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The Ganges River Basin is shared by Bangladesh, China, India, and Nepal. The ecosystem services of the basin sustain the lives and livelihoods of 650 million people in South Asia and provide more than 30% of the region's water resources. The Ganges flows South-East through India before

it enters Bangladesh. The largest part of the Ganges basin drains in India, almost 79%, followed by 14% in Nepal, 4% in Bangladesh, and around 3% in China.

With increasing development and population pressure the energy demand is rapidly rising in the Ganges

river basin, and thermal and hydro-power currently dominate the energy mix. The race for countries to fulfil rapidly rising energy demand comes at a time when clean energy and the conversations around climate change are providing pressure to shift the region's future energy pathway to be less

million people dependent on the Ganges River Basin

%

of South Asia's water resources come from Ganges River Basin

%

of the Ganges basin drains in India, followed by % in Nepal, % in Bangladesh, and around % in China.

Energy dominated by fossil fuel and hydropower

carbon-intensive. Hydropower is treated as an important energy source in this conversation—but hydropower's future reputation and expansion will depend on the policies, management, and governance strategies that governments adopt and whether or not they prioritize developing hydropower in an environmentally friendly and sustainable manner.

The heavy reliance on coal and hydropower is leading to a number of impacts on livelihoods and biodiversity in the region. Government data suggests that more than 160 dams are operational and more than 100 are under construction across the Ganges basin in India and Nepal. Dams contribute to the fragmen-

tation of rivers and as cumulative seasonal storage in dam reservoirs increases, this could alter the seasonal flow of water and have significant impacts on fish migration and fisheries as well as on sediment flow, threatening the integrity of the delta and affecting the communities downstream.

This paper gives an overview of each country's energy needs and provides recommendations for improved energy integration in the region, including the opportunity to build new renewable (solar and wind) for more affordable and secure energy systems while maintaining the ecological integrity of the Ganges and limiting impacts to livelihoods and climate change.

India is both a rapidly expanding electricity market and the world's third-largest energy consumer. India's energy demand has doubled over the last two decades. Projections from the International Energy Agency (IEA) indicate that India will make up the biggest share of energy demand growth at 25% over the next two decades, overtaking the European Union as the world's third-biggest energy consumer by 2030. This means that India's decisions have key implications not only in terms of ensuring electricity access and reliability for its population and the region but also for global trends on carbon emissions.

India currently has electricity grid connectivity with four of its neighbors: Nepal, Bhutan, Bangladesh, and Myanmar. To facilitate electricity trade, India launched the India Energy Exchange (IEX), which provides a nationwide

trading platform for the sale and delivery of electricity. In November 2021, India approved Nepal's participation in India Energy Exchange (IEX). Since then Nepal has been participating in electrici-



2,190 MW

Installed Capacity

1,964 MW

Peak Demand (2022)

12%

Demand Growth
(through 2025)

15,000 MW

Generation Plan
(by 2030)

267 kWh/person

Per Capita Electricity
Consumption (2020)

22,031 MW

Installed Capacity

13,000 MW

Peak Demand (2019)

10%

Demand Growth
(through 2025)

57,000 MW

Generation Plan
(by 2041)

422kWh/person

Per Capita Electricity
Consumption (2021)

405,773 MW

Installed Capacity

210,793 MW

Peak Demand

7%

Demand Growth
(through 2027)

165,300 MW

Generation Plan
(by 2027)

1,208 kWh/person

Per Capita Electricity
Consumption (2021)



South Asia offers huge potential for energy trade and cooperation. In recent years, bilateral and trilateral arrangements have paved the way for energy development in the region to meet its growing demands. Though India has started opening doors for multilateral cooperation on energy trade, one example being the growing India-Nepal energy partnership, there are still gaps in terms of actual implementation of various bilateral agreements due to the unavailability of grid connection among the countries sharing the Ganges River Basin.



Ganges River Basin countries are increasingly vulnerable to energy supply shocks, like recent hikes in gas prices, which makes the case for a transition to new renewables in the basin even more urgent. If there is sufficient investment in a diverse energy portfolio, if Bangladesh, India, and Nepal provide the policy support needed to expand alternative energy resources like solar and wind, and if projected prices of these alternatives continue to fall, then the pathway for renewable energy transition may accelerate.



In 2023, at least 30 hydropower projects in eastern Nepal suffered damage, estimated at USD 64 million, due to floods and landslides during

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