TATHASTU ICS

DAILY CURRENT AFFAIRS

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LARGEST INDIGENOUSLY DEVELOPED N-PLANT UNIT IN GUJARAT

SOURCE: The Indian Express

WHY IN THE NEWS?

- The third unit of **Gujarat's Kakrapar Atomic Power Project's** (KAPP3) **700-megawatt electric (MWe) nuclear power** reactor has started operating at full capacity.
- This occurred a little over three years after the unit reached its **"first criticality**" in July 2020, a technical phrase denoting the start of a **controlled but sustained nuclear fission process.**

THE IMPORTANCE OF NUCLEAR POWER CAPACITY FOR INDIA

- **ENERGY SECURITY:** It provides a reliable **and steady energy** source independent of **imported fossil fuels**, nuclear power lessens the country's **vulnerability to supply disruptions** in the global energy market.
  - India would require about **$1.6 trillion in investments** in power generation, transmission, and distribution **by 2035**, according to **the International Energy Agency** of the **OECD.**
  - Nuclear has a share of **around 3% in the energy mix.**

- **LOW CARBON EMISSIONS:** It can assist the nation in making the **transition to a more sustainable energy future** as it works to **cut its greenhouse gas emissions**.
  - In comparison to nuclear power, which emits **14 g of greenhouse gases per kWh** on average, **solar energy emits an average of 50 g/kWh**. (According to **NPCIL**)
- **ECONOMIC GROWTH AND DEVELOPMENT:** The **expansion of manufacturing and technology** sectors that depend on a **reliable power supply** can be made possible by nuclear power.

- **TECHNOLOGICAL AND RESEARCH DEVELOPMENT**: **Investing in nuclear energy capacity** encourages nuclear technology research and development, which has potential uses beyond power generation **like nuclear medicine**.
    - Nuclear medicine is more efficient than chemotherapy in the **treatment of cancer.**

CHALLENGES ASSOCIATED WITH NUCLEAR POWER IN INDIA:

- **High initial costs:** For **construction, security precautions, and technological advancement**, nuclear power facilities need a **large upfront financial investment**.
- **Limited domestic Uranium resources**: A **steady and dependable supply of nuclear fuel,** including **uranium and thorium**, must be provided. This necessitates contracts, alliances, and investments in local production capacity with other nations.
- **Safety concerns:** Questions concerning the safety of nuclear power have been raised in the wake of incidents like **the Fukushima Daiichi nuclear disaster in Japan in 2011**.
    - India has experienced protests and opposition to nuclear plants, which has caused delays and raised prices.
- **Nuclear waste management:** Radioactive waste from nuclear power generation must be **safely controlled and kept in storage for thousands of years**. India faces difficulties in creating and putting into practice **efficient long-term nuclear waste management** plans.
- **Technological challenges:** Advanced nuclear technology development is a challenging and resource-intensive task. Examples include fast breeder reactors and thorium-based reactors.
- **Geopolitical factors: China's veto prevented India from becoming a member of the Nuclear Suppliers Group.**

WAY AHEAD

Here are some of the strategies that can be adopted to enhance the nuclear power capacity in India:

- **Invest in advanced reactor technology: Small modular reactors (SMRs**), **fast-breeder reactors,** and thorium reactors are a few examples of cutting-edge nuclear technologies that India can research and fund. These advancements in **safety, fuel efficiency, and nuclear waste reduction** can make nuclear power more affordable and environmentally friendly.
- **Enhance safety measures:** To provide the greatest safety in **nuclear facilities, continually improve safety procedures**, and invest in staff training and development. Public confidence

Prelims Specific: WHAT IS CRITICALITY?

Nuclear power terminology for the condition of a nuclear reactor when the rate of neutron generation from nuclear fission is balanced by the rate of neutron loss from various processes is criticality.

A reactor is working at a stable and sustainable level when it reaches criticality, and the nuclear chain reaction is self-sustaining.

This idea is key to nuclear engineering because it's crucial to managing a reactor's power output and making sure it runs safely.

KAPP-3:

The indigenously constructed variation of the Pressurised Heavy Water Reactor (PHWR), KAPP-3 is the nation's first 700 MWe (megawatt electric) reactor.

A PHWR (Pressurised heavy water reactor) is a type of nuclear power reactor that typically burns naturally occurring, unenhanced uranium as fuel and uses heavy water (deuterium oxide, or D2O) as a coolant and moderator.

can be increased through regular safety reviews and international cooperation on safety standards.

- **Public-Private partnerships:** Encourage the formation of public-private partnerships to create nuclear projects, utilizing the resources and skills of the business sector while maintaining public control.
- **Grid integration**: Ascertain that the architecture of **the electrical grid can effectively incorporate nuclear power into the energy mix.** This involves grid improvements to support the consistent and uninterrupted production of nuclear facilities.
- **Nuclear agreements:** Promote nuclear energy cooperation agreements **with nations that possess advanced nuclear capabilities**, such as the **United States, Russia, and France**, in order to **streamline technology transfer and cooperation**.

MINISTRY OF JAL SHAKTI RELEASES THE 6TH CENSUS REPORT ON MINOR IRRIGATION SCHEMES

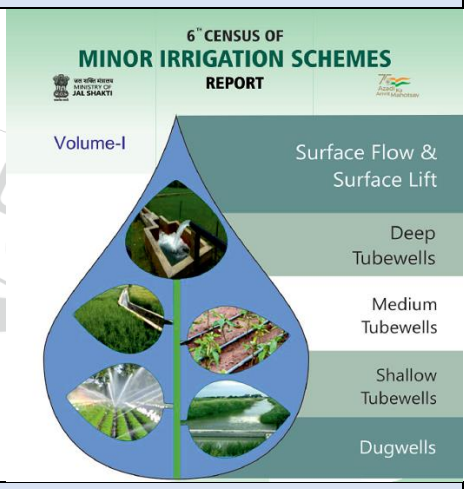
SOURCE: PIB

WHY IN THE NEWS?

- A report on the **sixth census** of **Minor Irrigation Schemes** was released by the **Department of Water Resources**, the **Ministry of Jal Shakti,** and **the Ganga Rejuvenation.**
- The **number of MI schemes** increased by around **1.42 million** between the 5th and 6th MI censuses.

WHAT IS A MINOR IRRIGATION SCHEME?

- In India, **a minor irrigation system** is one that has a **culturable command area (CCA)** of up to **2000 hectares.**
- The **six major types of projects** are as follows:
  1) Dug well
  2) Shallow Tube well
  3) Medium Tube well
  4) Deep Tube well
  5) Surface Flow projects
  6) Surface Lift Schemes.



IMPORTANCE OF MINOR IRRIGATION SCHEMES:

- The creation of India's entire **irrigation potential** is significantly influenced by minor irrigation.
- The **minor irrigation potential is 81.43 million ha**, or **58.19%,** of the **total irrigation potential of 139.95 million ha.**
- Therefore, attention needs to be placed on minor irrigation **to close the gap** between irrigation potential developed and utilized **(Planning Commission 2011).**

MAJOR FINDINGS OF THE CENSUS REPORT:

- According to the report, there **are 23.14 million minor irrigation (MI)** schemes in the nation, of which **21.93 million (or 94.8%) use groundwater** and **1.21 million (or 5.2%)** use **surface water.**
- The **majority of MI schemes** are located in **Uttar Pradesh**, which is followed by **Maharashtra, Madhya Pradesh, and Tamil Nadu**.
- **Uttar Pradesh, Maharashtra, Madhya Pradesh, Tamil Nadu, and Telangana** are the top states for **GW programs**.
- The states with the **greatest shares in SW programs** are **Maharashtra**, **Karnataka, Telangana, Odisha, and Jharkhand**.
- **Dug wells** have the **highest share** in **MI schemes** followed by shallow tube wells, medium tube wells, and deep tube wells.
- A **majority of MI schemes** (**96.6%)** are under **private ownership**.
- In **GW schemes**, the share of **private entities** in the ownership is **98.3%** whereas in SW schemes the respective share is 64.2%.
- For the first time, **information regarding** the **gender of the MI scheme** owner was also gathered in cases where there was individual ownership.

- **18.1%** of all **privately held** schemes **are owned by women**.

CHALLENGES FACED BY THE IRRIGATION SECTOR IN INDIA

- **Infrastructural problems**: The water supply is inefficient and suffers from severe water losses as a result of **leaky canals and aging pumping equipment**.
- **Energy Costs**: Farmers may experience a **large financial strain** due to the expense of the **electricity needed for irrigation**, especially when pumping groundwater. The problem is made more difficult by **fluctuating energy prices and an unstable electricity supply**.
- **Groundwater depletion**: Due to **excessive groundwater exploitation** and **inadequate recharging from rainfall,** there has been a continuous **reduction in the water table** in recent years in several regions of the nation, particularly in the western arid zone.
- **Costly micro irrigation systems: Richer farmers** make up the **majority of adopters**, as impoverished farms cannot afford it. A number of agencies have developed low-cost solutions to this issue.
    - An **NGO** called **International Development Enterprises (IDE)** is aggressively promoting low-cost micro irrigation systems and raising awareness among underprivileged farmers in Gujarat and Maharashtra.
- **Regional imbalances**: According to the **Ninth Five Year Plan** Document, just **28.6% of major, medium, and minor water resource** development projects are underway in the **North Eastern region,** compared to **95.3% in the Northern region**.
- **Environmental concerns**: Large-scale irrigation projects frequently have **negative effects on the environment**, such as **habitat destruction and altered river flows**. It can be difficult to strike a balance between **agricultural requirements and environmental protection**.

WAY FORWARD

The following steps can be taken to improve the productivity of our irrigation systems:

- **Sustainable water infrastructure:** The **design, development, and management** of water-related systems and facilities in a way that guarantees the **long-term availability** and **quality of water resources** while **minimizing detrimental environmental, social, and economic effects.**
    - According to a study, **extensive groundwater extraction** has caused the **Earth's tilt to shift eastward**, displacing it by about 31.5 inches.
- **Reduce evapotranspiration:** Utilise **mulching methods** to keep soil moist around crops and **decrease evaporation**. Mulch can also assist in controlling soil temperature.
- **Improve the water distribution channels:** The use of micro-irrigation techniques can be helpful.
    - Inspect the irrigation system **for blocked or broken emitters, pipelines, and valves**. It is essential to do **routine maintenance** and cleaning to guarantee that **water is delivered evenly** throughout the field.
- **Government support:** Through **subsidies, incentives, and rules that** promote water **conservation and responsible irrigation**, governments can play a critical role in supporting effective irrigation practices.

GOVERNMENT INITIATIVES:	
Initiative	**Objective**
Pradhan Mantri Krishi Sinchai Yojana (PMKSY)	To provide financial assistance to farmers to construct irrigation facilities and to improve the efficiency of irrigation systems.
Accelerated Irrigation Benefit Programme (AIBP)	To provide financial assistance to states to complete ongoing irrigation projects and to take up new projects.
Command Area Development Programme (CADP)	To improve the management of irrigation systems and to increase the efficiency of water use.
National Watershed Development Programme for Rainfed Areas (NWDPRA)	To improve the water conservation and management in rainfed areas.
Micro Irrigation Systems Development Programme (MISDP)	To promote the use of micro irrigation systems, such as drip and sprinkler irrigation, to improve water use efficiency.
National Water Policy	To provide a framework for the development and management of water resources in India.

IN INDIA, 74% CANNOT AFFORD A HEALTHY DIET

SOURCE: The Hindu

WHY IN THE NEWS?

- The recently released "**State of Food Security and Nutrition in the World" (SOFI) 2023** study reveals that although the cost of a nutritious meal has gone up recently in India, it is still the lowest among the BRICS countries (including the six new additions) and India's neighbours**.**
- The percentage of **individuals who can afford** such a nutritious diet **is still low**, with India being at the bottom of the list because **of stagnating or declining income levels**.

MAJOR FINDINGS OF THE REPORT:

- The **cost of sustaining a healthy diet** increased by **over 9% in Asia** between 2019 (before the COVID-19 pandemic) and 2021, the largest increase of all regions.
- **Africa and Asia** saw the **biggest increases in the proportion of persons** who could not afford a healthy diet between 2019 and 2021.
- Together, the two continents accounted for **92% of the global increase**.
- The **majority of Asians (1.4 billion)** and those who could not afford a healthy diet (72%) lived in South Asia. This rate was almost two times higher than the region's average.
- The **largest number of individuals (712 million**) and the **highest percentage (85%)** of **Africans** who could not afford a healthy diet were found in Eastern and Western Africa combined.

HEALTH AND MALNUTRITION IN INDIA:

- Globally, **wasting** was expected to afflict **45 million children under the age of five** (6.8%) in 2022, with 13.6 million of those children experiencing severe wasting. Half of them live in India.
- In 2022, there were **148.1 million stunted children** under the age of five in the world.
- **Africa and Asia** together account for **52% of all affected youngsters** worldwide.
- Worldwide, there **are 37 million under-five overweight children**, a rise of about four million since 2000. India's **overweight rate** increased from 2.2% in 2012 to 2.8% in 2022.

GOVERNMENT INITIATIVES:

INITIATIVE	OBJECTIVE
1. **MID DAY MEAL PROGRAM**	The major goal is to give children in **government-run and aided primary and upper** primary schools **a nutritious lunch.**
2. **POSHAAN ABHIYAN**	Focus on **reducing anemia in women, children, pregnant and lactating women**.
3. **NATIONAL FOOD SECURITY ACT 2013**	Provide **food grains at subsidized rates** to lower-income groups.
4. **PM MATRU VANDANA YOJANA**	**Financial and nutritional support to pregnant and lactating women.**
5. **INTEGRATED CHILD DEVELOPMENT SCHEME**	**All-round development of children at Anganwadi centers.**
6. **ASPIRATION DISTRICT PROGRAM**	Transforming the most **underdeveloped and disadvantaged districts** in all indicators**.**

WHY PEOPLE CANNOT AFFORD A HEALTHY DIET:

- **Income Inequality:** A significant portion of the Indian population earns low incomes, which makes it challenging to afford nutritious foods.
- **High Food Prices:** The cost of many nutritious foods, such as fruits, vegetables, lean proteins, and dairy products, has risen over the years, making them less accessible to low-income individuals and families.
- **Limited Access to Nutrient-Rich Foods**: Many rural and underserved areas lack access to markets and stores that sell fresh and affordable fruits and vegetables.
- **Preference for Affordable Caloric Intake:** People with limited resources may prioritize calorie-dense but nutrient-poor foods because they are more affordable, even if they are not as healthy.
- **Lack of Nutrition Education:** Limited awareness and education about the importance of a balanced diet and nutrition can lead to unhealthy eating habits.
- **Food Insecurity:** Food insecurity, which affects a significant portion of the population, often results in compromised food choices and inadequate access to healthy foods.
- **Infrastructure Challenges:** Inefficient supply chains, lack of cold storage facilities, and transportation issues can lead to food wastage and increased food prices.
- **Cultural and Dietary Preferences:** Cultural factors and dietary preferences also influence food choices, and these may not always align with a nutritious diet.

WAY FORWARD:

- **Fortification of foods:** Encourage the **addition of vital vitamins** and minerals to common meals like **salt, wheat, and rice** in order to alleviate **micronutrient deficiencies**.
- **Diversifying the diet:** To promote a well-rounded diet, encourage the consumption of a variety of **locally available, nutrient-dense foods**, such as fruits, vegetables, legumes, and nuts.
- **Programs for Community-Based Nutrition**: To identify and address malnutrition in their communities, **community leaders, volunteers, and healthcare professionals** should be involved in community-based nutrition programs.
- **Taking Social Determinants into Account:** Recognise and address the **societal causes of malnutrition,** including access **to clean water and sanitation, gender inequality, and poverty.**
- **Government Commitment:** Make sure there is political will and government commitment to give hunger and malnutrition a **high priority and adequate funding**. The government must prioritize on **SDG2.**