Prelims Exam Topics

NAVYA PROGRAMME

Context

The **Ministry of Skill Development and Entrepreneurship (MSDE)** informed the Lok Sabha about the implementation of the **NAVYA Programme**.

About Nurturing Aspirations through Vocational training for Young Adolescent Girls (NAVYA) Programme

- **Objective:** To promote the **socio-economic independence** of adolescent girls by equipping them with relevant vocational and industry-oriented skills.
- **Target Group:** It focuses on **adolescent girls aged 16–18 years** in **aspirational districts**.
- **Joint Initiative:** It is jointly implemented by the **Ministry of Skill Development and Entrepreneurship (MSDE)**and the **Ministry of Women & Child Development (MWCD)**.
- **Scheme Linkage:** The programme is implemented under **Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0**.
- **Skill Training:** Provides **industry-relevant skill courses with embedded On-the-Job Training (OJT)** to enable beneficiaries to pursue diverse career pathways.
- **Future-Oriented Skills:** Gives special emphasis to **futuristic job roles** and includes a mandatory **Holistic Development Module** covering **digital literacy, financial literacy, career readiness and entrepreneurship orientation**.
- **Digital Monitoring:** The **Skill India Digital Hub (SIDH)** is used for real-time tracking of **beneficiary registration, attendance, training progress, certification and other key performance indicators**.
- **Implementation Review:** The government monitors implementation through the **PMKVY monitoring framework**, with regular reviews involving **Project Implementing Agencies (PIAs), State Skill Development Missions (SSDMs) and other stakeholders**.

MOON BASE PROGRAMME

Context

During the **9th India–US Civil Space Joint Working Group (CSJWG)** meeting at ISRO headquarters in Bengaluru, **NASA invited ISRO to participate in its Moon Base Programme**, building on the growing space partnership under the **Artemis Accords**.

About Moon Base Programme

- **Nature:** The Moon Base Programme is a **NASA-led initiative** to establish a permanent human outpost near the **lunar South Pole**, where astronauts can live, conduct scientific research and test technologies for deep-space missions.
- **Lead Agency: National Aeronautics and Space Administration (NASA).**
- **Objective:** To establish a sustained human presence on the Moon, utilise **water-ice resources near the lunar South Pole**, and develop technologies for future **crewed missions to Mars**.
- Major Challenges: **Extreme temperature fluctuations** between permanently shadowed craters and sunlit regions, **low-angle sunlight and shifting shadows** affecting power generation and navigation, **abrasive lunar regolith** causing wear of equipment and seals, and **steep, rugged terrain** complicating landing, construction and rover operations.

Phased Development

- **Phase I (2026–2029):** Establish reliable lunar surface access, conduct **robotic reconnaissance** and test initial technologies.
- **Phase II (2029–2032):** Deploy foundational infrastructure including **power systems, logistics, communications and lunar terrain vehicles**.
- **Phase III (2032 onwards):** Develop an **expandable, permanently crewed lunar outpost** for extended human stays.

SHRUTI: NEXT GENERATION OFFSHORE PATROL VESSEL

Context

Yard 3037 (Shruti), an indigenously designed **Next Generation Offshore Patrol Vessel (NGOPV)** for the Indian Navy, was launched at **Garden Reach Shipbuilders & Engineers (GRSE), Kolkata**.

About Shruti

- **Type:** Shruti is a **Shachi-class NGOPV** designed and constructed indigenously for multi-domain maritime operations in **coastal and deep-sea waters**.
- **Developer: Garden Reach Shipbuilders & Engineers (GRSE), Kolkata**.
- **Purpose:** It is intended to strengthen maritime surveillance and support **offshore asset protection, anti-piracy, counter-infiltration and Humanitarian Assistance and Disaster Relief (HADR)** operations.
- **Speed & Endurance:** Powered by **two diesel engines**, it can exceed **25 knots**, has a range of about **8,500 nautical miles** and can remain at sea for up to **60 days**.
- **Armament & Defence:** Equipped with a **76 mm Super Rapid Gun Mount (SRGM), AK-630 Close-In Weapon System (CIWS), VSHORADS missiles, Kavach chaff decoy launchers and Maareech torpedo defence system**.
- **Aviation & UAV Operations:** Features a stern **helipad and enclosed hangar** capable of operating a **15-tonne multi-role helicopter**, along with **Remotely Piloted Aircraft (RPAs)/UAVs**.

THE RIVER GANGA AUTHORITIES ORDER, 2016

Context

The **National Mission for Clean Ganga (NMCG)** amended the 2016 Ganga Authorities Order, replacing the blanket construction-free classification of the Ganga floodplain with a **frequency-based, zoned regulatory framework**.

About The River Ganga Authorities Order, 2016

- **Nature:** The **River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016** is a statutory order issued under **Section 3 of the Environment (Protection) Act, 1986**.
- **Institutional Framework:** It provides statutory backing and mission status to the **National Mission for Clean Ganga (NMCG)** and establishes a multi-tier institutional framework for Ganga rejuvenation.
- **Objective:** To control pollution, maintain **ecological flows (Aviral Dhara)** and protect the ecological integrity of the Ganga basin through a unified, multi-state and inter-sectoral approach.
- **National Ganga Council:** Established as the apex authority, chaired by the **Prime Minister**, replacing the **National Ganga River Basin Authority (NGRBA)**.

- **Empowered Task Force:** Established under the chairmanship of the **Union Water Resources Minister** to coordinate action plans, milestones and timelines among ministries and State Governments.
- **Statutory NMCG:** Granted **statutory status** to NMCG and empowered it to issue binding directions under the **Environment (Protection) Act, 1986**.
- **Multi-Tier Governance:** Provides for **State Ganga Committees and District Ganga Protection Committees** to address pollution and implement conservation measures at State and local levels.
- **Ecological Flows:** Provides for maintaining minimum continuous **ecological flows** in the river to support its natural ecological functions and self-rejuvenation.
- **Original Floodplain Provision:** The Order originally treated the Ganga's **banks and floodplains based on a 100-year flood frequency** as a construction-free zone.

Recent Amendment

- **Removal of Blanket Prohibition:** The amendment removes the provision treating the **entire Ganga floodplain as an outright construction-free zone**.
- **Three-Tier Zonation:** The floodplain is now classified according to **flood-return periods**, broadly comprising an Active Flood Plain, Regulatory Zone and Warning Zone.
- **Active Flood Plain:** Areas corresponding to a **1-in-5-year return period**, where strict restrictions on construction continue, except for temporary structures associated with events.
- **Regulatory Zone:** Areas corresponding to the **5-to-25-year return period**, where development may be permitted subject to prescribed clearances.
- **Warning Zone:** Areas corresponding to the **25-to-100-year return period**, where development may be allowed subject to mandatory regulatory approvals.
- **Approval-Based Regulation:** Beyond the active 5-year flood line, infrastructure projects are subject to **prior approvals from NMCG and concerned regional authorities**, replacing the earlier blanket prohibition.

Places in news

HALLANIYAT ISLANDS

Context

A recent **crude oil spill from the tanker** is threatening the pristine marine environment around Oman's Hallaniyat Islands.

About Hallaniyat Islands

- **Location:** The Hallaniyat Islands, also known as the **Kuria Muria Islands**, are an archipelago of **five islands** off the southeastern coast of **Oman in the Arabian Sea**.
- **Islands:** From west to east, the islands are **Al-Hasikiyah, Al-Sawda, Al-Hallaniyah, Qarzawit and Al-Qibliyah**.
- **Largest & Inhabited Island: Al-Hallaniyah** is the largest and the **only inhabited** island.
- **Marine Productivity:** The surrounding Arabian Sea is influenced by the **Somali Current and seasonal upwelling**, in which cold, nutrient-rich deep waters rise during and after the monsoon, supporting plankton blooms and a highly productive marine ecosystem.

Mains Exam Topics

NATURAL FARMING

Context:

Rising **geopolitical and climate-related shocks** are increasing the need to strengthen agricultural resilience, bringing natural farming into focus as more than an ideological alternative to chemical-intensive agriculture.

Why does the success of natural farming vary across agro-climatic regions?

- **Crop-Specific Response:** Natural farming outcomes vary across crops because nutrient demand, rooting depth, crop duration and the timing of nutrient uptake differ, while biological nutrient release is generally slower than the immediate availability of synthetic fertilisers.
    - **e.g.,** A 2022 study of natural farming in Andhra Pradesh across **20 field experiments, six districts and seven crops** found no overall short-term yield penalty, but observed differences in treatment response across agro-climatic zones, showing that crop and location matter when assessing outcomes.
- **Labour and Knowledge Intensity:** Natural farming substitutes part of the purchased-input requirement with more intensive management, including preparation of bio-inputs, mulching, weed control, field observation and biological pest management.
    - **e.g.,** The **Andhra Pradesh Community Managed Natural Farming (APCNF)** model uses women's Self-Help Groups and Community Resource Persons for training, mobilisation and farmer-to-farmer learning, helping address the higher managerial requirements of natural farming.
- **Pest and Disease Pressure:** Routine humidity and rainfall can increase pest and fungal pressure, making biological and botanical controls more difficult where pathogens multiply rapidly and repeated rainfall reduces the persistence of protective sprays.
    - **e.g., Late blight in potato and tomato** becomes particularly difficult to manage under cool, wet and humid conditions, making such environments more challenging for farming systems that depend heavily on non-synthetic pest and disease management.
- **Soil-Water and Biomass Endowment:** Natural farming relies on biological nutrient cycling, so the availability of biomass, livestock resources, soil organic matter and adequate moisture affects how easily the system can be sustained.

- **e.g., Coffee–arecanut agroforestry systems in Kodagu, Karnataka**, generate continuous leaf litter and biomass that can support mulching and nutrient recycling, whereas degraded dryland farms with limited residues, livestock and water face greater constraints during transition.

- **Extreme-Event Exposure:** Distinct from routine weather conditions that shape pest and disease pressure, extreme events such as prolonged droughts, floods and cyclones can overwhelm the soil-cover, moisture-conservation and diversification benefits of natural farming.
    - **e.g.,** Natural-farming systems may buffer short dry spells through soil cover and improved moisture retention, but **cyclonic inundation in the Krishna–Godavari delta** can produce prolonged waterlogging and severe crop damage beyond the buffering capacity of farm-level ecological practices.

How could natural farming reshape India's fertiliser subsidy architecture?

- **Fiscal Sustainability:** The scale of fertiliser expenditure creates a fiscal rationale for gradually shifting agricultural support from subsidising chemical inputs towards resource-efficient farm systems.
    - **e.g.,** The Union Budget 2026–27 provides about **₹1.71 lakh crore** for affordable fertilisers, illustrating the significant public expenditure involved.
- **Resource-Efficiency Incentives:** Subsidy policy can increasingly reward lower chemical-fertiliser dependence and better nutrient-use efficiency rather than simply lowering the price of fertiliser consumed.
    - **e.g., PM-PRANAM** provides States and Union Territories an incentive linked to 50% of the fertiliser subsidy saved through reduced chemical-fertiliser consumption.
- **Urea Price Distortion:** The administered low price of urea makes nitrogen disproportionately cheap relative to other nutrients, encouraging imbalanced fertiliser use and weakening incentives for efficient nutrient management.
    - **e.g.,** A **45-kg bag of neem-coated urea has an MRP of ₹242**, with the government bearing the gap between the cost of production/import and the controlled retail price.
- **Political-Economy Constraint:** Because cheap urea is deeply embedded in farm economics and politically sensitive, direct subsidy reform must be gradual rather than abrupt.
    - **e.g.,** The government has retained the low urea MRP while pursuing incremental measures such as smaller bag sizes, illustrating the political difficulty of rapid price-based reform.

- **Outcome-Based Reallocation:** Gradual reform can create greater space for time-bound transition assistance and investment in soil health, bio-input infrastructure and sustainable farm practices.
    - **e.g.,** The **National Mission on Natural Farming** provides ₹4,000 per acre per year for two years, illustrating how support can shift towards temporary transition assistance rather than permanent input subsidisation.

What are the limits of natural farming as a climate solution?

- **Avoided Fertiliser Emissions:** The principal climate rationale is that reducing synthetic nitrogen use can lower nitrous oxide emissions from soils as well as the energy and fossil-fuel emissions associated with fertiliser production.
    - **e.g.,** Reducing synthetic nitrogen use in **rice–wheat systems** can lower emissions from fertiliser application while also reducing the energy demand associated with ammonia production.
- **Yield Trade-Off:** Climate benefits can weaken where natural farming produces substantially lower yields, because producing the same food output may then require additional land and shift environmental pressure from input use towards land use.
    - **e.g.,** A 2024 paddy study comparing inorganic, organic and natural farming reported **39.8% lower grain yield under its natural-farming treatment than conventional farming**, demonstrating why productivity effects must be tested crop by crop rather than assumed away.
- **Livestock–Methane Trade-Off:** Livestock can improve nutrient recycling within natural-farming systems, but greater dependence on cattle can increase methane emissions and offset part of the mitigation from reduced fertiliser use.
    - **e.g.,** A natural-farming system that substantially expands cattle numbers for dung- and urine-based inputs must account for the animals' **methane emissions** when assessing its net climate benefit.
- **Soil-Carbon Limits:** Higher soil organic carbon can improve soil health and provide some sequestration, but stored carbon is reversible and depends on continued biomass return and ecological management.
    - **e.g.,** Practices such as **mulching and crop-residue incorporation** can increase soil organic matter, but these gains can decline when biomass return falls or land-management practices change.

- **Resilience over Full Decarbonisation:** Natural farming may contribute more immediately through climate resilience, lower input dependence and improved soil-water management than through independently eliminating agricultural emissions.
    - **e.g.,** In **rainfed Andhra Pradesh**, natural-farming systems have been studied for their potential to improve resilience and reduce dependence on external inputs, illustrating the adaptation dimension alongside mitigation.

Way Forward

- **Adopt Agro-Climatic Zoning:** Natural farming should be promoted through region-specific packages based on crop response, soil, rainfall, irrigation, pest pressure, labour availability and local resource endowments.
    - **e.g.,** The evidence from multi-location APCNF experiments showing differences in treatment response across agro-climatic zones supports **location-specific scaling** rather than a uniform national prescription.
- **Build an Evidence-Based Transition:** Scaling should depend on multi-year evidence covering yield, farm income, input costs, soil health, water productivity and greenhouse-gas emissions rather than acreage alone.
    - **e.g.,** APCNF impact assessments use crop-cutting experiments and farmer surveys to compare yields, costs and returns between natural and conventional systems, providing a stronger basis for policy decisions.
- **Reform Fertiliser Subsidies Gradually:** India should move towards balanced nutrient management and outcome-based support while protecting farmers from abrupt productivity and income shocks.
    - **e.g., PM-PRANAM** already creates a bridge by linking public incentives to reductions in chemical-fertiliser consumption.
- **Create Market Pull:** Long-term adoption requires certification, traceability, branding, procurement linkages and reliable price premiums so farmers are not permanently dependent on government incentives.
    - **e.g.,** The **natural-farming certification framework** under the National Mission on Natural Farming can strengthen consumer trust, but its economic impact depends on connecting certified produce with organised buyers and remunerative markets.

- **Measure Farm-System Outcomes:** Success should ultimately be judged through farmer income, yield stability, input costs, soil health, water efficiency and net emissions rather than the area brought under natural farming.
    - **e.g.,** Recent APCNF assessments compare **cultivation costs, yields, fertiliser use and net returns**, illustrating the shift from measuring adoption alone towards evaluating actual farm-level outcomes.