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GIST OF KURUKSHETRA

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Shankar IAS Academy™

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1. ENSURING SAFE AND ADEQUATE DRINKING WATER

What is the status of water availability in the rural areas?

- India is among the world's most water-stressed countries. In 1950, India had 3,000-4,000 cubic meters of water per person.
- Today, this has fallen to around 1,000 cubic meters, largely due to population growth.
- Half of India's annual precipitation falls in just 15 rain-soaked days, making floods and droughts a fact of life in the country.
- Rural India has more than 700 million people residing in about 1.42 million habitations spread over diverse ecological regions.
- According to the National Sample Survey Office (NSSO) (2011-12), about 88.5 percent households in rural India had improved source of drinking water and among these, 85.8 percent had sufficient drinking water.
- Further, 46.1 per cent of the rural households do not have drinking water facilities within their premises.
- A person in rural India has to spend, on an average, 20 minutes to fetch drinking water.

What are the Government initiatives in this regard?

- Constant efforts have been made in this direction starting from the Bhore Committee in 1946 to Accelerated Rural Water Supply programme (1972), and 'Swajal Dhara' scheme (1999) by empowering and involving local communities in tackling water and sanitation issues.
- In 1981, Government of India launched the International Water Supply and Sanitation Decade (81-90) programme with one of the targets being 100 per cent coverage of rural and urban population with safe drinking water supply facilities.
- To supplement this effort, Technology Mission for drinking water was set up in 1986 which was renamed as Rajiv Gandhi National Drinking Water Mission in 1991.
- Again in 1999, the Department of Drinking Water Supply was created in the Ministry of Rural Development.
- Then came 'Bharat Nirman', a flagship programme of the Central Government which created the required infrastructure to have good quality water to rural households.
- Now, the task of providing safe drinking water in rural areas is through the National Rural Drinking Water

Programme (NRDWP) which aims at assisting States in providing adequate and safe drinking water to the rural population in the country.

- A pilot project in the name of "swajal" that is designed as a demand driven and community centred programme to provide sustainable access to drinking water to people in the rural areas.
- The Central 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.
- In March 2017, MDWS started a new sub- programme under NRDWP known as the National Water Quality Sub-Mission, aims to address the urgent need for providing clean drinking water in already identified 28,000 arsenic and fluoride affected habitations.

What are the challenges?

- According to a recent report by the Britain based charity WaterAid, nearly 163 million of India's population lack access to clean water close to home.
- As per the report submitted by the Committee on Restructuring the Central Water Commission (CWC) and the Central Ground Water Board (CGWB), 2016 if the current pattern of demand

continues, about half of the demand for water will be unmet by 2030.

- In addition, climate change poses fresh challenges as more extreme rates of rainfall and evapotranspiration intensify the impacts of floods and droughts.
- Moreover, 60 per cent of our districts face groundwater over-exploitation and with 251 cubic kilometer (cu km) annual groundwater extraction rate, our country is the world's biggest consumer of groundwater.

2. COMMUNITY PARTICIPATION AND QUALITY DRINKING WATER SUPPLY

What are the reasons for the deteriorating of water quality in the rural areas?

- Rapid depletion of groundwater level due to over extraction by Agriculture and industry sectors.
- Uncontrolled construction activities in rural areas and encroachment of the erstwhile water bodies.
- Siltation of rural water bodies and reduction of water bodies.
- Erratic rainfall and droughts or drought like conditions.
- Water pollution due to incessant and increased use of pesticides, fertilizers and effluents coming from the industry.

What are the steps should be taken by community to achieve water security?

- Social mobilization, initiation of need analysis, preparation of water security plan & village action plan.
- Discuss & deliberate on sustainability of drinking water schemes, explore new revenue sources like user fees, operation & maintenance fees, etc. for smooth operation & maintenance of water systems.
- Prepare water safety plan to ensure water quality.
- Ensure convergence with line departments of district to plan & execute water conservation projects under PMKSY, MGNREGA, etc to ensure water recharge & increased water availability in rural areas.
- Technical support cells in consultation with District / block administration to ensure convergence in community & near project areas.
- Coordinate with District / block level authorities for promoting timely execution of water projects & fund utilization towards improving household water connections, operation & maintenance of piped water scheme activities & other water supply systems.
- Coordinate with District / block level authorities for adopting technologies & digital medium for monitoring of water schemes.

- Arranging social audit of water schemes from time to time in consultation with district line department officials.
- Arrange training & capacity building programmes on water collection, storage & usage for grass root workers like ASHA workers, Anganwadi workers, science teachers, high school girl children, panchayat members, retired army officials, etc.,
- Conduct periodic sanitary survey.
- Monitor water availability water sources & quality of water & arrange awareness camps.
- Ensure availability of water testing kit for each Gram Panchayat & regular testing of water in accredited labs.
- Training a few educated community volunteers on monitoring parameters of water system installed in locality & disseminate in community for better monitoring of schematic interventions.

3. WATER SECURITY AND SUSTAINED DRINKING WATER SUPPLY

What is National Rural Drinking Water Programme (NRDWP)?

- It is a Centrally Sponsored Scheme, launched in April 2009 aimed at providing every person in rural India with adequate safe water for drinking, cooking

- and other domestic basic needs on a sustainable basis.
- As per the Integrated Management Information System (Ministry of Drinking Water and Sanitation), more than 80 per cent of the rural habitations have reached Fully Covered status that means they are receiving 40 liters per capita per day.
 - Whereas, around 15 percent of the habitations are Partially Covered and 3.5 per cent habitations have some water quality related issues.
 - This data is dynamic as it has been found in the past that many of the fully covered habitations have returned to partially covered status.
 - Thus, providing infrastructure support alone is not enough for sustained rural water management.

What are the basic water treatment technologies available?

- Slow sand filters (SSF)** - SSF is one of the most recommended methods of water treatment for rural areas.
- If designed properly, it purifies the water efficiently by reducing turbidity and bacterial contamination and it does not require highly skilled labor for operation and maintenance.
- Chlorination** - Disinfection using chlorine has been a common practice in various water supply systems.

- Being a strong oxidant, chlorine is used to remove taste and odour, as well as biological contamination.
- It can be used for community water supply system as well as at the individual household level.
- Solar Disinfection (SODIS)** - The SODIS method utilizes solar energy for water disinfection at the household level.
- A clean and transparent PET plastic bottle (preferably below 2 liters) is filled with water and kept in direct sunlight for 6 hours during noon on sunny days and two days if the sky is more than 50 per cent clouded.
- As reported, it removes 99.9 per cent of micro-organisms.

What are the policy reforms needed for rural water management?

- Better data:** The first and foremost step is to develop better data, on water quality and quantity, and a robust hydrological information system for developing precise information about the resource availability and planning accordingly.
- Basin / Sub-basin level water management :** As advocated by experts and also being realized by the people working on the ground, integrated water resources management is only possible at a larger scale as the resources supply and use are interconnected.

- Therefore, water management at the sub-basin level should be initiated.
- **Water source improvement:** Currently, as per a CPCB report 2018, 35L river stretches on 275 rivers across the country have got polluted due to the discharge of both municipal and industrial waste water over the years.
- Also, the ground water quantity and quality is degrading at an unprecedented rate which needs an immediate response.
- **Integrated water and waste management:** Open defecation, domestic solid waste, wastewater and waste from cattle are the major cause of water contamination in rural areas and it has high negative health impacts as well.
- **Supply and access augmentation:** On the supply side, wastewater reuse and recycling and rain water harvesting should be encouraged across the country without further delay.
- **Demand side management:** The Government will have to come up with innovative policies, incentives and subsidies, for increased adoption of water efficient practices and agro-ecology based crop selection in the agriculture sector as the groundwater sources are finite.
- **Capacity building:** Capacity building of institutions involved in water resources management would encourage informed decisions.
- It would also trigger more interactions between such institutions, which are currently not so frequent.
- **Institutional and legislative reforms:** Water is segregated amongst so many institutions that accountability is difficult to be defined.
- We would definitely need such bodies as well as better legislation for controlling ground water extraction and pollution.
- **Preparedness for disasters:** Rural areas are vulnerable to both floods and droughts thus preparation of integrated plans for extreme climatic should be done.
- Drinking water is heavily affected during such extreme events, thus people should be made aware of actions to be taken for restoring drinking water sources.

4. ACCESS TO DRINKING WATER AND PUBLIC HEALTH

How water is connected to health?

- Safe and readily available water is important for public health.
- The basic physiological requirement for drinking water has been estimated at 2 liters per person per day.
- This is minimum for survival and consumption of water (for drinking and otherwise) depends upon lifestyle, climate condition and habits.

- Contaminated water and poor sanitation are linked to transmission of diseases such as Cholera, Diarrhea, Dysentery, Hepatitis A, Hepatitis E, Typhoid, and Polio.
- In addition to these water transmitted diseases, there are water-borne, water-related and water-washed diseases.
- Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks.

Why water borne diseases are considered as public health problems?

- Their potential to cause large outbreaks.
- High disease burden.
- For being major causes of admissions and outpatient visits to the hospitals and health facilities mainly amongst young children.
- For many water borne diseases, no specific treatment is available and prevention is the best approach.
- These diseases spread rapidly and may cause panic in the community.

What is the GOI intervention in providing Drinking water in rural India?

- Rural drinking water supply is a state subject in India.
- The Ministry of Drinking water and Sanitation (MoDWS) under the centrally sponsored National Rural Drinking water Programme (NRDWP) provides financial

and technical assistance to State Government.

- The NRDWP aims at providing every person in rural India with adequate safe water for drinking, cooking and other domestic basic needs on sustainable basis.
- A strategic Plan for the rural drinking water sector has been prepared for the period 2011 - 2022, by the Government of India.
- The plan aims to extend the piped water supply to more households in the rural areas.
- The interim goal till 2017 was to cover 50% of all rural households with piped water supply which reportedly has been achieved.
- By 2022, the goal is to cover 90% rural households.
- A National Water Quality Sub-Mission was launched by the MoDWS, in March 2017, to address the problem of Arsenic & Fluoride affected habitations in the country and mitigate concerns.

What are the social and economical effects of water security?

- Improved water supply and sanitation, and better management of water resources, can boost countries' economic growth and can contribute greatly to poverty reduction.

- When water comes from improved and more accessible sources, people spend less time and effort in physically collecting it, meaning they can be productive in other ways.
- Better water sources also mean less expenditure on health, as people are less likely to fall ill and incur medical costs, and are better able to remain economically productive.
- Water, sanitation & Hygiene are interlinked, and the availability of safe drinking water is very much linked to the overall availability of water (for domestic use and otherwise) which in turn affects the overall health of people.
- With children particularly at risk from water-related diseases, access to improved sources of water can result in better health, and therefore better school attendance, with positive longer-term consequences for their lives.
- This is not only a good return on investment but will result in a healthier and economically productive population with reduced healthcare cost.
- Ensuring drinking water availability and improving sanitation is a development issue and agenda, which will contribute to economic growth and achievement of many other Sustainable Development Goals in India and globally.

5. WORLD ENVIRONMENT DAY

What are the clean air measures to be adopted for curbing the air pollution?

- **Strengthen emission standards for road vehicles :** Strengthen all vehicle emissions standards with a special focus on regulation of light and heavy duty diesel vehicles.
- This will require collaboration between environmental agencies, transport agencies, oil companies and vehicle manufacturers, among others.
- **Regularly maintain and inspect vehicles :** Introduce legislation and enforcement of regular mandatory emission checks and maintenance.
- Centralize inspection and maintenance systems and establish self-funding mechanisms for regular audits at test centers.
- **Mainstream electric vehicles :** Develop fiscal and non-fiscal policies to promote electric mobility.
- Invest in required infrastructure to encourage quicker uptake of electric vehicles.
- **Provide better mobility options :** Improve public transport system to encourage shift from private passenger vehicles to public transport and integrate with sustainable urban planning.
- Invest in walking and cycling infrastructure (sidewalk and bike-paths,

- sufficient lighting, bike sharing options, etc.).
- **Control dust from construction and roads :** Suppress construction and road dust through dust control measures including road washing and cleaning, road paving, water spraying, installation of barrier protection, avoiding dust-generating work during windy days, etc.
- Increase green spaces and areas especially in cities like public parks, gardens, etc.
- **Reduce emissions from international shipping :** Require low - sulphur fuels and control of particulate emissions.
- Collaborate with the International Maritime Organization to widen the ratification and implementation of International Convention for the Prevention of pollution from Ships.
- **Improve post-combustion control :** Introduce state-of-the-art end-of-pipe measures to reduce sulphur dioxide, nitrogen oxides and particulate emissions at power stations and in large-scale industry.
- Examples include flue gas desulphurization for sulphur dioxide, selective catalytic reduction for nitrogen oxides, and high efficiency particulate matter controls like fabric filters, multistage electrostatic precipitators.
- **Strengthen industrial process emissions standards :** Introduce advanced emissions standards in industries, e.g., iron and steel, cement, glass production, chemicals, etc.
- Strengthen production, performance and emission standards to control end-of-pipe emissions and fugitive emissions.
- **Introduce efficient brick kilns technology :** Improve efficiency and introduce emissions standards to stimulate shift to more efficient brick kiln technologies (such as zig-zag, vertical shaft brick kiln or tunnel kilns).
- This requires collaboration among kiln owners, technical experts, and government to demonstrate benefits of cleaner kiln technology.
- **Control methane from oil and gas production :** Encourage recovery of oil production and associated petroleum gas.
- Stop routine flaring and either utilize or convert to liquids that can be sold at higher value.
- **Improve solvent use and refinery controls :** Introduce low-solvent paints for industrial and do-it yourself applications.
- Establish leak detection and repair programs at refineries. Install double seal systems, vapour recovery unit, fixed covers and monitoring at refineries and fuel depots.

- **Use environmentally-friendly refrigerants :** a. Ensure full compliance with Kigali Amendment to phase-down hydrofluorocarbons which are commonly used in air conditioning, refrigeration and a host of industrial products.
- Establish regulations to support shift to low- global warming potential cooling agents.
- **Strictly enforce bans on household waste burning :** Strictly enforce bans on open burning of household waste.
- Burning ban needs to be complemented with comprehensive solid waste management plan including proper waste collection system, recycling, waste treatment, and awareness raising.
- **Provide incentives for improved energy efficiency in households :** Provide incentives to improve energy efficiency of household appliances, buildings, lighting, heating and cooling.
- Encourage rooftop solar installations.
- **Increase renewable electricity generation :** Establish renewable energy targets and supporting policies to achieve target.
- Leverage public pressure to switch from fossil fuels to renewables.
- **Improve energy efficiency for industry :** Introduce ambitious energy efficiency standards for industry.
- Include energy efficiency targets for industry in national development plans.
- **Recover coal mining gas :** Encourage pre-mining recovery of coal mine methane gas.
- Provide fiscal incentives, well-defined gas property rights and unsubsidized free gas market.
- **Improve livestock manure management :** Introduce covered storage (floating or permanent covers) and efficient application of manure (when plants need fertilizers, rapidly incorporate manure in soil or as narrow bands in canopy or grassland).
- Consider low emission options for new animal housing: regular floor scraping, air ventilation cleaning, closed storage tanks.
- **Strengthen management of nitrogen fertilizer application :** Establish efficient nitrogen fertilizer application (right timing and amount). Substitute urea and ammonium bicarbonate with e.g. ammonium nitrate fertilizer.
- Promote alternative formulations, e.g., neem coated urea, or use of urease inhibitors, where available and affordable.
- **Prevent forest and peatland fires :** Improve and enforce forest land and water management and fire prevention strategies.

- This includes fire spread protection zones, fire alarm and brigade system, prohibit access to forests during droughts, and ban on land clearing.
- **Promote more efficient rice production practices :** Encourage intermittent aeration of continuously flooded rice paddies (e.g. alternative wetting and , drying - practice of allowing the water table to drop below the soil surface at one or multiple points during a growing season).
- **Stop biogas leakage from wastewater treatment :** Introduce well-managed two-stage treatment with biogas recovery.
- Promote decentralized wastewater treatment units.
- **Improve solid waste management :** Encourage centralized waste collection with source , separation and treatment, including gas utilization.

6. RURAL DRINKING WATER SUPPLY INFRASTRUCTURE : MONITORING, OPERATION AND MAINTENANCE

What is the scheme Swajal?

- Ministry of Drinking Water and Sanitation aims to provide every rural person with adequate safe water for drinking, cooking and other domestic basic needs on a sustainable basis.
- This basic requirement should meet minimum water quality standards and be

readily and conveniently accessible at all times and in all situations.

- Ministry has initiated a pilot project in the name of “Swajal” that is designed as a demand driven and community centered program to provide sustainable access to drinking water to people in rural areas.
- Community – led drinking water projects to be called ‘Swajal’ aiming at providing sustainable and adequate drinking water in an integrated manner to the rural masses on pilot basis.
- It is envisaged that the State government in partnership with rural communities; shall plan, design, construct, operate and maintain their water supply and sanitation schemes; so that they get potable water and attain health and hygiene benefits.
- The state Government and its sector institutions shall act as supporter, facilitator and co-financier and as per need shall provide technical assistance, training and cater for bigger construction works and sectoral contingencies.
- In first phase, it is proposed to select pilot project district in six States, viz., Uttar Pradesh, Maharashtra, Uttarakhand, Madhya Pradesh, Rajasthan & Bihar under NRDWP.
- This will be implemented through convergence of other programmes like MGNREGS, PMKSY, RRR etc.

- The districts are to be identified by the States to start the project formulation in fast track mode.

What is Integrated Management Information System (IMIS) on drinking water?

- It is an integrated information management system on drinking water of all states. the information is regularly updated by each state on the water quality of various water sources, number of schools and habitats having access to drinking water in rural areas.

What are its salient features?

- Provides near to real time coverage status of a particular habitation available with water supply assets created within that habitation & their functionality status thereby promoting transparency.
- Allows viewing of quality status of a source to find out if safe potable water is available in a particular habitation.
- Facilitates monitoring of covered habitations which have slipped back to uncovered status again.
- Helps in elimination of repeated investments in some habitations while other uncovered /difficult habitations remain deprived.
- Achieves high transparency thru user friendly reports available in public domain. Creates interaction between Govt. & PRIs as both can monitor

community based programs & status of water supply assets handed over to PRIs.

- SMS & email automation is used to generate daily basis SMS alerts & sent to Ministry officials for monitoring of daily MPR reported, expenditure habitation covered etc.

What is the role of Gram Panchayat in Operation and Maintenance of Infrastructure of Drinking water supply?

- Village Panchayat / GP would pass a resolution for taking up maintaining works in distribution system of multi village WSS which is under their maintenance.
- Works may be such as attending leaks & burst changing gate value, extension of pipe, replacement of old pipeline etc.
- GP may pass necessary resolution for executing above works utilizing Panchayat funds.
- GP would maintain their single village water supply sachems & attend repair works in components such as pump sets pipeline etc. and collect water charges as fixed by respective state Govt.
- GP may provide household tap connections after passing GP resolution & after obtaining concurrence of PHED /Boards / PRIs Engineer.
- GP incur expenditure on water supply maintenance work as per finance limit as fixed by State Govt. when expenditure

- exceeds limit countersignature of Block Engineer may be obtained.
- GP would collect water charge from households at rate fixed by Govt. / DWSM.
 - GP should remit monthly bulk water charges to PHED/Board every Month.
 - For effective maintenance of Distribution system VWSC assist GP.
 - GP should consult & discuss w/VWSC before taking any decision/resolution regarding water supply maintenance works
 - VWSC is fully empowered to supervise & monitor all water supply maintenance works.