

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन नदी विकास एवं गंगा संरक्षण विभाग
केंद्रीय जल आयोग
जल प्रणाली अभियांत्रिकी निदेशालय



Government of India
Ministry of Jal Shakti
Dept. of Water Resources, RD&GR
Central Water Commission
Water System Engineering Directorate

विषय - समाचार की कटिंग का प्रस्तुतीकरण।

जल संसाधन विकास और संबद्ध विषयों से संबंधित समाचारों की कटिंग को केंद्रीय जल आयोग के अध्यक्ष और सदस्य (कार्य योजना एवं परियोजना / अभिकल्प एवं अनुसंधान / नदी प्रबंध) के अवलोकन के लिए संलग्न किया गया है। इन समाचारों की कटिंग की सॉफ्ट कॉपी केन्द्रीय जल आयोग की वेबसाइट पर भी अपलोड की जाएगी।

अंजलि मिश्रा
23/7/2019
वरिष्ठ कलाकार

जल प्रणाली अभियांत्रिकी निदेशालय

संलग्नक: उपरोक्त

उप निदेशक, (ज. प्र. आ.) निदे०

सिवेल
23/07/2019

निदेशक, (ज. प्र. आ.) निदे०

अ. जल संसाधन
23/7/19

सेवा में,

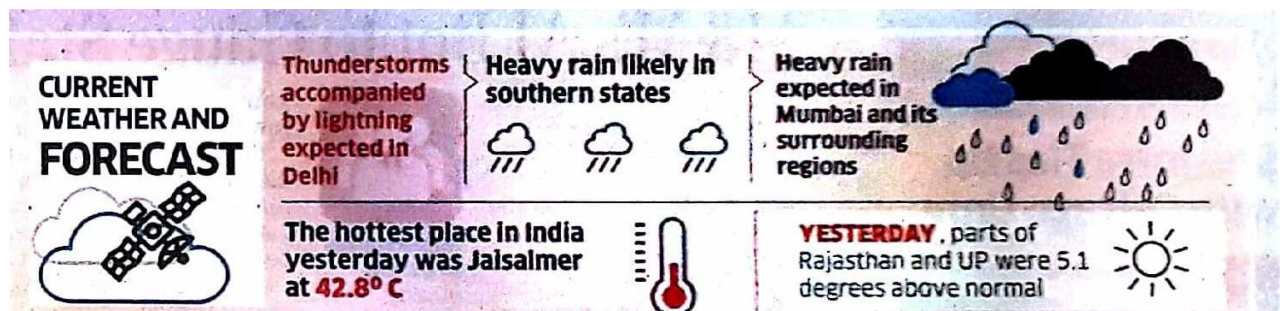
अध्यक्ष, के. ज. आ., नई दिल्ली

सदस्य (कार्य योजना एवं परियोजना/ अभिकल्प एवं अनुसंधान / नदी प्रबंध) और

जानकारी हेतु - सभी संबंधित केन्द्रीय जल आयोग की वेबसाइट www.cwc.gov.in पर देखें।



News item/letter/article/editorial published on 23.07.2019 in The Economic Times, New Delhi and documented at WSE Dte, CWC.



AN UNEVEN MONSOON

Floods in Bihar and Assam have claimed at least 170 lives with 10.7 million people still reeling under the effect of the deluge

OF SHORTAGE, AND ABUNDANCE

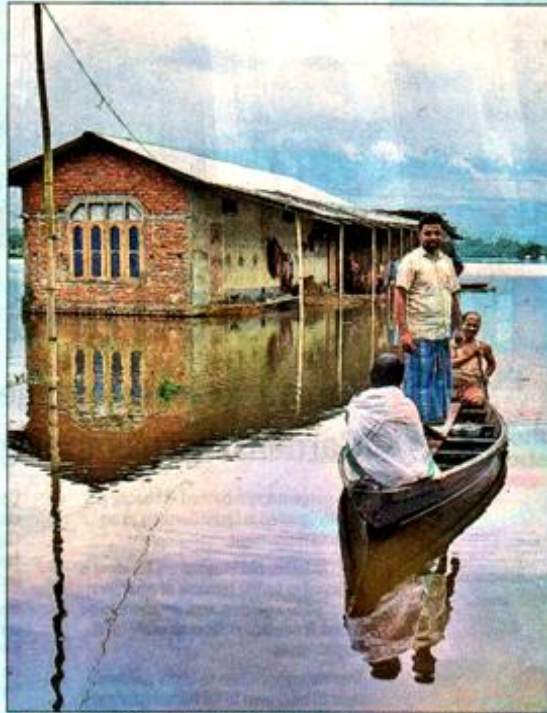
While emergency water supplies were needed in drought-hit Chennai a few weeks ago, in the north and northeastern parts of the country heavy rains through July have killed hundreds of people with many districts in Bihar and Assam cut off because of flooding

RAINS INCOMING

It will be a rainy week pan-India with the "break" monsoon-like condition ending, according to the private weather forecaster Skymet. This spell of rain is likely to continue for another 10 days. "Yes, rainfall is subdued and there will be an increase in the rainfall activity over the next two days," said Mrityunjay Mohapatra, IMD, director general

CUTTING DOWN EXPECTATIONS

IMD said it is set to cut estimates for average monsoon rain after decades of below-normal rain. "If you take an average of 30 to 40 years, compared to say a 100 years of normal rainfall, we are passing through a below-normal rainfall," IMD climate research chief Sivananda Pai said



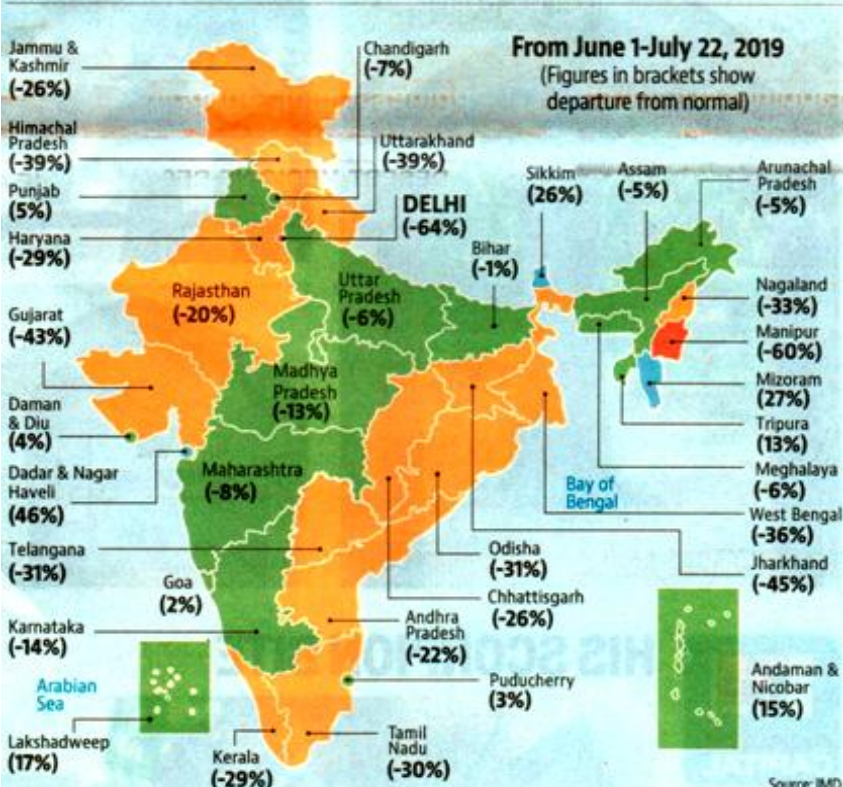
■ A total of 2,283 villages and 1.14 lakh hectare agricultural land is still inundated in the flood-hit districts of Assam, officials said. REUTERS

THE SHORTAGE OF RAINFALL

-19% While the entire country registered an overall deficit of 19% rainfall through the monsoon, Skymet said this is expected to go down to 14% or 15% by the end of July

STATUS CHECK

Large excess	Excess	Normal	Deficient	Large deficient
60% or more	20% to 59%	-19% to 19%	-59% to -20%	-99% to -60%



Water sector success needs people's movement: Minister

NISTULA HEBBAR
PRISCILLA JEBARAJ
NEW DELHI

To ensure that States implement the Centre's ambitious scheme to recharge groundwater and provide piped drinking water to all households by 2024, there must be pressure from both above and below, says Jal Shakti Minister Gajendra Singh Shekhawat.

There must be a people's movement while the Centre will provide funding incentives, with better performing States getting more mo-

ney, he told The Hindu in an exclusive interview on Monday. "Now it's a competition. If you do more work, you will get more funds," he said. Mr. Shekhawat said putting water on the concurrent list in order to bring State governments on board is no solution; success in the water sector needs people's participation.

He also emphasised the role of Central incentives and about taking a district-wise approach.

INTERVIEW ON PAGE 13

Part 1 of 2

INTERVIEW | GAJENDRA SINGH SHEKHAWAT

'Success in water sector development depends on a *jan andolan*'

An integrated approach will change water situation and the subject is being dealt with holistically, says Jal Shakti Minister

NISTULA HEBBAR
PRISCILLA JEBARAJ

People's participation – a jan andolan – and a holistic approach are crucial to ensure the success of the scheme to supply piped water to all, says Jal Shakti Minister Gajendra Singh Shekhawat.

The Jal Shakti Ministry has brought together many departments under your leadership. Are you prioritising one aspect, and is there any concern that some areas may be ignored?

■ This is the first time that the subject of water is being dealt with in a holistic manner, and I believe that no subject which is dealt with holistically ends up ignoring any aspect of it. We would have gained a lot if such a synergy had been attempted earlier. There are five pillars for this: rainwater harvesting; judicious use of water by individuals, agriculture, industry; use of technology for groundwater recharge, sewage treatment and desalination; reuse and recycling of water; and afforestation. If these five principles are followed, you will see change in the country's water situation.

One of your priorities is to

provide piped drinking water by 2024. However, the previous National Rural Drinking Water Programme failed to reach its goals of piped water to half the population by 2018, reaching only 18% of households. What is going to be done differently this time?

■ Today, there is so much more money. We have been given ₹10,000 crore in the budget allocation. But as importantly, we are following an integrated approach on the issue now.

It is not only about piped water supply. Prior to that is source sustainability, which can be attained in India by groundwater recharge only. Second is piped water supply and third is grey water disposal and reuse, either after treatment or for groundwater recharge. So it's a holistic approach. Previous drinking water programmes did not achieve at this pace because

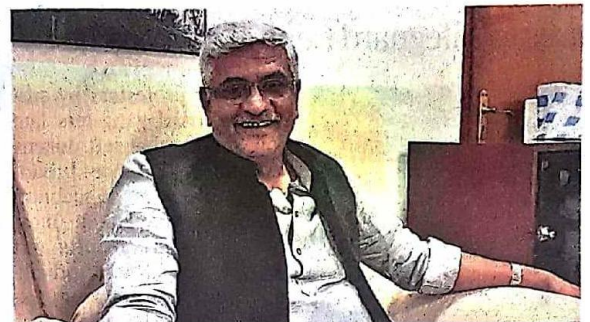
these aspects were not there.

In the previous programme, the CAG had shown that States did not even use the funds given to them.

■ This time, we have said it will be in challenge mode. So whichever State performs better, we will give more incentive to that State. If you do more work, you will get more funds. We are also taking a district-wise approach. Let each District Collector make the plan for his own district. Otherwise, what happens is that the bulk of the money just sits unused with the State.

If anyone wants to do work on these issues, there is no shortage of funding. What is needed is commitment and will to get it done. For that commitment, the *jan andolan* is the way forward. Anywhere in the world, you will find that success in water sector development has only happened because there has been a *jan andolan* in that country, not because of what the government has done.

What kind of policy changes are you looking to make to incentivise a *jan andolan*?




■ NISTULA HEBBAR

■ The biggest incentive is that in your house, you will get water. For every woman, what greater incentive does she need?

You have previously been in the Agriculture Ministry, and have said India has the most inefficient use of water in terms of agriculture, with 89% of our water going to that sector.

■ The lowest productivity of water in the world is in India. To grow one kilogram of rice, we require 5,600 litres of water, whereas the same is done in China with just 350 litres. We have rice in surplus today and if we want to diversify our crops, we have to incentivise it. In this context, I

 I have given a deadline to finish aquifer mapping in 256 water-stressed districts by March

appreciate the work done by [Chief Minister] Manohar Lal Khattarji in Haryana; he went to the basic reason why the farmer was growing paddy, which is that there is government procurement and hence an assured market for the crop. So paddy farmers were asked to switch to maize and told that the government would procure it, and simultaneously give a ₹2,000 per acre subsidy. At one shot, 18,000 hectares of land transferred from paddy cultivation to maize.

In Maharashtra, a similar thing was done by Devendra Fadnis [Chief Minister Devendra Fadnis] in the case of sugar cane, which is the largest water guzzler. He announced that no sugar cane could be grown without precision drip irrigation. They will be saving 75% of their water.

We have scheduled a meeting with the Ministry of Agriculture this week itself, on how best to take it forward nationally.

How will you ensure that State governments will get on board with all this? Are you going to put water on the concurrent list?

■ That is no solution. This will have to be a *Jan Andolan*, a people's mission. The day people's participation gets into the mission, then only it will work.

In my childhood, the entire village used to be concerned about waterbodies, their health and recharge. Now after tap water, the catchments of ponds was impaired, there was encroachment on ponds, and this slowly finished off the catchments, mainly because peo-

ple were not invested as communities.

I have given a deadline to finish aquifer mapping by March in 256 water-stressed districts. If they are given the knowledge, laymen on the ground can do so much. For example, in Latoria village in Rajasthan, 40 years ago, there was not a single drop of water. One man, Laxman Singh, started working on water harvesting and groundwater recharge. Today, Latoria is water-secure, and so are 58 nearby villages. Israelis came and studied our technology to replicate in their place.

There have been a number of steps taken to clean the Ganga... But in terms of impact, when you measure the presence of faecal coliform in the river, its still high.

■ Faecal coliform is just one parameter. If you look at the levels in 2018 in comparison to 2017, you will see there is some improvement. But also, there is a gestation period for capacity building being done by States, and you will start seeing the impact all together. By the end of the

year, we will be able to stop any untreated sewage flowing into the Ganga up to Haridwar and in Jharkhand. In U.P., it will take another year or so.

We have planned till 2035, taking into account the expected increase in population. You ask by what date the Ganga cleaning mission will be done. When you and I are not there any more, the Ganga will still be there. This is not an issue that will finish today.

That is true, but we keep setting deadlines and then extending deadlines...

■ We have planned targets for 2035. Previous experience shows that you make the STP, but nobody in the States has the money to run it. So we took another approach, where the manufacturer has build, operation and maintenance responsibility for 15 years.

So at least till 2035, we do not have to look at that again. Also under the 'One City, One Operator' concept whoever is building a new STP, will have to run the existing STPs for the next 15 years in that city.

For water plan, govt goes for 3D mapping of all villages

Aquifer Maps To Guide Steps For Conservation

Dipak Dash & Vishwa Mohan | TNN

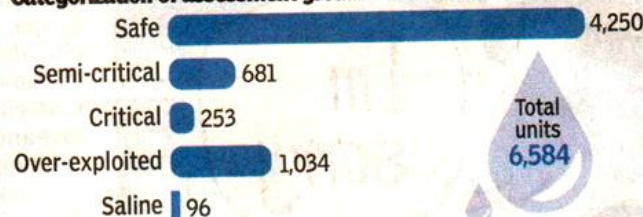
New Delhi: The Centre is carrying out 3D aquifer mapping of every village which will help it take specific water conservation measures at micro level across the country, said Union Jal Shakti minister Gajendra Singh Shekhawat.

"We have identified some agencies and we are carrying out the 3D mapping of all the villages. This will help us identifying the gradient and how the water flows naturally. No one ever thought about it in all these years. We have undertaken this task. This will help us in water conservation and rainwater harvesting," Shekhawat told **TOI** in an interview on Monday.

The deficit so identified will help the government to

QUENCHING THIRST

Categorization of assessment groundwater units (Blocks/ taluks)



carry out its recharge plan where the treated grey water can also be used. Grey water or 'sullage' is defined as all wastewater generated in households, except from toilets. Sources of grey water include, sinks, showers, baths, clothes washing machines or dish washers. Managing the waste water and solid waste have been identified as the major focus area under Swachh Bharat Mission after

achieving 100% toilet coverage in rural areas. He added the focus will be on recycling of the grey water. "Either you use the recycled water for agriculture or for groundwater recharge. Grey water is an asset while everyone thinks it's a liability. Once people find this is an asset, the problem will be over," he said.

The ongoing exercise of 3D aquifer (underground layer of water-bearing rock)

mapping at micro-level will assist the government in estimating quantity and quality of ground water in a particular village or cluster of villages and help in assessment of sustainable level of ground extraction. The mapping is being undertaken by the Central Ground Water Board on the scale of 1:50,000 in 3D. Currently, 1,034 blocks (ground water assessment units) out of 6,584 are over-exploited, which means withdrawal of ground water is more than recharge in those particular units.

Additionally, 934 blocks are in many stages of ground water criticality. Once the government has 3D aquifer map of entire mappable area, it will help in predicting ground water scenario and educating the stakeholders in water use efficiency. The focus to map the natural water flow across villages gains importance considering that an NSSO survey of 2016 had revealed that while 36.7% villages had pakki nali (pucca drain) and 19% villages had katchi nali.

Full report on www.toi.in

Ganga cleaning: NGT junks Bihar govt's plea seeking review of penalty 81-22

PRESS TRUST OF INDIA
NEW DELHI, 22 JULY

The National Green Tribunal has junked a plea to review its order imposing a fine of Rs 25 lakh on the Bihar government for inaction over continued damage to the river Ganga.

The green panel on May 29 had levied the penalty on Bihar, noting that there is practically no progress in cleaning the Ganga as not a single sewage infrastructure project has been completed.

A bench headed by NGT Chairperson Justice Adarsh Kumar Goel said the Bihar government's action plan lacked concrete measures to combat pollution, including punitive and remedial action against pol-

luters. "We have considered the review application and do not find any reason as to why we should interfere with the impugned order as prayed for by the applicant state.

The facts and circumstances set out do not satisfy with requirements contained in the directions referred to in the impugned order as well as the orders preceding those," the bench, also comprising justices SP Wangdi and K Ramakrishnan, said in a recent order.

The case relates to the cleaning of river Ganga, considering its immense environmental relevance to the country as heavy pollution and contamination has rendered the river water unfit for bathing, let alone drinking.

GREEN EFFORTS



» Even a drop of pollution in Ganga is a matter of concern and the attitude of all authorities should be stringent to protect the river, the NGT had earlier said

» The green panel on 29 May had levied the penalty on Bihar, noting that there is practically no progress in cleaning the Ganga

It refused to agree with the Bihar government's submission that the action taken by

the state had not been placed elaborately before the tribunal. "In any case, setting up

of the sewerage network and construction of the sewage treatment plants is only one of the several actions to be taken by the states...

"It was in these circumstances that the tribunal had observed that the response of the state applicant and other states was deficient and lag-gardly, leading to the direction for payment of interim compensation," the bench said, adding that there was "no merit" in the plea filed by the state government.

While imposing the fine on Bihar, Jharkhand and West Bengal, the NGT had also said that discharge of effluents is a criminal offence and directed the Uttar Pradesh government to prohibit any polluting indus-

trial activity instead of partially allowing it. Even a drop of pollution in Ganga is a matter of concern and the attitude of all authorities should be stringent to protect the river, the NGT had earlier said while seeking a concrete action plan on the issue.

It had asked the National Mission for Clean Ganga to take remedial action so that assistance of a suitable person is provided to this tribunal with precise information, failing which the tribunal may consider coercive measures against it.

The tribunal also asked the states concerned to take the matter seriously and assist the bench with precise information either through senior officers or through counsel.

The agony and the urgency of water

BS-23

In May 2014, Cape Town's major dams and reservoirs were at 72 per cent capacity. By May 2017, after three years of drought, levels were down to 21 per cent. By October only five months of water was left in storage. The city declared an impending "Day Zero" when water taps would be turned off and residents would have to go to public water distribution points. The declaration triggered panic — but also action. A series of water efficiency measures ensured that Cape Town's total water demand fell from 600 million litres per day (mld) in mid-2017 to 507 mld by April 2018 (short of the 450 mld target but significant nonetheless). In June 2018, authorities postponed Day Zero indefinitely.

Chennai's experience is not dissimilar to Cape Town's. In 2015, it was hit by a once-in-a-century flood. Thanks to three subsequent years of below-average monsoons, water levels in its four reservoirs kept dropping, down to 1 per cent by May 2018. But authorities reacted late with no concerted effort to reduce water demand. Last year, Shimla had to turn away tourists because water levels were dangerously low, once again a consequence of less rain and falling water levels, leakages in pipelines, and unchecked urban growth.

As one of the fastest urbanising countries in the world, Indian cities would continue to lurch from one water crisis to another if we only woke up during emergencies. Responses that merely deal with the symptoms of acute water crises cannot fix chronic water mismanagement.

Constant campaign: India's cities need a constant campaign to explain — and change — the use, misuse and reuse of the critical resource. The right to water is a right to a minimum amount of water for basic human needs. It is not a right to profligate or inefficient use of water.

We face two kinds of communication challenges. One, how not to create a sense of overconfidence that

solutions will emerge automatically. Reliance on water tankers, water trains or water desalination plants is myopic and inadequate unless consumption behaviour changes. The other challenge is how to not create a sense of despair when talking about too much or too little water.

Both communication problems persist because we have failed to empower individuals and communities. This is what Cape Town did. The "Zero Day" announcement jolted people out of their apathy and nudged a series of household-level actions: Using buckets in showers to reuse the extra water, recycling washing machine water, or flushing toilets once a day. Poorer residents in shantytowns had been used to such practices for years. It was the sight of rich residents queuing up for water that conveyed that something was seriously wrong — and had to change.

Measure, recharge, then build:

Each urban area and its associated watershed have a carrying capacity. Metropolitan Chennai with 8.6 million people has a daily demand of 1,200 mld in normal times. Cape Town, at half the population, managed far lower total demand after its water crisis. It is imperative that

we measure water availability and water consumption. Only then would water recharge measures (harvesting rainwater, rehabilitating lakes or desilting canals) prove effective.

More importantly, measurement should happen at a micro level (homes, offices, industries and farms). Building permits in cities should not be issued unless developers have demonstrated that they have installed systems to recharge more water than what is expected to be withdrawn. The same applies for flood management plans before new developments are sanctioned, as was done in California's Central Valley.

Bureau of Water Efficiency (BWE): For existing users, 20 per cent increase in water use efficiency must be mandated for all sectors. Water conservation will

not work only by force of moral suasion or regulatory diktat. A Bureau of Water Efficiency should be tasked with designing and implementing mechanisms for year-on-year improvements in water efficiency by creating positive incentives.

Incentives linked to price are easier but not always politically palatable. Other mechanisms are possible: Water efficiency labels for appliances; bulk purchase of water-saving devices to lower costs; or a water credit trading system among industries. Agriculture (which consumes more than 80 per cent water in India) cannot be exempted. Water savings could be linked to farm output and farmers' incomes. The proposed BWE could adopt standards and labelling of drip irrigation systems and support end-user financing to promote efficient farm equipment.

Circular economy of water: More than 20 years ago, Singapore began R&D on reclaiming treated sewage water to potable standards. NEWater, the brand name given to reclaimed water, can now supply up to 40 per cent of Singapore's water demand, compared to 25 per cent from desalination plants.

Eventually, an economic case for water conservation is needed. Most of the urban sewage in India goes untreated. If all sewage were treated, water could be reused to cool down power plants (the biggest guzzlers after farms) and minerals recovered could be used as fertiliser. A circular economy of water allows for each drop to be used many times over and reduces the tariffs necessary to make sewage treatment plants economically viable. What initially was just a cost can become a resource to generate revenue.

Risk and vulnerability are not the same. Insufficient rains, climate-related stresses, bad urban planning have increased water risks for our bustling cities. But episodic water crises will only trigger action when citizens (poor and rich) find their vulnerabilities exposed. From Cape Town to Chennai, the lesson is clear: When we endure the agony personally, we are also likely to register the urgency. Then, we might just wake up.

The writer is CEO, Council on Energy, Environment and Water (<http://ceew.in>). Follow @GhoshArunabha@CEEWIndia



INFLEXION POINTS

ARUNABHA GHOSH

1,500 people in relief camps in Kerala

Storage in reservoirs goes up; fishermen warned about rough sea conditions

SPECIAL CORRESPONDENT
THIRUVANANTHAPURAM

More than 1,500 people have been relocated to relief camps across Kerala by Monday, even as the IMD predicted a gradual reduction in rainfall intensity in most districts by Tuesday. The northern districts, however, are likely to receive heavy rain for one or two days more.

In all, 379 families (1,519 people) have been relocated to 26 camps, the government said. In Thiruvananthapuram, where coastal erosion has been severe, 680 people have been shifted to four camps opened in three schools and a Fisheries Department godown.

Nine camps have been opened in Kottayam where 208 people have been relocated. In Pathanamthitta, 201 persons have been shifted to two camps, and in Alappuzha, 288 people have



Depth of devotion: A devotee trying to enter the Sreekanteswaram Temple in Kozhikode on Monday after heavy rain. ■ S. RAMESH KURUP

been moved to three camps.

The IMD has issued red alerts (extremely heavy rainfall) for Kannur and Kasargod and orange alerts (heavy to very heavy rainfall) or Ma-

lappuram, Kozhikode and Wayanad for Tuesday.

Fishermen have been cautioned against rough sea conditions.

The storage in hydel reser-

voirs has risen courtesy the heavy spells over the past several days. As on Sunday, storage in hydel dams stood at 18%, with enough water to generate 740.6 million units.

Crops over 21K acres hit, govt steps up relief ops

GHAGGAR FURY Even after five days, only 75 per cent of 100-ft breach plugged

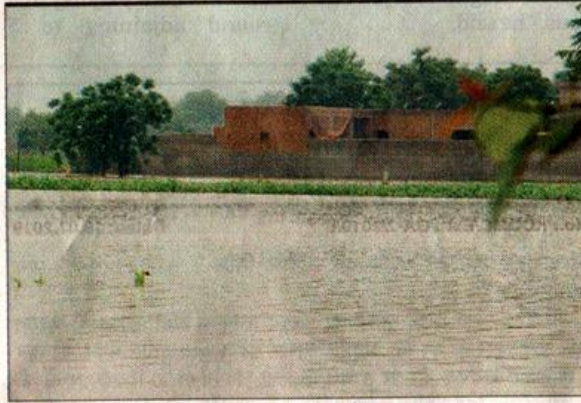
TRIBUNE NEWS SERVICE

SANGRUR, JULY 22

Days after a breach in the Ghaggar flooded many villages in the district, the authorities could only manage to plug three-fourths of the 100 ft breach.

As per the latest report, the overflowing Ghaggar has affected standing crop on 21,775 acres. Of this, crop on 15,569 acres was affected due to the breach in the river in the last five days.

Deputy Commissioner Ghanshyam Thori said, "The lack of required passage till the breach has delayed the operation. The water level in



Flooded areas near Moonak due to overflowing of the Ghaggar.

CM to conduct aerial survey

Chandigarh: CM Capt Amarinder Singh will on Tuesday conduct an aerial survey of the flood-affected areas of Sangrur and Patiala districts. The CM will fly over the affected areas to assess the extent of damage caused to the standing crops in villages of Moonak tehsil in Sangrur and Badshahpur in Patiala tehsil of Patiala. TNS



Bhundar Bhaini, 567 Surjan Bhaini, 1,883 Salegarh and 1,622 Phullad village. Apart from Ghaggar, rain has also affected 6206 acres of standing crops in Lehragaga, Andana, Sunam, Dhuri and Sangrur blocks.

Senior officials of the Agriculture Department said after remaining waterlogged for five days, the chances of survival of various crops were dim as even after plugging of the breach, the Drainage Department would not be able to dewater the fields immediately. SGPC chief Gobind Singh Longowal, said, "We have offered land in Dhamtan Sahib and Nankiana Sahib to be used to grow paddy saplings for the affected farmers."

the Ghaggar has come down to 745.01 today, while we have plugged around 75-ft breach

with only about 25 ft gap is left to be filled."

The flooding has affected

crops such as paddy, vegetables, cotton, maize and fodder over 7,392 acres in Moonak, 920

Water scarcity and poverty

ST-23

ISMAIL ALI

When I was visiting a museum in Athens last year, one of my Greek friends was explaining to me about an ancient water supply canal that went through underneath the museum. It was amazing to see that the authorities in Athens realised the importance of providing clean water for its newly urbanised citizens, even thousands of years ago.

Sadly, in the 21st century, 1,400 children under five die every day from diseases (such as diarrhea) linked to lack of safe water and inadequate sanitation according to Unicef, at a time when the world is richer, technology is better, and knowledge is ever-expanding. It appears that the governments, especially in South Asia and Africa, either do not understand the deep correlation between water and human wellbeing or simply do not care about those who are primarily affected - the voiceless poor.

The close connection between water scarcity and poverty is made clear in both the United Nations' Human Development Report 2006 and the Millennium Declaration 2000. It is essential for human survival but currently over two billion people live in countries experiencing high water stress, and about four billion people experience severe water scarcity during at least one month of the year (UN 2019).

Although the UN Water Development Report 2019 recognises safe drinking water and sanitation as basic human rights, as they are indispensable to sustaining healthy livelihoods and are fundamental in maintaining the dignity of all human beings, across South Asia and sub-Saharan Africa water scarcity is forcing young girls to drop out of school in large numbers. Traditionally, in these societies, it is women's responsibility to walk miles just to fetch clean water for their families. Meanwhile, inadequate and unequal access to water is both a result and a cause of poverty. The economic development that so many people need to climb out of poverty remains stagnant without the availability of water. With rapid population growth and increased industrial demand, water withdrawals have tripled over the last 50 years and are likely to continue, making billions vulnerable to food security and economic activities.

Water scarcity hits the poorest the hardest. They pay a poverty premium, directly and indirectly, to meet their water needs. A wealthy Warden Road (Mumbai) or Gulshan (Dhaka) resident has guaranteed availability of freshwater while the poor living in the nearest



slum of Dharavi in Mumbai or Korail in Dhaka not only struggle to find appropriate source of quality water but also pay more compared to the well-off. Eminent business thinker CK Prahalad, an expert in the field, exclusively illustrates this in his book *The Fortune at the Bottom of the Pyramid*.

According to the UN Multidimensional Poverty Index (MPI) 2019, Bangladesh has made significant strides in poverty reduction and all developing countries are urged to follow in Bangladesh's footsteps. In a brilliantly edited book *Poverty and Water*, Haakon Lein writes about Bangladesh in the chapter titled "Water, agricultural development and rural poverty in Bangladesh." He finds that during the 1990s, Bangladesh achieved substantial economic growth and made significant progress in poverty reduction. There may be many explanations and one of them is related to agriculture.

Lein argues, along with other issues in agriculture, the single most important factor has been water, or, more precisely, the fact that Bangladeshi farmers have been relatively successful in gaining control over water resources found in this delta. Agricultural growth has been driven by the expansion of dry season irrigation based on privately owned tube wells and pumps, combined with the spread of new high-yielding rice varieties, he goes on to say.

However, 24.2 million Bangladeshis are still undernourished, meaning one in six don't get enough to eat, and the benefits of economic growth have been distributed unevenly across the country.

When I was visiting my hometown

in Sunamganj last year, some farmers told me their accounts of how water is making their families poorer. For example, they cannot irrigate their croplands during the dry season for lack of water and due to floods during the monsoon, as heavy rains wash away their crops. At my request, some local government officials investigated the area, and explained to us the complexities, including government discouragement for private solutions that Lein had pointed out.

Water scarcity may endanger democracy and the state of human rights in India, according to the recently published UN Human Rights Report. It observes, 400 million people in India will have no clean drinking water by 2030. There will be mass migration to the already overpopulated and under-resourced cities; more people will compete for fewer resources; and food prices will go up. In the face of desperation, rule of law might not survive, which will have global implications, the report added, giving India's government five years to act.

For water-stressed countries, it is not necessarily about physical lack of water available for human use. Africa faces huge problems in securing sufficient clean water for all, but physically, the continent has more water available per capita than Europe. Even Cherrapunji in India, the wettest place on earth, suffers from recurrent water shortages. And bad policies are one of the main contributing factors.

Apart from water-poverty correlations, water will acquire the same strategic significance in the 21st century as oil did in the past century and will therefore play a crucial role in future geopolitical relations. The prospect of "water wars" is increasingly becoming likely: the number of water-related conflicts reported worldwide has risen sharply in the past 15 years, according to the Pacific Institute, a water research group.

Every country surrounded by mighty rivers such as the Nile, Mekong, Jordan Valley or Brahmaputra—vital sources of water for billions of people—are at risk of conflict. In his book *Water: Asia's New Battleground*, Brahma Chellaney argues, "Water scarcity is Asia's defining crisis of the 21st century." Water has emerged as a critical issue that will determine whether Asia is headed towards greater cooperation or greater competition as it has the world's largest number of people without basic or adequate access to water with the lowest per-capita availability of all the continents.

वर्षा जल बचाकर और सीवेज के पानी को दोबारा उपयोग लायक बनाकर जरूरत पूरी जल प्रबंधन और दो शहरों की कहानी

चंद्र भूषण



उप महानिदेशक,
सेंटर फॉर साइंस एंड
इनवायरनमेंट

आत्मनिर्भरता की मिसाल पेश करते दो शहर

विंडहोक

सीवेज से पेयजल तैयार करते
हुए बीती आधी सदी



नामीबिया की राजधानी विंडहोक में अगस्त, 2018 के दौरान मैंने पहली बार डायरेक्ट पोटेबल रीयूज (डीपीआर) का नाम सुना। मतलब है घरेलू सीवेज को पेयजल में तब्दील

करना। घरेलू अपशिष्ट (सीवेज) को साफ कर दोबारा पीने लायक बनाते हुए इस शहर को आधी सदी बीत चुकी है। विंडहोक की खासियत यह भी है कि औद्योगिक और अन्य जहरीले अपशिष्ट जल को घरेलू अपशिष्ट जलधारा से अलग रखा जाता है। घरेलू अपशिष्ट जल को पूर्वशोधन के बाद दस चरणों जमावट, फ्लोकुलेशन (रासायनिक अभिक्रिया), ग्रेविटी फिल्ट्रेशन (ठोस कणों को छानना), सक्रिय कार्बन कणों को छानना, अल्ट्रा-फिल्ट्रेशन, ओजोनीकरण से गुजारा जाता है।

सख्त मानक के अनुरूप

शहर की आबादी तीन लाख। जल आपूर्ति सीमित। सालाना वर्षा 300-400 मिलीमीटर। 1968 में पहली बार रीसाइक्लिंग प्लांट। पुराना प्लांट बंद हो चुका, 2002 में रीक्लेमेशन प्लांट ने जगह ली। नए प्लांट में हर दिन 21 हजार घन मीटर पेयजल तैयार। इस मरु शहर में प्रतिदिन प्रतिव्यक्ति करीब 60 लीटर पानी पहुंचाया जाता है। बुनियादी जरूरत पूरा करने के लिए पर्याप्त। इसके बाद जाकर कहीं पेयजल स्विटजरलैंड की पानी गुणवत्ता मानकों के अनुरूप बनता है। यह दुनिया का सबसे जटिल और सख्त पेयजल मानक है। 1968 से रीसाइकल किए गए पानी से सेहत पर दुष्प्रभाव का एक भी मामला सामने नहीं आया।

सिंगापुर

R 23/1

हर बूंद की गिनती से पूरी हो
पाती है सबकी जरूरत



सिंगापुर भी एक जलसंकट वाला शहर है। यह मलेशिया से पानी आयात करता है। शहर के लिए पानी का एकमात्र स्रोत वर्षाजल है। अब भी यह

पारंपरिक तरीकों और आधुनिक तकनीक के सामंजस्य से अपने नागरिकों को 140 लीटर स्वच्छ जल प्रतिदिन आपूर्ति करता है। 'गार्डेंस बाई द बे' सिंगापुर का मशहूर पर्यटक स्थल है। इसमें तीन वाटरफ्रंट वाले बगीचे हैं। लेकिन ज्यादातर लोग यह नहीं जानते हैं कि जिस जलाशय पर ये बगीचे मौजूद हैं, वह सिंगापुर का सबसे बड़ा वर्षाजल संचय का मारियाना जलाशय है। यहां पानी की घरेलू मांग के अलावा औद्योगिक मांग बहुत ज्यादा है।

बना ग्लोबल हाइड्रो-हब

वर्षाजल संचयन, सीवेज की रीसाइक्लिंग, आयातित पानी और डीसलाइनेशन प्लांट की संयुक्त व्यवस्था सिंगापुर को आज वाटर सरप्लस वाला शहर बना चुकी है। आज सिंगापुर खुद को ग्लोबल हाइड्रो-हब कहकर बुलाता है। शहर के पास 180 जल कंपनियां, 20 जल शोध संस्थान हैं जो जल क्षेत्र में अत्याधुनिक तकनीक विकसित कर रहे हैं। वर्षाजल संचय करने के मामले में सिंगापुर दुनिया में शीर्ष पर है। यहां सालाना 2400 मिलीमीटर वर्षा होती है। लेकिन इसके पास जमीन का एक छोटा-सा हिस्सा ही वर्षाजल संचय के लिए मौजूद है। आज दो-तिहाई सिंगापुर में जलसंग्रहण क्षेत्र बनाए गए हैं।

चेन्नई जब भयंकर जलसंकट से जूझ रहा था और वहां लोग एक बाल्टी पानी के लिए आपस में लड़ रहे थे, तब एक-दूसरे से 10 हजार किलोमीटर का फासला रखने वाले और पानी की अत्यंत कमी झेलने वाले दो शहर शांतिपूर्वक अपने नागरिकों को पानी की आपूर्ति कर रहे थे। मैंने इन दोनों शहरों की यात्रा की है और देखा है कि किस तरह पारंपरिक कोशिशों और अत्याधुनिक तकनीक का गठजोड़ कर सर्वाधिक जलसंकट वाले इलाकों में भी समस्या का निदान किया गया। सवाल उठता है कि उच्च प्रौद्योगिकी संपन्न भारत के शहर ऐसे उदाहरण प्रस्तुत क्यों नहीं कर सकते। तथ्य यह है कि बेंगलूरु को झीलों, तालाबों और टैंक में वर्षाजल संचय के बाद बनाया गया था, लेकिन ज्यादातर झीलें और तालाब या तो खत्म हो चुके हैं या फिर प्रदूषित हो चुके हैं, जिन्हें पुनर्जीवित किया जा सकता है।

चेन्नई या बेंगलूरु क्यों नहीं?

विंडहोक यह है कि ऐसे उदाहरणों का अनुसरण करने की बजाय बेंगलूरु 5500 करोड़ रुपए की कावेरी जल आपूर्ति परियोजना, चरण-पांच के जरिए अतिरिक्त 77.5 करोड़ लीटर

प्रतिदिन हासिल करना तय कर चुका है। क्या हजारों किलोमीटर से पानी लाना टिकाऊ और सस्ता है, या फिर वर्षाजल संचयन और अपशिष्ट जल की रीसाइक्लिंग बेहतर उपाय सिद्ध

हो सकते हैं। भारत में महंगी जलापूर्ति योजना पर कठिन सवाल पूछे जाने चाहिए, क्योंकि ज्यादातर भारतीय शहरों में विंडहोक से ज्यादा पानी है और सिंगापुर से ज्यादा कैचमेंट क्षेत्र।

सांच की आंच पर पड़ेगा क्या... शर्म का पानी?

अंशु पाठक

anshupathak1411@gmail.com



मैं कुछ समय पहले परिवार सहित यूरोप भ्रमण पर गई थी। अपने कुछ सुखद अनुभव आपसे साझा कर रही हूँ। जो देखा, जाना, समझा वो उल्लेखनीय है कि एक डैन्यूब नाम की नदी मध्य यूरोप में बहती है। जर्मनी के पहाड़ों में स्थित दोनाउएशिंगन कस्बे के पास शुरू होती और फिर दक्षिण-पूर्व को बहती है। अपनी 2,872 किमी. की लम्बाई में यह पांच मध्य और पूर्वी यूरोपीय देशों की राजधानियों से गुजरती है और फिर यूक्रेन और रोमानिया में एक डेल्टा बनाकर समुद्र में मिल जाती है। डैन्यूब दस देशों से गुजरती है। जर्मनी, ऑस्ट्रिया, स्लोवाकिया, हंगरी, क्रोएशिया, सर्बिया, बुल्गारिया, मोल्डोवा, यूक्रेन और रोमानिया। डैन्यूब यूरोप की दूसरी सबसे लम्बी नदी है जिसके किनारे अनेक प्रसिद्ध नगर बसे हुए हैं, जिनमें हंगरी देश की राजधानी बुडापेस्ट, सुप्रसिद्ध नगर वियना, जो एक समय रोमन राज्य की राजधानी था, चेकोस्लोवाकिया का मुख्य नगर ब्रेग्रेड, बलगेरिया एवं रूमेनिया के क्रमशः निकापोलिस तथा गालाटस उल्लेखनीय हैं।

आश्चर्यजनक ये बात थी कि विपना हो हंगरी या चेकोस्लोवाकिया, छोटे-छोटे देशों से गुजरती एक ही डैन्यूब नदी हर जगह खूबसूरत दिखती है, साफ़ स्वच्छ दर्पण सी चमकती, लहराती, बलखाती, इठलाती चलती जाती है और किनारे-किनारे की सड़क पर दौड़ते हैं वाहन, भागती हैं रेल, साईकिल चलाते, मस्ती करते हैं युवा, हाथ में हाथ डाले जीवन संध्या को मुड़ कर देखते हैं वृद्ध और खेलते, खिलाखिलाते हैं बच्चे। और अब ठीक इसके विपरीत हमारी मोक्षदायनी पतितपावनी मां गंगा में जिसे भगीरथ अपने पूर्वजों का उद्धार करने स्वर्ग से उतार कर लाए और साक्षात् भगवान शिव ने अपनी जटाओं में धारण किया, वहीं पवित्र गंगा गौमुख से निकल ऋषिकेश के बाद जो हरिद्वार से मैदानी इलाकों में पहुंचती है तो अपनी दुर्दशा

पर खुद ही बिलख कर जोर-जोर से पड़ती है। स्वयं विचार कीजिए- उत्तर प्रदेश का गढ़मुक्तेश्वर हो या फर्रुखाबाद, कन्नौज, कानपुर हो या फिर तीर्थराज प्रयाग या बिहार के पटना या भागलपुर या पश्चिम बंगाल का मिर्जापुर, किस शहर में मां गंगा को वो आदर, वो सम्मान, वो गौरव मिलता है जो मिलना चाहिए। सुबह शाम की पूजा-अर्चना, आरती, शंख, घड़ियाल, हजारों श्रद्धालुओं की भीड़, दीपदान, तरह-तरह के आयोजन फिर चाहे श्राद्ध कर्म हो या मुंडन संस्कार, हर घाट, हर किनारे पर मिलती है गन्दगी, बदबू, साथ-साथ नहाते गरीब बच्चे और गाय, भैंस, उलटी सीधी पूजा करा आप से रुपए झटकने को पंडे और जगह-जगह बहती अधजली लाशें और मृत जानवरों के अधगले शव।

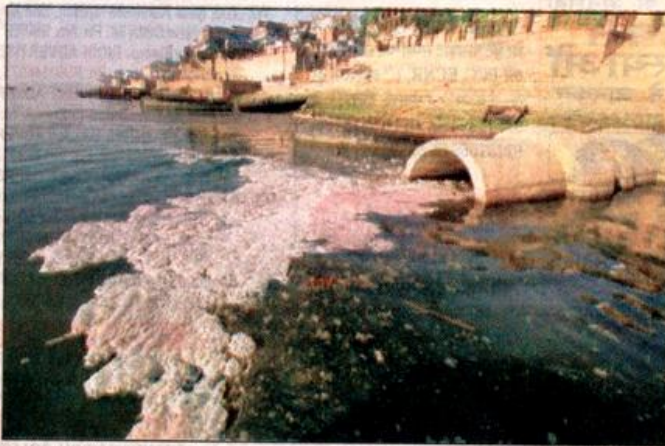
प्रश्न जो मूल में है वो ये है कि हमारी नदियों के किनारे यूरोप जैसे पिक्चर परफेक्ट दृश्य क्यों नहीं दिखते या क्यों वैसे नहीं दिख सकते? क्यों हम ये विचार नहीं करते कि पूजने योग्य पवित्र जल धारा की ऐसी उपेक्षा क्यों? आखिर क्यों हमारे घाट यूरोप के किनारों जैसे साफ़-सुथरे नहीं रह पाते? क्यों वहां की तरह हमारे यहां के लोग संवेदनशील नहीं? पश्चिम में वे लोग तो नदी की पूजा तक नहीं करते, बस उसे साफ़ रखना अपना कर्तव्य मानते हैं। विचार कीजिए कि गंगा एक्शन प्लान भले ही वर्ष 85 में आरम्भ हुआ हो, आज 35 वर्ष बीतने को आए और नमामी गंगा परियोजना के तहत भी करोड़ों रुपए बहाए जा चुके हैं किन्तु गंगा मां हैं कि ढीठ और जिद्दी बच्चे सा व्यवहार करने की ठाने बैठी हैं कि स्वच्छ साफ़ होना ही नहीं चाहती। क्यों? आखिर कारण क्या है? कहीं ऐसा तो नहीं कि गंगा को साफ़ करना तो बहाना है असली मकसद लाखों करोड़ों रुपए का अनुदान पाना है। ऊपर से नीचे तक नेता हो या अफसर सबका नारा एक राम राम जपना सरकारी माल अपना और जनता की गाड़ी पसीने की कमाई से छीना जबरन टैक्स बह कर पहुंचे सीधा उनकी जेब में, आखिर एक

हमामें सभी तो नंगे हैं। नमामी गंगा की जलधारा का रुपया पैसा जरा कालिख लिए हैं तो क्या हुआ, कोयले की दलाली में हाथ तो काले होंगे ही ना। स्वयं विचार कीजिए कि गंगा एक बार यदि साफ़ हो जाए तो फिर बार-बार की बहती भ्रष्टाचार की गंगा में डुबकी कैसे लगेगी? अतिरिक्त आय का स्रोत ही बन्द हो न जाएगा। यदि गंगा के किनारे भी यूरोप की डैन्यूब नदी जैसे विकसित हो जायें तो भविष्य में आने वाली पीढ़ियों में मां गंगा की साफ़ सफ़ाई के प्रति स्वयंमेव पूर्णतः जागरूक रहेंगी। फिर क्यों और कैसी सफ़ाई परियोजना की आवश्यकता रहेगी भला?

यूरोप भले डैन्यूब की पूजा नहीं करता पर उसके किनारे पर बसा हर

आलोकित हुआ। हमने नदियों को मां कहकर पूजा है। पाषाण या प्रस्तर युग का जन्म और विकास यहां होने के कितने ही साक्ष्य मिले हैं। इसी घाटी में रामायण और महाभारत कालीन युग का उद्भव और विलय हुआ और आज उसी गौरवशाली संस्कृति की ये दयनीय दशा, स्वयं विचार कीजिए।

आज ऋषिकेश से कलकत्ता तक गंगा के किनारे परमाणु बिजलीघर से लेकर रासायनिक खाद तक के कारखाने लगे हैं। कानपुर का जामक इलाका अपने चमड़ा उद्योग के लिए मशहूर है और यहां तक आते-आते गंगा का पानी इतना गंदा हो जाता है कि उसमें डुबकी लगाना तो दूर, वहां खड़े होकर सांस तक नहीं ली जा सकती। सत्य यही है कि गंगा मैया उत्तर



छोटा देश भी उसे साफ़ जरूर रखता है, ये नहीं कि हमारे देश से हो कर गुजरेगी नदी तो हम उसका ऐसा सत्यानाश करेंगे की अगले आगे के देश को ना पीने को साफ़ पानी मिले, ना नहाने को, ना ही चूल्हू भर डूबने को। कम से कम हम भारतवासी तो ये ही सोच रखते हैं, भले ही लाख वसुदेव कुटुम्बकम् का राग अलापते रहें। आज का सत्य भले कड़वा है किन्तु एक सत्य ये भी है कि गंगा की इसी घाटी में एक ऐसी सभ्यता का उद्भव और विकास हुआ जिसका प्राचीन इतिहास अत्यन्त गौरवमयी व वैभवशाली रहा है। जहां ज्ञान, धर्म, अध्यात्म व सभ्यता-संस्कृति की ऐसी किरण प्रस्फुटित हुई जिससे न केवल भारतवर्ष, बल्कि समस्त संसार

भारत के लगभग सभी प्रमुख शहरों के उद्योग और करोड़ों लोगों की श्रद्धा की आधार हैं और यही उसके लिए सबसे बड़ा अभिशाप साबित हो रहे हैं भारतीय जनमानस की भावनात्मक आस्था का आधार गंगा के तट पर घने बसे औद्योगिक नगरों के नालों की गंदगी सीधे गंगा नदी में मिलने से प्रदूषण पिछले कई सालों से भारत सरकार और जनता की चिन्ता का विषय बना हुआ है और बना रहना चाहता भी है। औद्योगिक कचरे के साथ-साथ प्लास्टिक कचरे की बहुतायत ने गंगा जल को बेहद प्रदूषित किया है। वैज्ञानिक जांच के अनुसार गंगा का बायोलॉजिकल ऑक्सीजन स्तर 3 डिग्री (सामान्य) से बढ़कर 6 डिग्री हो चुका है। गंगा में 2 करोड़ 90 लाख

लीटर प्रदूषित कचरा प्रतिदिन गिर रहा है। विश्व बैंक रिपोर्ट के अनुसार उत्तर-प्रदेश की 12 प्रतिशत बीमारियों की वजह प्रदूषित गंगा जल है। यह चिन्तनीय है कि गंगाजल न स्नान के योग्य रहा, न पीने के योग्य रहा और न ही सिंचाई के योग्य और गंगा के पराभव का अर्थ होगा हमारी समूची सभ्यता का अन्त। सब जानते समझते भी शत्रुर्ग की भांति हम हर गलत को बस होने देते हैं। जो कुर्सी पर अधिकारी हैं वे भी आंखें बंद रखते हैं, नेता भी क्योंकि इसमें उनका फ़ायदा है और जनता जाए भाड़ में।

एक कड़वा सच ये भी है कि सरकारी आंकड़ों के अनुसार 16889 इलाकों में 147 करोड़ लोग आरसेनिक की अधिकता वाला पानी पीते हैं। हर वर्ष सावन के आते ही प्रशासन की पोल पट्टी खुल जाती है, शहरों में सड़कों पर जल भराव की समस्या हर वर्ष ज्यों की त्यों रहती है और गांवों में नदी-नाले उफान पर। भारत विश्व का दूसरा बाढ़ प्रभावित देश है। हम सभी जानते हैं कि बाढ़ एक ऐसी स्थिति है जिसमें कोई निश्चित भूक्षेत्र अस्थायी रूप से जलमग्न हो जाता है और जन-जीवन प्रभावित हो जाता है फिर भी साल दर साल सारा देश सूखे से भी जूझता है और बाढ़ से भी। पुरानी कहावत है कि आरी में लकड़ी का दस्ता ना होता तो लकड़ी के कटने का रास्ता ना होता। आप स्वयं सोचिए कहीं ये एक ऐसा सोचा समझा षड्यन्त्र तो नहीं कि प्रति वर्ष बाढ़ अवश्य आएगी ही और तभी तो प्रति वर्ष लाखों करोड़ों का अनुदान जो बाढ़ प्रभावित क्षेत्रों को सहायतार्थ दिया जाता है वो मोटी राशि नेताओं व अफसरों को उदरस्थ करने व डकारने का अवसर मिलेगा।

जनता का क्या है, कच्चे मकान फिर बना लेगी। जरा गौर से सोचिए! आखिर राज्य जब बाढ़ ग्रस्त होगा तभी तो केन्द्र से करोड़ों की सहायता मिलेगी। यदि एक बार मर्ज का पक्का इलाज कर दिया जाए तो हर साल लाखों करोड़ों की धनराशि की मलाई कैसे उड़ाई जा सकेगी? तो ये है सांच यानि सत्य की आंच यानि अलख। अब देखना ये है कि इस विषय पर नेता, शासन-प्रशासन की आंखों का पानी मरता है या शर्म का पानी पड़ता है। स्वयं विचार कीजिए।