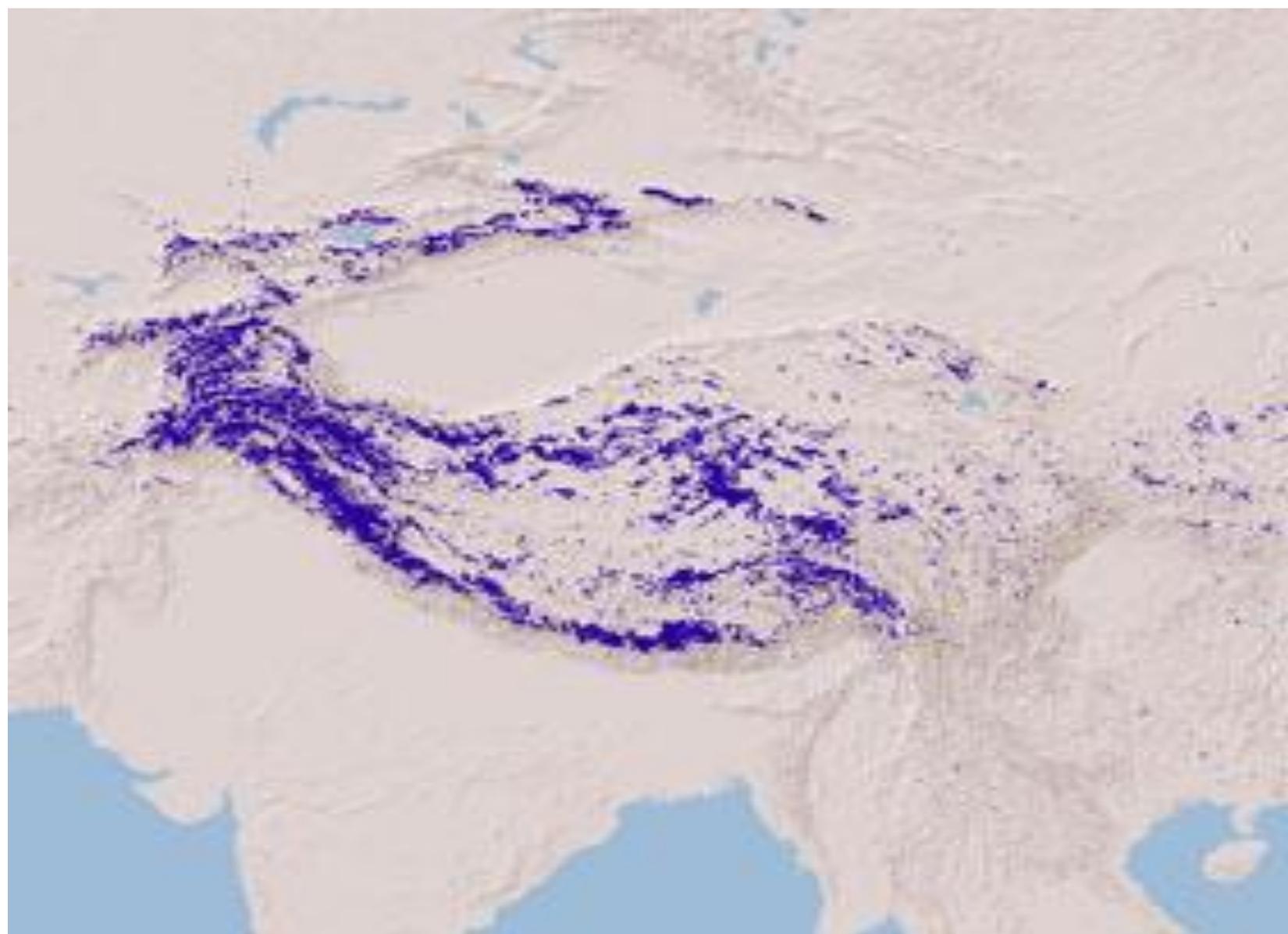


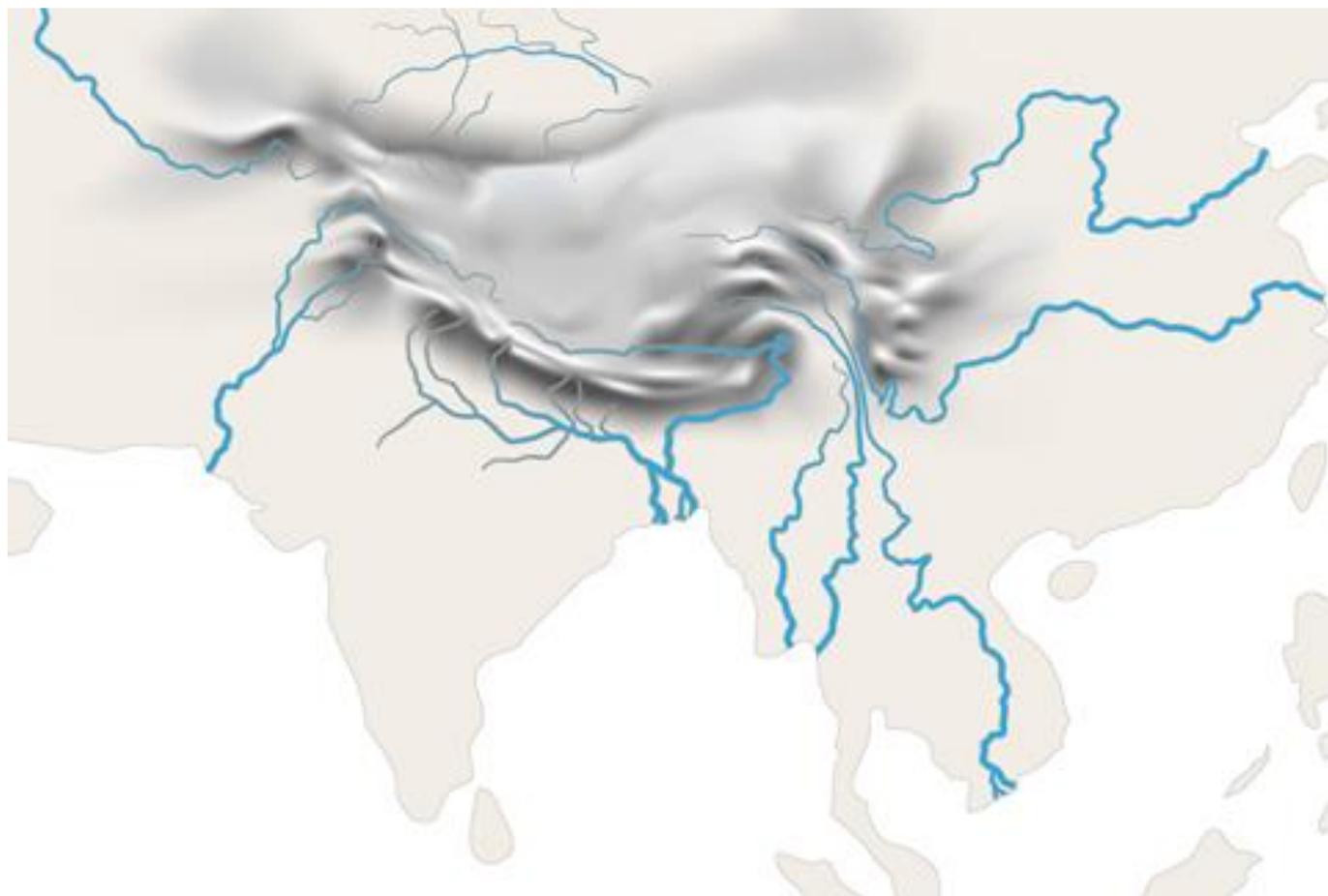
Rivers in Indus Basin



Major Rivers Flowing in Eastern India







Hydro-diplomacy

- Hydro-diplomacy is a tool for states to balance interests related to national sovereignty while strengthening regional cooperation with countries sharing common resources. It is invaluable to ensure that shared water resources are managed efficiently, sustainably and equitably.
- Cooperative governance between countries is necessary in formulating long-term strategies for sustainable management of international river basins and water resources.
- 2013 as the International Year of Water Cooperation.

- Hydro-diplomacy goes well beyond the science of water management, by involving sovereignty, political security and economic considerations.

Key geopolitical question

- The hydrology and hydropolitics in realpolitik framework suggest that the 'preciousness' of water translates into 'possessiveness' and at times 'resource aggressiveness'
- Water insecurity relates to availability, reliability and quality
- Water security relates to insecurity arising from control of headwaters
- Resource decisions are a series of complex trade-off decisions between food, energy and water, national security, cost, and carbon emissions

-contd-

- Stable flow of river water will strongly determine the stability in the region
- Glacial-melt will affect the down riparian hydrological system and have significant security and geopolitical implications
- How to deal with China's hydro-ambition?
- Can Tibet water resources be argued from a 'commons' perspective or 'common heritage for mankind'?

South Asia: A Paradox

- South Asia has 2.4 per cent of world landmass and is home to about 17 per cent of population
- Enjoyed long period of economic growth, averaging 6 per cent a year since the 1990s
- Yet poverty remains widespread. 1 billion people live on less than USD 2 a day

-contd-

- Rise in fuel and food process has affected the region
- SA has a young population. Human resource is a key asset.
- 300 million people will enter the prime working age population in the next decade

-contd-

- The lagging areas in South Asia are located in border areas and suffer from lack of market integration
- Half a billion people live in the Indus and Ganga-Brahmaputra basins
- These basins are shared by six countries

Regional Integration

- South Asia is the fastest growing region in the export of services
- **Integration will help provide:**
 - growth
 - increased investment
 - flow of information and technology
 - energy trade will fuel faster growth
 - cross-border management of rivers will have large pay-offs
- Unfortunately, South Asia remains the least integrated region in the world

IWT Plans in India

- Total 111 waterways declared
- Dedicated institution for waterways development: IWAI
- About 14,500 km of navigable waterways comprising rivers, canals, backwaters & creeks
- About 55 million tones of cargo is being moved annually by IWT: Ganga-Bhagirathi-Hooghly, Brahmaputra, Barak, rivers in Goa, backwaters in Kerala, inland waters in Mumbai and the deltaic regions of the Godavari - Krishna rivers.
- Country boats operate in various rivers and canals; substantial quantum of cargo and passengers transported by unorganized sector
- NW1 being supported (technical, investment) by World Bank funded project
- NW2 has strategic relevance: connects landlocked NE region, crucial to security concerns, connects riverine communities with no other form of connectivity.

Challenges to IWT

Natural

- Hydrology – most rainfall occurs in three months – low river flows most of the year
- Shallow depths on bars, river bends, and in the wide delta areas
- Floods in rainy season; flood waters can rise as much as 10 meters
- Cyclones in the Bay of Bengal - often strong and destructive – cause loss of life and infrastructure damage

Human-influenced

- Diversion of water for irrigation, resulting in low river flows
- Lack of multimodal connectivity
- Lack of adequate finances
- Region's political economy

Water storage: IWT, flood management & regional cooperation

- IWT provide a case of better economic utilization of enhanced river flows vis-à-vis agriculture, if dams are built in the upper reaches of river basins
- Dams in upper reaches of Ganges-Brahmaputra-Meghna basin may provide higher returns with enhanced flows utilized for IWT
- Attractive to Nepal and Bhutan to be connected to waterways; cheaper form of transport of goods, direct connectivity to ports
- IWT holds the potential to change the discourse of regional water cooperation, adding new strategic benefits and leverages for upper riparian countries such as Nepal
- Changed economic benefits may alter investment patterns in dams by different countries

Strong socio-economic case for water storage structures: but key is regional cooperation

- Water storage could provide the triple benefits of adequate water flows for navigation; flood management; & climate change mitigation & adaptation.
- Socio-economic costs of floods are increasing; greater imperative to address them
- Climate change mitigation through reduced emissions & adaptation through higher availability of water in dry months
- Key is strategic regional cooperation in river basin management and disaster management to realize the benefits
- International experience from Amazon, Rhine, Danube river basins provide good examples of robust waterways and ecological protection
- Will result in increased push towards water use efficiency in agriculture, industry, households

