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EXPLAINER

DECODING INDIA'S GROUNDWATER DATA

The 2022 Dynamic Groundwater Resources of India report, which says that the country's annual groundwater recharge and extractable groundwater levels have improved since 2020, has drawn criticism from experts. They believe the assessment isn't accurate. **Sarthak Ray** explains how the data on groundwater is reported.

What are dynamic and static groundwater resources?

GROUNDWATER RESOURCES that can be replenished annually are called dynamic groundwater resources. They are more important from a development planning perspective since annual replenishment of the other source of groundwater—static or in-storage resources—is often not possible. Indeed, any change to such resources indicates long-term impact of groundwater mining.

Extraction from in-storage resources, the Central Ground Water Board says, may only be allowed during exigencies, with planning for "augmentation in succeeding excess rainfall years". The World Bank, some years ago, had predicted 21 Indian cities, including Delhi, Bengaluru, and Chennai, to run out of groundwater.

India extracts
60.08%
its extractable groundwater

HIGHEST USAGE
of groundwater globally

Over-exploited, critical, and saline units
A FIFTH OF THE TOTAL

How do dynamic groundwater sources get replenished?

RAINFALL IS THE MAIN source of recharge. It accounts for over three-fifths of the total annual groundwater recharge. However, there is high spatial and temporal variation. Large swathes of India receive rainfall primarily during the Southwest Monsoon season (June to September). Tamil Nadu, on the other hand, depends on the Northeast Monsoon (October to December). J&K, Himachal Pradesh and Uttarakhand receive significant rainfall throughout the year.

Rock types have a significant effect on recharge. Porous ones, such as alluvial formation in the Ganga-Brahmaputra basin, are good repositories. Groundwater in two-thirds of the country, on the other hand, is limited to weathered, jointed, and fractured portions of the rock.

How is groundwater data calculated?

ASSESSMENT OF dynamic groundwater in India focuses on annual extractable groundwater, extraction, and percentage of use with respect to resources. The assessment units are *talukas*/blocks/*mandals*/*firkas*. Assessment has been done in 1980, 1995, 2004, 2009, 2011, 2013, 2017, 2020, and 2022. Earlier, the Groundwater Estimation Committee 1997 (GEC 97) norms were used. Since 2017, GEC 2015 is used.

Under GEC 2015, if aquifer geometry has not been established for the unconfined aquifer (whose upper water surface rises and falls) in an assessment unit, the static resources have to be assessed in the alluvial areas down to the depth of bedrock or 300 m, whichever is less. For hard rock aquifers, the depth would be limited to 100 m. For confined aquifers, if groundwater extraction is being done, the dynamic, as well as static, resources are to be estimated.

What has the 2022 report found, and why is it being criticised?

THE TOTAL ANNUAL groundwater recharge is estimated at 437.60 billion cubic metres, higher than 2020's 436.15 bcm by 1.45 bcm. Crucially, the annual extraction is reported to have dropped from 244.92 bcm to 239.16 bcm. Of the 7,089 assessment units, 1,006 are classified as over-exploited (annual extraction exceeds recharge), while 260 are 'critical' (extraction at 90-100%). Both categories report improvement from 2020 (1,114 and 270).

The findings have been criticised by water experts. Himanshu Thakkar of South Asia Network on Dams, Rivers and People says, "The findings on recharge and extraction both seem counter-intuitive. What is happening on the ground doesn't seem to reflect what has been reported." He also said that given aquifers—except the alluvial formations—are very localised, the assessment units are too large to reflect the condition accurately. Also, whether the additional recharge is happening in water-logged areas or saline areas—accrual in the latter would mean the recharge can't be used—needs to be seen. "Communities need to be made aware and empowered to collectively conserve groundwater," Thakkar says.

Deccan Chronicle- 24- November-2022

Yamuna pollution up significantly since 2017, claims city govt report

New Delhi, Nov. 23: As the Delhi government has promised to clean the Yamuna to bathing standards by 2025, the pollution load in the river has increased substantially over the last five years, according to a report by the environment department. The report shows that barring Palla, the annual average level of biological oxygen demand (BOD) increased at every location of water sample collection for testing in the national capital.

BOD, an important parameter for assessing water quality, is the amount of oxygen required by aerobic microorganisms to decompose organic material present in a water body. BOD levels less than 3 milligram per litre (mg/l) is considered good.

There was no immediate reaction available from the environment department.

THE REPORT shows that barring Palla, the annual average level of biological oxygen demand increased at every location of water in the national capital.

The Delhi Pollution Control Committee (DPCC) collects river water samples at Palla, where the Yamuna enters Delhi; Wazirabad, ISBT bridge, ITO bridge, Nizamuddin bridge, Agra Canal at Okhla Barrage, Okhla Barrage and Asgarpur.

The DPCC data showed while there has been no major change in the annual average BOD level at Palla over the last five years (from 2017 to 2022), it has increased from around 3 mg/l to around 9 mg/l at Wazirabad.

The BOD level has risen from around 30 mg/l to 50 mg/l at the ISBT bridge and from 22 mg/l to 55 mg/l at the ITO bridge during the period.

Similarly, the BOD level worsened from 23 mg/l to around 60 mg/l at Nizamuddin bridge, from 26 mg/l to 63 mg/l at Agra Canal at Okhla Barrage, from 26 mg/l to 69 mg/l at Okhla Barrage and from around 30 mg/l to 73 mg/l at Asgarpur, the data showed.

The Yamuna river can be considered fit for bathing if BOD is less than 3 milligram per litre and dissolved oxygen (DO) is greater than 5 milligram per litre.

Dissolved oxygen (DO) is the amount of oxygen available to living aquatic organisms. Aquatic life is put under stress if DO levels in the water drop below 5 mg/l. — *PTI*

The Pioneer- 24- November-2022

Delhi Govt promises to clean Yamuna to bathing standards by 2025

Pollution load in the river has increased substantially in past five years

STAFF REPORTER ■
NEW DELHI

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Twenty-two drains carrying domestic wastewater and industrial effluent fall into the Yamuna between Wazirabad and Okhla. Though the 22-km stretch is less than two per cent of the river length, it accounts for about 80 per cent of the pollution in the river. Though a minimum environmental flow is required to clean the river to bathing standards, treating all the domestic wastewater and industrial effluent and further cleaning it using in-situ techniques can help reduce pollutant load significantly, according to eminent environmentalist Manoj Mishra.

In-situ bioremediation techniques involve treatment at the site using aquatic plants or microbial remediation methods. Such systems take less time to become operational, are easy to operate, and require less energy as compared to conventional treatment technologies.

Some common in-situ treatment systems are microbial bioremediation, phytoremediation, constructed wetland system and root zone treatment. Adequate space and appropriate flow are general requirements for adoption.

Millennium Post- 24- November-2022

Report: Significant increase in Yamuna pollution since 2017

OUR CORRESPONDENT

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Untapped wastewater from unauthorised colonies and jhuggi-jhopri clusters, and poor quality of treated wastewater discharged from sewage treatment plants (STPs) and common effluent treatment plants is the main reason behind high levels of pollution in the Yamuna

Hindustan- 24- November-2022

पिंडर नदी के पानी से जी उठेंगी कोसी-गोमती

उत्तराखंड

- नदियों को जोड़ने वाला देश का पहला प्रोजेक्ट बनेगा उत्तराखंड में
- पेयजल को जागरूकता फैलाने को मनेगा ग्राम सभा स्थापना दिवस

देहरादून, मुख्य संवाददाता। नदियों को आपस में जोड़ कर उन्हें पुनर्जीवित किया जाएगा। देश के इस पहले प्रोजेक्ट की नींव उत्तराखंड में पड़ेगी।

पिंडर नदी के पानी से सूखने की कगार पर खड़ी कोसी-गोमती नदी को पुनर्जीवित किया जाएगा। पेयजल को लेकर लोगों में जागरूकता फैलाने को ग्राम सभा स्थापना दिवस मनाए जाएंगे। सशक्त उत्तराखंड @25 चिंतन शिविर में पेयजल सचिव नितेश कुमार झा ने नेचुरल रिसोर्स मैनेजमेन्ट पर अपना प्रस्तुतिकरण दिया। नदियों को आपस में जोड़ने वाले प्रोजेक्ट का भी ब्यौरा सामने रखा। इस प्रोजेक्ट का कांसेप्ट जल निगम के मुख्य अभियंता मुख्यालय सुरेश चंद्र पंत ने खोजा।

इस योजना में ग्लेशियर से निकलने वाली पिंडर जैसी नदी से कोसी, गोमती जैसी सूख रही नदियों को पुनर्जीवित किया जाना है। पिंडर के पानी को चैनल कर कोसी, सरयू, गोमती तक पहुंचाया जाना है।

Rashtriya Sahara- 24- November-2022

जल चुनौतियों के मुद्दे पर भारत व आस्ट्रेलिया एक साथ

नई दिल्ली (एसएनबी)। देश की जल संबधी चुनौतियों का समाधान करने के लिये भारत व आस्ट्रेलिया ने मिलकर सहयोग व अनुसंधान की शुरुआत की है। केन्द्रीय जल शक्ति मंत्रालय, ऑस्ट्रेलियाई जल भागीदारी, पश्चिमी सिडनी विश्वविद्यालय और भारतीय प्रौद्योगिकी संस्थान, गुवाहाटी द्वारा दोनों देशों के बीच जल अनुसंधान, प्रशिक्षण और शिक्षा में सहयोग तेजी से बढ़ रहा है। जल संबधी चुनौतियों का सामना करने के लिये राष्ट्रीय जल विज्ञान परियोजना, जल संसाधन विभाग, आरडी और जीआर, जल शक्ति मंत्रालय ने पश्चिमी सिडनी विश्वविद्यालय और भारतीय प्रौद्योगिकी संस्थान, गुवाहाटी के सहयोग से एक अभिनव युवा जल व्यावसायिक कार्यक्रम शुरू किया है। इस कार्यक्रम का उद्देश्य यंग वाटर प्रोफेशनल्स की क्षमता का निर्माण करना और उन्हें नेतृत्व की भूमिका और जिम्मेदारियों को स्वीकार करके देश के जल क्षेत्र में अपना सर्वश्रेष्ठ देने के लिए आवश्यक ज्ञान, कौशल, दृष्टिकोण और योग्यता प्रदान करना है।