WHAT INDIA CAN DO TO REDUCE FOOD WASTAGE

Context

- The **issue of food loss and waste (FLW) is a critical global challenge** that has profound implications for food security, environmental sustainability, and economic efficiency.
- Recognising the urgency of the matter, **the United Nations designated September 29 as the International Day of Awareness of Food Loss and Waste (FLW).**
- It is **important to have an assessment on the scale of food loss and waste, its environmental impact, and India's specific challenges** and efforts to mitigate these losses.

Global Impact of Food Loss and Waste

- **According to a 2023 Food and Agriculture Organisation (FAO) report**, food lost between harvest and retail **accounts for 13.2% of global food production, while UNEP estimates that 17% of food is wasted** at the retail and consumption stages.
- **If just half of this food could be saved, it would be sufficient to feed all the world's hungry people,** thus contributing to the global fight against hunger.

An Assessment on Causes of Food Loss in India

- **Lack of Mechanisation**
    - The **All-India Debt and Investment Survey (AIDIS)** in 2019 revealed that only **4.4% of cultivator households in India owned tractors, and only 5.3% owned essential farm equipment** such as power tillers, combine harvesters, or threshers.
- **Inadequate Cold Chain Infrastructure**
    - India's **cold chain infrastructure is underdeveloped**, particularly for perishable goods like fruits, vegetables, and dairy products.
    - The **absence of efficient cold chains results in spoilage and wastage**, reducing both the availability of fresh produce and the potential income for farmers.

- **Traditional Drying and Storage Methods**
  - While **sun drying is a low-cost option, it exposes food to contamination from dust, pests, and uneven moisture levels**, leading to quality degradation and food loss.
- **Transportation and Supply Chain Inefficiencies**
  - India's vast geography, coupled with poor road infrastructure in rural areas, means that **transporting crops from farms to markets can take considerable time.**

Impact of Food Loss in India

- **Economic Consequences**
  - The monetary value of food loss in India is alarming, **with Rs 1.53 trillion worth of food wasted annually.**
  - Food loss **also affects the country's GDP, as agriculture accounts for a significant portion** of India's economy.
- **Environmental Impact**
  - **Agriculture is a resource-intensive sector**, requiring large amounts of water, energy, and land, therefore, **when food is lost or wasted, all the resources that went into producing it are wasted as well.**

Solutions to Address the Food Loss Problem in India

- **Mechanization and Technological Interventions**
- **Improving Cold Chain Infrastructure**
- **Policy Reforms**
- **Education and Awareness Campaigns**

India's food loss and waste problem presents **both a challenge and an opportunity. Reducing food loss is not merely an economic necessity but a moral obligation**, especially in a country where millions still suffer from hunger and malnutrition.

Current Affairs - 30 September 2024

ETHANOL

- It is an **agricultural by-product** which is mainly obtained from the processing of sugar from sugarcane, but also from other sources such as rice husk or maize.
- Ethanol appears as a **clear colorless liquid** with a characteristic vinous odor and pungent taste.
- Since ethanol is produced from plants that harness the power of the sun, it is also considered as **renewable fuel.**
- In India, ethanol is mainly produced from **sugarcane molasses by fermentation process.**
- **Ethanol blending** is the process of combining ethanol and petrol to use less fossil fuel while driving a vehicle.
- To supplement ethanol supplies, the Government of India has permitted the procurement of ethanol produced from sources other than molasses, which is known as first generation ethanol or 1G.
- Apart from molasses, ethanol can be derived from rice straw, wheat straw, maize cobs, corn stover, bagasse, bamboo and woody biomass, which are known as second generation ethanol sources or 2G.
- **Applications**
    - Ethanol is an important **industrial chemical;** it is used as a solvent, in the synthesis of other organic chemicals, and as an additive to automotive gasoline.

SWACHH BHARAT MISSION (SBM) URBAN 2.0

- The Government of India had launched **the SBM on 2nd October 2014** to accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation.

- The mission has two components - rural (**SBM-Gramin,** overseen by the Ministry of Jal Shakti) and urban (**SBM-Urban**, overseen by the Ministry of Housing and Urban Affairs [MoHUA]).
- Under these components, **all villages, Gram Panchayats, Districts, States and UTs** in India had to declare themselves "open-defecation free" (ODF) by 2 October 2019 - the 150th birth anniversary of Mahatma Gandhi.

- **Achievements:**
  - As one of the largest cleanliness drives in the world, SBM has brought in **a remarkable transformation and traceable benefits** to the society as a whole.
  - Many States have achieved the status of 100% ODF and Individual Household Latrines (IHHL) coverage, thereby **leading to a sea change in the dignity of people, especially women**.
  - This mission acts as a driver for **eliminating the gender disparity** through the construction of gender-specific latrines in public areas such as schools, roads and parks.
  - This public movement will have an indirect positive impact on society by **increasing the enrolment ratio of girls in schools and improving health standards.**

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10 YEARS OF MAKE IN INDIA

Launched on September 25, 2014, by PM Modi, the "Make in India" initiative marked a pivotal shift in India's economic strategy.

The 10th anniversary of the initiative in 2024 celebrates its success in reinvigorating the Indian economy, boosting global competitiveness, and setting India on a path to self-reliance (Atmanirbhar Bharat).

Make in India (MII)

- Make in India came in response to a critical economic situation where, by 2013, India's growth rate had plummeted to its lowest in a decade.
- The promise of the BRICS Nations (Brazil, Russia, India, China and South Africa) had faded, and India was tagged as one of the so-called 'Fragile Five'.
- The country stood at a crossroads, with questions arising about whether it was too large to succeed or too large to fail, necessitating an urgent and substantial economic push.

- **About**
  - In September 2014, PM Modi launched the "Make in India" initiative as part of a broader strategy to revitalize the nation's economy.
  - The initiative aimed to transform India into a global design and manufacturing hub.
  - At its core, "Make in India" sought to create a robust manufacturing ecosystem that could elevate India's economic position and provide employment to its vast workforce.
  - The initiative emphasized the importance of making India a global hub for design, innovation, and manufacturing across a wide range of sectors.
- **Key Sectors Under MII**
  - The initiative focused on 27 sectors, grouped under two broad categories:
    - **Manufacturing Sectors**: Aerospace and Defence; Automotive and Auto Components; Pharmaceuticals and Medical Devices; Biotechnology; Textiles and Apparels; Chemicals and Petrochemicals; Electronics System Design and Manufacturing (ESDM); Food Processing; Gems and Jewellery; Railways, and more.
    - **Service Sectors:** Information Technology (IT) and IT-enabled Services (ITeS); Tourism and Hospitality; Medical Value Travel; Transport and Logistics Services; Accounting and Finance Services; Audio Visual and Legal Services, among others.

- **Key Achievements**
  - **Manufacturing Growth**
  - **Self-Reliance in Defence**
  - **Global Export Growth**
  - **Employment Creation**
- **Other achievements**
  - Kashmir willow bats have become a global favorite.
  - Amul has expanded its presence by launching its dairy products in the US.
  - The textile industry has created a staggering 14.5 crore jobs across the country.
  - India produces an impressive 400 million toys annually, with 10 new toys being created every second.

SMALL MODULAR N-REACTORS

Introduction:

- As the world grapples with the urgent need to decarbonize energy systems and reduce greenhouse gas emissions, nuclear energy is resurfacing as a critical component of the solution.
- While traditional nuclear power plants are large and costly to build, Small Modular Nuclear Reactors (SMRs) are emerging as a promising alternative.
- These compact reactors offer the potential to provide safe, scalable, and sustainable energy to meet global demands.

What are Small Modular Reactors (SMRs)?

- Small Modular Reactors are nuclear reactors designed to generate a small amount of electricity—**typically up to 300 MW per unit**.
- Unlike traditional large nuclear reactors, which generate up to 1,000 MW or more, SMRs are smaller in size, allowing for modular deployment, enhanced safety features, and reduced construction times.

- SMRs operate on the same fundamental principles as traditional nuclear reactors, using nuclear fission to generate heat.
- This heat is then used to produce steam, which drives a turbine to generate electricity.

Characteristics of SMRs:

- **Modularity**: SMRs can be factory-built in modules and transported to the installation site, which significantly reduces on-site construction time and costs.
- **Scalability**: The modular nature allows for flexible scaling, enabling utilities to add capacity as demand grows.
- **Safety Enhancements**: Many SMR designs incorporate passive safety systems, which rely on natural forces like gravity and convection, reducing the need for operator intervention in emergencies.
- **Lower Capital Costs**: Smaller reactors mean lower upfront investments, making SMRs an attractive option for countries and regions with limited financial resources for energy infrastructure.

Types of SMRs:

- **Pressurized Water Reactors (PWRs)**: Most SMRs are based on PWR technology, where water is used as both a coolant and moderator.
- **Fast Neutron Reactors**: These reactors use fast neutrons and liquid metal coolants to achieve higher efficiency in fuel use.
- **Molten Salt Reactors (MSRs)**: Instead of solid fuel, MSRs use liquid fuel dissolved in molten salt, offering inherent safety benefits by reducing the risk of meltdown.
- **High-Temperature Gas-Cooled Reactors (HTGRs)**: These reactors use helium as a coolant and can operate at higher temperatures, increasing efficiency.

Benefits of SMRs:

- **Safety:**

- SMRs are designed with advanced safety features that significantly reduce the risk of accidents.
- Many designs feature **passive safety systems** that automatically shut down the reactor without human intervention if certain safety parameters are exceeded.

- **Cost-Effectiveness:**
  - Traditional nuclear plants are capital-intensive and often face construction delays. SMRs, on the other hand, are designed to be more affordable.
  - With their modular design, they can be manufactured in factories and assembled on-site, lowering construction costs and timelines.
- **Scalability & Flexibility:**
  - One of the primary advantages of SMRs is their scalability.
  - Utility companies can install a single reactor to meet current energy demand and add more modules over time as demand grows.
  - This makes SMRs particularly suitable for smaller grids or regions with fluctuating energy needs.
- **Lower Environmental Impact:**
  - While nuclear power is already considered low-carbon, SMRs offer further environmental benefits:
  - **Reduced Waste Generation**: Some advanced SMR designs are capable of reusing spent nuclear fuel, reducing the volume of radioactive waste.
  - **Small Physical Footprint**: SMRs occupy less land compared to traditional nuclear plants, making them easier to site in remote or space-constrained areas.

KEY FACTS ABOUT CHIKUNGUNYA

The chikungunya outbreak in Pune and nearby regions has been traced to the Indian Ocean lineage of the virus, according to scientists at the National Institute of Virology (NIV).

- It is a **viral disease transmitted** to humans **through the bites of mosquitoes** infected with the **chikungunya virus**.
- The word comes from the African Makonde language and means "bent over in pain."
- **Transmission**:
    - It is most commonly transmitted **by mosquitoes**, Aedes (Stegomyia) aegypti and Aedes (Stegomyia) albopictus, which can also transmit dengue and Zika viruses.
    - It is **not spread from person to person.**
- It was first described during an outbreak in southern Tanzania in 1952 and has now been identified in nearly 40 countries in Asia, Africa, Europe and the Americas.

Symptoms:

- Symptoms usually begin 4 to 8 days after a mosquito bite but can appear anywhere from 2 to 12 days.
- The most common symptom is an **abrupt onset of fever**, often accompanied by **joint pain**.
- Other symptoms include **muscle pain, headache,** nausea, fatigue, and rash.
- **Serious complications are uncommon**, but atypical severe cases can cause long-term symptoms and even death, especially in older people.

- **Treatment**:
    - There is currently **no approved vaccine or specific treatment** for chikungunya virus infections.
    - The goal of treatment for the infection is to relieve symptoms with rest, fluids and drugs.