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Jatin Verma's IAS Academy

KURUKSHERTA - DRINKING WATER FOR RURAL INDIA

The idea of population health or public health is said to have born in Rome with the development of bath (for hygiene), sewers (drainage), and aqueducts (to supply safe water to cities). Romans brought pure water to all their cities through aqueducts, drained marshes to combat malaria and built sewerage systems.

The basic physiological requirement for drinking water has been estimated at 2 liters per person per day. For urban settings, the water availability of 150-200 liters per person is considered adequate to meet all domestic purposes. In rural India, a norm of 40 liter per person per day is a set target.

- The **Millennium Development Goals (MDGs)**, 2000-2015, had the target of reducing the proportion of the worlds population without sustainable access to safe water (MDG 7).
- In 2010, the **UN General Assembly (UNGA)** explicitly recognized the **human right to water and sanitation**.
- In 2015, WHO & UNICEF jointly developed **WASH FIT** (water and sanitation for health facility improvement tool). It aims to guide small, primary health care facilities in low and middle income countries through a continuous cycle of improvement.
- Clean water and sanitation is the **6th goal of SDGs**. It is targeted to achieve the following global goals by 2030:
 - ✓ **Universal and equitable access** to safe and affordable drinking water for all
 - ✓ Access to adequate and equitable sanitation and hygiene for all and end open defecation, **paying special attention to the needs of women and girls** and those in vulnerable situations
 - ✓ **Improving water quality by reducing pollution**, eliminating dumping and minimizing the release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially **increasing recycling and safe reuse** globally.

Global Facts: Related to Water

- According to the reports published by UN, **2.1 billion people live without safe drinking water** at home and 80% of those who have to use unsafe and unprotected water sources, **reside in rural areas**.
- Contaminated water and poor sanitation are linked to **transmission of diseases** such as Cholera, Diarrhoea, Dysentery, Hepatitis A, Hepatitis E, Typhoid and Polio.
- Diarrhoea is the most widely known disease linked to contaminated food and water. Globally, an estimated 8,42,000 people die each year due to diarrhea as a result of unsafe drinking water, sanitation and hand hygiene.

- Nearly, 2/3rd of the **world's population experiences severe water scarcity** at least for 31 days per year. The intense impact of water scarcity could displace 700 million people by 2030.
 - In 8 out of 10 households, women and girls are responsible for water collection.
 - Water **consumption of the world is doubling** every 20 years, which is more than twice the rate of increase of our population.
 - The majority of the reduction in the world's water tables, large rivers that run dry and increasingly saline groundwater is caused by **Agriculture**.

India Facts: Related to Water

- India is among the **world's most water stressed countries**. In 1950, India had 3000-4000 cubic meters of water per person. Today this has fallen to around 1000 cubic meters, largely due to population growth.
- According to NSSO, about 88.5% households in rural India had improved source of drinking water and among these 85% had sufficient drinking water.
- In our country ground water is the major source of water and around 85% of the population is dependent on it. Remaining 15% of the rural water supply comes from surface water sources.

Rural Drinking Water Infrastructure

Fully Covered	80.9%
Partially Covered	15.59%
Drinking Water Quality Affected	3.5%
Piped Water Supply Schemes	44.84%

Challenges

Water Quality Issues

The erstwhile Planning Commission had found that between 1995-2004, the proportion of unsafe districts (semi-critical, critical, and over-exploited), the proportion of areas affected and population affected had grown from 9 % to 31%, from 5% to 33% and from 7% to 35% respectively.

As many as 4 crore rural population are suffering from water contamination that varies from fluoride, arsenic, iron, salinity, nitrate, heavy metals etc.

Factors leading to the deterioration of water quality in rural areas;

- Over-Extraction by agriculture and Industry sectors

- Uncontrolled construction activities
- Siltation of rural water bodies
- Erratic rainfall and droughts
- Incessant and increased use of pesticides, fertilizers and industrial effluents

Other Challenges

- **Equity** – Unequal spatial distribution. For example, Brahmaputra and barak basin with only 7.3% of the geographical area have 31% of the annual water resources.
- **Disparities** – Sharp socio-cultural and economic inequalities persist, not only between rural and urban areas but also in towns and cities.
- **Access** - According to the Britain based charity WaterAid, nearly 163 million of India's population lack access to clean water close to home.
- **Demand Pressure**– According to a report submitted by CWC, if current pattern of demand continues about half of the demand for water will be unmet by 2030.
- **Climate Change** – Extreme rates of rainfall and evapotranspiration will intensify the impacts of floods and droughts.
- **Over-Exploitation** – 60% of our districts face ground water over-exploitation and with 251 (cu km) annual groundwater extraction rate, our country is the world's biggest consumer of groundwater.

Prevalent Technologies for Water Purification & Treatment

- **Capacitive Deionization (CDI)** – In this, a separator channel (with a porous electrode on each side) removes ions from water.
- **Ozonation Technique** – It is based on the ozone infusion into the water for chemical water treatment
- **Ultraviolet Technology** – It is used to kill micro-organisms of water.
- **Reverse Osmosis** – Majority of contaminants are removed through a semi-permeable membrane.
- **TERAFIL** – It is a burnt red clay porous media used for filtration & treatment of raw water into clean drinking water. (Developed by CSIR)
- **OS-Community scale arsenic filter** – It is an organic arsenic filter which is developed by the IIT Kharagpur.
- **Solar Water Purification Systems.**

Government Initiatives: Water Governance in India

Article 47 – In India, the provision of clean drinking water has been given priority in the constitution with article 47 conferring the duty of providing clean drinking water and improving public health standards to the state.

Supply of potable and drinking water has been a top priority of central and state governments. Rural water supply is a **state subject** in India.

- In 1946, **Bhore Committee** advocated for the provision of safe water to cover 90% of India's population within a timeframe of 40 years.
- The **first ever formal schematic intervention** was initiated with the implementation of the **Accelerated Rural Water Supply Programme (ARWSP)** during 1972-73, it was aimed at speeding coverage of drinking water supply.
- ARWSP's approach got modified by the introduction of the National Drinking Water Mission in 1986.
- The first ever **National Water Policy** was drafted in 1987 to give a concrete direction to the approach adopted to create sustainable water infrastructure.
- In 1991, **Rajiv Gandhi National Drinking Water Mission** replaced NDWM.
- **Swajal Dhara Scheme** was implemented to fulfill the MDGs commitment on sustainable access to safe drinking water. It accorded priority to serving villages which did not have an adequate source of water.
- In 1994, the **73rd constitutional amendment** incorporated specific provisions of entrusting the responsibility of drinking water supply to PRIs.
- The period 2005-12, witnessed **Bharat Nirman Programme** during which **National Rural Drinking Water Programme (NRDWP)** was launched in 2009, to cover all rural habitations with safe drinking water.
- A strategic plan for the rural drinking water sector has been prepared for 2011-2022. It aims to extend the piped water supply to more households in the rural areas.
- From 2016, NRDWP was transformed into an **outcome oriented schematic intervention** to ensure adequate potable water availability without undermining the importance of **convenience, affordability and equity** in distributing drinking water in rural areas.
- The central government aims to cover 90% rural households with piped water supply and 80% rural households with tap connections by 2022.
- In 2017, MDWS started a new sub-programme under NRDWP known as the **National Water Quality Sub-Mission (NWQSM)** to address the urgent need for providing clean drinking water in already identified 28,000 arsenic and fluoride affected habitations.
- A pilot project in the name of '**Swajal**' as a demand driven and community centered programme was launched in 2018 to provide sustainable access to drinking water to people in the rural areas.



- Government has also come up with a 6,000 crore world bank aided **Atal Bhujal Yojana** with community participation to ensure sustained groundwater management in overexploited and ground water stressed areas in seven states.
- **Integrated management information system** – To monitor the coverage status of rural habitations and population with potable drinking water.
- In a renewed focus, the thrust area is piped water supply, preferably through a **balanced mix of sustainable surface and groundwater based resources**.

Central Water Commission (CWC)	<ul style="list-style-type: none"> • It regulates the use of water to irrigate surface waters, the industry and potable water. • It also mediates in disputes related to the inter-state water allocation.
Central Groundwater Board (CGWB)	<ul style="list-style-type: none"> • It monitors ground water levels and rates of depletion and the production of water resource inventories and maps.
National River Conservation Directorate (NCRD)	<ul style="list-style-type: none"> • It oversees implementation of Action Plans to improve the quality of the rivers in india.
Central Pollution Control Board (CPCB)	<ul style="list-style-type: none"> • It promotes basin wide pollution control strategies. • It liaises with the state water pollution boards for laying down the standards for the treatment of sewage and effluents. • It is also responsible for action in the case of non-compliance by agencies.
Ministry of Drinking Water and Sanitation (MDWS)	<ul style="list-style-type: none"> • It is the nodal ministry for the overall policy, planning, funding and co-ordination of the NRDWP.
Ministry of Agriculture (MoA)	<ul style="list-style-type: none"> • It deals with planning, formulation, monitoring and reviewing of various watersheds based developmental project activities.
Central Bureau of Health Intelligence (CBHI)	<ul style="list-style-type: none"> • It performs collection, compilation, analysis and dissemination of the information on health conditions in the country
Bureau of Indian Standards (BIS)	<ul style="list-style-type: none"> • It is responsible for the drafting of standards pertaining to drinking water quality.

Role of Community

The effective implementation of these schemes demands active engagement of community through PRIs, SHGs and Co-operatives in rural areas.



Case Study

Gujarat Government in 2001 created **WASMO** (Water and Sanitation Management Organisation), an autonomous entity to facilitate community managed drinking water facilities in rural areas of Gujarat. It adopted a **demand-driven community led cost sharing service approach** with a thrust on capacity building.

It focused on bulk transfer of water from water surplus south Gujarat to water deficient north Gujarat. It also involved community in recharging both traditional and other existing water structures by utilizing both local and modern technical knowledge.

It was bestowed the 2010 Commonwealth CAPAM International Award for relentless work to ensure sustainable safe drinking water.

Government need to provide timely and adequate technical and financial support and an enabling environment for PRIs and local communities like SHGs and cooperatives to manage and monitor rural drinking water sources and systems at local level to achieve the objective of 'Har Ghar Jal'.

Way-Forward

Traditional Water Harvesting (TWH) Structures

TWH structures catered to the local needs, utilized local resources and were based on the wisdom and knowledge handed down from generation to generation. Some of the TWH structures in Rajasthan are; Kundi, Kui/Beri, Baori, Jhalara, Nadi, Toba, Tanka etc.

Reasons for the dysfunctional state of TRH structures:

- Availability of other sources of water.
- Requirement of financial resources for their use and maintenance
- Requirement of time and labour
- Lack of ownership and participation
- Tendency to disregard age old and time tested lifestyle

Revival Strategies

- NGO, Tarun Bharat Sangh (TBS) has been working on the revival of johads since 1986. It has revived five river systems. It relied on community participation and involved religious leaders.
- NGO, Jal Bhagirathi Foundation (JBF) has been working in the area of water security for the Marwar region. It promotes revival of TWH structures by using inexpensive, simple and traditional technology.
- Under CSR, some corporates have also been involved in supporting the revival of

TWH structures. For example, in 2015, Vedanta Cairn was involved in cleaning and maintaining the Bhap Nadi in Barmer. Lupin was involved in construction of check dams and anicuts in Bharatpur.

- Educational and research institutions have also been involved in working for popularizing revival of TRH structures.

The success stories on the revival of Traditional Rainwater Harvesting Structures available from different parts of the state indicate such efforts are a viable and cost effective option for mitigating drought and for meeting water needs.

- **Better Data** – Develop better data on water quality and quantity, and a robust hydrological information system for developing precise information about the resource availability and planning.
- **Shift in approach** is required to ‘area-specific development interventions’ from universalization of schemes.
- **Independent Mapping** – To identify localities within the community itself with greater developmental issues relating to supply of safe drinking water.
- **Basin/Sub-basin level water management** – Several basins are interstate, thus it would require riparian states to come to a consensus, which is a complex & time taking process.
- **Water Source Improvement** – Ground water quantity and quality is degrading at an unprecedented rate which needs an immediate response.
- **Integrated Water & Waste Management** – Waste water and waste are the major causes of water contamination in rural areas with high negative health impacts.
- **Supply and Access Augmentation** – On supply side, wastewater reuse and recycling and rain water harvesting should be encouraged. On the access front households and farms with poor access to water should be targeted on priority.
- **Decentralised Systems** – Decentralised solutions for topographies which are difficult to be connected to centralized systems needs to be promoted in a big way to complement the existing water infrastructure.
- **Demand Side Management** – Increased adoption of water efficient practices and agro-ecology based crop selection in the agriculture sector as the groundwater sources are finite.
- **Capacity Building** – Of institutions involved in water resources management to trigger more interactions.
- **Institutional and Legislative reforms** – Water is segregated amongst so many insitutions that accountability is difficult to be defined. There is no umbrella agency that controls the governance of the water sector.
- **Revival of Traditional Wisdom** – It is essential to recognize, acknowledge and document traditional practices and customs. Community needs to be made the guardian of water resources in their locality. For example, Beris (Shallow wells) in Rajasthan.

- **Preparedness for Disasters** – Rural areas are vulnerable to both floods and droughts. Drinking water is heavily affected during extreme events thus people must be made aware of actions to be taken for restoring drinking water.
- **Implementation** - In order to arrest the problems of arsenic and fluoride contamination in drinking water, NITI Aayog had recommended commissioning of community water purification plants and advocated for last mile connectivity of piped water supply schemes.
- **Empowerment of PRIs** with more resources is a viable and sustainable option for scaling up the decentralized service delivery model.
- **Finding Nature based solutions** - In 2001, Tamil Nadu government made it compulsory for each household to have rainwater harvesting infrastructure and the results are now reflected in the improvement of overall water quality within 5 years. A similar experiment has been tried out in the cities of Bangalore and Pune, where housing societies are required to harvest rainwater.

YOGA

Yoga is essentially a spiritual discipline based on an extremely subtle science which focuses on bringing harmony between mind and body.

The literal meaning of the Sanskrit word yoga/yuj is ‘Yoke’ which is **joining of individual’s soul energy with that of God’s (supreme soul)**.

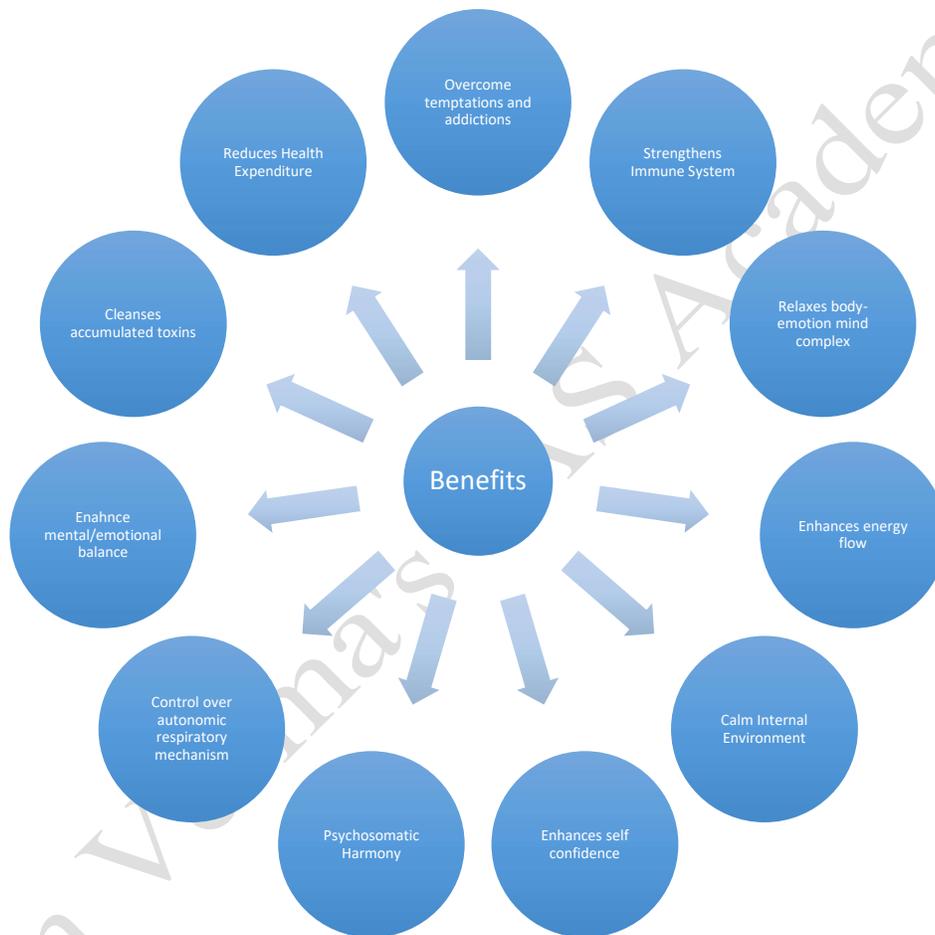
Goals

- To overcome all kinds of sufferings that lead to a sense of freedom in every walk of life with holistic health, happiness and harmony. To look inward to nurture spirit and stay healthy.
- Living life ethically based on certain rules of eating, sleeping and performing duties without fear and attachments.
- Yoga is universal with no relation with caste, sex, religion, region, etc.

Brief History & Development of Yoga

- **Adiyogi Lord Shiva** is regarded as the father of yoga who transmitted knowledge about mechanism of human system to the saptishis and saints.
- **Agastya**, the saptishis, travelled across the India sub-continent, crafted this culture around a core yogic way of life.
- **Maharishi Patanjali**, father of modern yoga, systematized and codified the then existing yogic practices, its meaning and its related knowledge through Patanjali Yoga Sutras.
- Yoga is widely considered as an ‘**immortal culture** outcome’ of the Indus Valley Civilization dating back to 2700 BC and has proven itself to cater both material and spiritual uplift of humanity.
- A number of seals and fossil remains of Indus Valley Civilization with Yogic motifs and figures performing yoga sadhana suggest the presence of yoga in ancient India.

- The presence of Yoga is also available in folk traditions, vedic and upanishadic heritage, Buddhists and Jain traditions, Darshanas, epics of Mahabharata including Bhagwadgita and Ramanyana, theistic traditions of Shaivas, Vaishnavas and Tantric Traditions.
- Before the industrial revolution, fitness was defined as the capacity to carry out the day's activities without undue fatigue.
- World Parliament of Religions in Chicago in 1893, Swami Vivekananda introduced Yoga to the USA.



Limited Success;

- Few educational institutions have promoted this as daily activity.
- People indulge in yoga only when they suffer some ailments.
- Limited set of people are doing it from childhood in schools or as part of family traditions.
- Actual benefits at the deeper levels in form of attaining peace and everlasting happiness remain largely untouched.

The increasing use of alternative medicine not only in developing nations but also in industrialized and presumable advanced western nations presents itself as something of an enigma. Yoga is proving to be the most desirable complimentary and traditional system of health care in the present scenario.

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