



*Deopur Watershed, Kodarma, Jharkhand*

## **Commentary**

With increasing intensity and variability of the southwest monsoon, India is experiencing significant shifts in rainfall patterns due to climate change. The Ministry of Science and Technology and Earth Sciences, Government of India, prepared a detailed report titled *Assessment of Climate Change over the Indian Region*, based on long-term datasets. The study found that dry spells during the summer monsoon increased by 27% between year 1981–2011 compared to 1951–1980, while wet spells became more intense.

The India Meteorological Department (IMD), in its report *Observed Rainfall Variability and Changes*, analyzed rainfall trends over the past 30 years at state and district levels. It observed a sharp rise in heavy rainfall events (6.5 cm or more) in traditionally dry regions such as south-eastern Rajasthan, Saurashtra and the arid Kutch region of Gujarat. Similar increases were noted in northern Tamil Nadu, northern Andhra Pradesh, south-west Odisha, parts of Chhattisgarh, southwest Madhya Pradesh, and sections of West Bengal, Manipur,

Mizoram, Konkan, Goa, and Uttarakhand. Conversely, areas historically known for high precipitation—including Meghalaya (Cherrapunji-famous globally for highest precipitation), Nagaland, Arunachal Pradesh, and Himachal Pradesh—showed declining rainfall trends.

The IMD also reported a significant decrease in southwest monsoon rainfall between 1989 and 2018 across the Gangetic plains—covering Uttar Pradesh, Bihar, and West Bengal. These states, often referred to as India's breadbasket, rely heavily on monsoon rains to sustain kharif crop cultivation, making this decline particularly concerning for food security and rural livelihoods.

Complementing these findings, the Council on Energy, Environment and Water (CEEW) conducted a tehsil-level study titled *Decoding India's Changing Monsoon Patterns: A Tehsil-level Assessment*. Using high-resolution meteorological data from 1982 to 2022, the study revealed that 55% of India's 4,419 tehsils experienced a rise in short-duration, high-intensity rainfall. Such events often trigger flash floods, damaging crops, unlike the steady, prolonged rains traditionally favourable for agriculture.

This year's monsoon further underscored the trend. August alone witnessed over 20 extremely heavy downpour events—a 50% increase compared to 14 events last year. North India recorded unusually high rainfall across June, July, and

August, a rare occurrence seen since 2013. While August of the previous year was dominated by “heavy” (64.4–115.5 mm) and “very heavy” rainfall events, this year saw a surge in “extremely heavy” rainfall episodes.

These evolving rainfall patterns—marked by greater intensity, variability, and shifting geographic distribution—pose serious threats to ecosystems and traditional farming systems. The declining monsoon over the fertile Gangetic plains, in particular, represents a severe challenge to kharif crop production, food security, and rural livelihoods.

## **NEWS**

### **1. Shining Change in Deopur Watershed**

IRBMS commenced the watershed development work of Deopur watershed, block- Domchanch, District- Kodarma, Jharkhand in the year 2018-19 in participation with Savera Foundation, Koderma and concluded in the year 2023-24. The measures taken for the development of the watershed has led the people of Deopur watershed far ahead with a shining change in their livelihood.





Small-scale farmers have transformed their once modest plots into vibrant nutrition gardens. By using cow dung as a natural biofertilizer and

and farmers in the community to embrace eco-friendly farming methods.

Today, they are not just cultivating crops—they are



*Reaping the Fruits, Deopur watershed, Kodarma, Jharkhand*

adopting sustainable practices such as composting and crop rotation, they now cultivate tomatoes, cucumbers, brinjals, bitter gourds, beans, chillies, and leafy greens throughout the year. With continued support from the organization—through the provision of seeds, training, and technical guidance—farmers have ensured a steady supply of nutritious food for their families while earning additional income from surplus produce. Their commitment has also inspired other women

nurturing a sustainable future for their families. Their journey stands as a living example of how small, consistent steps toward sustainability can lead to lasting transformation.

## **2. Bandhwari landfill near Gurugram declined taking Faridabad's waste after September 30**

The towering Bandhwari landfill 19 metres high near Gurugram, has long been burdened with excessive plastic waste that often triggers recurring fires. Commissioned in 2008, the Bandhwari

landfill was originally designed to process around 1,200 tonnes of waste daily.

Over the years, however, the volume has increased to nearly 2,000 tonnes per day, far beyond its intended capacity with a contribution of 900–1,000 tonnes of garbage every day from Faridabad. The excessive dumping of plastic and other non-biodegradable materials has led to severe legacy waste accumulation and frequent fire hazards, turning the site into a critical environmental concern for the region.



- Source:
- [www.downtoearth.org.in/waste/bandhwari-landfill-near-gurugram-to-stop-accepting-faridabads-waste-after-september-30](http://www.downtoearth.org.in/waste/bandhwari-landfill-near-gurugram-to-stop-accepting-faridabads-waste-after-september-30)

### 3. High Seas Treaty Reaches Historic Confirmation Milestone: A New Era for Global Ocean Conservation

The High Seas Treaty, officially called the Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ), two years after its opening for

signature in September 2023, has earned 60 ratifications, the number required for the treaty to enter into force on January 17, 2026, with recent ratifications from Sri Lanka, St. Vincent and the Grenadines, Sierra Leone, and Morocco.

#### Contextual and Purpose

The BBNJ treaty operates under the United Nations Convention on the Law of the Sea (UNCLOS) — a global framework adopted in 1982 and enforced in 1994 to establish rules, maintain law and order for world's ocean governance, States' rights and jurisdiction in maritime rights, and peaceful use of marine resources.

The treaty focuses on the conservation and sustainable use of marine biodiversity in international waters, i.e., areas beyond 200 nautical miles from coastal countries' exclusive economic zones.



Photo: iStock

## Key Objectives

**Expanding Marine Protected Areas (MPAs)** are regions marked for long term conservation protecting marine ecosystems, resources, and heritage. As per International Union of Conservation of Nature (IUCN), at present only 6.35% of the ocean is protected, while just 1.89% is strictly no-take MPAs (where extractive activities are prohibited). The treaty aims to significantly increase this coverage.

This treaty will facilitate **equitable sharing of Marine Genetic Resources (MGR)** of plant, animal, and microbial materials used in industries such as medicine and pharmaceuticals.

### **Mandatory Environmental Impact Assessments (EIA):**

Any activities such as deep-sea mining or carbon sequestration in international waters will need prior evaluation of their potential environmental impact assessment (EIA).

### **Global Participation**

A total of 143 countries, including India, have signed the treaty with the intention to ratify it. More countries are expected to join during the UN General Assembly High-Level Week starting on September 22, 2025.

### **Next Ladders**

Countries have already participated in two Preparatory Commission meetings to develop the

operational framework for the treaty which includes:

- Governance and implementation structure.
- Clearing-House Mechanism.
- Financial rules and resource mechanisms.

The first Conference of the Parties (COP1) will formalize these frameworks and implement the treaty.

*Source:*

[www.downtoearth.org.in/water/bbnj-treaty-receives-60-ratifications-will-enter-into-force-to-protect-marine-life-in-international-waters-in-january-2026](http://www.downtoearth.org.in/water/bbnj-treaty-receives-60-ratifications-will-enter-into-force-to-protect-marine-life-in-international-waters-in-january-2026)

## **RIVERS OF INDIA**

### **Godavari River**

#### **(Part - 7)**

### **Wainganga River Sub-basin**

The Wainganga River is an important source of water resource in central India, flowing through the Deccan Plateau and symbolizing ecological wealth, cultural traditions, and the strength of local communities. Its initial source starts from the Mahadeo Hills of the Satpura range near Mundara village in Seoni district, Madhya Pradesh, at about 1,048 meters above sea level, though some sources place its origin near Partabpur in Maharashtra at 640 meters, showing that several other streams

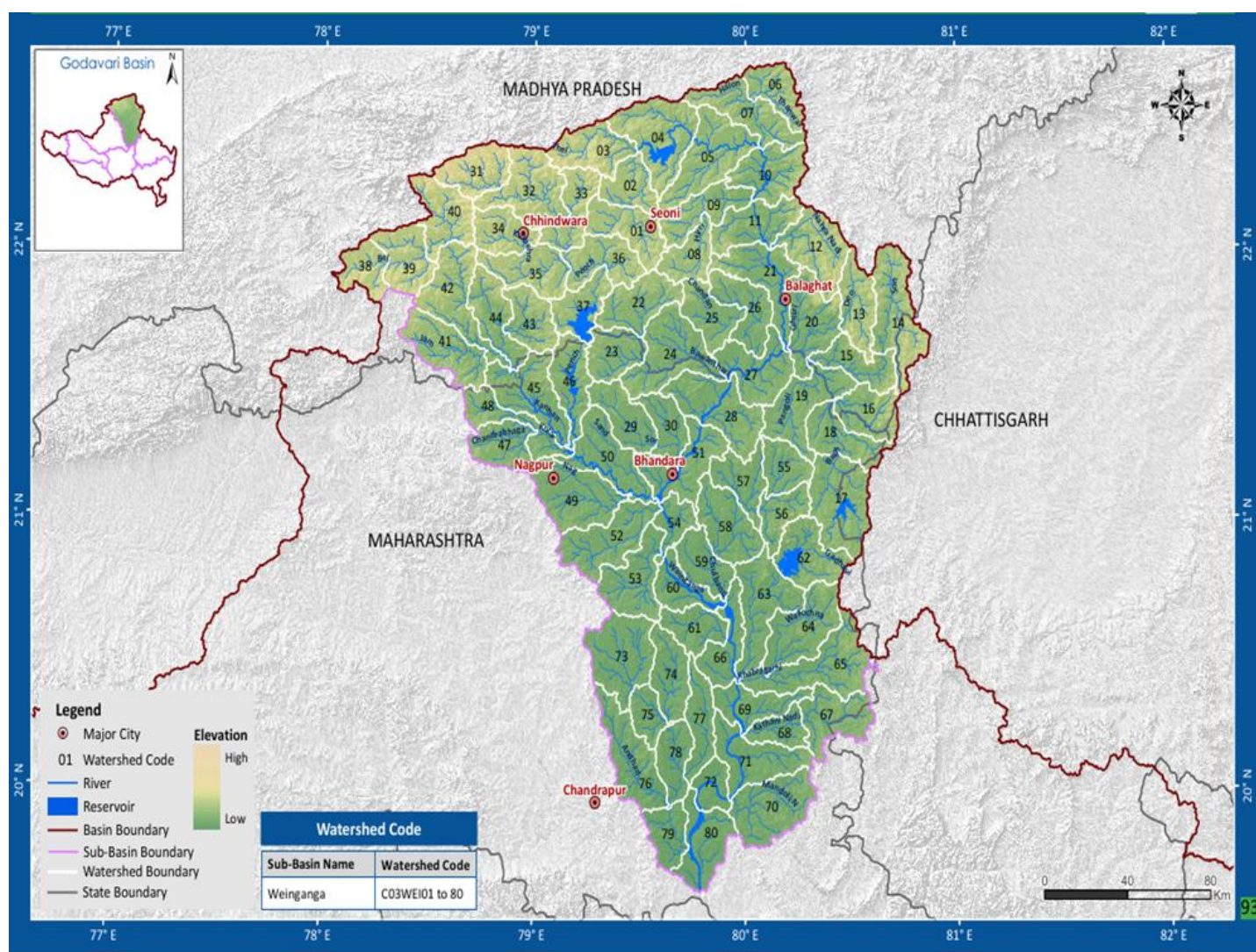




from highland contribute to its formation. The river is mainly fed by monsoon-based springs and streams and moves southward through Seoni and Balaghat before entering Maharashtra, where it meanders through the Vidarbha region, passing towns such as Bhandara and Gadchiroli. Along its banks, the river supports farming, dense forests, and expanding cities, making it vital for both rural and urban life. After flowing for roughly 639 km, it

meets the Wardha River at Chaprala in Gadchiroli to form the Pranhita River, a major tributary of the Godavari. This junction is important both for water systems and for the region's ecological and cultural unity. Approximately 270 km of its length lies in Madhya Pradesh and 369 km in Maharashtra.

The Wainganga basin covers around 49,949 sq km and falls within the broader Godavari Basin, lying



between 19°30'N–22°30'N latitude and 79°00'E–80°30'E longitude. The basin features diverse landforms: 0.52% low relief, 28.69% moderate relief, 58% moderately high relief, and 12.78% high relief.

The basin area receives 900–1600 mm of rain annually, with over 90% occurring during the June–October. Major towns like Seoni, Bhandara, and Bramhapuri have developed with the river's support. The Wainganga also nurtures rich biodiversity and is closely tied to local culture and folklore. However, the river now faces threats of pollution, illegal sand mining, and rising water demand, endangering its long-term sustainability.

The river basin includes many important tributaries—such as the Pench, Kanhan, Bawanthadi, and Bagh rivers—which increase its ecological and hydrological value. Key infrastructure, including the Gosikhurd Dam with 33 gates and the Bheemgarh (Upper Wainganga) Dam in Seoni, plays a major role in irrigation and flood management. The basin contains fertile plains, wetlands, and forests of teak, sal, and bamboo, which provide habitats for tigers, leopards, sloth bears, and many bird species. The Wainganga holds deep cultural and spiritual meaning, especially for the Gond tribes, who see it as sacred and perform rituals along its banks. The

river is also connected to literature—Rudyard Kipling's *The Jungle Book* was inspired by the forests of Seoni, through which the Wainganga flows. Temples such as the Markandeya Temple in Gadchiroli attract thousands of pilgrims, especially



**Markandeya Temple in Gadchiroli**

during Makar Sankranti. During the British era, the Wainganga served as an important route for transporting timber, minerals, and agricultural goods. The basin is one of India's richest wildlife regions, home to diverse species in Pench National Park and 84 species of fish in the river, including the endangered Deccan mahseer.

The forests along the river form wildlife corridors linking major tiger reserves, helping preserve genetic diversity in tiger populations.

Economically, the Wainganga supports about 1.2 million hectares of farmland through irrigation, making it essential for crops like soybean, rice,

cotton, wheat, and pulses. It contributes to

Land Use Type	Percentage (%)
Built-up Land	1.80
Agricultural Land	17.77
Forest Cover	62.07
Water Bodies	1.62
Barren Land	8.65
Fallow Land	5.36
Gravel Land	0.34
Rocky Land / Open Space	2.38

renewable energy through the Sanjay Sarovar hydroelectric project and supports fisheries employing over 50,000 families and producing around 12,000 metric tons of fish each year. However, unchecked sand mining and small industries along its banks have harmed the river's natural flow and sediment balance.

The basin's geology is mainly made up of ancient Gneissic Complex rocks, covering 48.18% of the area. It contains both shallow and deep aquifers replenished by rain and seepage from canals and tanks. Total groundwater availability stands at about 6,719.95 Mm<sup>3</sup>, with 4,336.95 Mm<sup>3</sup> used for irrigation. Aquifers in the southern basin lie at depths of 30–100 m and 160–230 m (sometimes up to 300 m), with tube well yields of 1.3–15 lps (Litre

Per Second). The central basin has higher transmissivity (85–250 m<sup>2</sup>/day), and wells range from 79–264 m deep, while those in the Gondwana formation range from 10–137 m with yields of 0.78–16.4 lps, indicating good groundwater potential.

Environmental problems continue to grow. Industrial pollution, especially from textile and paper mills in Nagpur has lowered water quality. Since 2000, nearly 30% of forest cover has been lost due to farming and urban growth, causing erosion and habitat decline. Floods occur every 5–7 years, with major flooding in 1998, 2001, 2004, and 2007, and heavy discharges reported in 2020, 2022, 2023, and 2025. To address these issues, multiple conservation programs have been launched. The National River Conservation Plan targets industrial wastewater, Maharashtra's "Green Wall" aims to plant 50 million trees along riverbanks, and the Jal Shakti Abhiyan in Bhandara focuses on reviving traditional water bodies and rainwater harvesting. Eco-tourism near Pench National Park also helps support local communities. The National Green Tribunal works to control illegal sand mining, though enforcement is difficult.

Large water-transfer projects have been proposed as well. The Wainganga–Nalganga (Purna–Tapi) Link Project plans to divert 2,721 Mm<sup>3</sup> of water from the Gosikhurd Dam through a 478-km canal





system to irrigate 4.13 lakh hectares in Vidarbha. With a cost of about ₹8,294 crore, a BCR (Benefit-Cost Ratio) of 1.96, and an IRR of 15.9%, it is considered economically sound. On the other hand, the Wainganga Hydro Electric Project (HEP)–Manjra Valley Link Project, which would transfer 1,527 Mm<sup>3</sup> for irrigation and urban use in Yavatmal, Latur, and Beed, has a BCR of 0.66 and an IRR (Internal Rate of Return) of 5%, making it less feasible.

Overall, these developments highlight the need for balanced river management that supports economic development while protecting the Wainganga's ecological and cultural value.

**(to be continued)**

**Source:**

- Ministry of water Resources, Govt. of India, Godavari Basin.
- Watershed Atlas of India.
- The Times of India
- Wikipidea.
- Basin and Dhuti Dam with Impact on Crops at Balaghat Station (India) by S. K. Patle, C. Parasar, R. Chavan.
- GIS-based assessment of morphological and hydrological parameters of Wainganga River Basin part-1 & part-2, Central India by Nanabhau S. Kudnar. <https://kirtankar.com/wainganga-river-lifeline-of-central-indias-ecology-culture-and-economy/>
- Water Quality Maharashtra 2016 -17
- NRCP program for the Wainganga River
- Study of Flood Variation of Wainganga River

## **Special Feature:-**

### **The Himalayan disasters and climate change – a new reality**

#### **(Part – 2)**

Monsoon ended this year (2025) with 8% surplus rain, with 937.2 mm registered rainfall against 868.6 mm – the normal one and the India Meteorological Department (IMD), declared it as “very successful”.

Throughout the entire four month stretch from June to September, India enjoyed lot of precipitations but events of flash floods, disaster, cloudbursts, mudslides, landslides in Himalayan states caused a dark picture claiming loss of lives, damage to properties, broken road network and communication. This year the northwest India (north India as labelled by IMD) got 747.9 mm rainfall about 27.3 % above normal of 587.6 mm which is highest rainfall in north India considering 2001 and the sixth highest since 1901. As said by the IMD chief, Mrutyunjay Mohapatra, “All districts in northwest India saw above-normal rainfall in June, August, and September”.

Though the rainfall in east and northeast



India faced rain deficit of around 20% yet Central India gained 15.1% increase over normal and southern peninsula 9.9% over normal. So when the surplus rainfall, the main source of water, refills reservoirs and facilitates good crops in agricultural plain land, the excessive rainfall makes the hilly and mountainous regions of north India highly vulnerable to “successful” monsoon. The variation in rainfall pattern and its impact on different topographic region urgently needs to be addressed to chalk out disaster proof action

plan and preparedness keeping in mind the local topography, geology, river morphology, glacial movements, moraine deposition and weather pattern.

### **Heavy Rain and Snowfall in Jammu & Kashmir**

Multiple landslides and accumulation of snowfall due to heavy rains have disrupted transportation across the state of Jammu and Kashmir, forcing the closure of the Jammu–Srinagar and Srinagar–Leh National Highways, as well as the Mughal and Sinthan Top roads.

Zojila Pass received about six inches of snowfall,



*Search and rescue operation in flash flood-hit Chasoti village, in Kishtwar, Jammu and Kashmir by Indian Army, SDRF, police and local administration, August 17, 2025. Photograph: ANI Photo*

while areas like Peer Ki Gali and Sinthan Top saw 3–4 inches. Pilgrimages to Vaishno Devi and Machail Mata remained suspended for three days due to the weather condition. The life has stopped, roads were closed, and Schools across the Jammu division were also closed. Udhampur recorded the heaviest rainfall (100.2 mm). According to the weather department, due to this heavy rainfall, temperatures dropped sharply — in Jammu city with 21.3 degree Celsius, about 11 degree Celsius below normal at this time of the year and 11°C degrees, about 6 degree Celsius below normal for this season. Reports of snowfall were also received from the upper reaches of Doda, Ramban, Kishtwar, Kathua, Rajouri and Poonch districts in the Jammu region.

So the entire region is under the spell of extremely heavy rainfall for which temperature goes below normal which will have great impact on flora, fauna and human lives.

### **High risk of Glacial Lake Outburst at Kishtwar, Jammu and Kashmir**

Kishtwar situated in the Western Himalayas of Jammu and Kashmir has possessed 197 glacial lakes – having the highest number of lakes in the Union Territory and accounts for over one-third of all lakes in the Union Territory. Most of these lakes are small but some gained bigger areas as a result of rising temperature and accelerated rate of

retreat of glaciers triggered by climate change and the vulnerability of Glacial Lake Outburst Flood is increasing.

Mundikar and Hangu have been categorised as high risk and Palta Pani with other unnamed lakes categorised as of moderate risk.

The Glacial Lake Outburst Flood Management Plan for 2024-25 for Kishtwar marked 5 tehsils, namely, Padder, Machail, Dachhan, Marwah, and Warwan which are most vulnerable due to their nearness to the glacial lakes. They warned that the entire region also the Kishtwar High Altitude National Park are in risk zone for sudden flood damaging its habitat and biodiversity loss along with keeping the infrastructures, roads, schools, hospitals and Government buildings in peril.

The Hydroelectric Project areas including Pakal Dul, Kiru, Kwar, and Dangduru are also in the high risk zone as increasing water level or breaches of dam walls would ravage the infrastructure and increase the downstream floods. The possibility of contamination of drinking water sources by flood water would be another hazard which would affect public health.

The **warning** is not a futile one as in August 14 of the current year the Chishoti village in Peddar tehsil, the last stop for vehicles to reach Mata temple was ruined by flash flood triggered by cloudbursts killing 65 people and harmed 115.

So the entire region with its ecology is under flood





threat.

The report chalked out some **mitigation steps** and these are continuous monitoring of glacial lakes, early warning system, strengthening of moraine dams, drainage of excess accumulated water in lakes, vulnerability mapping and preparedness of the disasters by the community. The report also suggested some long term remedies – climate resilient construction, planting trees to stabilise slopes, analysis of glacial dynamics and funding from District Planning and Development Council for Glacial Lake Outburst Flood preparedness.

**Source:**

- i) [infra.economictimes.indiatimes.com/news/roads-highways/heavy-snowfall-and-landslides-disrupt-traffic-on-major-highways-in-jammu-and-kashmir/124360366](https://infra.economictimes.indiatimes.com/news/roads-highways/heavy-snowfall-and-landslides-disrupt-traffic-on-major-highways-in-jammu-and-kashmir/124360366)
- ii) [english.hindusthansamachar.in/Encyc/2025/10/7/Major-Highways-Roads-Closed-Due-To-Heavy-Rain-Sn.php](https://english.hindusthansamachar.in/Encyc/2025/10/7/Major-Highways-Roads-Closed-Due-To-Heavy-Rain-Sn.php)

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