YK GIST - APRIL 2021

JAL JEEVAN MISSION

FOLK ART & CULTURE

WWW.IASBABA.COM


IAS BABA
PRELIMS EXCLUSIVE PROGRAM (PEP) – 2021
ONE STOP DESTINATION FOR PRELIMS
Everything You Need To Clear Prelims In A Go!
2nd BATCH
Prelims Strategy Classes
Subject-Wise Daily Classes Including CSAT
Subject-Wise Daily Tests
Prelims Oriented Current Affairs Tests & Handouts
Exclusive Tests On Maps, Economic Survey, Budget Etc.,
Revision Tests & Full Length Tests Including CSAT
Mentorship
Topper's Enrichment Sessions
PEP
(Online Program)
Program Starts On May 24th
REGISTER NOW


1 Hybrid Model
2 Integrated Programme (Prelims, Mains, Interview)
3 Focus on Fundamentals through Strategy Classes
4 Frequent Prelims & Mains Tests/Assignments
5 Value Add Notes
6 Connecting the Dots - Sessions by Experts & Toppers
7 Subject-wise Mentorship by Experts
8 Direct interaction with mentors and teachers (offline classes) and Live Doubt Clearing Session (Online classes)
IASbaba
8 FOLD PATH

Preface

This is our 73rd edition of Yojana Gist and 64th edition of Kurukshetra Gist, released for the month of April 2021. It is increasingly finding a place in the questions of both UPSC Prelims and Mains and therefore, we've come up with this initiative to equip you with knowledge that'll help you in your preparation for the CSE.

Every issue deals with a single topic comprehensively sharing views from a wide spectrum ranging from academicians to policy makers to scholars. The magazine is essential to build an in-depth understanding of various socio-economic issues.

From the exam point of view, however, not all articles are important. Some go into scholarly depths and others discuss agendas that are not relevant for your preparation. Added to this is the difficulty of going through a large volume of information, facts and analysis to finally extract their essence that may be useful for the exam.

We are not discouraging from reading the magazine itself. So, do not take this as a document which you take read, remember and reproduce in the examination. Its only purpose is to equip you with the right understanding. But, if you do not have enough time to go through the magazines, you can rely on the content provided here for it sums up the most essential points from all the articles.

You need not put hours and hours in reading and making its notes in pages. We believe, a smart study, rather than hard study, can improve your preparation levels.

Think, learn, practice and keep improving!

You know that's your success mantra ☺

Table of Contents

JAL JEEVAN MISSION

A. Water Security & Integrated Water Management

73rd Amendment of Constitution of India: Gram Panchayats or its sub-committees will play a crucial role in planning, designing, execution, operations and maintenance of the in-village infrastructure under the Jal Jeevan Mission – Every village is to prepare a village action plan (VAP) which will be essentially having three components namely;

1. Water source & its maintenance
2. Water supply and
3. Grey water management.

SDG-6: Ensuring universal access to safe and affordable drinking water for all by 2030

Water is enshrined as a Human Right in Resolution Number 64/292 of the UNGA, which calls upon Governments to ensure adequate and affordable quantities of safe water for domestic use.

The Alma-Ata Declaration on primary health care in 1978 identified the availability of safe water and basic sanitation as essential to achieve the 'Health for All' goals by 2000.

What is water stress? Which parts of India is water stressed?

In 1951, per-capita water availability in India was just over 5,000 cu m per year. In 2011, it was 1,545 cu m. The figure has almost certainly come down since. Should it drop below 1,000 cu m per year, India will formally become a water-scarce country for the first time in its 5,000-year history. If water availability is a problem, inequality in access is even more so. India has 180 million rural households. About 33 million have access to piped water; a little over 145 million don't.

Water stress is a situation where in the demand for water exceeds the available amount during a certain period or when poor quality restricts its use. Water stress causes deterioration of fresh water resources in terms of quantity and quality.

Water Availability in India: Grim Situation

- India consists of 16 percent of the world's population but with only 4 percent of the world's water resources. The total annual water available from precipitation in India is about 4,000 cubic km. Surface water and replenishable groundwater contribute to 1,869 cubic km but only 60 per cent of this can be put to beneficial uses.
- The 2018 Composite Water Management Index (CWMI) 2.0, a pan-India set of metrics that measures different dimensions of water management and use across the lifecycle of water report 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.
- The report also indicated that, by 2030, the country's water demand is projected to be twice the available supply, which will lead to a 6% loss in India's GDP.

Causes of Water Scarcity

- **Overuse of Water:** In developed countries per capita water consumption is far more than developing and poor countries. An average U.S. family wastes 13,000 gallons of water every year.
- **Geographical distribution:** Usage depends on availability of water; Canadian households use an average of 91 US gallons each day, while American households use just over 100 gallons.

Contrast this to Israel, where water supplies are limited, which uses an average of only 36 gallons per household per day.

- **Pollution of Water:** 80 percent of wastewater from human activities is discharged into waterways without any pollution removal. Bangalore water crisis was due to pollution in city's lakes and rapid urbanisation.
- **Conflict:** Water stress in Yemen, Syria, and Iraq are examples of water crisis due to conflicts. War disrupts the infrastructure as well as administration.
- **Distance:** Areas that are considered to be desert, or areas that are secluded deal with water scarcity because they just aren't close to anywhere that has water.
- Women in sub-Saharan Africa collectively spend about 40 billion hours a year collecting water. This significantly impacts their employment opportunities.
- **Drought:** A drought is an area which is not getting enough rainfall to be able to sustain the life that is residing there. Some areas are in perpetual drought, whereas other areas may be dealing with a drought on occasion. Some examples of it are from India itself, Marathwada region in Maharashtra is usually under drought conditions throughout the year. Another classic example is the recent water crisis in Cape Town, South Africa, major reason here was drought.
- **Climate Change:** Due to climate change and rising temperature there is change in global weather pattern and monsoon. Leading to drying up of rivers and reservoirs. Floods too affect the usability of water.

Evolution of Water Policy

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 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. In the droughts of the late 1990s, state governments launched massive programmes to capture rainwater.

Later, these efforts coalesced into the **Mahatma Gandhi Rural Employment Guarantee Act**, investing labour into building rural water assets. By this time, it was also understood that groundwater-considered a "minor" resource was the "major" supplier of water for both drinking water and irrigation in the country. It was also understood that over 50 per cent of agriculture was still rainfed and so water conservation and decentralised rainwater harvesting was critical for productivity.

In the decade of 2010, the crisis of urban drought hit homes. But again, policy evolved as it learned that augmenting water supply was only one part of the challenge. Other challenges were – long distance source; pumping and piping led to discharge loss; electricity consumption etc. It made the available water expensive and more inequitable. As water supply dried up, people turned to groundwater and without recharge meant declining water levels. Water supply was linked to pollution — the more the water supplied the more is wastewater generation. This, without adequate treatment, leads to pollution of rivers.

Later, research revealed that the bulk of urban residents depend on on-site sewage 'disposal' systems, as they are not connected to the underground sewerage network. In all this, new solutions emerged — if the affordable water supply was critical, then cities needed to cut the length of their distribution pipelines. If cities needed to ensure affordable sanitation for all and affordable treatment of wastewater, onsite systems could be re-engineered so that waste was collected from each household, transported, and treated. We have learned that if this urban-industrial wastewater is treated for reuse then water is not lost. More importantly, our rivers will not be lost.

The Indian experience shows the world how water management can be reinvented so that it is

affordable and sustainable; it puts water in the hands of communities and focused on decentralised recharge and reuse. Making water everybody's business is the only way ahead. The Government's **Har Ghar Jal mission** has recognised the fundamental flaw in water infrastructure projects and, therefore, has stressed on **sustainability** as a key objective. This requires focusing on improving the durability of the water asset that is created — it means ensuring that the pond or lake or tank is not encroached and that the watershed is not destroyed.

The problem lies in the fact that land and water bureaucracies are fractured — somebody owns the pond; another agency the drain, and yet another, the catchment. Water security requires this to change. This means giving much greater control over the water structures to the local community is then the answer to water management.

Access to Safe Drinking Water is Access to Opportunity for All

Against the backdrop of Covid-19 out, children will have to continue to practice cleaning their hands with water and soap.Early habits of sanitation and hygiene cannot be taught in the absence of regular access to the said facilities. According to the data submitted to the Lok Sabha back in 2019, almost 160,000 Anganwadi Centres (AWCs) did not have access to water.

With regards to the value of water and sanitation, every dollar invested in water access and sanitation yields an average of $6.80 in return, through averted health and productivity costs. 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**.

- The campaign mandated States/ UTs to actively prioritise the provision of piped water supply in schools and AWCs in previously unserved or serving vulnerable communities.
- Against the campaign's baseline, six States reported achieving 100 percent coverage for schools, another five States reported achieving coverage above 90 percent.
- 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.

How will climate change hit supply?

"Rain is decentralised, so is the demand for water. So, capture rain when and where it falls"

While growth in urban population is leading to increased water demand, climate change will make supply more variable. In some places, it will lead to a reduction of availability. In future, one in six large cities is likely to be at the risk of water deficit.

Increased demand for urban water supply will put pressure on groundwater resources. We investigated urban groundwater stress by calculating the urban groundwater footprint of regional aquifers. Climate change and socio-economic factors like urbanisation will lead to an increasing urban groundwater footprint. Historically, many cities in less developed countries had systems that were inadequate to provide 24X7 water access to its people, a goal that will become even harder to reach in the future.

How is urbanisation affecting the water bodies in the cities? What are its implications?

Urbanisation is taking place at a faster rate in India. Population residing in urban areas in India crossed 30% as per 2011 census, standing at 31.16%.

Urbanisation affecting Waterbodies:

A. Exploitation of Ground water: We need to also realise that with the country's rapid urbanisation, demand cannot be met by groundwater reserves alone. For instance, according to the Delhi Jal Board estimates, groundwater meets just 10% of Delhi's drinking water needs. The rest is met by surface water sources, most of it transported from outside Delhi.

B. Encroachment: In Bengaluru, 15 lakes have lost their ecological character in less than five years according to a High Court notice to the city's administrative body responsible for civic amenities and some infrastructural assets.
C. Pollution: There is an increasing level of urban population which however is not having enough civic facilities such as adequate infrastructure for the disposal of waste. Therefore, lakes become the dumping grounds for disposing untreated local sewage and solid waste.
D. Eutrophication: Lakes are closed water bodies. Therefore, a large part of the substances that enter in the lakes become a permanent part of it. There is a rapid change in the in the lakes which leads to growth of unwanted weeds destroying ecology of the lakes.
E. Unplanned Tourism Activities: There is unplanned tourism activities as there is no systematic planning and regulation. There is no adequate facility to dump garbage which leads to lakes becoming dumping grounds. Therefore, adequate arrangements for sustainable tourism must be made in cities like Udaipur which is filled with lakes, Dal Lake in Srinagar, etc.

Implications:

A. Water Quality

- Research within India revealed the scale of urbanisation impacts in Hyderabad, where the number of waterbodies has fallen dramatically. Lakes in Hyderabad were also found to have **fluoride concentrations** exceeding maximum permissible limits set by the Bureau of Indian Standards and World Health Organization.
- Fresh Water Watch measurements identified key links between the nutrient concentration and inputs of raw sewage, domestic waste and industrial effluents.

B. Urban floods: Improper and Inefficient Urbanisation is the primary cause for the floods in urban areas, especially in metros. For instance, failure of the drainage system is believed to be one of the primary causes behind the Chennai floods in December 2015 that led to the death of more than 400 people.

C. Water Crisis

- Cooum, Buckingham canal and Adayar are the three rivers that runs through the chennai city, all are dried up and dead due to industrial wastes and lack of civic measures.
- These coupled with Over exploitation of ground waters are turning cities into Dry and Dead cities in near future.

The Solutions

A. Efficiency in Agriculture: The agricultural sector consumes over 85 per cent of the available water today in India, and there is enormous scope to save water here through improved efficiency.

- Shifting cropping pattern from water-intensive to less water consuming crops can save significant amount of water.
- Micro-irrigation method (drip and sprinkler) of rice cultivation promises to enhance water use efficiency with increased crop productivity.
- Rainwater harvesting is one of the cheapest and easiest ways of augmenting water stock.
- Investing and promoting water-recycling technologies and storm water capturing schemes should also be given utmost emphasis.
- The proposed water conservation fee on groundwater extraction is definitely a right step in the direction of regulating water use.

B. Rethink water management

- Creative and imaginative governance in the form of building larger storage dams which can store excess water in lesser time is the need of the hour.

- People should be sensitised about the judicious use of water and educated about water-retention dams and other conventional structures such as eari, bawli, talab, anict, dam etc. to store water.
- The old practice of rainwater harvesting should also be popularised. Tamil Nadu has made mandatory installation of water harvesting structures in every house and this must be replicated in other States as well.
- Investing and promoting water-recycling, storm-water capturing technologies and micro-irrigation techniques in crop cultivation can also solve the problem of water scarcity.
- The cost effective method of reviving the traditional small water bodies under the age old practice of Kudimaramath should be given top priority.

C. To deal with Urbanisation and Climate Change

Need to make "every drop count - This will ensure that cities survive under drought. This can be done by

- Long-distance water transfers, but can also come from groundwater or desalination.
- When cities appropriate more water, they impact the freshwater ecosystem. Sometimes urban water usage is more than in agriculture. Society should make more efficient use of water. Putting in place an efficient piped supply system has to be top on the agenda of policymakers and planners.
- Steps must be taken to make farmers efficient in use of irrigation water. Water reuse is an option too.
- Both in urban and rural areas, digging of rainwater harvesting pits must be made mandatory for all types of buildings.

Nature-based solutions can address overall water scarcity through "supply-side management," and are recognised as the main solution to achieving sustainable water for agriculture.

- Environmentally-friendly agricultural systems like those which use practices such as conservation tillage, crop diversification, legume intensification and biological pest control work as well as intensive, high-input systems.
- The environmental co-benefits of nature-based solutions to increasing sustainable agricultural production are substantial as there are decreased pressures on land conversion and reduced pollution, erosion and water requirements.
- Constructed wetlands for wastewater treatment can also be a cost-effective, nature-based solution that provides effluent of adequate quality for several non-potable uses (irrigation) and additional benefits that include energy production.
- Watershed management is another nature-based solution that is seen not only as a complement to build or "grey" infrastructure but also one that could also spur local economic development, job creation, biodiversity protection and climate resilience.
- **Two areas that need urgent measures are**
  - Augmentation of watersheds that can store more good water, for use in agriculture and to serve habitations
  - **Strict pollution control enforcement:**
    - User-centric approach to water management, especially in agriculture
    - Decentralisation of irrigation commands, offering higher financial flows to well-performing States through a National Irrigation Management Fund
    - Steady urbanisation calls for a new management paradigm – augmenting sources of clean drinking water supply and treatment technologies that will encourage reuse.

Conscious efforts need to be made at the household level and by communities, institutions and local bodies to supplement the efforts of governments and non-governmental bodies in promoting water

conservation. Sustained measures should be taken to prevent pollution of water bodies, contamination of groundwater and ensure proper treatment of domestic and industrial waste water.

Reduce, reuse, and recycle must be the watchwords if we have to handover a livable planet to the future generations.

Do you know?

A. Water is a State subject

B. First state to have water policy: Meghalaya; to address water issues, conservation, and protection of water sources in the state.

C. Water stress and water scarcity

- Water stress is the difficulty of obtaining sources of fresh water for use during a period of time and may result in further depletion and deterioration of available water resources.
- Water scarcity involves water stress, water shortage or deficits, and water crisis.
- Water scarcity can be due to physical water scarcity and economic water scarcity. Physical water scarcity refers to a situation where natural water resources are unable to meet a region's demand and economic water scarcity is a result of poor water management resources.
- The latter is found more often to be the cause of countries or regions experiencing water scarcity, as most countries or regions lack the means to provide water in an accessible manner.

D. Water-stressed districts: Districts with critical or over-exploited groundwater levels as per the Central Ground Water Board (CGWB) 2017. For states without critical and over-exploited groundwater levels, districts with the least availability of groundwater in comparison to the rest of the districts in the state have been selected.

E. Per Capita Availability of Water

- The average annual per capita water availability in the years 2001 was 1816 cubic meters while it reduced to 1545 cubic meters in 2011
- This may further reduce to 1486 cubic meters in 2021 and 1367 cubic meters in 2031
- As per Ministry of Housing and Urban Affairs, 135 litre per capita per day (lpcd) has been suggested as the benchmark for urban water supply.
- For rural areas, a minimum service delivery of 55 lpcd has been fixed under Jal Jeevan Mission, which may be enhanced to higher level by states
- As per NCIWRD percentage of water used for irrigation out of the total water use for the year 1997-98 was 83.30%. The same is estimated to decrease to 72.48% by 2025.
- **NCIWRD=** National Commission for Integrated Water Resources Development

B. Jal Jeevan Mission & Jal Shakti Abhiyaan

Tashigang, a village in Lahaul and Spiti situated at 15,256 feet above sea level has the rare distinction of being the highest polling booth in the world. Recently it achieved another impossible feat, the first household tap water connection was provided in this village in September 2020. Stories like that of Tashigang are one part of a series of success stories of Jal Jeevan Mission which aims to provide tap water connection to every rural household of the country by 2024. In one year of **Jal Jeevan Mission**, more than 3.73 Crore household tap connections were provided.

Jal Jeevan Mission

Government of India has restructured and subsumed the ongoing National Rural Drinking Water Programme (NRDWP) into Jal Jeevan Mission (JJM) to provide **Functional Household Tap Connection (FHTC) to every rural household** i.e., *Har Ghar Nal Se Jal* (HGNSJ) by **2024**.

Jal Jeevan Mission is a decentralized, community-managed and sustainable water management scheme:

- Out of 17.87 crore rural households in the country about 14.6 crore which accounts for 81.67 percent are yet to have household tap connections for water.
- JJM envisages a structural change in the provision of drinking water supply services. The service provision should change to 'utility based approach' centered on 'service delivery'
- The government had also integrated different ministries and departments dealing with water into one ministry — the Ministry of Jal Shakti.

Focus on Service Delivery

- Under the mission, 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 to build the capacity.
- Under JJM, all villages with water quality issues, have been prioritised for potable tap water supply. Provisions have been made to install community water purification plants to provide safe water.
- 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. Atleast 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 etc. Therefore, making provision of potable tap water in these institutions has been taken up in a campaign mode.
- On October 2, 2020, a 100day-campaign was launched to ensure potable tap water supply in adequate quantity in these premises.
- 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

- Every village has to prepare a Village Action Plan co-terminus with 15thFinance Commission period. The motto of Jal Jeevan Mission is 'Building Partnerships, Changing Lives'.
- Village Action Plan – Gap analysis of existing water supply system; Water demand-drinking, cattle, agriculture; Source sustainability; Grey Water management; Proposed water supply scheme; Community contribution, proposed user charges; Appropriate technology, financial efficiency
- Role of Village Water & Sanitation Committee – 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; develop and collect water user charges
- Atal Bhujal Yojana has been started in 78 waterstressed districts of 7 States, to conserve water by involving the village community and Gram Panchayats. • Trusts, foundations, NGOs, etc. are empanelled as 'Sector Partners' as JJM aims to harness the huge potential of organisations working in the drinking water sector.

- **'Margadarshika for Gram Panchayats and Paani Samitis under Jal Jeevan Mission'** (Guidelines for the Village Panchayats and Water Committees)
  - The Mardarshika Guidelines will guide the members of the Water Committee and Gram Panchayats in taking the right decisions.
  - A special 100-day campaign is being launched on 2nd Oct this year under Jal Jeevan Mission to ensure drinking water connection to every school and Anganwadi in the country.

Technological Interventions

- Jal Jeevan Mission leverages the use of technology to ensure transparency, accountability, proper utilisation of funds, and service delivery.
- A robust JJM-IMIS captures physical and financial progress under JJM with a dedicated 'Dashboard' is in the public domain.
- A 'MobileApp' is for the use of all stakeholders to bring in ease of working. A sensor-based IoT solution is piloted for measurement and monitoring water supply with respect to quantity, quality, and regularity in villages on a real-time basis.
- Every water supply asset created is geo-tagged. Hydro-geo morphological 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 Aadhaar number of the 'head of household' and more importantly, all financial transactions are undertaken through Public Finance Management System.

Jal Shakti Ministry

- The new ministry has been formed by merging the Ministry of Water Resources, River Development and Ganga Rejuvenation and Ministry of Drinking Water and Sanitation.
- All water related works will be merged under one ministry.
- The new ministry will encompass issues ranging from providing clean drinking water, international and inter-states water disputes, to the Namami Gange project aimed at cleaning Gang and its tributaries, and sub tributaries.

Jal Shakti Abhiyan

The Jal Shakti Abhiyan (JSA) is a time-bound, mission-mode water conservation campaign. Ensuring India's water security and providing access to safe and adequate drinking water to all Indians is a priority of the government. The Jal Shakti ministry will look at the management of country's water resources and water supply in an integrated and holistic manner, and will work with states to ensure Har Ghar Jal (piped water supply) to all rural households by 2024 under the Jal Jeevan Mission

During the campaign, officers, groundwater experts and scientists from the Government of India will work together with state and district officials in India's most water-stressed districts for water conservation and water resource management by focusing on accelerated implementation of five target intervention.

The JSA aims at making water conservation a Jan Andolan through asset creation and extensive communication.

Nodal agency for Urban Renewal: Ministry of Housing and Urban Affairs

Why was it required?

- One Ministry will lead to one integrated data management system and understanding the gaps present.
- The need of the hour is the creation of water availability data from various resources on both quality and quantity at one platform.

Intervention Areas

1. Water conservation and rainwater harvesting

2. Renovation of traditional and other water bodies/tanks
3. Reuse and recharge structures
4. Watershed development
5. Intensive afforestation
6. Development of Block and District Water Conservation Plans (To be integrated with the District Irrigation Plans)
7. Krishi Vigyan Kendra Melas to promote efficient water use for irrigation (Per Drop More Crop), and better choice of crops for water conservation
8. Urban Waste Water Reuse: In urban areas, plans/approvals with time-bound targets to be developed for waste water reuse for industrial and agriculture purposes. Municipalities to pass by-laws for the separation of grey water and black water. Every urban local body has been asked to first constitute a rainwater harvesting cell which would monitor ground water extraction, water harvesting potential of the city and oversee projects on rainwater harvesting.
9. Scientists and IITs to be mobilised at the national level to support the teams
10. 3D Village Contour Mapping: 3D Village Contour Maps may be created and made accessible for efficient planning of interventions

Water Quality Testing Framework

Citizens can now get the water quality in their taps tested at reasonable rates, as part of the framework. A network of National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited labs will be set up in every State, district and block over the next year. It is a portal developed with the support of the Indian Council of Medical Research.

- At the panchayat level, teams of women of the village water and sanitation committees will be given field testing kits.
- Limited number of Private players can also be included.
- **Estimated cost:** ₹600 for all 16 water quality parameters
- **Turnaround time for chemical tests**: 24 hours
- **Turnaround time for the biological contaminants**: 48 hours.
- All results of testing will be fed into the Water Quality Information Management System (WQMIS).

This mission means 4.5 times more houses have to be linked to piped water in the coming five years than has been done in the past 72 years- Augmenting water availability will be the sum of several efforts:

- Conservation and revival
- Recycle and reuse of water (including grey water)
- Rainwater harvesting
- Judicious use of water for farming (an expansion of 'per drop, more crop')
- Efficient use of water in industry
- In situ treatment of waste rather than transporting it long distances using copious quantities of water
- Labelling products, or pushing industry to benchmark optimal use of water

The Way Forward

- Need to relook at water-guzzling sugarcane —with a value chain that sucks is terrible in terms of subsidies at various stages
- Need to reimagine the public health engineering department (PHED) as not just a technical body but also as a public utility that oversees water entitlements as well as pricing of such

entitlements is a goal. Digital sensors could facilitate remote monitoring of household water supply and quality, and eliminate tedious meter readings.

- This devolution can be incentivised by GoI, linked to milestones state governments and gram panchayats must reach, and hand-held by NGOs. For instance, JJM could tie up with the skill development ministry to train village women to measure turbidity and quality.
- On the lines of the Swachh Bharat Mission, extensive information, education and communication will be needed to create a jan andolan for water management. The ongoing Jal Shakti Abhiyan will help in creating awareness about the importance of integrating source sustainability and water reuse with the provision of household water supply.

Do you know?

A. The Uniform Drinking Water Quality Protocol, 2019 has specified some important parameters to be monitored for assuring portability of drinking water as per BIS IS 10500:2012 and subsequent amendments.

B. Five technologies recommended in Drinking Water and Sanitation to provide Field Level Solutions to the States

- A multi-disciplinary Technical Committee in the Department of Drinking Water and Sanitation, Ministry of Jal Shakti has recommended five technologies in Drinking Water and Sanitation to provide Field Level Solutions to the States.
- The Ministry of Jal Shakti gives importance to the infusion and deployment of innovative technological solutions to realize the objective of the Jal Jeevan Mission to provide Functional Household Tap Connection to every rural home by 2024.

Key takeaways

- The first technology recommended is **Grundfos AQpure**, a solar energy based water treatment plant based on ultra-filtration.
- The Second is **Janajal Water on Wheel**, an IoT based electric vehicle based on GPS location to enable delivery of safe water to the doorstep of households.

- Another technology is **Presto Online Chlorinator**, a non-electricity dependent online chlorinator for disinfection of water for removal of bacterial contamination.
- **Johkasou technology** recommended is an inbuilt sewage and Kitchen and bath water treatment system having advanced anaerobic-aerobic configuration that can be installed underground.
- The last innovative technology is **FBTec®**, a site assembled in a decentralised sewage treatment system using fixed filter media.

C. Groundwater Management

According to the Composite Water Management Index developed by NITI Aayog, 70% of the water resources are identified as polluted. A study, published in Environmental Science and Technology Letters, has found over 30 micrograms per litre (mcg/l) of uranium in parts of northwestern, southern and southeastern India, which can damage one's kidneys.

Defects in Earlier Approach of Water Conservation

- It did not focus on reducing demand through more efficient use.
- It suffered from a top-down approach with little or no community participation
- Most of these schemes were implemented in isolation
- Lessons learned from success stories of community-led groundwater management, mostly in the non-government space, were not incorporated

Severity of groundwater contamination

- Arsenic contamination- West Bengal, Jharkhand, Bihar, Uttar Pradesh, Assam, Manipur and Chhattisgarh – have reported contamination level that is above the permissible limit of 10 micrograms per litre (µg/L.)
- Nitrate levels above 10 mg/L (10 ppm) in groundwater caused "blue baby syndrome" in several villages in Punjab.
- Many states have a high concentration of Fluoride, way above the permissible limit, in groundwater.
- Most of the Indian states report high salinity in groundwater.

Causes for groundwater contamination:

- Industries- Manufacturing and other chemical industries require water for processing and cleaning purposes. This used water is recycled back to water sources without proper treatment. Also industrial waste is dumped in certain areas, the seepage of which results in groundwater contamination.
- Agriculture- the fertilizers, pesticide and other chemicals used in growing plants contaminate groundwater.
- Residential areas- These generate pollutants (microorganisms and organic compounds) for groundwater contamination
- Mining- Mine drain discharge, oilfield spillage, sludge and process water also contaminate groundwater.
- Coastal areas- Saltwater intrusion increases the salinity of groundwater in nearby areas.
- Excessive extraction- It increases the concentration of minerals in the extracted areas, thus making it contaminated.

Nitrate pollution of groundwater

With groundwater forming largest share in agriculture irrigation supply and drinking water in India, nitrate pollution in groundwater is a serious concern. According to Central ground water board report

387 districts in 21 states in India suffer from nitrate pollution in groundwater.

Causes:

Natural

- Decomposition of organic dead bodies releases nitrate compounds in soil which are leached down by rain or running water into ground water
- Animal waste and manure is spread off and mixed with groundwater

Anthropogenic

- Excessive utilization of urea fertilizers more than that can be absorbed by plants
- Usage of fertilizers without matching soil type and crop requirement for the fertilizer
- Unscientific construction of sewers and septic tanks leads to leakages of nitrate compounds into groundwater

Health hazards:

- Acute toxicity of nitrates may be harmful for neonatal health; Blue baby syndrome and birth defects are attributed to concentration of nitrates
- Nitrate compounds trigger ulcers & cancer
- Eutrophication caused by nitrate excess negatively affects aquatic ecosystem

Remedies

- Neem coating urea to slowdown dissolution of nitrates into soil
- Preventing urea fertilizers excess usage through spreading awareness, soil health monitoring and inclusion of urea under NBS
- Using manure and chemical fertilizer basis crop and soil characteristics and avoiding usage during monsoon
- Urban waste treatment plant; scientific construction and proper maintenance of sewer lines and septic tanks.
- Behavioural change to increase usage of proper toilets
- Blending drinking water from contaminated source with clean water to reduce nitrate concentration
- Biological denitrification

Atal Jal — Scaling-up Informed Demand Management

- The Central Sector scheme aims to improve ground water management through **community participation** in identified priority areas in seven States, viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.
- The Department of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Jal Shakti are the implementing agency for the scheme.
- Out of the total outlay of Rs. 6000 crore, 50% shall be in the form of World Bank loan, and remaining 50% shall be through Central Assistance from regular budgetary support. The entire amount shall be passed on to the States as Grants.
- ATAL JAL has two major components:
    - **Institutional Strengthening and Capacity Building** for sustainable ground water management in the States including improving monitoring networks, capacity building, strengthening of Water User Associations, etc.
    - **Incentivising the States** for achievements in improved groundwater management practices namely, data dissemination, preparation of water security plans etc.

Groundwater depletion may reduce winter cropping intensity

Groundwater depletion may reduce winter cropping intensity by 20% in India.

- India is the second-largest producer of wheat in the world, with over 30 million hectares in India dedicated to producing this crop.
- Some of the important winter crops (Rabi crops): wheat, barley, mustard and peas.
- But with severe groundwater depletion, the cropping intensity or the amount of land planted in the winter season may decrease by up to 20% by 2025
- The international team studied India's three main irrigation types on winter cropped areas: dug wells, tube wells, canals, and also analysed the groundwater data from the Central Ground Water Board.
- They found that 13% of the villages in which farmers plant a winter crop are located in critically water-depleted regions.
- These villages may lose 68% of their cropped area in future if access to all groundwater irrigation is lost.
- The results suggest that these losses will largely occur in northwest and central India.

Groundwater governance

- Governed by British common law sanctified by the Indian Easement Act of 1882
- In this, landowner has the absolute right to draw any amount of ground water from under the land owned by him.
- Water being a state subject, the centre's attempt at legislative reforms has focused mostly on allocation and setting up a public regulatory authority for groundwater regulation and management.
- The need is to address the challenge of equitable access and aquifer protection and move away from focus on link between land ownership and control over groundwater.
- Groundwater has to be treated as a common pool resource only for public good.

Membrane-based water purification (Osmosis)

- Osmosis is the naturally occurring tendency for two solutions of differing salinities to want to neutralize.
- Reverse Osmosis utilizes pressure to overcome the natural tendency and to force pure water through a semi-permeable membrane while concentrating salts and other dissolved solids on the feed side of the membrane.
- It is commonly used to generate clean drinking water from brackish groundwater.

D. Water Governance: River Rejuvenation & Inland Waterways

I. River Rejuvenation

Water pollution is a major environmental issue in India. Due to the large scale industrial development, long term effects of green evolution and other soci-economic reasons, the pollution of Himalayan rivers forms a centre of debate. The following are the reasons for the pollution of these stretches of river:

- **Untreated Sewage:** A 2007 study found that discharge of untreated sewage is the single most important source of pollution of Himalayan rivers water in India. There is a large gap between generation and treatment of domestic waste water in India. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained. A 1995 report claimed 114 Indian cities were dumping untreated sewage and partially cremated bodies directly into the Ganges River. Lack of toilets

and sanitation facilities causes open defecation in rural and urban pill areas of India, like many developing countries.

- **Organic matter:** In 2010 the water quality monitoring found almost all Himalayan rivers with high levels of BOD (a measure of pollution with organic matter). For instance, BOD in river Yamuna canal (247), river Yamuna at Delhi (70).
- **Coliform levels:** Rivers Yamuna, Ganga, Gomti, Ghaghara River, are amongst the other most coliform polluted water bodies in India. For context, coliform must be below 104 MPN/100 ml, preferably absent from water for it to be considered safe for general human use, and for irrigation where coliform may cause disease outbreak from contaminated-water in agriculture.
- **Heavy untreated water effluents** are directly send in to river without treatment is also one of the aggravating factor. Recently, the Central Water Commission (CWC) has reported that the samples from two-thirds of the water quality stations spanning India's major rivers are contaminated by one or more heavy metals, exceeding safe limits set by the Bureau of Indian Standards.

Water conservation in India is gaining pace. The Ganga rejuvenation efforts by the union government, the Yamuna clean up are some of the government initiated efforts.

- The Union government recently formed a new Jal Shakti (water) ministry, which aims at tackling water issues with a holistic and integrated perspective on the subject.
- The government has given importance to the problem of river pollution with the establishment of a National River Conservation Authority chaired by the Prime Minister. The river conservation programme was initiated with the Ganga Action Plan (GAP) in the year 1985.
- Namami Gange Programme', is an Integrated Conservation Mission, approved as 'Flagship Programme' by the Union Government to accomplish the twin objectives of effective abatement of pollution, conservation and rejuvenation of National River Ganga.
- Citizen led initiatives to keep clean river will also be one of the most effective ways. e.g. Every weekend, a group of professionals – doctors, engineers, and scientists – assemble at the banks of Yamuna river near the ITO, armed with brooms and shovels for cleaning up the waste strewn along the ghat.
- A larger perspective of pollution needs to be taken. Encouraging farmers to move towards organic farming, failing which they must be encouraged to use biological pesticides or safer chemical pesticides.
- One way to deal with the problem will be to permit water quality rights of citizens. State governments are responsible for implementing water pollution control laws.

National Mission for Clean Ganga (NMCG)

- It is the implementation wing of the National Ganga Council.
- It was established in the year 2011 as a registered society.
- It is under the Ministry of Jal Shakti.
- It has a two-tier management structure.
- It comprises of Governing Council and Executive Committee.

Objectives

- To ensure effective control of pollution and rejuvenation of the river Ganga by adopting a river basin approach.
- To maintain minimum ecological flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.

Namami Ganga Programme: The Namami Ganga Programme is an initiative, to make villages on the bank of river Ganga ODF along with interventions dealing with solid and liquid waste management (SLWM). It incorporates activities like sewage infrastructure, ghats & crematoria development, river

front development, river surface cleaning, institutional development, biodiversity conservation, afforestation, rural sanitation, and public participation.

Focussed on -

- **Infrastructure development-** Activities like sewage infrastructure, river-front development, ghat and crematoria development, ghat cleaning, rural sanitation, etc. have been undertaken under this and all the villages near Ganga have been declared Open Defecation free.
- **Improving flow and ecology (Aviral Ganga) –** E-flow; wetland mapping and conservation; Floodplain Protection; Sustainable Agriculture; Afforestation and Biodiversity Conservation; Small River Rejuvenation
- **Strengthening People-River Connect (Jan Ganga) - Decentralization-** Panchayat Raj Institutions (PRIs) have been accorded a prominent role in the planning and execution of the projects under the Namami Ganga Programme as in case of Ganga Grams initiative. River front, ghat and Crematoria; Community Engagement; Ganga Run; Ganga Amantran (Rafting Expedition), Ganga Utsav (Celebrating national river), Ganga Quest (Online quiz)
- **Mobilization of resources-** financial and technological resource mobilization from the private sector is given priority. The Hybrid Annuity-PPP model has been adopted for the sewage sector.
- **Zero black liquor discharge** has been achieved in paper and pulp industries.
- **Pollution Abatement (Nirmal Ganga) -** Sewerage infrastructure; Industrial Pollution; Wastewater Reuse and recycle; Rural Sanitation; Solid Waste Management.
    - **National Mission for Clean Ganga (NMCG),** nodal agency for implementing this programme has partnered with the National Institute of Urban Affairs to prepare Urban River Management Plan, which aims at preventing the deterioration and to ensure sustainable use of water resources.
    - Namami Gange introduced PPP for sewerage infrastructurefor the first time in India, through Hybrid Annuity Mode (HAM) with 40% of capex being paid during construction and 60% with interest by 15-year annuity with separate payment for operation & maintenance (O&M). This model has brought a paradigm shift from payment for construction to PerformanceLinked Payments. The 'One City One Operator' approach to improve governance was introduced.
- **Knowledge dissemination and awareness building-** Ganga Knowledge Centre (GKC) was established as a premiere and autonomous knowledge based institution to enhance the quality of the implementation of the Namami Ganga Programme. Water quality monitoring; High Resolution Mapping of Ganga; Aquifer Mapping and Spring Rejuvenation; Cultural Mapping and Climate Scenario Mapping, Microbial Diversity, Urban River Management Plan

II. Inland Waterways

Independent India created the Inland Waterways Authority of India in 1986 to help maintain and energise infrastructure around key inland waterways. India has an elaborate network of inland waterways in the shape of rivers, canals, backwaters, and creeks. Of the total length that can be navigated 20,236 kilometres - 17,980 kilometres of the river and 2,256 kilometres of canals - can be used by mechanized crafts.

Five such waterways were identified at that time:

1. Ganga-Bhagirathi-Hoogly river system between Haldia (Sagar) and Allahabad (1,620 kilometres)
2. River Brahmaputra between Sadiya and the Bangladesh border (891 kilometres)
3. West coast canal (Kottapuram to Kollam), the Udyogmandal canal, and the Champakara canal (205 kilometres)

4. Kakinada-Puducherry stretch between - Rajahmundry stretch of River Godavari and Wazira - Vijayawada stretch of River Krishna (1,078 kilometres)
5. Talcher- Dhamra stretch of River Brahmani, Geonkhali-Charbatia stretch of the east coast canal, the Charbatia-Dhamra stretch of River Matai and the Mangalgadi-Paradip stretch of Mahanadi delta rivers (623 kilometres)

Advantages of Waterways

- A well-coordinated inland waterways network could bring a fundamental alteration in the logistics scenario of the country. It represents a ready built infrastructure network, which can be utilised without any further capital investment.
- Waterways do not involve challenges associated with land acquisition, which has always been a sensitive issue, causing time and cost overruns of numerous projects. The significant investment which India needs to build its roads/highways infrastructure network can be conserved through increased utilisation of the waterways.
- Waterways are a cheaper mode of transportation vis-à-vis the available alternatives, significantly reducing the point-to-point cost of goods transportation. As per a recent study of the Integrated National Waterways Transportation Grid, one litre of fuel will move 24 tons through one kilometre on road, 95 on rail and 215 kilometres on inland water transport.
- Movement of goods and passengers through inland waterways would necessitate setting up large number of landing and loading/unloading points. This has the potential to open up large and accessible hinterland for supply of goods which can be transported at a lower cost.
- Waterways have lots of tourist potential especially for pilgrimage as many famous pilgrim centres are mainly located on river side

Implementation Challenges - Implementation of the national waterways network is, however, fraught with challenges.

- The channel draft of the national waterways is not uniform at 2 meters throughout the year, as is required. Some of these rivers are seasonal and do not offer navigability through the year. Around 20 out of the 111 identified national waterways have reportedly been found unviable.
- Further, all the identified waterways require intensive capital and maintenance dredging, which could be resisted by the local community on environmental grounds, including displacement fears, thereby posing implementation challenges. Water also has important competing uses, viz. need for living as well as for irrigation, power generation etc. It would not be possible for local government/others to overlook these needs.
- The exclusive jurisdiction of the Central Government is only in regard to shipping and navigation on inland waterways declared to be 'national waterways' by an act of Parliament. Utilisation/sailing of vessels, in other waterways, is within the ambit of the concurrent list or is in the jurisdiction of the respective state governments.
- As every riverine system is unique and presents diverse challenges, separate studies based on a detailed micro-level review to assess viability need to be done for each, before taking up implementation. An effective waterways network would necessitate drawing up a well-coordinated strategy on lines of complementarity between the national network and other waterways, not declared as such, as well as between waterways and roadways/railways. The said strategy should closely look into the various undercurrents, including competing uses/needs, possible local resistance and also work closely and in coordination with local governments for quick and successful implementation of this important national project.

Maritime India Vision 2030 Includes a 10-year plan for infrastructure creation and improvement of services

Composite Water Management Index

This index is an attempt to budge States and UTs towards efficient and optimal utilization of water and recycling thereof with a sense of urgency. The Index and this associated report are expected to:

- Establish a clear baseline and benchmark for state-level performance on key water indicators
- Uncover and explain how states have progressed on water issues over time, including identifying high-performers and under-performers, thereby inculcating a culture of constructive competition among states
- Identify areas for deeper engagement and investment on the part of the states.

Major Issue: Data and centre-state and inter-state cooperation are some of the key levers that can help address the crisis. Data systems related to water in the country are limited in their coverage, robustness, and efficiency.

- Limited coverage: Detailed data is not available for several critical sectors such as for domestic and industrial use, for which data is only available at the aggregate level and lacks the level of detail required to inform policies and allocations.
- Unreliable data: The data that is available can often be of inferior quality, inconsistent, and unreliable due to the use of outdated methodologies in data collection. For example, estimates on groundwater are mostly based on observation data from 55,000 wells, while there are 12 million wells in the country.
- Limited coordination and sharing: Data in the water sectors exists in silos, with very little inter-state or centre-state sharing, thereby reducing efficiencies.

The Composite Water Management Index (CWMI) is a major step towards creating a culture of databased decision-making for water in India, which can encourage 'competitive and cooperative federalism' in the country's water governance and management.

The adverse impacts of excessive sand mining on the river ecosystem

Sand mining is a practice that is used to extract sand, from various environments, such as beaches, inland dunes and dredged from ocean beds, and river beds of deltaic regions. Today, demand for sand and gravel continues to increase. By 2020, 1.4 billion tonnes of sand will be required in India. Sand mining is thus a lucrative business and fuels illegal extraction. Illegal and unscientific sand mining is turning out to be one of the biggest ecological disasters in modern India.

Body

- Sand is vital for sustenance of rivers. River supports an extraordinary array of species, many of which are under threat due to habitat destruction. During the past 3-4 decades, river systems of the world have been altered significantly due to indiscriminate sand mining. Sand mining has many deleterious direct and indirect effects on the physical, chemical and biological environments of river systems.
- Excessive sand mining can alter the river bed, force the river to change course, erode banks and lead to flooding. It also destroys the habitat of aquatic animals and micro-organisms besides affecting groundwater recharge.
- Depletion of sand in the streambed and along coastal areas causes the deepening of rivers and estuaries, and the enlargement of river mouths and coastal inlets. It may also lead to saline-water intrusion from the nearby sea. The effect of mining is compounded by the effect of sea level rise. Any volume of sand exported from streambeds and coastal areas is a loss to the river ecosystem.
- Sand mining disturbs the equilibrium of a river channel because it intercepts material load moving within a dynamic system and triggers an initial morphological response to regain the balance between supply and transport. Channel widening causes shallowing of the streambed,

producing braided flow or subsurface inter-gravel flow in riffle areas, hindering movement of fish between pools.

- It is now widely realized that, in spite of the short term benefits, the indiscriminate sand mining from the rivers is detrimental to these life sustaining systems, in the long run. Moreover, the effects of instream sand mining may not be visible immediately because it requires continuous monitoring and takes a decade or more to surface and propagate the effects along the river channel in measurable units.
- Mining which leads to the removal of channel substrate, resuspension of streambed sediment, clearance of vegetation, and stockpiling on the streambed, will have ecological impacts. These impacts may have an effect on the direct loss of stream reserve habitat, disturbances of species attached to streambed deposits, reduced light penetration, reduced primary production, and reduced feeding opportunities.
- Sand-and-gravel mining in stream channels can damage public and private property. Channel incision caused by gravel mining can undermine bridge piers and expose buried pipelines and other infrastructure.
- Apart from threatening bridges, sand mining transforms the riverbeds into large and deep pits; as a result, the groundwater table drops leaving the drinking water wells on the embankments of these rivers dry. Bed degradation from instream mining lowers the elevation of streamflow and the floodplain water table which in turn can eliminate water table-dependent woody vegetation in riparian areas, and decrease wet periods in riparian wetlands.
- The problem is serious in the case of the rivers in the southwest coast of India, especially in Kerala, where the rivers are small with limited river bed resources. At the same time, the mining of sand is on the rise to meet its ever increasing demand in the construction sector.
- Guidelines on the extraction of sand say that the amount of sand removed should be in proportion to its replenishment rate and river width. Mining from a braided channel with a wide floodplain will have less impact than from a narrow channel. Manual mining is preferred over the use of machines but enforcement and monitoring of these guidelines remain weak.
- A few states are exploring options like manufactured sand, produced by crushing of rocks and quarry stones, to meet the ever-increasing demand of the construction industry. The new sand mining framework suggests the use of geo-fencing, and GPS-enabled transportation to check illegal mining. Price control, the involvement of women self-help groups and regular audits of sand reserves have also been recommended.

Sand sustains the rivers and the percolation of water to far off distances both for the growth of trees to sustain drinking water and raise cultivation. It is almost a lifeline to the human existence. The nation is to advance industrially and economically by the proper development and exploitation of these resources. It has to be remembered that the sand once removed cannot be replaced in the next generation as it takes centuries for replacement.

E. Centrality of Women in Water Management

According to a report by the National Commission for Women, on an average, a rural woman in Rajasthan walks over 2.5 km to reach a water source. This is probably an underestimate, but the bottomline is that our women and girls spend a significant proportion of their time on fetching water. With women playing a leadership role in managing their community's water resources, minus the drudgery of walking for miles to fetch water for their families, the Jal Jeevan Mission aims to provide a massive fillip to the ease of living for women, and they will no longer be beasts of burden.

Water and Gender

- Women and girls in India spend a considerable time (up to 352 minutes/day) 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. Variability in water supply due to heavy dependence on monsoon rains and groundwater adds up to their vagaries. It **exacerbates gender inequality**.
- It is well known that 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.
- In some locations, when water collection has to be done in the early/late hours because of the erratic supply or nature of the source (sandy river beds), there are issues of **women's safety** also.
- As per a study, it was observed that women who have experienced a large number of dry shocks (below-average rainfall) during infancy are 29% more likely to have their child suffer through some anthropometric failure.

Core Stakeholder in Functional Household Tap Connections

Being water carriers and water managers, women are traditional knowledge bearers of the season-wise water availability in different water sources, source-wise water quality as compared to men. This knowledge is very useful for planning the water supply scheme. Hence, women become the core stakeholder in the provision of Functional Household Tap Connections. By involving women, the programme also empowers the women thus creating a gender transformative impact.

- Mandatory 50% participation of women, especially those belonging to SCs/ STs and OBCs, in the Village Water & Sanitation Committee (VWSC)
- Elected women representatives at local levels should be given greater powers in all water-related schemes and separate training empowering them in decision-making also.
- Special recognition of VWSCs with women leaders or larger women's membership. For example, in Gujarat, additional funds were granted to villages with all women VWSCs.
- Gender sensitisation of the implementation team staff is essential
- Train at least five village women for the supervision of implementation, and later for a regular supply of water. Nominate and train women as Jal Doots/ BhuJaankar, if there is a cadre of water para-legal workers.
- Develop women entrepreneurs and SHG-led enterprises for water supply services like defluoridation treatment plants, water-testing kits etc.

Himachal Pradesh Water Crisis

Why is the state with perennial sources of water such as Sutlej and Beas rivers staring at a water crisis?

- Deficient Rain and Snow: Himachal Pradesh received less snow and rain this winter. After winter, melt-water from glaciers and the snow cover regularly feeds the groundwater as well as other downhill water sources such as springs, wells, rivers etc. But water sources have already started drying up this year due to deficient snowfall.
- 69% less than normal precipitation: According to the Indian Meteorological Department, the state received only 59 millimetres of precipitation this winter (January 1 to February 28), which was 69 per cent less than normal.
- Increasing demand: Generally, over the decades, demand for water has been growing due to increasing population in the state, with people now relying more on piped water supply

schemes rather than traditional sources such as springs and bawries etc.
- Climate Change: Rainfall patterns, too, have become erratic. During dry periods, water sources dry up quickly in some areas, especially in the Shiwalik hills where the water-holding capacity of the soil is low.

Similar type of situation before also

- Himachal had received deficient snowfall in 2018, too, when drinking water shortage in the capital town of Shimla in summer had invited global media attention.
- The situation has been better in Shimla since then because its water supply source from Gumma stream has been augmented to provide 10 million litres daily (mld) more water to the city.
- The extent of the problem this year will become clearer in the coming summer months, but government claimed that it has never been so dry before in Himachal so early during the year. There are parts of Beas river which can now simply be crossed by wading through on foot

What are the proposed solutions?

- Installation of hand-pumps and borewells was stopped last year in view of depleting water table. But it will be resumed now wherever necessary.
- Water harvesting tanks will be built throughout the state and all MLAs are required to start building rainwater harvesting structures in their constituencies.
- A large number of habitations in Himachal Pradesh are not connected by road, but the connected villages will be provided water tankers during periods of shortage
- Government will try to explore the option of "snow harvesting" in the higher reaches.

Distribution of Freshwater Resources in Asia

Most water in the Earth's atmosphere and crust comes from the world ocean's saline seawater, while freshwater accounts for nearly 1% of the total. The planet's fresh water is also very unevenly distributed. Today most fresh water exists in the form of ice, snow, groundwater and soil moisture, with only 0.3% in liquid form on the surface. Of the liquid surface fresh water, 87% is contained in lakes, 11% in swamps, and only 2% in rivers. Small quantities of water also exist in the atmosphere and in living beings. Of these sources, only river water is generally valuable.

Asia has 47 percent of the global average of fresh water per person, but also has 65 percent of the world's population.

- In Asia, water shortages—both in the form of stress and scarcity—are emerging as a major social and economic threat, especially in India and China.
- The glaciers in the Himalayan region are the major source of fresh water in the surrounding regions of India, Nepal, Bhutan, China. As the Brahmaputra river originates in eastern Tibet where as the Ganges river's source is in the West. Both the rivers are perennial in nature.
- Many of the lakes such as Dal lake and Wular lake in India, Lake baikal in Siberian region of Russia, Lake Balkhash in Kazakhasthan are the main freshwater resources in the region where freshwater supplied from river is sufficient.
- The Mekong Delta – Vietnam, Candaba Swamp – Philippines, Hakaluki Hoar – Bangladesh, etc. are the major freshwater supplying swamps.

As per Asia-Pacific center for security studies, water scarcity is likely to worsen in Asia in the years ahead. India is experiencing shortages in accessing freshwater. In 1998, it is predicted that per capita availability of freshwater was declining due to rapid population growth and industrialization.

- The per capita availability of freshwater in 2025 is expected to be 1,500 cubic meters per year, as compared to 2,200 cubic meters in 1997 and 5,300 cubic meters in 1955.
- This will have a huge negative impact on food security, as Asian agriculture is already heavily

reliant on irrigation, with much of the anticipated increases in food production likely to be dependent on even higher levels of irrigation and irrigation efficiency.

- The Green Revolution resulted in increased crop yields, but achieved these yields largely through extensive irrigation and with increased reliance on freshwater. In fact, almost 70% of the world's freshwater supply is devoted to agriculture, and thus is unavailable for other uses. In Asia, this reliance is even more significant because an estimated 35 to 40 percent of the region's cultivated land is irrigated and this area produces over 60 percent of Asia's total agricultural output.
- Aside from agriculture, another factor that influences the state of water security in a particular country is its degree of industrialization. Industries account for roughly 25% of the world's water use and that number is much higher in industrial countries (as high as 50-80%). In developing countries, the percentage tends to hover around 10-30 percent.
- Environmental factors (such as pollution or climate change) can also influence water security for a particular nation or region. In many parts of Asia, pollution is a major culprit behind the dwindling availability of freshwater. In South Korea, for example, more than 300 factories along the Naktong River illegally discharged toxic wastes directly into the river.
- The specific impact of freshwater on intra-state security is far more complex and less easily ascertained. e.g. Kaveri water issue in between the states of Karnataka and Tamilnadu.
- Freshwater resources are likely to spark conflict international relations. e.g. Tista water sharing issue between India and Bangladesh.

Access to clean, safe, freshwater is recognized universally as one of the most basic and vital needs of humanity. Yet with the world population projected to increase to nearly 9 billion over the next few decades, bringing with it the associated need for greater food production and industry, it stands to reason that shortages of clean freshwater can potentially have broad and far-reaching security implications.

Hence, to conserve fresh water resources following steps needs to be taken:

- At the individual level the 3R formula of REDUCE, REUSE, RECYCLE needs to be applied.
- Also the basic individual level steps such as Check taps for leaks, Taking shorter showers, Turning off the water while brushing teeth needs to be taken up so that fresh water can be saved.
- At the government level too minimizing the pollution of the rivers, lakes and time to time precaution by cleaning them will in turn help to add fresh water availability. Such as Namami Gange programme.
- At the international level, various water cooperation initiatives will help to conserve freshwater resources.

Conclusion:

Clean freshwater is not only essential for human life, but also for economic development and agriculture in the Asian continental region. Emerging water scarcity and water security issues are posing a big challenge to the conservation of freshwater resources. Hence, as the impact of freshwater scarcity varies as per variation in distribution of fresh water resources in Asia the collaborative approach is essential to assure the conservation of freshwater resource.

RURAL FOLK & CULTURE

A. Nurturing, Showcasing & Preserving India's Rich Folk Art & Cultural Heritage

India with its glorious past has bequeathed a remarkable variety of monuments and sites spread all across the length and breadth of the country. It is estimated that there are more than 5 lakh historic buildings and sites that constitute the built heritage of India. There are 38 UNESCO World Heritage Sites in India (as of 2021), of which 30 are cultural sites, seven are natural sites and one mixed site. Along with there are the rich and varied intangible cultural heritage of the country like oral traditions and expressions, craftsmanship, etc. which are lying unidentified, unprotected and untapped.

Heritage is not just brick and mortar but the culture and people who live around it every day. There is history related to the place, culture, way of life, artisanship and economy developed based on the structure.

How can heritage structures change the rural economy?

- The built heritage is not just a reflector of the past, but present opportunities to generate employment and income in the present and future through heritage tourism.
- Proper management of the built cultural heritage structures and sites can bring in a huge change in the lives of the people living in and around the place.
- Preservation, conservation and promotion of such places can play a substantial role in enhancing the quality of life of the local population.
    - Even though 70 percent of the population still lives in villages, more than half of them are dependent only on agriculture or allied activities. Villages are experiencing out-migration and marginalization, and loss of cultural and biological diversity.
    - The growth of rural tourism and heritage tourism will enhance the employment and business opportunities in the villages in a big way.

Other benefits:

- Traditional step-wells apart from their heritage significance can also be explored to revive the dwindling water sources.
- Water wells can, apart from attracting tourists on the one hand, with a multiplier effect on the village economy with the development of infrastructure, shops, service facilities, etc., can also solve the water issue faced by the people in the area.
- Preservation, management and promotion of these structures will contribute to the technical know-how of the younger generation too.

Due to the pandemic, people are now more interested in visiting less-crowded rural India. There are various heritage structures with overwhelming cultural and historical significance in the rural hinterlands lying untapped and unattended.

I. NURTURING

Governmental efforts:

A. Development of iconic sites:

- The government of India, in its budget 2020-21, has proposed five archaeological sites, namely, Rakhigarhi (Haryana), Hastinapur (Uttar Pradesh) Shivsagar (Assam), Dholavira (Gujarat) and Adichanallur (Tamil Nadu) to be developed as iconic sites with on-site museums.
    - Rakhigarhi is a site of a pre-Indus Valley Civilization settlement, dating back to about 6500 BCE.
    - Dholavira is a site of ruins of ancient Indus Valley Civilization/Harappan city in Gujarat.
    - Adichanallur is one of the oldest early Iron-Age cemeteries to exist in South Asia.

- These sites are of immense historical, religious and heritage significance and the development of these will augment knowledge, recognition and tourism, which will boost the rural economy, enriching the socio-economic status of the inhabitants of the place.

B. Swadesh Darshan scheme: There are different theme based circuits being developed under the Swadesh Darshan Scheme of the Ministry of Tourism.

C. Acknowledging tribal heritage: Rural heritage with tribal settlements is now also being recognized under the category of 'Cultural Landscape' with the World Heritage inscription of Kanchendzonga National Park in 2016 on the World Heritage list and Apatani cultural landscape, cold desert cultural landscape of Spiti-Ladakh on the UNESCO's tentative list.

D. Adopt a Heritage project:

- The 'Adopt a Heritage' project under the Government of India aims to develop the heritage sites/monuments, making them tourist-friendly and enhancing the tourism potential.
- The corporate agencies are to partner in the noble social responsibility initiative by becoming "Monument Mitra".

Policy Recommendations:

A. Documentation: At the very outset, the state should work towards the creation of a National Archaeological Database.

B. Use of advanced technology: Advanced technology needs to be used for documentation, surveys, excavation, conservation, and promotion and marketing of the sites.

C. Promoting heritage tourism: Heritage tourism needs to be promoted with a focused and professional marketing strategy.

Enhancing Buddhist theme based circuits:

- To attract Buddhist tourists, particularly from South Asian and South-East Asian countries, composite development of Heritage and Tourism of Iconic Buddhist Sites of significance in India can be undertaken.
- Ten Buddhist sites particularly the sites of major Ashokan edicts (Rock and Pillar), eg., 5 rock edicts of Girnar, Sopara, Dhauli, Jaugada, Sannati, Yerragudi and five pillar edicts, namely Kalsi, Delhi, Vaishali, Rampurva and Lauriya can be developed in a circuit manner.

Exploring new themes:

- Reviving the lost traditional gardens, for example, the royal gardens of Bundelkhand can be considered to provide a boost to the local rural economy.

D. Developing requisite human resource:

- Skilled staff is required for managing the monuments at the ground level.
- Under the 'Hunar se Rozgar Tak' programme of the Government of India, training can be imparted to the rural youth belonging to the economically weaker strata of the society to become tourist escorts, event facilitators, security guards, tour assistants, transfer assistants and office assistants.
- Attempts should be made to increase the skills of local people under the schemes like Pradhan Mantri Kaushal Vikas Yojana (PMKVY), SANKALP (Skills Acquisition and Knowledge Awareness for Livelihood Promotion), UDAAN, etc.

E. Overarching management plan:

- An overarching management plan is required to revive the heritage structures.
- The National Policy on Conservation needs to be implemented vigorously by ASI and all State Archaeology Departments. It is a comprehensive policy focusing on tourism and development (within and around a monument), capacity building, partnerships with multi-disciplinary organizations and institutions and the role of local communities.

F. Convergence between various initiatives:

- The Archaeological Survey of India (ASI) or State Archaeology Departments need to identify projects that could be carried out in rural areas with MNERGA funds.
- This could lead to other significant government objectives such as reviving historic water bodies and collecting rainwater too.

G. Community participation:

- Projects can be participatory wherever possible including the community in reviewing design, involving them in maintenance such as volunteers for heritage walks, maintaining historic public spaces for reuse, advising them on maintenance for their historic houses, creating opportunities for the local economy (crafts and other production).
- Volunteering from the local community will help instil a sense of pride among the local communities.
- Local community participation is essential to protect, manage and promote heritage structures. This gives a sense of ownership, local authorities should also be involved.

H. Collaboration and Cooperation: Stronger support and partnership with the local bodies like Panchayats, NGOs, business and experts can enhance the proficiency of the heritage asset base and market it systematically.

I. Outreach programmes:

- The concerned authorities should develop their annual outreach programme of activities to engage all segments of visitors including children, families, etc.
- All heritage sites should develop special programmes for engaging school students' visits with a round the year calendar for children's workshops, activities and events.
- Souvenir shops with innovative local crafts products need to be established.
- Special Heritage walks to enhance the visitor experience with proper interpretation and storytelling on-site or specialized interpretation centre needs to be implemented.

J. Emulating the Ruritage programme:

- The 'Ruritage' programme, promoted by UNESCO aims to create innovative, rural regeneration-based models for cultural and natural heritage.
- A similar programme may be launched for India, bringing the role of culture as the fourth pillar of sustainable development and to contribute to socially inclusive economic growth and environmental sustainability in rural areas.
- The scheme of Rural Tourism showcases rural life, culture, art, handloom and heritage of the place attracting tourists which benefits the local community economically and socially as well as enriches the interaction and experience between tourists and the local population.
- Rural India focused Incredible India 2.0 campaign showcasing the invaluable gems of our country along with the rich intangible assets of the country could be the post-pandemic plan for the tourism sector.

II. SHOWCASING

Folk media as an effective development communication tool

Folk media and entertainment is deeply entrenched in festivals and fairs. In India, we have festivals for every season, deity, rituals, history and for all occasions. The popularity of the folk media is because of its inexhaustible treasure of vivid forms, local aesthetics and meaningful themes. Folk media draws its strength from age-old traditional stories and mythology, providing entertainment in the local dialect, and has the aesthetic air of belonging and affinity in the local cultural context, thus it touches hearts and minds so easily.

Every state or every region has a culture or region-specific festival, for example, Onam in Kerala, Pongal in Tamil Nadu, Ganesh Chaturthi in Maharashtra, Rath Yatra in Odisha, Durga Puja in Bengal, Phool Dei

in Uttarakhand, Baisakhi in Punjab, etc. These festivals and fairs are great occasions to communicate the behaviour change messages. Despite the arrival of mass media and new communication technologies, it still exists as a vital mode of communication in the rural hinterland.
However, for a long time, the literature on development communication ignored the role of the folk media. As a result, most of the development communication resources were devoted to technology-based media like radio and television, new age information, almost alien to the local culture.
The experience in India showed that these top-down communication approaches, though were peripherally successful to send across the message, could not bring the necessary behaviour change at the grassroots.
In fact, one of the reasons for SBM's success in bringing **behaviour change** among crores of Indians was its **proactive and judicious use of folk media** in the amalgamation of modern technology and huge public participation.

The Way Forward
A. An integration of traditional and modern communication systems is important. In a developing, predominantly rural, multi-lingual and diverse country like India, folk institutions, traditions and culture serve as a significant tool in motivating rural masses towards the government's programmes implemented at national, state and district levels.
B. Governmental efforts: The Song and Drama Division (SDD) of the Ministry of Information and Broadcasting was created in 1954 to meet the need to use folk media for development. Since then it has been using folk media such as theatre, mime, song, puppetry, ballets and dances for informing people about services and programmes made available by the government.
C. Swachh Bharat mission: Experience of Swachh Bharat communication strategy indicates that it is the amalgamation of three (triveni) elements:
(i) A direct connect,
(ii) Traditional forms of communication i.e, use of folk art as communication media and
(iii) An enabling environment that touches the heart of people most, that makes behaviour change possible.

Nautanki has intense melodic exchange among performers who perform song, dance, skit, comedy and chorus singing. Nautankis were used extensively in family planning, anti-dowry campaigns.
Jatra is a popular folk theatre in **West Bengal, Odisha, Tripura, Assam and Bihar**. It is a very long play preceded by a musical concert. These Jatras have been used **to bring literary works** to the village.

Challenges in preservation and conservation of folk art:

Rural and tribal folk art emerged from the raw lifestyles of the common man and was not necessarily meant for a proscenium setting. The unrestrained commercial push to folk art may result in a scenario where intricate and intangible elements of the form get neglected, diluting the grandeur and uniqueness of each folk form today. An impatience to exhibit and popularize folk arts without preserving their original flavour and distinctiveness, through increased marketing of folk culture to boost the economy, may strip many folk forms of their uniqueness and individual specialty. This is more dangerous than ignoring the arts. The intent of promoting culture is for its preservation apart from the livelihood opportunities they bestow on the associated artists.

Preservation and conservation in India have been perhaps limited to that of traditional tribal and folk art. These vibrant and colourful art forms hold immense potential in the international market owing to their aesthetic sensibility and authenticity. The increased commercial attention received by some art forms has in fact helped their preservation and conservation. The increased commercial attention has

helped art forms like Ganjifa painting, Bhil painting, Roghan Art, Champa Rumal to return to popular culture.

Limitations associated with sacred forms:

- Transportation Hubs including metro stations and airports in India have volunteered in preserving and sensitizing the passenger crowd it holds about various art forms. This effort has helped India in the drive to preserve its fine, folk and tribal arts to near perfection.
- But this exercise of encasement is practical only for Visual Arts. Sacred forms like Baul Sangeet, Sopana Sangeetam, Theyyam, Gurbani and Qawwali need to be preserved in their original sacrosanct form rather than being solely presented as a cultural extravaganza in a performer-audience setting.

Calls for status quo: The pursuit to bring the folk into the mainstream through implementing policies, use of communication facilities, has also been invasive in the traditional domain in a sense that strips away the barriers that once protected them. There have been calls for the preservation of culture whilst maintaining the status quo.

Indian Monuments & Restoration Threats

According to UNESCO, monuments are any form of structures with historical significance used for reconstruction and understanding of the past. Though India is blessed with many such monuments across the nation, according to report of INTACH, 60 percent face serious restoration threats.

Reason for deterioration

1. Pollution like yellow colour of Tajmahal due to acid rain
2. Poor maintenance
3. Excessive encroachment
4. Apathy of people and government

Need for conservation of monuments artificially

1. Using modern scientific technique, these monuments can be brought to original position.
2. Will bring large tourist inflow to India
3. Large scale employment will be generated
4. Greater revenue for the government
5. Can be restored for long time and without artificial restoring can't be restored for e.g. Sarai at Nizamuddin, Delhi was restored by Aga Khan Foundation
6. Monuments help connectedness with past and if not restored the future generation may lose this connected with history

Whether it would take away the antiquity

1. People visit these monuments to get attached to their heritage, which won't be after artificially restoring them.
2. Chemical might react with original and destroy their antiquity
3. There won't be much difference between new one and old heritage.

Way forward

1. The government scheme of Adopt a heritage is a positive step in this regard
2. Take help of international methods and technology for restoration
3. Avoid painting over panels and carving to preserve antiquity
4. Enforce strict restoration through amendment to monument and preservation act, 2016
5. Use of organic colours

'History is the insights of our soul'. As monuments represent our history, we should holistically protect and preserve them as entailed in the fundamental duty of our constitution in form of **Article 51(A).**

Efforts taken by Government

The government machinery in their respective capacities has tried their best in drawing Folk Culture along with other Classical Art forms to a Global Setting. The number of schemes and policy decisions implemented for the promotion of folk arts has increased in the last decade.

Grant in aid: Through ICCR, in the last six years alone, Rs 1267.71 crores (ICCR Report, 2014-2020) was spent as Grant-in-Aid to various agencies for the promotion of art.

Outreach activities in other countries:

- The government has organized 'Festivals of India Abroad' and 'Namaste India' in countries like Senegal, Cote d'Ivoire, Liechtenstein, Korea and Ukraine.
- ICT initiatives including the Sanskriti Channel, virtual museums and the Indian culture portal, have tried reducing the distance between art and art enthusiasts overseas.
- Promotion of Culture Ties with Diasporas (PCTD) schemes, various commemorations and festivals, establishments/renovations of cultural centres like the centre in Jaffna, Sri Lanka have all facilitated the showcasing of traditional Indian culture at an international level.

Bilateral agreements: India has signed several bilateral agreements with other countries for cultural exchanges and promotion.

Rashtriya Sanskriti Mahotsav: Since 2015, eleven Rashtriya Sanskriti Mahotsavs have been organised under the EK Bharat Shreshtha Bharat campaign which have served as a catalyst to protect and promote folk culture.

National Mission on cultural mapping:

- National Mission on Cultural Mapping (NMCM) has been set up by the Ministry of Culture in 2017. The mission will compile data of artists, art forms & geo-location with inputs from Central Ministries, State Governments & art/culture bodies.
- Participatory movements and efforts involving documentation could facilitate the ambitious National Mission on Cultural Mapping and Roadmap.

'Dekho Apna Desh':

- Instead of taking art forms to people, initiatives like 'Dekho Apna Desh' will help people go back to their roots, help appreciate that of others, and experience them in their natural setting so that torchbearers of culture needn't migrate from their habitat in search of opportunities.

National List of Intangible Cultural Heritage (ICH) of India:

- The Ministry of Culture had launched a draft National List of Intangible Cultural Heritage (ICH) of India as part of its Vision 2024. Through this, the government aims to increase awareness about the various intangible cultural heritage elements from different states of India at the national and international level. This will aid the protection and preservation of traditional Indian folk art and culture.

Independence movement of India

- "Baul, "Kavigan", "Chhau" dance of Bengal, "Lavani" of Maharashtra, "Gee-Gee" of Karnataka, and "Villupattu" of Tamil Nadu were effective in arousing the conscience of the people against British colonial rule.
- The eminent Tamil poet Sumbramania Bharati started using folk music to evoke patriotic feelings.
- The traditional media were effective in many political and social campaigns launched by Mahatma Gandhi.Folk tunes were used to popularize songs and glories of spinning wheels and consequently boycotting British goods.
- Similarly, in the 1940s, the India People Theatre Association successfully used some of the popular regional theatres like "Jatra" of Bengal, "Baval" of Gujarat, "Tamasa" of Maharastra,

"Burkatha" of Andhra Pradesh, to increase social awareness and political education.

Do you Know?

Representative List of the Intangible Cultural Heritage of Humanity:

- **Kumbh Mela** is a recognized list item in the representative list of Intangible Cultural Heritage of Humanity.
- UNESCO's upcoming meeting of the Intergovernmental Committee for the Safeguarding of Intangible Cultural Heritage will consider including **Durga Puja** in the Representative List of the Intangible Cultural Heritage of Humanity.

FOLK DANCES	
Ghode Modini	Goa; performed to praise warriors from Goa, who fought ferocious battles against the Portuguese and to drive out thieves from villages.
Poikkaal Kuthirai Aattam	Tamil Nadu; linked to the worship of Ayyanar in costumes of kings and queens indulging in acrobatics for hours.
Kachchi Ghodi	Rajasthan; uses the folk media at weddings to narrate the tales of the Bhanwariya bandit.

ART – CLASSICAL & FOLK	
Natya Shastra	By Bharata Muni; first compiled between 200 BCE to 200 CE.
Abhinaya Darpana	Book by Nandikeshvara
Sangita Ratnakara	Book by Sarngadeva
Lai Haraoba	Manipur
Vilasini Natyam	Andhra Pradesh
Bor Geet	Assam
Gaudiya Nritya	West Bengal
Mahari	Odisha
Yakshagana	Karnataka
Krishnanattam	Kerala
Hojagiri	Tripura

Refer: Previous Year Questions

Kumbh Mela

Held four times every 12 years at four different locations across central and northern India, the Kumbh Mela is the largest religious congregation and largest peaceful gathering on the planet. This vast celebration attracts tens of millions of Hindu pilgrims, including mendicant nagas. According to the legend, the gods and demons vied for the pot that held the nectar of immortality. During the fight for possession which lasted 12 days, Vishnu was running with the pot when four drops of amrit fell to earth namely at places Nasik, Ujjain, Haridwar and Allahabad. The Kumbh Mela is celebrated at each of these places.

Spiritual significance:

- Kumbh means an earthen pot. The human body is called 'Parthiv'. The body is created from earth and merges into the earth; therefore, 'Kumbh' (the earthen pot) symbolises the human body.
- This Kumbh is still immature and is filled with anger, lust, ego about our appearance, wealth,

achievements and other desires etc.
- As a consequence, when man moves in pursuit of desires he is likely to experience pleasure and/or pain. He experiences them in a never ending cycle.
- Caught up in the recurring moments of pleasure and pain humans seek Moksha and achieve a state of eternal bliss and emptiness that transcends all of the joys, pain, and sorrow of the physical body.
- It is believed that dip in the holy river nullifies sins of devotees and offers the chance to transcend, to reach beyond the endless suffering of material existence and reincarnation.
- It promises to purify us in the spiritual sense, and merge or become connected with the Divine in all of us. Thus promotes spiritual growth, health, emotional strength and puts us on the path to moksha.
- Transmission of knowledge: Since many Deities, individuals with Divine Knowledge, Saints and Sages congregate during the Kumbh Mela, the benefit of their guidance can be obtained within a short time and at one place.
- Performance of pitrutarpana is believed to ensure liberation to the departed ancestors.

Given its significance there should be equal focus to address concerns like:
- Environment pollution: degradation in water quality.
- Inadequate infrastructure to handle large pilgrimage.

Apart from its central role in spirituality of the country, the event encapsulates the science of astronomy, astrology, ritualistic traditions, and social and cultural customs and practices, making it extremely rich in knowledge. Hence, UNESCO has inscribed it on the Representative List of the Intangible Cultural Heritage of Humanity.

B. Arts and Crafts of Northeast India

The northeastern region of India bears a huge testimony to the country's colourful tradition and heritage. The seven states of the region is home to **over 160** major Scheduled Tribes and over **400** other tribal and sub-tribal communities and groups, each having its own distinct and unique cultural tradition, replete with a rich history and folklore.

Challenges to the art forms:
- The above-mentioned art and crafts have been facing stiff competition from machine-made products, whether manufactured elsewhere in the country or outside India.
- Traditional artisans are increasingly facing a tough time, especially with production cost rising every passing day, while the majority of customers look for low-priced items.

Recommendations:
- Preserve the traditional art forms from becoming extinct.
- Integrate the traditional technique with modern know-how.

Art products produced traditionally can be promoted as souvenirs, decorative items and collector's items alongside tourism.

ARTS AND CRAFTS	
Nagaland	▪ **Handloom:** The Ao shawl is known as tsungkotepsu, and the Angami shawl is called loramhousho. ▪ **Woodcraft:** Different Naga tribes like Ao, Konyak, Sangtam, Phom, Chang,

	Khiamniungam and Yimchunger, also make log-drums carved out of solid pieces of logs — as part of their community tradition.
Arunachal Pradesh	▪ **Handloom:** Singpho women weave the pukang, Nyishi women the par-ij, Apatani women the bilan-abi and chinyu-abi. ▪ **Bamboo and cane product-** Adi bolup, the Apatani bopo; make hanging bridges across swift-flowing rivers including the Siang (Brahmaputra) with cane and bamboo ▪ **Wood carving** varies from tribe to tribe – o The Sherdukpen and Monpa artisans produce a variety of door and window frames, boxes and wooden saddles, apart from beautifully painted household items like bowls, cups, plates and saucers. o The magnificent wooden masks produced by the Monpa, Sherdukpen, Memba and Khamba tribes, used in ceremonial dances are really eye-catching. o Wood carving of the Khamti, Wancho, and Tangsa communities on the other hand depicts human figures, as also replicas of birds and animals. o The Khamtis, being Buddhists by faith, also make beautiful images of various deities. ▪ **Masks:** Monpas and Sherdukpens use a wide range of masks in their traditional and ritual dances and festivals. These are made of handmade paper, cloth, fur, feathers, bamboo and cane. ▪ **Jewellery:** Singpho, Monpa, Sherdukpen, Wancho and other communities use beads, shells, stones, wax, silver, gold, wood, clay, wild seeds, bamboo, cane and reeds, feathers, etc. to make various ornaments. **Tribes:** Adi, Apatani, Sherdukpen, Tangsa or Khamti tribe
Mizoram	▪ **Handloom:** Women weave different varieties of the puan — a drape and uncut rectangular fabric with well-crafted edges, as also the punchei and tuallohpuan ▪ **Bamboo and cane product-** Mizo varika
Manipur	Longpi, a village in Ukhrul district stands out with its **black earthenware.**
Meghalaya	▪ **Handloom:** Garo women of Meghalaya weave the dakmanda, and occasionally an eking too. ▪ **Pottery:** In the Jaintia Hills of Meghalaya, the Larnai area excels in the blue-grey earthen pottery that is shaped by hand, without the aid of a potter's wheel.
Tripura	**Handloom:** Experts in weaving the rignai and pasara **Tribes:** Reang, Jamatia, Noatia or Uchai tribe
Assam	▪ **Handloom:** The gamosa – a traditional hand-woven cotton towel and also the Bodo scarf aronai. ▪ **Bamboo and cane product-** The decorative jaapi made of bamboo and palm leaves is almost a must for welcoming guests and VVIPs ▪ **Masks:** concentrated in the Satra institutions — Vaishnavite monasteries—in Majuli, the world's largest inhabited river island. Artisans, mostly monks, use bamboo, cane, clay, cloth, jute, coir and paper pulp to make masks, which are an integral part of the traditional Bhawona performance. ▪ **Jewellery:** Traditional gold and silver jewellery for marriage ceremonies, as also part of a dancing girl's attire during Rongali Bihu. ▪ **Brass and Bell metal:** Sarthebari and Hajo are traditional centres for manufacturing various brass and bell-metal products. They also make bhor-taal

	(large cymbals) used during prayers in the naam-ghar and Satra, while smaller cymbals are musical instruments used with Bihu and oja-pali songs. ▪ **Pottery:** o Wheel-less pottery villages exist, particularly in Majuli island. o In Dhubri (western Assam), a cluster of villages has specialized in manufacturing fascinating terracotta and pottery items. While tubs, pots and pitchers are common, they also manufacture a wide range of clay toys depicting dolls, animals, and idols of gods and goddesses, which have a global attraction. ▪ **Woodcraft:** o The dhol played in Rongali Bihu is made of wood, so are the traditional drums of the Bodo, Rabha, Mishing and Karbi communities. o Monks in Satra monasteries create sculpted wooden door-frames, and various kinds of guru-asana — the altar where the Holy Scripture is kept inside the naam-ghar, the traditional prayer hall.
Predominant materials used for Handloom: cotton, muga (golden silk), endi (warm silk) and paat (white silk).	
Bamboo industry: Northeast is home to at least 90 species of bamboos, of which 41 are endemic to the region. The bamboo sector has provided means of livelihood to thousands of families across the region.	

C. Understanding India's Classical Dance

Classical dance forms refer to those religious Hindu art forms whose roots can be traced back to Bharat Muni's Natyashastra, the source book of the art of drama, dance and music.

In the dance there is the combination of the movements of the body, of the hands, of the expression, of the face and the eyes together with a music accompaniment exalting the theme that the dance wants to describe; a theme which can have a religious, mythological, legendary character or one from the classic literature. The Sanskrit terms used to refer to the dance confirm such assertion. It is divided, in fact, in three categories: ***natya, nritta, nritya***.

A. Natya:

Natya means abhinaya and it is the combined manifestation of bhava, rasa and abhinaya. The term natya is derived from the root Nat, meaning movement and to mean to dance or act. It can also be considered as the combination of Lyal, isai and nataka, ie, Literature, music and Drama. Thus Natya is telling the story through dance and music or laya and abhinaya or Nritta and Nritya. Bharatha described Natya as pure abhinaya having six angas such as postures, words, gestures, expression of temperament, music and rasa. Facial abhinaya is very important in Natya. It is divided into ten sections. They are Bhana, Veedhi, Anga, Vyayoga, Samavakara, Yihamriga, Dima, Prahasana, Nataka etc. This constitutes the Dasarupakas. Example, In Bharatanatyam the Padams come under the Natya.

B. Nritya:

Nritya consists of footwork and abhinaya. It relates to Rasa and psychological state. Angika abhinaya relating to Hasta, eyes, eye brows, lips etc. are very important in Nritya. It can be termed as the explanatory aspect of dance where hand gestures and facial expressions convey the meaning of the lyrics of the performing song. Bhav of the dancer is of prime importance in this so it can also be considered as the miming aspect of dance. 'Rasabhavavyanjanaadiyuktam nrutyamitiryate '.Nritya mainly depends on Bhavabhinaya. It has five forms such as Vishama, Vikata, Laghu, Perani and Gundali.

The term is believed to have derived from Nrit, meaning bodily movements. Nritya is considered to be that form of dance that suggests both Bhava and Rasa. It combines all the three forms of abhinaya, namely, Angika, Vachika, and Sattvikam. Example In bharatanatyam Swarajathi, Sabdam and Varnam which come under Nritya.

C. Nritta:

Nritta means pure dance, a presentation of rhythm through graceful movement of the body. It always reflects the mood, Bhava and Rasa underlying the compositions sung for dance. It is important for its pure beauty. This presentation of dance does not stress on facial expressions. Footwork is given prominence in this. Beat and tempo are the guiding factors for the synchronization between the rhythm and time. Abhinaya Darpana defines nritta as bodily movements without evoking Rasa Bhava. 'Rasa bhaavaviheenaantu nrittamityabhidiyate' Tala and laya are the basic concepts of nritta. "Nrittm talalayasritam"as given in Dasarupaka stresses the basic concepts of nritta. Nritta figures in the first part of a dance performance. It involves bodily movements and consists of chari, rechika, Angaharas, Karanas, Bhramaris, Nrittahastas etc. Nritta is divided into three forms such as Vishama, Vikata and Laghu. Generally, expressional aspect is given less importance and more emphasis is given for the movement of various angas of the body. Example, in the art of Bharatnatyam, the starting items, Alarippu, Kauthuvam, Jathiswaram all come under Nritta.

The movements of Nritta, Nritya and Natya should always be in concordance with the primary standards of Dance. Laya found in Nritta in combination with Bhava becomes Nritya, which in turn when combined with gestures and actions becomes Natya. Natya will ultimately be impressive as well as effective only when there is a harmony between the bodily movements of the dance and emotional expressions of the abhinaya. All great dancers display a perfect blend of all three in each of their performances.

Living embodiment of India's devotional tradition

1. **Bharatnatyam:** Tamil Nadu
    - Starts with invocation song to Supreme being.
    - Shabdam: The accompanying song is generally in adoration of the Supreme Being.
    - Kriti is a composition in which the musical aspect is highlighted. Both are usually devotional in character and represent episodes from the lives of Rama, Siva, Vishnu, etc.
    - Padams and javalis, are on the theme of love, often divine.
2. **Kathakali:** Kerala – Kathakali is a blend of dance, music and acting and dramatizes stories, which are mostly adapted from the Indian epics.
    - Aharya: Make-up is suited to character like Krishna and Rama wear special crown decorated with peacock feathers.
    - Todayam: It is a devotional number performed where one or two characters invoke the blessings of the gods
    - sopana sangeet: It is said to be the ritual singing of the Ashtapadis on the flight of steps leading to the sanctum sanctorum.
3. **Kathak:** Uttar Pradesh – Only classical dance of India having links with Muslim culture, it represents a unique synthesis of Hindu and Muslim genius in art.
    - Raslila: The Vaishnavite cult which swept North India in the 15th century. And the resultant bhakti movement contributed to a whole new range of lyrics and musical forms. The Radha-Krishna theme proved immensely popular along with the works of Mirabai, Surdas, Nandadas and Krishnadas.
4. **Manipuri:** Manipur – Because of its geographical location, Manipuri has been protected from outside influences, and able to retain its unique traditional culture.

- The dance is associated with rituals and traditional festivals, there are legendary references to the dances of Shiva and Parvati and other gods and goddesses who created the universe.
- Ras: The theme often depict the pangs of separation of the gopis and Radha from Krishna.

5. **Odissi:** Odisha
   - Opening item is Mangalacharan where the dancer slowly enters the stage with flowers in her hands and makes an offering to mother earth. This is followed by an invocation to the deity of the dancer's choice. Generally, Ganesha is called upon to grant an auspicious beginning. The item ends with a nritta sequence with salutations to God, the Guru and the audience
6. **Kuchipudi:** Krishan Village, Andhra Pradesh – Based on the Myth of Krishna asking Siddhendra Yogi to compose dance, drama about bringing Parijata flower for Sathyabama.
   - Invocation: Beginning with invocation called ganesha Vandhana. Now other gods are also invoked.
7. **Sattriya:** Assam
   - The dance was introduced in 15th Century by a great Vaishnava Saint Mahapurush Shankardev in Assam.
   - It was primarily a monastery dance and later on evolved as a distinctive dance form and spread across Assam.
   - It has been for centuries, nurtured and preserved with great commitment by the Sattras i.e. Vaishnava maths or monasteries. Because of its religious character and association with the Sattras, this dance style has been aptly named Sattriya.
8. **Mohiniyattam:** Kerala– It literally means Dance of Mohini, The female avatar of Lord Vishnu to seduce Asuras during churning of ocean.
   - Practiced by a group of Female temple dancers, who assisted the temple rituals by adding expressive gestures to the mantras chanted by the temple priests.

D. Traditional Toy Industry: New India's Sunrise Sector

Toys are an important part of childhood, as they aid in physiological, mental, and emotional development. The activities and control that are required to understand and operate varying types of toys, instill a sense of shape and colour, enhance cognitive abilities, and improve creativity.

Traditional toys:

- Local toys are manufactured from various raw materials such as plastic, wood, rubber, metals and textiles.
- It is a labour-oriented industry based on master craftsmanship and creative designing.
- Toymakers who live in cities and industrial areas make use of recycled waste materials such as old newspapers, discarded cartons, metal scraps, boxes and tins. The use of recycled materials has no overhead cost and hence enables artisans to manufacture and sell toys at an unbelievably low price.

Significance of traditional toy industry:

A. Source of livelihood: The Indian toy manufacturing industry is the livelihood of thousands of craftsmen and their families. This sector also plays an important role in generating employment

opportunities for women and providing a regular source of income for rural households. In the toy industry, over 60 percent of toy factory workers are women.

B. Cultural asset:

- Traditional toys depict ancient mythological stories and display the beliefs and traditions that exist among communities.
- Manufactured all over the country, Indian toys reflect cultural diversity in the range of products manufactured.
- Traditional toys are a means to preserve the cultural heritage of the nation.

Concerns associated with the sector:

A. Untapped potential: The Indian toy retail market was valued at INR 16,000 Crore (USD 2.2 Bn) in 2020, which accounts for <1 percent of the global market.

B. Continued dependence on imports:

- Currently, 85 percent of the domestic demand for toys is met through imports from China, Sri Lanka, Malaysia, Germany, etc.
- India's toy exports stand at Rs. 730 Crore (USD 100 Million).
- This trade deficit is alarmingly large, given the potential of India to be self-reliant in an industry that is likely to grow at 10-15 percent against the global average of 5 percent.

Governmental efforts:

With Hon'ble Prime Minister Narendra Modi's call for 'Vocal for Local', concerted efforts are being made to uplift the traditional toy industry in India to a global level. To boost the toy industry, the Government has undertaken the following initiatives:

A. National Action Plan: A comprehensive action plan to boost local manufacturing and incentivize toy and handicraft manufacturers in the country has been initiated.

B. Toy Fair: In line with the national initiative to promote the domestic toy industry, the government organized a National Toy Fair. The toy fair aimed to provide a platform to promote traditional, eco-friendly, and indigenous toys and boost the Indian economy by supporting the local toy industry.

C. Toycathon: A first-of-its-kind hackathon to develop indigenous toys and games highlighting India's culture, history and mythology, it aims to invite students, teachers, start-ups, toy experts and professionals to innovate and submit feasibility assessments for local manufacturing of creative toys, games and concepts.

D. Toy Cluster Programme:

- 90 percent of the Indian toy industry is unorganized, with more than 4,000 micro, small and medium enterprises operating across the country.
- To streamline this sector, the government announced the 'Product Specific Industrial Cluster Development Programme' in 2020 to build toy clusters in dedicated SEZs and help them become customized, self-sustained ecosystems catering to export markets.
- The government is also providing incentives at each step, from setting up a plant and facilitating key resources at subsidized rates to incentivizing running costs with the single goal of attracting investments and building export capacity.

E. State government schemes:

- Several state governments have swung into action and allocated dedicated areas for building toy cities and park clusters.
- Karnataka is creating **India's first toy cluster in Koppal district**, designed with a view of housing an inclusive ecosystem of ancillary suppliers and industrial and social infrastructure.

With the numerous government initiatives, growing awareness around traditional toys and a countrywide push for local handicrafts, New India's traditional toy industry is at the cusp of unprecedented growth. The industry is witnessing rapid transformation through a plethora of

technological innovations and is likely to become a major contributor to the economy in the coming years.

E. Warlis: Life around Nature

Warlis are an aboriginal tribe living in the foothills of the Sahyadri mountain range of Maharashtra.The Warlis are mainly found in Thane, Palghar, Mokhada, Talasari, Vikramgad, Vada, Jawahar, Dahanu, Cosbad, Nashik and Dhule districts in Maharashtra; Valsad district in Gujarat; and the Union Territories of Dadra and Nagar Haveli and Daman and Diu.
Warlis speak an unwritten Warli language. Their main occupation is agriculture and allied activates. They cultivate, gather and grow a single crop for subsistence and also gather forest produce in the form of fruits and herbs. Farming is their main occupation and also a way of life for them. Warlis' life revolves around forest and forest products. They remain highly dependent on nature and natural products.

Warlis worship nature and believe in peaceful and sustainable co-existence with nature.

- The Warlis worship the earth and refer to it as the mother goddess.
- They are well known to have a faith in Tiger God (Vaghai). They acknowledge Waghoba and worship its role in balancing the food chain. They consider the tiger as a symbol of life and regeneration. They do not have well-built temples but have carved wooden statues of tigers for worship.
- The Warlis' daily social settings show a close relationship with nature which is reflected in their art, communicated through their paintings, on the wall in the form of stories and happenings of their daily life.

Warli painting:

The most crucial form of art of the Warli's is the Warli painting. There are no records of the exact origin of this art but its roots can be traced to the early 10th century AD.

- They use fine powder of Geru known as lal mati and mix it with water to form liquid colour to prepare the mud-plastered walls. They use the muddy walls as their canvas.
- Bamboo sticks are crushed at the end to form a brush.
- The Warlis use only white colour for their paintings. The white colours are made using a mixture of rice dough and natural glues which are obtained from trees.

Features:

- In Warli paintings, usage of basic geometric shapes like triangles, circles, squares and lines are used to add effect and beauty.
- All these shapes are influenced by nature.
    - The triangle often symbolizes hills and pointed trees.
    - The circles symbolize the sun and the moon god.
    - The squares symbolize chowks. Inside the chowk, they paint their mother goddess, Palghata, symbolizing fertility.
    - 'LagnachaChauk', meaning marriage paintings, are sacred and without them, marriage cannot take place.
    - Warli paintings, which were first made by women to communicate their daily social life situations, are now even done by men.
    - Warli painting is now a new source of income for the Warli community.

- **Mysore painting:** These paintings are known for their elegance, muted colours and attention to detail. The themes for most of these paintings are Hindu Gods and Goddesses and scenes from Hindu mythology.
- **Tanjore paintings:** A style of painting characterised by bold drawing, techniques of shading and the use of pure and brilliant colours flourished at Tanjore in South India during the late 18th and 19th centuries. These paintings like Mysore painting also focused on detailing. The style is decorative and is marked by the use of bright colours and ornamental details.
- **Hyderabad:** A miniature showing a princess in the company of maids is a typical example of the Hyderabad school of painting. Distinctive features of the Deccani paintings of the 18th and 19th centuries are observed in the treatment of the ethnic types, costumes, jewellery, flora, fauna, landscape and colours.
- **Karnataka Painting:** dates back to pre-historic era of 2000-1000 BC. These showed depictions of animals, human figures, etc. painted under projected rocks.
- **Hoysala paintings:** available in the painted palm leaf manuscripts. This painting was prevalent in Karnataka region.
- **Kerala mural paintings:** are the frescos depicting mythology and legends dislplayed on ancient temples, churches and palaces in Kerala. These paintings depicted themes based on gods and godesses in very detailed manner.
- **Madhubani Painting:** Also known as Godhna, Maithaili and Chaitra figure painting,deal with the Hindu deities, nature and social events of the time.
- **Kalamkari Painting:** This style of painting evolved in the Mughal rule and was patronized by the Golconda Sultanate. The subject of these paintings are narratives from Ramayana, Mahabharata and the Puranas.
- **Patachitra Painting:** Paata Paintings or patachitra, is a devotional art form worshipping Lord Jagannath, originating from indian state of Orissa. The themes are usually religious, mythological, and folklore. Needless to say, most of the motifs are centred around tales from the Krishna Leela and Lord Jagannath.
- **Warli Art:** The central motive of each painting is a square in which resides the Goddess of fertility, Palaghata.

Performing Art	State
Ras, Rasiya Geet, Nautanki, Birha, Sohar, Hori, Dhobiya Dance, Alha, Ramleela	Uttar Pradesh
Pankhida, Lotia, Ghoomer, Kalbelia, Swang, Phad, Langa and Mangniyar, Khyal, laavni	Rajasthan
Pandvani, Baans Geet, Loriki, Nacha	Chhattisgarh/ Madhya Pradesh
Ramleela, Shakunakhar, Mangalgeet, Devgeet, Baramasa	Kumaon
Mando, Dasavatar	Goa

Chhakri, Bhand Pather, Rouf Dance, Bachnagama, Bhakha	Jammu and Kashmir
Laman	Himachal Pradesh
Tappa, Bhand Mirasi, Jugni, Dhad Sarangi, Algojha, Heer, Bhangra, Gidda, Shabad Kirtan	Punjab
Sang/Swang ragini	Haryana
Powada, Lavani, Tamasha, Dasavatar, Jhadipatti	Maharashtra
Burrakatha	Andhra Pradesh
Bhuta Song, Kuttiyattam, Kathakali, Mohiniattam, Mudiyattu, Chavittunatakam	Kerala
Daskathiya, Prahalad Natak, Bharat Leela, Ramleela, Daskathia, Chhau	Odisha
Bihu, Sattariya, Gayan Bayan, Tokri Geet, Jikir Zari, Ojhapali, Dhulia Circus, Mobile Theatre, Devdhani, Bhavona	Assam
Li Haroba, Manipuri Ras, Sumang Leela, Pung Cholam, Dhol Cholam, Moirang Parva	Manipur
Saikuti Zai, Bamboo Dance	Mizoram
Basant Geet, Ghasiyari Geet	Garhwal
Salhes Naach, Chandaini, Vidapat, Bhikari Thakur's Bidesia, Chaiti, Jat Jatin, baramasa, Poorvi, Hori, Jogida	Bihar
Villu Paatu, Ammanaivari	Tamil Nadu
Hojagiri	Tripura
Chhau	Jharkhand
Jhumur, Chand Biwir Pala Gaan, Baul, Chhau, Jatra	West Bengal
Bhavai, Garba, Dandiya	Gujarat

Connecting the dots

1. Enlightened water policy needs infrastructure. But more than that, it requires institutions with local and village ownership. Analyse.
2. To solve the growing water crisis, the solution that is proposed and pushed by world bodies such as WTO and IMF through international agreements is privatisation of water. Do you think India should also privatise its water? Critically analyse.
3. Many parts of the country are facing severe water crisis and drought conditions. There are many traditional water harvesting and conservation practices in various parts of India which can be employed locally to fight the ongoing crisis. Can you identify few such practices? Also mention the states where they are more prevalant.
4. How are lacunas in Solid waste management responsible for underground water pollution? What are ill effects of underground water pollution?
5. Water should be transferred to concurrent list. Critically Analyse.

Essay Topics:

1. No culture can live if it attempts to be exclusive.
2. Art enables us to find ourselves and lose ourselves at the same time.
3. The true India resides in its villages.

All the best ☺
Team IASbaba