

GANGA

600 million people in India, just under half the country's entire population and all of Nepal's population (29M) live in the Ganges basin, as do millions in Bangladesh. The sheer scale (2,525km in length and 1,086,000km² in expanse) and social dynamics of the Ganges River Basin (gender, poverty and social inequity) make it one of the most complex in the world.

79% of the basin area lies in India. 14% in Nepal, 4% in Bangladesh, 3% in China.

Some of South Asia's poorest and most marginalised populations live on the banks of the river, and are dependent on it for fishing, tourism, and aquatic ecosystem services for their livelihoods.

FAO has dubbed it one of the poorest areas in the world. One third of the total Indians living in the basin (200M people) are below the poverty line, reliant on the river for food, drinking water, agricultural work.

Disastrous floods already happen yearly, and during the dry season water scarcity and droughts are already common. Both are likely to increase in both frequency and severity due to climate change.

Impacts are already disproportionately felt by women, disabled people, lower caste groups – these groups are likely to become increasingly vulnerable.

Future scenarios project up to 27% increase in summer rainfall over most of the basin by 2050, which coupled with melting glaciers, is likely to result in increased run-off, changed evaporative fluxes and water use patterns.

Ultimately the water security of some of the planet's most vulnerable people will be hit.

Industrialisation, urbanisation, and sewage have left the river **hugely polluted**. New and increasingly difficult to manage contaminants, including plastics and microplastics, as well as endocrine disruptors from antibiotics, other medicines ingested by humans and animals, are found in rising numbers in the river.

Treaties, governance

There is no multilateral agreement, system of governance or cooperation on water management for the Ganges river basin.

Bilateral agreements over the last 70 years are:

India and Nepal: Kosi Agreement (1954, which shows inland navigation as a common priority for stakeholders of the basin); Gandak Agreement (1959); Mahakali Treaty (1996)
India and Bangladesh: Ganges Water Sharing Treaty (1996) and Framework Agreement on Cooperation for Dev (2011)

Notably, the GWST which expires in 2026, and the Framework Agreement are both seen as promising vehicles for progress. The first sought to resolve disputes at the India Bangladesh border and considered dry season water use. Omissions were floods and droughts, failed to include other countries. The latter included a focus on benefits for both countries – including cooperation on energy generation, science, educational and cultural exchange.

Data and knowledge gaps across the Ganges River Basin extend to nearly all aspects of social, economic, and environmental realities. Governments (especially India) tend to maintain private data regarding water resources, usage, and users, limiting cooperation, increasing stakeholder fragmentation, and wasteful duplication of activities.

The way ahead

Politics, economic interests, climate change, increased population growth, urbanisation, and industrialisation make collective action urgent, but fraught.

The strategic delinking of the science from politics of rivers could foster urgently needed cooperation and trust.

Provisions under existing agreements/treaties around shared priorities (eg inland navigation, joint financing ventures and investment) could be considered afresh and expanded to include newly pertinent issues such as DRR and early warning for all, hydro generation and management, groundwater salinity, flood management, the environment, resilience.

Flood management (demarcation of flood zones, wetland mitigation banking, encouragement of aquifer storage)

Climate resilience (especially to cope with increasingly frequent and intense floods and droughts)

Platforms, such as the Koshi DRR Knowledge Hub (KDKH), and initiatives, such as ICIMOD and WMO's HKH Hydrological Cycles Observation System (HKH-HYCOS) which shares hydro-met data between Nepal, Bhutan, Bangladesh and Pakistan, exist that could be augmented by for instance UNESCO's recommendation on Open Science and WMO's Global Climate Observing System to encourage collaboration. HKH HYCOS 'introduced countries to the benefits of using automatic and real-time hydromet stations.

India

50 Indian cities lie within the Gangetic basin.

Inclusion issues

Discussions on river basin management are generally male dominated, legal agreements and treaties are blind on gender equity, social inclusion, and justice and little is known about the experiences and contributions of women, people with disabilities, and marginalised communities and it is important to open up discussion to wider stakeholder groups.

In Bhutan, community-level organisations are working to address poverty by developing programmes that direct compensation from downstream beneficiaries in Bhutan to communities upstream for their environmental stewardship and ecosystem protection services.

In China, organisations are providing greater insights into the specific access to, and usage of, water, sanitation, and hygiene by particular disadvantaged groups such as women, disabled people, and ethnic minorities

In Bangladesh, cyclone shelters are being made safe and secure from a gender and disability perspective and components of these designs are being replicated in other cyclone-prone parts of the world.

We need a transformative approach to change to bring system-wide change in GEDSI. For about 4 decades we have used incremental approaches to change which is slow and less effective.

