BYJU'S

Gist of YOJANA

VOL.01 | April 2021

Jal Jeevan Mission - Har Ghar Jal

Taking Water to Every Home and Soul

Water Security

Water Future in a Climate-risked World: The Indian Experience

Ushering a **Social Revolution**

Water Governance

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Y Megha Swaroop

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CSE 2018 Results

11 Ranks in Top 50 | **28 Ranks in Top 100** | **183 Ranks in the Final List**


Rank 11
Pujya Priyadarshni


Rank 16
Dhodmise Trupti Ankush


Rank 21
Rahul Jain


Rank 24
Anuraj Jain

CSE 2017

5 Ranks in top 50 | **34 Ranks** in top 100 | **236 Ranks** in the final list


Rank 3
Sachin Gupta


Rank 6
Koya Sree Harsha


Rank 8
Anubhav Singh


Rank 9
Soumya Sharma


Rank 10
Abhishek Surana

CSE 2016

8 Ranks in top 50 | **18 Ranks** in top 100 | **215 Ranks** in the final list


Rank 2
Anmol Sher Singh Bedi


Rank 5
Abhilash Mishra


Rank 12
Tejaswi Rana


Rank 30
Prabhash Kumar


Rank 32
Avdhesh Meena

CSE 2015

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Rank 24
Khumanthem Diana Devi


Rank 25
Chandra Mohan Garg


Rank 27
Pulkit Garg


Rank 47
Anshul Agarwal

CSE 2014

6 Ranks in top 50 | **12 Ranks** in top 100 | **83 Ranks** in the final list


Rank 4
Vandana Rao


Rank 5
Suharsha Bhagat


Rank 16
Ananya Das


Rank 23
Anil Dhameliya


Rank 28
Kushaal Yadav


Rank 39
Vivekanand T.S

CSE 2013

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Rank 40
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Team BYJU'S

Gist of Yojana April 2021 Issue: Jal Jeevan Mission - Har Ghar Jal

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Chapter 1: Introduction

Water stress is being experienced across the world with increased spells of drought, desertification, and inequitable access to water. Assured availability of potable water is vital for human development. Sustainable Development Goal-6, of ensuring access to water and sanitation for all, involves reaching to people who lack basic services and improving accessibility.

Importance of potable water:

- The Covid-19 pandemic re-emphasised the value of clean and accessible water in our lives.
- Running tap water is critically important for sanitation and hygiene.
- The Prime Minister announced in August 2019 to take tap water to every household through the Jal Jeevan Mission.
    - The initiative aims to provide tap-water connection to every rural household in the country by 2024.
    - It also implements source sustainability measures as mandatory elements, such as recharge and reuse, through greywater management, water conservation, and rainwater harvesting.

Various initiatives of the government:

Jal Jeevan Mission (JJM):

- Jal Jeevan Mission aims to reach all rural households by 2024, which is six years well ahead of the Sustainable Development Goal-6 target and could become a model for other developing countries to adopt such practices and achieve their targets.

Swachh Bharat Abhiyan 2.0:

- Swachh Bharat Abhiyan had already done the groundwork with bringing sanitation to the forefront and made the country open-defecation free.
- Now, the Swachh Bharat Abhiyan 2.0 makes necessary interventions in biodegradable solid waste management, greywater management, and faecal sludge management.

Atal Bhujal Yojana:

- Atal Bhujal Yojana is an initiative that demonstrates community-led sustainable groundwater management, taken to scale.
- It is a pioneering and unique experiment involving stakeholders to bring about innovative reform in the management of groundwater by energising the local communities.

Pradhan Mantri Krishi Sinchayee Yojana:

- Pradhan Mantri Krishi Sinchayee Yojana, on micro-irrigation, has an objective to enhance water use efficiency in the agriculture sector by promoting appropriate technological interventions like drip & sprinkler irrigation and encouraging the farmers to use water-saving and conservation technologies.

Know more about Pradhan Mantri Krishi Sinchayee Yojana in the link.

Chapter 2: Taking Water to Every Home and Soul

The Jal Jeevan Mission is based on a community approach to water, creating a jan andolan for water, thereby making it everyone's priority. It implements source sustainability measures as mandatory elements, such as recharge and reuse, through greywater management, water conservation, rainwater harvesting.

> Tashigang village in Lahaul and Spiti has the rare distinction of being the highest polling booth in the world. The first household tap water connection was provided in the village in September 2020

- In 2020, 81,154 villages, 41,835 Panchayats, 669 blocks, and 52 districts and two states have achieved the distinction of having 100% households with tap water connections.

Jal Shakti Abhiyan Key Intervention Areas:

- Water conservation and rainwater harvesting
- Renovation of traditional and other water bodies/tanks
- Recharge and reuse structures
- Watershed development
- Intensive afforestation

Swachh Bharat Mission 2.0:

While the Department of Drinking Water & Sanitation is presently in news because of the Jal Jeevan Mission, the stellar work being done by Swachh Bharat Abhiyan's successor, the Swachh Bharat Abhiyan 2.0 is an equally important programme being implemented by the Ministry.

- As per one study conducted by WHO, the Mission resulted in averting more than 300,000 deaths (diarrhoea and protein-energy malnutrition) between 2014 and October 2019.
- While the sanitation coverage rose from 38.7% at the time of the Swachh Bharat Abhiyan's inception to 100% by October 02, 2019, the larger challenge of a holistic sanitation coverage remained.
- Recently allocated, more than Rs.1.40 lakh crore for SBM Phase II, is an attempt to address the challenge of holistic waste management by focusing on various aspects of waste management in rural India, including faecal sludge management and treatment source segregation of garbage, reduction in single-use plastic, etc.
- The Swachh Bharat Mission 2.0 comes at an appropriate time. India makes a large contribution to plastic waste pollution worldwide, and appropriate community action to reduce the waste production and its suitable disposal is the need of the hour.
- The other three impact areas of Swachh Bharat Abhiyan 2.0 are Bio-degradable Solid waste Management, Greywater management, and Faecal Sludge Management.
- Swachh Bharat Abhiyan 2.0 is needed to halt the advent of a staggering health menace caused by the mismanagement of faecal sludge also.
- The Department of Water Resources, River Development and Ganga Rejuvenation under the Ministry of Jal Shakti is also heralding vital policies needed for the sustenance of water security in the country.

Atal Bhujal Yojana:

- India is the largest user of groundwater in the world.
- Atal Bhujal Yojana is one such initiative that demonstrates community-led sustainable groundwater management, taken to scale.
- The major objective of the scheme is to improve the management of groundwater resources through a convergence of various on-going schemes.
- Atal Bhujal Yojana, with an outlay of Rs. 6,000 Crores aims to facilitate sustainable groundwater management with an emphasis on community participation and demand-side interventions for sustainable groundwater management in identified water-stressed areas.
- About 22% of our groundwater resources are in critical or over-exploited category with annual withdrawal exceeding annual replenishment of groundwater, and hence, demand-side management was the call of the hour. Atal Bhujal Yojana was constituted for this explicit purpose.

Pradhan Mantri Krishi Sinchayee Yojana:

- Pradhan Mantri Krishi Sinchayee Yojana is the centrally-sponsored scheme on micro-irrigation.
- It has an objective to enhance water use efficiency in the agriculture sector by promoting appropriate technological interventions like drip & sprinkler irrigation and encouraging the farmers to use water-saving and conservation technologies.
- Armed with a four-pronged vision of: Accelerated Irrigation Benefits Programme (AIBP), Har Khet Ko Pani (HKKP), Per Drop More Crop and Watershed Development, the scheme aims to bridge the gap between the micro-irrigation potential of the country which stands at 6.95 crore hectares of which only 10% was achieved till 2014.

Chapter 3: Water Security

India, a centuries-old civilisation has originated and flourished on the banks of the sacred rivers of Indus and Saraswati. The importance of water conservation and management was often highlighted in the ancient texts. India consists of 16 percent of the world's population but with only 4 percent of the world's water resources. At present, India is facing many challenges in the water sector with rising pollution levels and climate change. The water cycle is expected to undergo significant change all across the world.

2018 Composite Water Management Index (CWMI) 2.0:

- The 2018 Composite Water Management Index (CWMI) 2.0 is a pan-India set of metrics that measures different dimensions of water management and use across the lifecycle of water report.
- It is released by the NITI Aayog in association with the Ministry of Jal Shakti and the Ministry of Rural Development.
- It indicated that 21 major cities including Delhi, Bengaluru, Chennai, Hyderabad, and others are racing to reach zero groundwater levels by 2020.
    - This would affect access for over 100 million people.
- The report also indicated that, by 2030, the country's water demand is projected to be twice the available supply, implying severe water scarcity for hundreds of millions of people which would consequently lead to 6% loss in India's GDP.

- It is believed that water will also be a major source of geopolitical conflict in this century. It is therefore critical to manage this natural resource well.

Green Cover in India:

Year 2019 – Total forest cover: 80.73 million hectare (% of geographical area – 24.56%)

Top Three States Showing Increase in Forest Area:

1. Karnataka (1.025 sq km)
2. Andhra Pradesh (990 sq km)
3. Kerala (823 sq km)

Area Wise Largest Forest Cover in the Country

1. Madhya Pradesh
2. Arunachal Pradesh
3. Chhattisgarh
4. Odisha
5. Maharashtra

Namami Gange:

- The Flagship Programme Namami Gange was launched in 2014 with a budget outlay of Rs.20,000 Crore to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of the National River Ganga.
- The National Ganga Council is chaired by the PM and is working towards this goal by:

1. adopting a river basin approach to promote inter-sectoral coordination for comprehensive planning and management, and
2. maintaining minimum ecological flows in the river Ganga to ensure water quality.

Draft National Water Framework Bill, 2016:

- A draft National Water Framework Bill, 2016 containing provision for an overarching national legal framework with principles for protection, conservation, regulation, and management of water as a vital and stressed natural resource was suggested under the Chairmanship of Dr. Mihir Shah through a committee constituted by the Ministry of Water Resources, River Development, and Ganga Rejuvenation in 2016.

Other Government Initiatives:

- The Government is planning to update the 2012 version of the National Water Policy (NWP) and set up a National Bureau of Water Use Efficiency to bring a paradigm shift in water management.
- The Ministry of Jal Shakti was created in 2019 by merging the Ministry of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Drinking Water and Sanitation.
- The Government launched Jal Jeevan Mission (JJM) on India's 73rd Independence Day in 2019 to provide Functional Household Tap Connection (FHTC) at the rate of 55 litres per capita per day (lpcd) to every rural household (Har Ghar Nal Se Jal-HGNSJ) by 2024.

- Inter-Linking of Rivers is a long-cherished dream project comprising 14 rivers in the peninsular region and 16 rivers of Himalayan origin.
- The government is already working on many initiatives to solve the water crisis. It has launched a nationwide movement (campaign) named 'Nisarg Raksha' on Environmental Conservation and Water Rejuvenation.
    - Its aim is to train around 1 million Nisarga Rakshaks – One volunteer for every village in the country.
    - These volunteers will be trained by 50,000 Nisarga Shikshaks (teachers) across the country and they will carry out various activities towards Environmental Conservation and Water Rejuvenation at the local level.
    - 'Nature Protector Forum' at the national and state level are established to monitor this project implementation.
    - The project will be implemented through four divisions: State-> District->Taluka->Village.
- 'Nature Protector App' has been designed to help any conscious citizen to participate in the nature conservation campaign. This would be a first of its kind project on Environmental Conservation and Water Rejuvenation in India on a national scale.

Chapter 4: Water Future in a Climate-risked World: The Indian Experience

Water is a key determinant for health security and economic growth. Water wars are not inevitable but will happen only if resources are not managed prudently. Over the past few decades, India has learned critical lessons on water management and evolved a new paradigm.

Evolution of water management in India:

- Till the late 1980s, water management was largely confined to the issue of irrigation projects – the building of dams and canals to store and supply water over long distances.
- But then came the big droughts of the late 1980s and it became clear that it was not enough to plan for augmenting water only through large projects.
- The Centre for Science and Environment (CSE) published its report in which it documented traditional technologies for rainwater harvesting in ecological diverse regions of India.
    - The slogan was "Rain is decentralised, so is the demand for water". So, capture rain when and where it falls.
- By the mid-2000s, these efforts united into the Mahatma Gandhi Rural Employment Guarantee Act (MGREGA) – investing labour into building rural water assets.
    - If the affordable water supply was critical, then cities needed to cut the length of their distribution pipelines, which meant an increased focus on local water systems like ponds, tanks, and rainwater harvesting.
    - If this urban-industrial wastewater is treated for reuse then water is not lost.
    - The key challenge is to ensure sustainability of the water supply systems.

- The Government of India's ambitious and much-needed Har Ghar Jal mission has recognised this fundamental flaw in water infrastructure projects and has stressed that its objective is sustainability so that water continues to flow in pipes and taps.
- Much more needs to be done to capture the rain when and where it falls so that groundwater is recharged.

Conclusion:

Our water future is about our water wisdom and in this we must recognise that water and culture go together. Water shortage is not about the mere failure of rain. It is about the failure of society to live and share its water endowment. So, we can be water-secure, because we are water-wise.

Chapter 5: Ushering a Social Revolution

Water and sanitation is enshrined as a human right in resolution number 64/292 of the United Nations General Assembly. It calls upon governments to ensure adequate and affordable quantities of safe water for domestic use.

How does water scarcity affect women?

- Women and girls in India spend a considerable time performing domestic chores.
- Collecting drinking water for their families constitutes a major part of it.
- This poses a major barrier to the enrolment of girls in schools, especially those belonging to poor households.
- The magnitude of the problem can be imagined as over 11 crore rural women are pegged to be below the poverty line in India (Planning Commission estimates, 2004-05).
- Variability in water supply due to heavy dependence on monsoon rains and groundwater adds up to their vagaries.
- It exacerbates gender inequality.
- 42% of the Indian landmass is rendered drought-prone. Extreme weather events like droughts have a devastating impact on weaker sections of society as they lose out on livestock and crop yield.
- Food prices shoot up and it has a crippling effect on their health and nutrition, ultimately affecting human capital.
- Women and girl child, in particular, bear the brunt and are most adversely affected. It leads to their stunted growth, which further translates through generations.

These factors reflect the urgency to provide potable water to every household to secure our human capital and to prevent stunting of our future generations.

Steps taken:

- Goa and Telangana have emerged as the first and second states respectively, to achieve 100% water coverage under Jal Jeevan Mission.
- Under JJM, tap water connection is being provided to one and all irrespective of caste, community, religion, race, etc. with an approach i.e. "No one is left behind".
- Priority has been given to villages with a majority of SC/ST population to secure 55 lpcd.

How is JJM ushering a revolution?

- The secular and inclusive approach in JJM is primarily benefiting people from the weaker and marginalised sections of society and is proving to be a Social Revolution.
- The mission mandates the provisioning of water supply infrastructure at an unprecedented scale.
    - It requires skilled manpower like plumbers, masons, electricians, fitters, pump operators, etc. which will be met by skilling people from respective villages, therefore opening vistas for skilled employment in-situ and creating entrepreneurial opportunities in villages.
- The entire mission follows a bottom-up approach.
- It requires the formation of Village Water & Sanitation Committees/Pani Samitis that will prepare a 5-year Village Action Plan consisting of drinking water source strengthening, water supply, greywater management, and operation & maintenance so that people in the villages get assured tap water supply on a regular basis uninterruptedly.
- These committees are mandated to have 50% women members, since women are the most affected stakeholders and their participation is seen as a crucial input for its effective implementation.
- Further, a suitable representation of the weaker sections of the society is there in the Pani Samiti. This seeks to provide a platform for their participation as well as empowerment.

Making use of Information Technology:

- Information Technology has been leveraged to collate and display real-time nationwide water data on a portal.
- A Rashtriya Jal Jeevan Kosh (RJJK) is set up for accepting contributions from corporates, organizations, and individuals, who have moved from villages but still nurture love for their native place.

Jal Jeevan Mission is not merely a scheme whose outcome is limited to the aggregate of tap water connections provided. It aims to mitigate the economic, social, and physical hardships that the weakest sections of our society have to endure in absence of a supply of regular, reliable, and safe drinking water at their doorsteps. It is ushering a social revolution marked by people's participation, empowerment, convergence, inclusion, and equity.

Chapter 6: Water Governance

Multiple issues in water governance require action on several fronts. Given their complexity, a multi-disciplinary approach is needed to address them effectively. Above all, it is important to keep awareness of water issues and mobilisation of the community at the centre of our strategies for sustainable use of this precious resource.

Utilization of Water in India:

- In India, about 78% of the water utilised goes for agriculture; 8% goes towards domestic use; 6% is used for industry, and the remaining 8% goes towards other uses.
- With increasing population, India's per capita water availability is declining.

- India is already in a water-stressed situation defined by per capita availability of less than 1,700 cubic meters.
- The per capita availability is projected to further reduce to 1,340 cubic meters by 2025 and 1,140 cubic meters by 2050.

Water Governance Issues:

- Making adequate quantity of drinking water available to the people.
- Improving the low water-use efficiency in irrigation and industry.
    - A drop of water saved is a drop added to the ecosystem.
- Tackling pollution of water bodies, especially our rivers.
- Reusing and recycling water.

Jal Shakti Abhiyan – The Approach:

- The Jal Shakti Abhiyan (JSA) aims at targeted interventions in terms of water conservation, rainwater harvesting, renovation of traditional and other water bodies/tanks, reuse and recharge structures, watershed development, and intensive afforestation in water stressed districts.
- Community awareness and mobilisation are at the core of the campaign.

Improving Water Use Efficiency through National Water Mission:

- The activities under the National Water Mission (NWM) that aim to optimise water use efficiency by 20% seek to conserve water and minimize wastage.
- 'Sahi Fasal' campaign of NWM is an initiative to nudge stakeholders in agriculture towards crops that use less water but more efficiently.
- There is considerable potential for saving water through improving water use efficiency in irrigation and industry.
- The activities under the National Water Mission also aim to ensure more equitable distribution both across and within states with a special focus on recycling of wastewater.
- The mission has been able to nudge various stakeholders to see water as a limited resource through campaigns like 'Catch the Rain', 'Sahi Fasal', etc.

National Project on Aquifer Management (NAQUIM):

- The National Project on Aquifer Management (NAQUIM) is one of the world's biggest programmes of its kind.
- It envisages the formulation of aquifer management plans to facilitate the sustainable management of groundwater.
- So far, an area of over 13 lakh sq km has been mapped out of a total of 24.8 lakh sq km.

Chapter 7: Jal Jeevan Mission – Har Ghar Jal

Jal Jeevan Mission:

- Jal Jeevan Mission (JJM) was announced by the Prime Minister on August 15, 2019 to provide Functional Household Tap Connection (FHTC) to every rural home by 2024.
- The outlay of JJM is Rs. 3.60 lakh Crore.
- The mission is to give a boost to the manufacturing industry, creating job opportunities, and helping the rural economy.
- Assured tap water supply in rural homes reduces the drudgery of women and provides them with quality time to educate themselves, teach their children, learn a new skill, and explore better livelihood options.

Issues:

- Consumption of contaminated water leads to water-borne diseases.
- Groundwater is a major source of drinking water and in some parts of the country, there are geo-genic contaminants like arsenic, fluoride, iron, salinity, nitrate, heavy metals, etc.

Focus on 'Service Delivery':

- The focus has shifted to the assured supply of potable water to every home rather than merely infrastructure creation.
- Massive training and skilling programmes are being taken up.
- Public Health Engineering Department and Gram Panchayats and/or its sub-committees to play the role of a public utility.
- Jal Jeevan Mission has identified key priority areas such as water quality-affected habitations, villages in desert and drought-prone areas, SC/ST majority, and Sansad Adarsh Gram Yojana villages.
- Under the mission, 112 Aspirational Districts with low human development indices and 61 Acute Encephalitis Syndrome (AES), Japanese Encephalitis (JE) affected districts have been given top priority for providing piped water supply to every home.
- Drinking water quality testing laboratories in various States/UTs have been opened to the general public so that they can get their water samples tested at nominal charges and ascertain the quality of drinking water.
    - It will help improve public health and reduce water-borne diseases benefitting the entire rural population, especially vulnerable groups like pregnant women and children.
- At least five persons in every village, preferably women, are trained to use Field Testing Kits (FTKs) for testing water quality at the village level.

Special Focus on Children:

- Children are most susceptible to water-borne diseases and they spend a considerable amount of time in their educational spaces such as schools, Anganwadi centres, and Ashramshalas (tribal residential schools).
- Therefore, making provision of potable tap water in these institutions has been taken up in a campaign mode.

- So far, States like Andhra Pradesh, Goa, Haryana, Himachal Pradesh, Tamil Nadu, and Telangana have provided tap water supply to 100% of schools and Anganwadi centres.

Making Water Everyone's Business:

- The motto of Jal Jeevan Mission is 'Building Partnerships, Changing Lives'.
- Jal Jeevan Mission focuses on the involvement of women at every step since they are the primary stakeholder in the drinking water sector.
- The Gram Sabha forms a Village Water and Sanitation Committee (VWSC)/Pani Samiti with 50% women and 25% from weaker sections of society, proportionate to their population.

What is Village Water & Sanitation Committee (VWSC)

- Sub-committee of Gram Panchayat.
- May also be called as Paani Samiti.
- Consists of 10-15 members.
- Headed by Sarpanch/up-sarpanch/traditional village head, etc. as the Gram Sabha may decide.
- Panchayat secretary/Patwari/Talati may act as Secretary of the Committee.

Role of Village Water and Sanitation Committee (VWSC):

- Function as local water utilities.
- Play lead role in planning, implementation, management and operation & maintenance of in-village water supply systems.
- Mobilize and motivate community to contribute 5% or 10% of in-village capital expenditure in cash and/or kind and/or labour.
- Ensure periodic water quality testing using the FTKs.
- Develop and collect water user charges.

Technological Interventions:

- Every water supply asset created is geo-tagged.
- Hydro-geo morphological (HGM) maps are used in the planning of single-village schemes in identifying drinking water sources as well as building aquifer recharge structures.
- Household tap connections provided are linked with the Aadhaar number of the 'head of household' and more importantly, all financial transactions are undertaken through Public Finance Management System (PFMS).

Conclusion

To achieve the goal of Jal Jeevan Mission, communities to be trained and empowered to plan, implement, manage, operate & maintain their in-village water supply system. Thus, Jal Prabuddh Gaon (water enlightened villages) will lead the path to make Aatma Nirbhar Bharat (Self-Reliant India) a reality.

Chapter 8: Framework for River Rejuvenation

Rejuvenation of River Ganga:

- River Ganga is revered, is the country's cultural and spiritual mainstay, and its basin sustains about 45% of our population.
- The largest and most important basin is rich in agriculture, biodiversity, and a lifeline for millions.
- Namami Gange is the most comprehensive program which is showing results and laying down the foundation for river rejuvenation in the country.

Namami Gange:

- Namami Gange was launched in 2014-15 for the rejuvenation of Ganga and its tributaries with assured funding of Rs 20,000 crores.
- National Mission for Clean Ganga (NMCG) is the implementing agency. Backed by Ganga River Basin Management Plan by a consortium of 7 IITs, it has a holistic multi-sectoral, multi-agency and multi-level approach in four broad categories:
    - Pollution Abatement (Nirmal Ganga)
    - Improving flow and ecology (Aviral Ganga)
    - Strengthening People River connect (Jan Ganga)
    - Research, knowledge management (Gyan Ganga).
- Unlike previous efforts, it is not limited to cleaning or piecemeal selected city interventions but follows river centric, basin-based approach for comprehensive rejuvenation.

Improving Governance and Empowering Institutions:

- In a major policy decision, the government notified NMCG as an authority under Environment Protection Act, 1986 and created empowered institutions, and laid down fundamental principles with a comprehensive framework for rejuvenation of rivers in the Ganga Basin.
- This approach is now considered a model for application for rejuvenation of other rivers in the country.
- It integrates rivers, tributaries, wetlands, flood plains, springs, and small rivers as a single system.
- An integrated administrative structure from the national to the district level facilitates a shared vision, convergence, effective implementation, and involvement of people.

Pollution Abatement (Nirmal Ganga):

- Sewerage infrastructure projects have been sanctioned to create treatment capacity in the Ganga basin.
- Namami Gange introduced PPP for sewerage infrastructure for the first time in India, through Hybrid Annuity Mode (HAM).
- HAM is now accepted by NITI Aayog and states outside the Ganga basin have also started using it.

Improvement in Flow and Ecology (Aviral Ganga)

- The historic Notification of Ecological flow for river Ganga in October 2018 is a big step for Aviral Ganga.

- Demarcation and protection of floodplains, protection & conservation of wetlands especially floodplain and urban wetlands, spring and small river rejuvenation projects are under implementation.
- Sustainable agriculture is being promoted through organic farming, eco-agriculture, and medicinal plantation, and improving water use efficiency.
- Demand-side management, rainwater harvesting, aquifer mapping, and recharge are in progress.
- A comprehensive programme for fisheries and biodiversity conservation includes baseline survey, habitat and species improvement, and community involvement in the biodiversity hotspot of Ganga.
- Conservation of the Gangetic Dolphin, the National Aquatic Animal is a top priority.

People River Connect (Jan Ganga)

- Jan Bhagidari is central to this mission.
- Dedicated cadres of Ganga saviours are working to reach out to the community and create awareness.

Research, Policy & Knowledge Management (Gyan Ganga)

- Centre for Ganga River Basin Management & Studies was set up at IIT Kanpur for long-term basin studies, and technology development.
- Scientific mapping of different aspects – LIDAR mapping for high-resolution Digital Elevation Models & GIS-ready database, mapping of springs, microbial diversity, fisheries, biodiversity, heli survey for aquifers help in evidence-based decisions.
- The unique cultural mapping for natural, built and intangible heritage has the potential for development of tourism, heritage, and traditional livelihood opportunities.
- Namami Gange is also leading to the development of Arth Ganga model linking the economic development of the Ganga Basin with ecological improvement and Ganga Rejuvenation.

Chapter 9: Groundwater Management: A Paradigm Shift

Groundwater – An Invisible Resource

Groundwater is sometimes called an invisible resource. It sustains critical ecosystems, such as lakes, wetlands, and woods. It is, however, largely invisible and users have no knowledge about aquifers that yield the groundwater they use, and what constitutes sustainable and equitable usage of this common-pool resource.

The Indian Context

India is the largest user of groundwater in the world, using more than a quarter of the available global resources.

- Groundwater has played an important role in ensuring the food security of the country.
- It was a major driver in ensuring the success of the 'Green Revolution' through millions of energised tube wells.

- This finite resource currently caters to more than 60 per cent of irrigated agriculture, 85% of rural drinking water supply, and more than 50% of urban water supply.
- Increasing and unsustainable extraction of groundwater has resulted in significant depletion.

Groundwater – a few figures:

According to a report published by the Central Water Commission in 2019, the utilisable water available in India is 1,122 billion cubic meters (BCM) per annum. The total requirement of the country for different uses for a high demand scenario for the years 2025 and 2050 has been assessed as 843 BCM and 1,180 BCM respectively. This implies that, even if we store every drop of available water, we will still fall short in 2050, unless we manage demand.

The Community Leads the Way

- Success stories of initiatives taken up at Hivre Bazaar, Ralegaon Siddhi, and elsewhere in the country provided inspiring examples of community-based groundwater management.
- In the Hivre Bazar village in Maharashtra, combined efforts of the Gram Sabha, local government, and Non-Government Organisations turned a drought-ridden village into a thriving community.

Atal Jal – Scaling-up Informed Demand Management

- Government intervention through a combination of strengthening of institutions at State and district levels, community mobilisation, a convergence of ongoing schemes with a focus on more efficient use of water, and efforts to change the behaviour of the community toward judicious use of available water was perceived to be the need of the hour.
- The Atal Bhujal Yojana (Atal Jal) is an important step in this direction.
    - Atal Bhujal Yojana is a Central Sector Scheme with an outlay of Rs. 6,000 Crore.
    - The scheme, partly funded by the World Bank, was launched on Good Governance Day i.e. December 25, 2019.
    - Know more about the Atal Bhujal Yojana in the link.

Disbursement of Resources against measurable indicator

- A key feature of this outcome-focused scheme is the disbursement of incentive funds (disbursement linked indicators – DLIs) to states based on performance against selected indicators.
    - DLI#1 – Public disclosure of groundwater data/information and reports.
    - DLI#2 – Preparation of community-led Water Security Plans.
    - DLI#3 – Public financing of approved Water Security Plans through a convergence of ongoing/new schemes.
    - DLI#4 – Adoption of practices for efficient water use.
    - DLI#5 – Improvement in the rate of decline of groundwater levels.
- This scheme is a harbinger of change in groundwater management.

Way Forward

States are being encouraged to innovate in the process of implementation, in recognition of the fact that solutions of Karnataka will not be the same for Uttar Pradesh. Innovations are also happening as

communities are involved in the preparation of water security plans with the use of a custom-built mobile app for capturing geo-tagged field data.

Strengthened water-aware communities, reliable water data that informs decision making, and a participatory regulatory framework are the three pillars that will support sustainable groundwater use in the country, making water available for life, for livelihoods and culture and enabling us to combat the effects of climate change.

Chapter 10: Swachhata Movement Continues

Swachha Bharat Mission (SBM)

As a result of this Mission, rural sanitation coverage has increased from 38.7 per cent in 2014 to 100 per cent in 2019, with over 10.25 crore toilets built across India; and all states & districts had declared themselves ODF. For eligible households Rs. 12,000 were provided as an incentive to construct a toilet.

- Various global agencies such as UNICEF, WHO, BMGF, Dalberg, and others have estimated significant economic, educational, environmental, health, and social impacts of Swachh Bharat Mission's ODF achievements.
- India achieved SDG Goal 6.2 declared by the United Nations for providing safe sanitation for all 11 years before the targeted year, 2030.
- The success of the programme is attributed to the 4 Ps – political leadership, public financing, partnerships, and public participation.
- In February 2020, the Union Cabinet approved Phase II of the Swachh Bharat Mission- Grameen (SBM-G). It focusses on solid and liquid waste management (SLWM), and the sustainability of ODF status.
- The Department of Drinking Water and Sanitation (DDWS) is implementing this in a Mission Mode from 2020-21 to 2024-25.

Read more about the Swachh Bharat Abhiyan in the link.

SBM Phase II: From ODF to ODF Plus

- The key objective of the SBM Phase II is to make villages across India **ODF Plus villages**.
- An ODF Plus village is a village that sustains its open defecation-free (ODF) status and also ensures solid and liquid waste management and is visually clean.
- A village is called visually clean if at least 80 per cent of its households and all its public places have minimal litter and minimal stagnant water, and the village does not have any plastic waste dump.
- Various components which can help to convert a village into ODF Plus status are:
    - Constructions of individual household latrines
    - Retrofitting of toilets
    - Need-based construction of community sanitary complexes
    - Biodegradable waste management
    - GOBAR-Dhan (Galvanizing Organic Bio-Agro Resources-dhan)
    - Plastic waste management

- Greywater management
- Faecal sludge management

Planning for SBM (G) Phase II

- Swachh Bharat Mission promotes decentralised sanitation interventions.
- Therefore, it is required that each Gram Panchayat prepares Village Action Plans for all of its villages in a convergent manner for the SBM (G) and the Jal Jeevan Mission, in a participatory manner, especially involving women and marginalised people, so that everyone could get equally benefitted from the implementation of the village action plan.
- States and UTs are required to develop a Project Implementation Plan (PIP) and Annual Implementation Plan (AIP) every year consolidating the District Swachhata Plans to achieve the objectives of SBM (G) Phase II.

Capacity Building

- Swachhagrahis are the foot soldiers of the SBM (G) and have proved excellent motivators in bringing behaviour change for construction and usage of toilets.

Role of Panchayati Raj Institutions (PRIs)

- As per the Constitution 73rd Amendment Act, 1992, sanitation is included in the 11th Therefore, the role of Gram Panchayat (GP) is pivotal in implementing SBM (G).
- Each Gram Panchayat is expected to develop a village Swachhata plan for each financial year and feed it as per GPDP planning principles in the designated Plan Software, as well as into the SBM (G) MIS.

Monitoring and Evaluating

- DDWS leads the monitoring and evaluation of the SBM Phase II work in coordination with the States/UTs and Districts.
- The monitoring and evaluation have two aspects: first is ensuring the status of ODF Plus villages and second is that of created assets and expenditure incurred.

The Way Forward

DDWS has begun to work towards the management of biodegradable waste, animal waste (gobardhan), and plastic waste management in the spirit of waste to wealth along with liquid waste management that includes both grey water as well as faecal sludge management. India is hopeful that like ODF, its people will achieve the goals of ODF Plus by 2025 as the Swachhata momentum accelerates.

Chapter 11: Jal Shakti Abhiyan

Assured availability of potable water is vital for human development. India is home to 18% of the global human population and 15% of the global livestock population. However, it has only 2% of the landmass and 4% of global freshwater resources.

Taking over water management by colonial rule led to the decline in community participation and made them dependent on the Government for meeting both drinking water and agriculture requirements. Any solution to

the water management issue has to be planned with a people-centric strategy that encourages and ensures their participation.

The Department of Drinking Water & Sanitation, Ministry of Jal Shakti on July 1, 2019 launched Jal Shakti Abhiyan (JSA), in coordination with States/UTs, as a time-bound campaign in 256 districts covering 1,562 blocks that were classified as water-stressed.

Intervention Areas

Under this campaign, targeted activities were undertaken under five key areas of interventions namely:

1. Water conservation and rainwater harvesting;
2. Renovation of traditional and other water bodies/tanks;

- Reuse and recharge structures;

1. Watershed development; and
2. Intensive afforestation.

Apart from these interventions, special interventions like preparation of district and block-level water-conservation plans, Krishi Vigyan Kendra Meals, urban wastewater re-use, preparation of 3D village contour maps were also envisaged.

- These areas of intervention broadly fell under the mandate of the Ministry of Jal Shakti, Ministry of Rural Development, Department of Land Resources, Ministry of Agriculture, Cooperation & Farmers' Welfare, Ministry of Environment, Forests & Climate Change and Ministry of Housing & Urban Affairs.
- The Office of Principal Scientific Adviser, Government of India, along with ISRO and others, assisted the Department of Drinking Water & Sanitation in providing scientific inputs (like digital maps of districts showing various layers like drainage, water bodies, MGNREGA works, etc.) as well as in outcome monitoring.

Funding

The funds allocated under various regular schemes (both Centrally Sponsored Schemes of Government of India and State Government Schemes having similar interventions as objectives) were dovetailed at the district level. There was no separate fund allocation for the campaign.

Monitoring

A national-level JSA monitoring dashboard was developed to capture the progress of the states/districts against JSA interventions.

Outputs and outcomes

Outcomes were assessed under four activities:

1. Increase in the groundwater level

2. Increase in the surface water storage capacity

- Increase in the soil moisture in farmlands

1. Increase in the area covered with plantation and number of saplings planted

Intervention/Special Intervention Areas

- Water conservation and rainwater harvesting
- Renovation of traditional and other water bodies/tanks
- Reuse and recharge structures
- Watershed development
- Intensive afforestation
- Block and district water conservation plans
- KVK Melas
- Mobilisation of farmers

Post Jal Shakti Abhiyan – Way Forward

Though JSA could not be carried out in 2020-21 due to the pandemic, it is essential to consolidate the gains of the campaign by undertaking the following activities:

1. The digital inventory of all the water bodies/resources should be completed and shared with all stake-holding departments and their headquarters.
2. The list of water bodies that were renovated, rejuvenated or the ones in which encroachments were removed should be documented and recorded in the revenue records.
3. Such water bodies should be linked to people's livelihood so that the people's economic interest can protect them.
4. Encourage social water bodies policing (volunteer Jal Rakshaks) for the sustenance of restored water bodies using the services of college and senior secondary students, volunteers, NGOs, etc.
5. Survival of plantations has to be monitored periodically so that the original number is maintained.
6. Capacity building of farmers on water conservation should go on simultaneously. The main focus should involve the usage of micro-irrigation for water-guzzling plants.

Chapter 12: Integrated Water Management for Faster Socio-economic Development and Water Security

Gujarat is considered the capital of India's dairy industry. Farmers of Gujarat and their families are entrepreneurial and very industrious. Animal husbandry is one of the major sources of income to rural families. Ensuring adequate and assured availability of clean water for cattle is a pre-requisite for productivity.

Water sources in Gujarat

- The annual rainfall in Gujarat is skewed.

- The uneven distribution of water in Gujarat creates a peculiar situation wherein 1/4th of the area has adequate water and remaining 3/4th of the State is water-scarce, especially Kachchh.
- It is a severely water-stressed state, next only to Rajasthan.
- Western India, especially Rajasthan, Gujarat and parts of Maharashtra regularly experience scarcity of water due to peculiar edapho-climatic conditions. This also necessitates drinking water supply by road tankers and water trains.

How the increasing demand for water was met

In order to meet the rising demand of water due to expanding economic activities and aspirations of people for a better life, the following broad strategy was adopted to achieve water security:

1. In all decision-making related to water, people's participation became the non-negotiable principle.
2. Rainwater harvesting and/or artificial recharge with scientific planning and monitoring based on watershed principles, using satellite data was adopted.

- Completion of Sardar Sarovar Dam on Narmada river and distribution canal network was taken up on top priority.

1. Inter-basin transfer of water from reasonably water rich South and Central Gujarat to North Gujarat, Saurashtra and Kachchh was planned.
2. Strengthening of existing canal system, participatory irrigation management and micro-irrigation promoted in a big way.
3. Agriculture extension activities to educate to promote the concept of 'Per Drop More Crop' and conserve water was initiated as a campaign.

- The drinking water supply sector was reorganized in the form of three organizations carrying out specific tasks:-
    1. Gujarat Water Infrastructure Limited (GWIL) for building bulk-water transfer infrastructure.
    2. Gujarat Water Supply & Sewerage Board (GWSSB).
    3. Water and Sanitation Management Organisation (WASMO).

Village Action Plans (VAPs)

- With the help of NGOs, village after village started preparing their Village Action Plans (VAPs) to achieve drinking water security.
- In every village, five persons, especially women were trained to test the quality of water.
- The Government issued a special resolution under the Panchayati Raj Act making a provision to form Village Water & Sanitation Committee (VWSC) popularly known as 'Pani Samiti' as a sub-committee of gram panchayats, comprising 10-15 members with 50% women and 25% representation from weaker sections of society, proportionate to their population.

Water transfer through canals

- A unique approach of transferring flood water from Narmada to water scarce regions of North Gujarat and Saurashtra was taken up by constructing 332 km long 'Sujalam Sufalam' (unlined recharge) canal, on the northern side, parallel to the Narmada main canal.
- This helped in groundwater recharge leading to reversal of the depletion in groundwater.
- To ensure drinking water supply grid was planned.

Water conservation in agriculture sector

- To bring behaviour change, promote water conservation and judicious use, micro-irrigation was promoted in a big way.
- In 2005, Gujarat Green Revolution Company (GGRC) Ltd. was set up to bring in water-use efficiency in the agriculture sector by promoting drip and sprinkler irrigation systems.
- To make Gujarat a 'water secure state', 'Sujalam Sufalam Jal Abhiyan' was launched in 2018 under which a number of water conservation activities including cleaning and deepening of ponds, canals, tanks, checkdams and reservoirs, repair of water structures, construction of rainwater harvesting structures, etc. were taken up.

Ensuring water supply in Saurashtra

- To ensure water security in the drought-prone Saurashtra region, 'Saurashtra Narmada Avtaran Irrigation' (SAUNI) Yojana was taken up under which on completion during monsoon, surplus water from Narmada will be transferred and stored into about 115 reservoirs of Saurashtra.
- In southern and eastern Gujarat inhabited by tribals, small lift irrigation schemes have been taken up in a big way providing assured irrigation.

Conclusion

Today in Gujarat, more than 82% of rural households have assured tap water supply in their homes. The pioneering work by WASMO (Water and Sanitation Management Organization) has gained multiple recognitions including Prime Minister's Civil Services Award in 2018; United Nations Public Service Award in 2009; and CAPAM International Innovations Award in 2010. The success of this integrated approach in Gujarat inspired the formation of the Ministry of Jal Shakti in 2019.

Chapter 13: Access to Water is Access to Education and Opportunity for All

Assurance of running water in toilets not only helps children's hygiene but also helps motivate adolescent girls and teachers not to miss school, especially during menstruation days.

- Schools and Anganwadi Centres play a crucial role in the lives of children and are considered important places for learning and socialization.
- According to the data submitted in 2019, almost 160,000 AWCs did not have access to water and there were significant gaps in hard-to-reach communities.
- Studies have found that access to water has an identifiable influence on reducing the odds of absenteeism amongst students, especially girl students.

Government's 100-Day Campaign

- Given the health implications of no water in school and Anganwadi centre grounds, especially due to the closures and the impact of the pandemic, the Government launched a 100-Day Campaign, which mandated States/UTs to actively prioritise the provision of piped water supply in schools and AWCs in previously unserved or serving vulnerable communities.
- UNICEF has been a proud partner of the Campaign and has been working with both central and state governments to drive forward the vision of achieving universal access to safely managed drinking water and sanitation.
- This work puts India on an optimistic trend towards achieving the Sustainable Development Goal-6, while also contributing to the other SDGs assessing better resource management and socio-economic progress.

The Jal Jeevan Mission, therefore, is not just about the provision of drinking water, it is about increasing women's participation in the workplace and economy, by giving them more time to pursue their aspirations. It is about helping adolescent girls practice menstrual hygiene management while still having access to education. It is about keeping safe hygiene and sanitation practices at the centre of all the work we do to keep children safe at home and outside.

Chapter 14: Safe, Adequate, and Sustainable Drinking Water

Importance of safe water

Water is lifesaving, yet it is also a carrier of pathogens and toxic chemicals which when consumed causes diseases and deaths.

- Diarrheal diseases, cholera, typhoid, polio, hepatitis A & E are water-borne diseases.
- Water is necessary for personal hygiene and allows for hand hygiene which are key factors in preventing the spread of respiratory diseases and trachoma which is yet to be eliminated in India.
- Many vectors which transmit diseases like lymphatic filariasis, dengue, malaria, Japanese Encephalitis, etc. breed in water bodies.
- Water is essential for morbidity management and disability prevention for lymphedema patients (lymphatic filariasis).
- In Arsenic and Fluoride-affected areas, drinking water can expose people to these chemicals, and prolonged exposure could lead to Arsenicosis and Fluorosis.
- Safe drinking water has a positive impact on the nutritional status of children and prevents financial loss in the household and contributes to the overall economy of the country.

India's achievement in drinking water

As of 2019, more than 93% of the population has access to basic drinking water. The National Health Policy 2017 recognises access to safe drinking water and sanitation as a cross-sectoral goal and emphasizes on the need to eliminate water and sanitation-related diseases.

Convergence: Health and Water

1. Prioritize water schemes in village/blocks, where water-related disease burden (diarrheal, soil-transmitted helminths, lymphatic filariasis, kala azar, etc.) is high. This would require working with the health sector to identify common health-based targets and develop an implementation plan for jointly agreed target areas.
2. Strengthen current operation and management of water schemes by introducing a systematic risk assessment and risk management approach aligning with the principle of Water Safety Planning, which is the central recommendation of WHO's guidelines for drinking water quality. This approach would proactively identify risks to water quantity and quality, to enable corrective action as opposed to the traditional system of fixing problems when they are encountered.
3. Develop surveillance of drinking water quality by an entity independent of those charged with water service provision. This would serve as verification that the water systems are supplying safe water.

Conclusion

Safe water is critical for preventing diseases and sustaining the elimination status of diseases such as polio. The nexus between water and health is clear, however, we normally tend to work in isolation. Hence, there is an urgent need to change the way we work by converging with health to produce maximum health benefits from Jal Jeevan Mission. The goal of the water sector would be to build water systems and taps, however, if the taps do not produce safe water and it is not available when needed, the purpose is defeated. Hence, the need to have health-based targets for water and institute a proactive and preventive approach with the participation of the community and local government to ensure safety, availability, and sustainability of drinking water.

Chapter 15: Centrality of Women in Water Management

Women have played an integral role in water management and policies need to be designed in a manner to enhance this role even further.

Gender roles: Ownership and Management

In most rural communities, the collection of drinking water has been traditionally allotted to women. Young girls miss school to fetch water, and the drudgery of water collection is known to cause many health problems. Thus, the provision of water service at the household level would benefit women the most, and save them substantial time and drudgery. Gender roles also make women the "health care-takers of the family". Thus, the poor quality of water which causes water-borne diseases also affects women the most.

Hence, within the larger rural community, because of the gender role division, women become the core stakeholder in the provision of Functional Household Tap Connections and therefore, are likely to contribute more effort and time, in both the development of the system and its management. It is critical to involve women in decision-making processes at all the stages of planning, implementation, management, operation, and maintenance of rural drinking water supply schemes.

There are many ways in which women's contribution can be sought and their voice be given weight:

1. Mandatory 50% participation of women, especially those belonging to SCs/STs and OBCs, in the Village Water & Sanitation Committee (VWSC).
2. Separate meetings with women during the mobilization process: The 73rd/74th Amendments of the Constitution and PRI Act make women's representation mandatory and many Gram Panchayats

have women Sarpanches. Each Panchayat has at least 1/3rd women and many states have 50% women representation in the Panchayat. These elected women representatives (EWRs) should be given greater powers in all water-related schemes.

3. Interaction with existing women's groups during the initial village visits: Many of these SHGs have women, mainly from economically weaker sections, and hence, involving them ensures the inclusion of the poor and vulnerable communities in the village.
4. Special recognition of VWSCs with women leaders or larger women's membership.
5. Gender sensitization of the implementation team staff is essential and women should be part of the capacity building.
6. Train at least five village women for the supervision of implementation, and later for regular supply of water. Nominate and train women as Jal Doots/Bhu Jaankar, if there is a cadre of water para-legal workers.

Thus, women across the country need to be engaged in rural drinking water supply schemes consciously for long term security in villages.

Also read: 73rd Amendment Act – Panchayati Raj

Chapter 16: A Case Study of Goa

Introduction

Goa is gifted with many rivers viz., Terekhol, Chapora, Mandovi, Zuari, Baga, Sal, Saleri, Talpona, and Galgibag with several tributaries. Most of these rivers are perennial and some have seasonal variance inflow.

- Surface water and reservoirs are the main sources of raw water besides localized spot sources across the State.
- Most of the water treatment facilities available in Goa are more than half a century old.
- The major drinking water supply is through water treatment plants, wherein the process involved is pumping from source, aeration, coagulation, flocculation, sedimentation, filtration, pre and post disinfection, collection into clear water tanks, and pumping to Master Balancing Reservoir or Overhead tanks.
- The water-supply demand is catered by 10 Regional Water Supply Schemes covering Multi Village Schemes and Single Village Schemes with spot sources covering the remainder of the State.
- The State has already adopted computerized billing to ensure accuracy; one district even provides "On the Spot Billing" using the water supply billing application.
- The water billing has been successfully rolled out to all consumers, with affordable water tariffs to all.
- A host of technology initiatives will help ensure the quality and quantity of the supplied water to develop a "Smart Water Utility" for the State of Goa.

Technology solutions by PWD

- While Goa receives abundant rainfall, and adequate sources of freshwater, its water pipeline assets were aging and in need of an upgrade.

- PWD decided to review various technology solutions that could help strategically approach the problem.
- The mandate was to move ahead at a rapid pace while adopting a low-cost solution.
- The PWD partnered with a local 'Startup' working on Water Utility Management Systems and adopted their smart platform to provide the requisite tools.
- Goa adopted an Integrated Utility Management platform that acted as a Single System of Reference for all asset data.
- The "Made in India" solution was able to serve the needs of the PWD, at a fraction of the cost of imported products.
- Major water supply assets were cataloged on a GIS platform along with additional information that would assist in decision making.

Jal Jeevan Mission in Goa

In 2019, Jal Jeevan Mission, to provide functional household tap connections – Har Ghar Jal – by 2024 was announced.

- Goa had already achieved the primary mission objective of providing 100% tap water connections to all homes on October 2, 2020, well ahead of schedule, so it was decided to go a step ahead and build a system that would rival international standards.
- The target of 100% connections was only possible because the State invoked a special provision in the Health Act, whereby the concerned Health Officer can direct the PWD authorities to provide a water connection to households, that don't have water connections.
- Jal Jeevan Mission recommends the use of sensors that monitor important safety parameters at various points to guarantee the quantity and quality of our water supply while minimizing distribution losses.

Plans for the future

Goa has a vision to build a predictable and assured water utility so that consumers can have confidence in the availability and quality of their tap water. Consumers would be informed in advance about any service outages, in a targeted manner to minimize the impact and allow them to plan their lives better.

Conclusion

Water Utilities across the world are attempting to go beyond the simple delivery of water. Regulatory compliance, customer service parameters, and assured service levels are the new benchmarks. These changes are not necessarily more expensive, since the added cost is offset by fewer breakdowns and reduced economic hardships to citizens at large. Internet of Things (IoT) devices are low-cost gadgets that can help us monitor various parameters linked to the health of a system. The strategic use of IoT devices, combined with an analytics platform will allow the State to monitor the real-time status of its infrastructure. The Government of Goa has an ambitious plan to be more proactive in these maintenance parameters and act as a model for other utilities in India and abroad

Chapter 17: Technological Innovation for Assured Water Supply

It is high time that we secure water for drinking purposes else we will have to do it by compulsion. We should design the system in such a way that drinking water should never become a limiting factor for the growth, wellbeing, and development of our society. Recognising the need, the Government of India in 2019 announced the Jal Jeevan Mission to provide all the households in villages with functional household tap water connection (FHTC) by 2024.

Jal Jeevan Mission – Leveraging technology for ensuring water supply

The Jal Jeevan Mission is taking advantage of the digital revolution in India to ensure the existing problems in the rural water supply are addressed. Various issues can be addressed if we have a system to accurately monitor the water supply performance and ensure the accountability of a responsible person. The challenges of effectively monitoring and managing rural water supply systems across the length and breadth of a vast and diverse country like India are daunting.

- Jal Jeevan Mission has advocated taking the digital route to effectively monitor water supply in each village.
- It was decided to explore the Internet of Things (IoT) based remote monitoring which provides real time information by using sensors and communication infrastructure without any manual intervention.
- This would not only allow effective monitoring and management on the ground, but also enable real-time 'visibility' to senior officials, people representatives, and citizens.
- The JJM envisions creating a Digital Wall and Remote Command and Control Center for monitoring and managing supply of good quality water every day in all of the more than 19 crore rural households in India.

Technology leading to behavioural changes

The pilot studies undertaken for this project have demonstrated that technology-enabled real-time monitoring leads to positive behavioral change thereby ensuring significant gains in socio-economic and health parameters for the village communities:

- Equitable distribution of water – all clusters now get water supply (adequate quantity and pressure): Recognition of low-pressure issue in two clusters led to the community installing two gate valves to regulate pressure.
- Long term sustainability of water source: Observing the fast-depleting groundwater level on a TV screen dashboard on a real-time basis led to the awareness in the community to create rainwater harvesting structures and management of watershed.
- Regular chlorination process at the service reservoir: 'Visibility' of chlorine levels on the TV screen dashboard created awareness and led to another behavior change of getting regular disinfection done by the local community operator.
- Other benefits observed at the pilot sites include efficient and responsible use of water by consumers due to household level metering and reduced cost of operations through data-enabled leak detection, predictive maintenance, and automation.

Other benefits:

On a systematic level, the benefits of such a system will include minimization of Non-Revenue Water (leakage and unauthorized connections), reduction in repair and maintenance costs with predictive maintenance and automation for pump, reduction in excess manpower, efficient use of resources (water and electricity), and reduction in wage loss and healthcare costs for villagers.

JJM initiatives for creating an ecosystem

- In collaboration with the Ministry of Electronics and Information Technology (MeiTY), a grand challenge has been launched.
- The challenge has been successful in providing correct signal to IoT industry and gives a boost to the idea of Aatma Nirbhar Bharat.

Testing laboratories

- For assurance of water quality at the household level all the water testing laboratories under the control of rural water supply/public health and engineering department have been opened to public for testing of water samples.
- The network of labs is also being strengthened with 2% funds exclusively earmarked for this purpose.
- To democratize the testing of water further, in both urban and rural areas, another technology challenge has been launched with DPIIT to develop portable devices to test the quality of water.
    - This device, when developed can be used to test the quality of water from the comfort of the house.
- This will increase the trust of people in supplied water and enable them to drink water from taps and avoid wasteful expenditure on water purification plants.

With a partnership with States/UTs, the Jal Jeevan Mission is rolling out this vision to secure the availability of potable water at the household level and ensure 'ease of living' of people living in rural areas.

Chapter 18: Inside India's Inland Waterways Plan

Introduction

Independent India created the Inland Waterways Authority of India (IWAI) in 1986 to help maintain and energise infrastructure around key inland waterways.

- Five such waterways were identified at that time.
- These waterways have served India well for seven decades, and in recent years, there has been renewed momentum to explore the full potential of the country's inland waterways.
- This is especially because India has an elaborate network of inland waterways in the shape of rivers, canals, backwaters, and creeks.
- To transform this situation and make the best use of the inland waterways' potential of India, 106 additional inland waterways were declared as national waterways through The National Waterways Act, 2016.

Only the Central Government has to take the initiatives to develop this sector and as per the constitutional provision, the Central Government can undertake development and regulation of an inland waterway for

navigation, only when it is declared as a National Waterway (NW) by an Act of Parliament. Therefore, a new law had to be introduced to subsume the older national waterways and introduce a new range of national waterways for rejuvenation and the introduction of new ideas on India's rivers – from goods and services transport to recreation.

Advantages of water transportation

Water transportation being the safest mode, can reduce road accidents and result in decreased casualties significantly. It also reduces treatment and rehabilitation costs to a great extent. There is a shortage of free land for road construction.

Decision to waive off usage charges from waterways

In 2020, the Ministry of Shipping declared that all usage charges from waterways would be removed, for an initial period of three years, to promote the greater commercial and tourist exploration of inland waterways network.

- This was done to promote the idea that inland waterways could serve as a supplementary mode of transport that is not only more economical but also environment friendly.
- The existing rate of usage of the inland waterways system stood at a mere 2 per cent of the total cargo traffic.
- The decision to waive the charges is expected to reduce the costs to industries, simplify administration, and ultimately promote ease of doing business in the country.
- It is also estimated that more vessels will make use of inland waterways, with traffic expected to rise to 110 MMT in 2022-23 from 72 MMT in 2019-20.
- While India's national highway network is unparalleled in terms of connectivity, there are many reasons due to which the promotion of a supplementary mode of transport has become imperative.

Therefore, the use of inland waterways has opened up a whole new innovative vision of transportation in India combining speed and safety. For the 2016 Act, the country now has a total of 111 inland waterways which are marked as national waterways and the total length of the national waterways is 20,275 kilometres spread across 24 states.

Chapter 19: TIDBITS

#1 'Azadi Ka Amrit Mahotsav', India@75 launched

Azadi Ka Amrit Mahotsav is an initiative of the Government of India to celebrate and commemorate 75 years of progressive India and the glorious history of its people, culture, and achievements.

- Azadi Ka Amrit Mahotsav is an embodiment of all that is progressive about India's socio-cultural, political, and economic identity.
- The official journey of "Azadi Ka Amrit Mahotsav" commenced on March 12, 2021 which started a 75-week countdown to the 75th anniversary of Independence.

#2 History of Sanitation Programme in India

- The first sanitation programme for rural India was introduced in 1954 as a part of the First Plan of the Government of India (GoI).
- Given that the 1981 Census revealed that rural sanitation coverage was only 1%, a greater emphasis was then given to rural sanitation during the International Decade for Drinking Water and Sanitation (1981-90).
- The GoI introduced the Central Rural Sanitation Programme (CRSP) in 1986 with the primary objective of improving the quality of life of rural people and providing privacy and dignity to women.

Total Sanitation Campaign

- From 1999, a “demand-driven” approach under the “Total Sanitation Campaign” (TSC) was adopted.
    - It emphasized Information, Education and Communication (IEC), Human Resource Development (HRD), and Capacity Development to increase awareness regarding safe sanitation leading to demand generation for sanitary facilities.
    - Financial incentives were provided to Below Poverty Line (BPL) households for construction and usage of individual household latrines (IHHL), in recognition of their achievements.

Nirmal Bharat Abhiyan

- The ‘Nirmal Bharat Abhiyan’ (NBA), the successor programme of the TSC, was launched on April 1, 2012.
    - The objective was to accelerate the sanitation coverage in the rural community through renewed strategies and saturation approach.
    - NBA worked towards achieving the necessary outcomes to create Nirmal Gram Panchayats.

Under the NBA, the incentives for IHHLs were enhanced and further support was obtained in convergence with MGNREGS.

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