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TGPSC Current Affairs

TOPICS

Telangana News Summary

Two Telangana Panchayats Rewarded ₹1 Crore Each for Going Solar

Source: Telangana Today

Relevance:
GS Paper III: Energy and Environment – Renewable Energy, Sustainable Development
(Highlights decentralised renewable energy governance and rural participation in India's solar mission.)

Important Key Concepts for Prelims and Mains

For Prelims:

- PM Surya Ghar: Muft Bijli Yojana
- Ministry of New and Renewable Energy (MNRE)
- TSREDCO (Telangana State Renewable Energy Development Corporation)
- TGNPDCL (Northern Power Distribution Company Limited)
- Model Solar Villages
- Rooftop Solar Plants

For Mains:

- Decentralised Renewable Energy and Rural Electrification
- Panchayati Raj and Local Governance in Climate Action
- Energy Self-Reliant Villages and Sustainable Development Goals
- Community-Based Renewable Energy Transitions in India

Why in News:

Two-gram panchayats — Konijerla (Khammam) and Bhadrachalam (Kothagudem) — were awarded ₹1 crore each under **the PM Surya Ghar:** Muft Bijli Yojana by the Ministry of New and Renewable Energy (MNRE) for achieving the highest rooftop solar installations in Telangana.

The gram panchayats of Konijerla in Khammam and Bhadrachalam in Kothagudem were selected for the incentive.

Image source: Telangana Today

PM Surya Ghar: Model Solar Panchayats in Telangana

1. Objective:

- To promote large-scale adoption of **rooftop solar energy systems** in villages and identify **model solar villages** with populations exceeding 5,000 under the *PM Surya Ghar Muft Bijli Yojana.*
- The scheme aims to build **energy self-sufficient rural communities** and enhance India's renewable energy footprint.

2. Model Panchayats Identified:

- **Konijerla (Khammam):** Installed **11 rooftop solar plants** with a total capacity of **75 kW**.
- **Bhadrachalam (Kothagudem):** Installed

208 rooftop solar plants with a total capacity of **2,098.15 kW**.

These panchayats recorded the **highest adoption of rooftop solar systems**, earning recognition as Telangana's model solar villages.

3. Implementation Mechanism:

The project was jointly executed by:

- **Telangana State Renewable Energy Development Corporation (TSREDCO)**
- **Northern Power Distribution Company Limited (TGNPDCL)**
- **Panchayat Raj Department**

A **district-level committee** has been formed to supervise the utilisation of the ₹1 crore grant and ensure accountability.

4. Utilisation of Incentive Funds:

The awarded funds will be used for:

- Installation of **additional rooftop solar plants** in community and government buildings.
- Setting up of **solar-powered streetlights** across panchayat areas.
- Powering **government schools, sub-centres, and local offices** through solar systems.
- Supporting maintenance and capacity-building of local energy systems.

5. Significance and Impact:

- Strengthens grassroots renewable energy governance through active participation of panchayats.
- Promotes energy self-reliance and reduces dependence on conventional electricity.
- Aligns with India's renewable energy goals — 500 GW capacity by 2030 and Net Zero by 2070.
- Enhances local employment, awareness, and environmental consciousness in rural communities.
- Demonstrates how village-level climate action can integrate technology, governance, and sustainability.

6. Challenges Ahead:

- Limited technical capacity in panchayats for solar system maintenance.
- Need for regular audits and transparent fund management.
- Requirement for greater community awareness on solar upkeep and grid safety.
- Expansion to smaller or tribal panchayats remains crucial for inclusivity.

Conclusion:

The success of **Konijerla** and **Bhadrachalam** panchayats demonstrates how **decentralised renewable energy governance** can transform India's villages into **energy-secure and climate-resilient ecosystems**.By combining government incentives, local participation, and sustainable technology, the initiative sets a benchmark for **grassroots-led clean energy transformation** in rural India.

PM Surya Ghar: Muft Bijli Yojana

Basic Details

- **Launched by:** PM Narendra Modi on **15 Feb 2024**
- **central sector scheme**
- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE)
- **Objective:** Free electricity up to **300 units/month** for residential consumer

Subsidy Structure

Avg. Monthly Consumption	Capacity	Subsidy Support
0–150 units	1–2 kW	₹30,000–₹60,000
150–300 units	2–3 kW	₹60,000–₹78,000

>300 units	Above 3 kW	₹78,000 (max cap)
RWAs / GHS	Common facilities (up to 500 kW @ 3 kW/house)	₹18,000 per kW

+10% subsidy for Special Category States (NE, UTs, Himalayan).
Loans: Collateral-free up to ₹2 lakh @ **6.75%** interest.
Subsidy credited to beneficiary account within **15 days** via DBT.

Eligibility

- Must be an **Indian citizen**.
- Must **own a house** with a suitable roof.
- Must have a **valid electricity connection**.
- Must **not have availed any other solar subsidy**.

Source: PIB

Real-Time Alerts on RTC Buses: Telangana Pushes for ADAS Integration to Prevent Accidents

Source: Telangana Today

Relevance: TGPSC Paper III Governance, Paper V – Science and Technology

Important Key Concepts for Prelims and Mains

For Prelims:

- Advanced Driver Assistance Systems (ADAS)
- AI in Transport Safety
- Vision Zero (India's Road Safety Goal 2025–2030)

For Mains:

- Application of Artificial Intelligence in Public Safety
- Role of Technology in Road Accident Prevention
- Challenges in Technology-led Public Service Deliver

Why in News

The tragic **Chevella bus accident**, in which **19 people died** and over a dozen were injured when a **Telangana RTC bus collided head-on** with a gravel-laden tipper on the **Hyderabad–Bijapur highway**, has reignited discussions on adopting **Advanced Driver Assistance Systems (ADAS)** in public transport vehicles to prevent fatal road crashes.

The Chevella bus mishap was one of the most tragic road accidents where a gravel-laden truck collided head-on with a State Road Transport Corporation bus near Mirzaguda village in RR district.

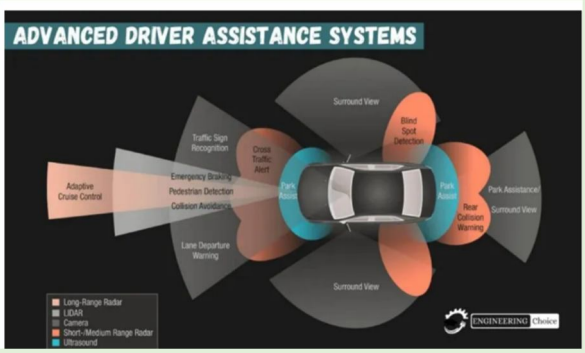
Image source: Telangana Today

Telangana's ADAS Pilot Initiative

The **Telangana State Road Transport Corporation (TSRTC)** had earlier commissioned a **technical study** on integrating ADAS into its fleet to enhance safety standards.

- Under a **pilot project**, ADAS systems were installed in selected RTC buses operating on **three major highway routes —**
  1. Hyderabad–Bengaluru
  2. Hyderabad–Vijayawada
  3. Hyderabad–Nagpur
- Between **March 2023 and April 2024**, the **number of fatal accidents dropped by nearly 40%** on corridors where buses were equipped with ADAS compared to
- those without the system.

About ADAS Technology



Advanced Driver Assistance Systems (ADAS) are **AI-powered systems** designed to enhance driver safety by issuing **real-time alerts** on possible hazards. They monitor **vehicle surroundings** using **cameras and sensors**, helping drivers react swiftly to potential dangers.

Key Features:

- **Collision Warning:** Detects imminent collisions with vehicles, pedestrians, cyclists, or stray animals.
- **Lane Departure Alert:** Warns when vehicles drift unintentionally from their lanes.
- **Safe Distance Monitoring:** Maintains safe vehicle gaps to avoid tailgating.
- **Dual Alert Mechanism:** Provides **audio and visual warnings** to drivers for instant corrective action.

Technology and Implementation

The ADAS project in Telangana is being spearheaded by **INAI (Industry and Academia Initiative)**, a joint venture of **IIIT-Hyderabad**, the **Telangana government**, and **Intel Corporation**.

Key Developments:

- The project utilises **AI and computer vision** to promote road safety, mobility, and transport efficiency.
- The system is powered by **Mobileye (an Intel company)** — which uses **windshield-mounted cameras** and **algorithms** to track potential safety risks.
- It provides **real-time alerts** to drivers to avoid collisions or lane departures.

Challenges and Delays

Despite promising outcomes, the **large-scale implementation** of ADAS across the RTC fleet has faced delays due to:

- **Budgetary constraints** and high installation costs,
- **Procedural approvals** between State and Central transport authorities, and
- **Tendering and procurement delays.**

Official sources note that once approved, the project could significantly enhance **road safety and accident prevention**, particularly on **high-risk intercity routes** used by **heavy vehicles and long-distance buses**.

Way Forward

1. **Institutionalise ADAS in Public Transport:** Make ADAS installation mandatory in RTC and State Transport buses across India.
2. **Financial Incentives:** Introduce central subsidies or PPP models to scale up deployment.
3. **Driver Training:** Conduct regular awareness and digital safety workshops for RTC drivers.
4. **AI Integration Policy:** Align ADAS adoption with the **National Road Safety Strategy (2025–2030)** and India's **Vision Zero** goal of eliminating road fatalities.
5. **Data Analytics:** Use ADAS-generated data to monitor road conditions, driver behaviour, and high-risk zones.

Conclusion

The Chevella bus tragedy serves as a stark reminder of the urgent need to integrate **AI-driven safety systems** in India's public transport network.The successful ADAS pilot in Telangana highlights the potential of **technology-based interventions** to reduce accidents, improve driver awareness, and strengthen India's journey towards **safer highways and zero-fatality transport systems**.

Nanosized Fertilizers Boost Rosemary Growth and Oil Quality

Source: Telangana Today

Relevance: **TGPSC Paper–V Science & Technology**

Important Key Concepts for Prelims and Mains

For Prelims:

- Rosmarinus officinalis (Scientific name of Rosemary)

For Mains:

- Role of nanotechnology in sustainable agriculture, Precision nutrient delivery and water conservation

Why in News

Researchers from the **University of Hyderabad (UoH)**, in collaboration with other institutions, have successfully demonstrated that **foliar application of nanosized macro- and micro-nutrients** can significantly enhance the **growth, essential oil yield, and quality of Rosemary** — even with fertilizer dosages 20–30% lower than conventional recommendations.

Background

Rosemary (*Rosmarinus officinalis*), valued globally for its **aromatic essential oil** used in the **food, cosmetic, and pharmaceutical industries**, faces challenges from **high-input fertilizer use** and environmental degradation.To address this, UoH scientists developed **nanosized fertilizers** by converting standard fertilizers into nanoparticles using **design-directed mechanical milling** — improving nutrient delivery and absorption efficiency.

About Rosmarinus officinalis

Scientific Name: *Rosmarinus officinalis*
Family: Lamiaceae
Type: Evergreen aromatic shrub (up to 2 m tall)

Key Features:

- Linear, aromatic leaves; blue or white bilabiate flowers; four nutlet fruits.
- Widely cultivated for its **essential oil** used in food, cosmetics, and pharmaceuticals.

Major Constituents:

- **Essential Oils:** 1,8-cineole, camphor, α-pinene, borneol, limonene
- **Phenolics & Acids:** Rosmarinic acid, caffeic acid, carnosic acid, carnosol, ursolic acid

Medicinal Properties:

- **Antioxidant & Anti-inflammatory:** Prevents lipid peroxidation, reduces inflammation.
- **Antimicrobial:** Effective against *E. coli* and *S. aureus*.
- **Antidiabetic & Hepatoprotective:** Enhances insulin secretion, protects liver.
- **Neuroprotective:** Inhibits AChE, boosts nerve growth factor.
- **Anticancer & Anti-obesity:** Induces apoptosis, limits fat accumulation.

Industrial Relevance:

- Used as a **natural preservative, flavoring agent, and cosmetic ingredient**.

Scientific Findings

- The nanosized fertilizers enhanced the **surface area and mobility** of nutrients like **nitrogen, iron, zinc, manganese, and copper**.
- Plants treated with nanosized fertilizers exhibited:
  - Improved **shoot and root growth**
  - Increased **biomass accumulation**
  - Enhanced **nutrient uptake and metabolic activity**
  - Higher **1,8-cineole levels**, a key compound determining **Rosemary oil quality**.

Nano Fertilizers

Nano fertilizers are nutrient carriers developed using nanotechnology to deliver essential plant nutrients (like nitrogen, phosphorus, potassium) in nanoscale form for efficient absorption and minimal wastage.

Launch in India:

- **Introduced by:** *Indian Farmers Fertilizer Cooperative (IFFCO)*
- **Product:** *Nano Urea Liquid (2022)*
- **Significance:** Reduces urea consumption by ~50%.

Key Benefits

Higher Efficiency:

- Ensures targeted and gradual nutrient release directly to plant roots.
- Reduces losses due to leaching and volatilization.

Increased Yield:

- Provides balanced nutrition and improves productivity.
- Helps address food security challenges.

Cost-Effective:

- Requires smaller doses with long-lasting effect.
- Reduces repeated application and input cost.

Environmentally Sustainable:

- Minimizes soil and water contamination.
- Preserves soil fertility and promotes sustainable agriculture.

Drought Resistance:

- Enhances water retention and crop resilience during dry spells.

Nutrient & Pesticide Synergy:

- Enables development of *"Smart Fertilizers"* that combine nutrients and pest protection.

Conclusion

This breakthrough by UoH underscores the potential of **nanotechnology in agriculture** to optimize nutrient delivery, enhance plant productivity, and support **sustainable crop management** — aligning with India's vision of **precision and eco-friendly farming**.

Dr. Ande Sri (1961–2025): The People's Poet Who Gave Telangana Its Anthem

Source: Deccan Chronicle,

Relevance: Paper–II History and Cultural Heritage of Telangana, Paper-VI - Telangana Movement and State Formation

Important Key Concepts for Prelims and Mains

For Prelims:

- *Jaya Jaya He Telangana* – Official State Anthem
- M.M. Keeravani – Anthem Composer
- Telangana Writers' Forum (2001)
- Telangana Folk and Dalit Literary Traditions

- Kakatiya University – Honorary Doctorate (2014)

For Mains:

- **Role of Ande Sri in Telangana Statehood Movement**

Why in News

Rebarthi village in **Maddur mandal, Siddipet district**, plunged into mourning following the death of **Dr. Ande Sri (Ande Yellaiah)** — the lyricist of Telangana's **State Anthem "Jaya Jaya He Telangana."** The poet, who rose from humble beginnings as a **cattle grazer**, became one of Telangana's most celebrated cultural icons and voices of its statehood movement.

Image source: Deccan Chronicle,

Early Life and Struggles

- Born on **July 18, 1961**, in **Rebarthi village**, Ande Sri was the **son of Ande Boddaiah and Yellamma**.
- Belonging to a **Dalit family**, he lost his parents early and never attended school.
- Worked as a **shepherd** and **agricultural labourer**, later moving to Hyderabad as a **construction worker**.
- Learned language and rhythm from **oral folk traditions**, composing poetry by **listening and memorising** — his daughter often acted as his scribe.
- Mentored by **Prof. Biruduraju Rama Raju**, who refined his poetic instincts.

Rise to Literary Fame

Ande Sri's poetry reflected the **voice of the marginalized**, blending **folk emotion** with **political consciousness**. His breakthrough came with *"Chudu Telangana, Chukka Leni Telangana" (2001)*, performed at the Telangana Writers' Forum, which became a rallying cry for the movement.

Notable Works:

- *"Jaya Jaya He Telangana Janani Jaya Ketanam"* — official Telangana State Song
- *"Palle Neeku Vandanamulo Ammo"* — tribute to village life
- *"Mayamai Potunna Damma, Manishanna Vadu"* — critique of urban moral decay
- *"Jai Bolo Telangana, Jana Garjana La Jadi Vana"* — anthem of Telangana's statehood struggle (2011)

His songs were **widely sung at protests and marches (2009–2014)**, symbolising Telangana's cultural awakening.

Jaya Jaya He Telangana: The State Anthem

- First recorded in **2004** in singer **V. Ramakrishna's** voice.
- Symbolised Telangana's **dignity, self-respect, and resurgence**.
- Officially adopted as the **State Anthem** on **June 2, 2024**, under **Chief Minister A. Revanth Reddy**, fulfilling Ande Sri's lifelong dream.
- **M.M. Keeravani** re-tuned the composition to match official standards.
- Represents the emotional culmination of the **Telangana movement's cultural assertion**.

Cultural and Political Significance

1. **Voice of Telangana Identity:** Transformed the political struggle for statehood into **cultural expression**

through poetry and song.

2. **Empowerment through Folk Aesthetics:** Elevated **Dalit and rural voices**, turning folk idioms into tools of **social and political awareness**.
3. **Symbol of Linguistic Pride:** Refused to sing *"Maa Telugu Talliki"*, asserting Telangana's **distinct language and ethos**.
4. **People's Poet:** His works mirrored Telangana's **agrarian landscape**, **toddy palms**, and **everyday resilience**.

Association and Influence

- Collaborated with **revolutionary poet Gaddar**, believing that **poetry is resistance**.
- Contemporary poets like **Gorati Venkanna** and **Nandini Sidda Reddy** hailed him as *"the Kaloji of modern Telangana."*
- His performances reached **diaspora audiences** in the **U.S. and Egypt**, where he composed a song on the **Mississippi and Nile rivers**.

Awards and Recognitions

Award / Honour	Year
Nandi Award for *"Ganga"* (Film)	2006
Doctorate – Academy of Universal Global Peace	2014
Dasharathi Literary Award	2015
Ravuri Bharadwaja Literary Award	2015
Nakamma National Award	2022
Dasharathi Krishnamacharya Literary Award	2024
Lok Nayak Award	2025

- Awarded **₹1 crore cash** and a **350 sq. yard plot in Ghatkesar (2024)** by the Telangana Government.

Rebarthi Village Tribute

After his passing on **November 9, 2025**, Rebarthi village — his birthplace — mourned deeply.

- Villagers, students, and teachers observed **two minutes of silence** in the local government school.
- Elders recalled his early days as a **cattle grazer and singer** of *"Palle Neeku Vandanam"*.
- They expressed pride that **a shepherd from their village became the voice of Telangana's pride**.
- **Chief Minister Revanth Reddy** announced a **State Funeral** and described Ande Sri's demise as "an irreparable loss to Telangana's soul."

Legacy

Ande Sri turned **pain into poetry** and **poverty into pride**, transforming personal struggle into collective strength.
He immortalized Telangana's identity through verse — making *"Jaya Jaya He Telangana"* not merely a song, but the **heartbeat of a people's movement**.

Conclusion

Dr. Ande Sri's life encapsulates the **essence of Telangana's cultural renaissance** — rooted in soil, driven by self-respect, and voiced through art.
From a shepherd's field to the state anthem, his journey stands as a testament that **true poetry is born from the people and belongs to them fo**

Smart Farming in Siddipet

Source: Telangana today

Relevance: PAPER – V (Science & Technology, Environment, Disaster Management)

Important Key Concepts for Prelims and Mains

For Prelims:

- Smart Farming, Precision Agriculture, Internet of Things (IoT), Krishivams App, Sensors in Agriculture, Weather Information Network and Data System (WINDS)

For Mains

- Smart Farming as Climate-Resilient Agriculture, Role of Technology in Enhancing Farmer Income, Sustainable, Data-driven Farm Practices

Why in News

The **Department of Agriculture, Siddipet**, in collaboration with the **Telangana Development Forum (TDF)**, has introduced **smart farming technologies** to promote precision agriculture. Using **satellite data, ICT tools, and mobile-based alerts**, this initiative aims to reduce agrochemical use, enhance productivity, and promote sustainable farming practices.

What is Smart Farming?

- **Smart farming** is the application of **Information and Communication Technologies (ICTs)**, **data analytics**, and **automation tools** to make agriculture more efficient, data-driven, and sustainable.
- According to the **International Organization for Standardization (ISO)**, smart farming represents *"data-driven, principled decision-making in agriculture and food value chains occurring as multi-objective optimization in the context of global volatility, uncertainty, complexity, and ambiguity."*
- In simpler terms, smart farming integrates advanced tools like **drones, IoT sensors, robotics, and AI-based analytics** to enable farmers to monitor soil, crop, and weather conditions in real time — allowing informed, timely, and sustainable decisions.

Smart Farming in Siddipet: The Model Initiative

Technology Integration:

- Satellite-based data collection is used to identify and monitor stress in crops caused by biotic (pests, diseases) and abiotic (drought, nutrient deficiency) factors.
- Each field is digitally mapped into **geo-fenced grids of 3x3 metres** for detailed observation.

Krishivams App (Digital Monitoring):

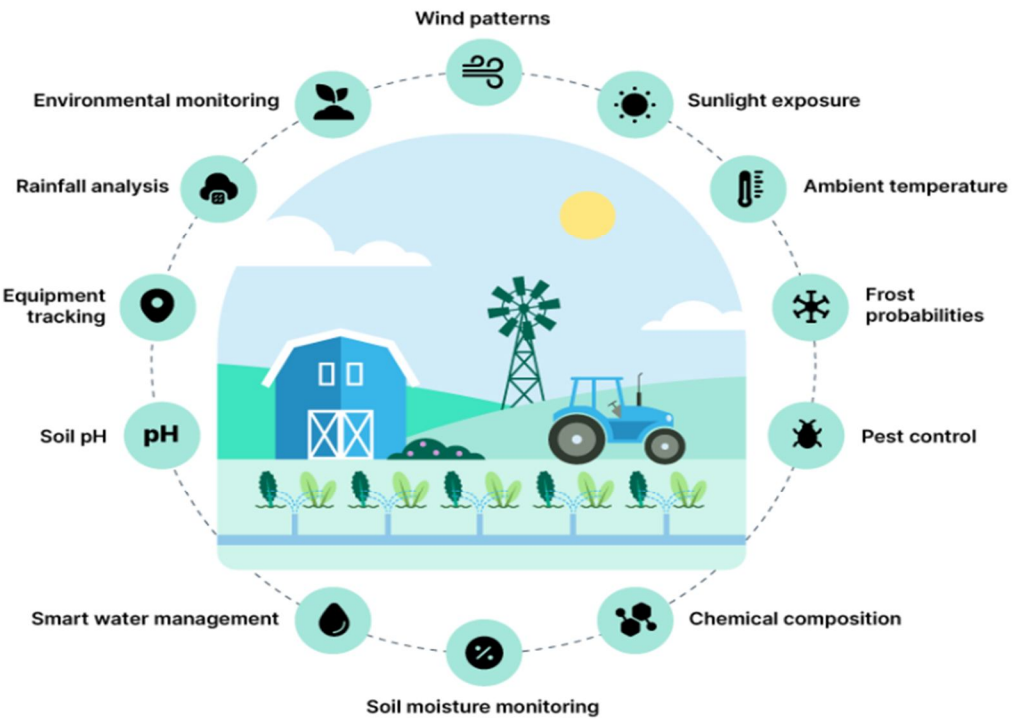
- Crop stress levels are displayed through color-coded indicators:
- Green → Healthy crop
- Yellow/Orange/Pink → Mild to moderate stress
- Red → Severe stress
- Farmers receive **real-time alerts** guiding them to the affected area.

Reduction in Chemical Use:

- Accurate detection prevents unnecessary spraying and overuse of fertilizers or pesticides.
- This helps **reduce environmental harm** and **input costs**.

Capacity Building:

- Farmers are trained to interpret satellite-based advisories and act swiftly.
- Agricultural Extension Officers (AEOs) assist in advisory services.



Benefits of Smart Farming

Smart farming offers multifaceted advantages to farmers, the environment, and the economy.

1. Efficiency and Resource Optimization

- Enables targeted use of seeds, fertilizers, and water through **variable-rate applications**.
- Prevents overuse of agrochemicals, reducing costs and pollution.

2. Early Detection and Intervention

- Detects biotic (pests, diseases) and abiotic (drought, nutrient stress) factors early, allowing timely treatment.

3. Data-Driven Decision-Making

- Provides accurate insights for irrigation scheduling, pest management, and crop planning.

4. Reduced Environmental Impact

- Lowers greenhouse gas emissions and prevents soil degradation.
- Encourages sustainable land and water management.

5. Enhanced Farmer Connectivity

- Farmers can access weather data, market trends, and digital financial services through mobile devices.

Challenges Ahead

Despite its promise, scaling smart farming requires addressing several challenges:

- Limited **digital literacy** among small farmers.
- Need for **affordable devices** and better internet connectivity in rural areas.
- Ensuring **data privacy and ownership**.
- Integration with **existing agricultural policies** and subsidies.

Way Forward

- **Capacity Building:** Train farmers and AEOs in ICT-based farming methods.
- **Public-Private Partnerships:** Collaborate with agri-tech startups for

innovation and local adaptation.

- **Subsidized Access:** Provide incentives for purchasing smart devices and precision tools.
- **Data Integration:** Link state-level agricultural dashboards with local farm-level IoT networks.

Conclusion

The **Smart Farming Initiative in Siddipet** is a transformative step toward a **digitally empowered and climate-smart agriculture system**.By combining traditional knowledge with modern science, Telangana is setting an example of how **technology can democratize agricultural innovation**, making farming profitable, sustainable, and resilient.

Key Government Initiatives Using AI & Technology

1. Kisan e-Mitra (AI Chatbot for Farmers)

- AI-powered multilingual chatbot under **PM-KISAN**.
- Provides **instant, accurate responses** to farmers' queries.
- Supports **11 regional languages**.
- Now expanding to include advisory on crop insurance, fertiliser subsidy, and other agri schemes.
- **Impact:** Enhances transparency, reduces middlemen dependency.

2. National Pest Surveillance System (NPSS)

- Launched: **August 2024**
- AI + Machine Learning platform that:
  - Detects **pest attacks, diseases, crop damage**
  - Provides **real-time crop protection advisories**
  - Connects farmers with **agriculture scientists**
  - **Impact:** Reduces crop losses, prevents overuse of pesticides.

3. YES-TECH (Yield Estimation System Using Technology)

- Uses **remote sensing + AI** for scientific yield estimation.
- At least **30% weightage** given to tech-based estimation.
- Implemented in **9 major states** including Andhra Pradesh, Haryana, Odisha, Karnataka.
- **Impact:** Strengthens crop insurance, procurement planning, and reduces disputes.

4. WINDS (Weather Information Network and Data Systems)

- Establishes:
  - **Automatic Weather Stations (AWS)** at block level
  - **Automatic Rain Gauges (ARGs)** at Panchayat level
- Aims for **5× increase** in weather data density.
- Governments pay **only data rental**, not infrastructure cost.
- **Impact:** Hyper-local weather data improves advisories, irrigation planning, and disaster preparedness.

5. Digital Agriculture Mission (2024–2030)

Three Major Components (Digital Public Infrastructure for Agriculture):

1. **AgriStack** – unified farmer database linked to land records.
2. **Krishi Decision Support System (DSS)** – uses AI for crop choice, sowing dates, irrigation, and pest management.
3. **Soil Profile Maps** – digital soil health and nutrient maps for precision fertilisation. **Impact:** Enables personalised "farm-specific advisory".

6. SATHI Portal (Seed Authentication, Traceability & Holistic Inventory)

- Launched: **April 19, 2023**
- Tracks seeds from **production → certification → distribution → farmer**.
- Ensures removal of **fake/adulterated seeds**.
- Developed by **NIC + Agriculture Ministry**.
- **Impact:** Protects farmers from seed fraud and increases trust in supply chains.

Saffron Blooms in Horticultural Varsity: Telangana Scientists Achieve Aeroponic Breakthrough

Source: *Telangana Today*

Relevance: TSPSC Group-I: Paper – V (Science & Technology)

Important Key Concepts for Prelims and Mains

For Prelims

- Aeroponics
- Controlled Environment Agriculture (CEA)
- SKLTSHU – Sri Konda Laxman Telangana Horticultural University
- Nutrient-rich mist
- NABARD funding

For Mains

- Technology-driven horticulture innovation
- Climate-independent cultivation of high-value crops
- Role of agricultural universities in research
- Significance of aeroponics for farmer income diversification
- NABARD's role in agricultural technology dissemination

Why in News

Vibrant saffron flowers – which traditionally grow only in Kashmir's cold climate – have bloomed **mid-air** at the Sri Konda Laxman Telangana Horticultural University (SKLTSHU). This was achieved **without soil and without sunlight**, using an advanced **aeroponic cultivation system**.

Scientists at Sri Konda Laxman Telangana Horticultural University are growing saffron flower in its special lab.

Image source: Telangana Today

Aeroponics Farming


Working of an Aeroponic Farming System

Aeroponics is an advanced **soilless farming technique** in which plants grow with their **roots suspended in air** and are sprayed with a **nutrient-rich mist**. This method ensures **maximum oxygen** supply to roots and allows **direct nutrient absorption**, leading to **faster growth**, **higher yields**, and **greater resource efficiency**. The system operates in a **closed-loop**, using up to **95% less water** and eliminating **soil-borne pests and diseases**. Key environmental variables—**light**, **temperature**, **humidity**, and **CO_2 levels**—are precisely controlled, making aeroponics ideal for **high-value crops**, **urban agriculture**, and **climate-independent farming**. However, it requires **high initial investment**, **technical expertise**, and reliable **power and pump systems**, as any malfunction can quickly damage the exposed roots. Despite these challenges, aeroponics is emerging as a major innovation in **sustainable agriculture**, **vertical farming**, and **controlled environment cultivation**.

Background:

- Saffron is known as **'red gold'** due to its high value and medicinal benefits.
- It has been cultivated for centuries in the **Pampore region of Kashmir's Pulwama district**, where unique cold climatic conditions support flowering.
- In recent years, saffron cultivation in Kashmir has declined because of:
  - Real estate expansion
  - Environmental changes
  - Reduction in yield and quality

This raised concerns about long-term cultivation sustainability.

Telangana's Breakthrough in Aeroponic Saffron

1. Futuristic Climate-Controlled Laboratory

- SKLTSHU scientists established a modern lab capable of **fully controlling the saffron growth environment**.

2. Kashmir Weather Replication

- The lab recreates **cold weather conditions** similar to Kashmir through automated systems.

3. Aeroponic System: Air + Nutrient Mist

Plants are grown using:

- **Air**,
- **Nutrient-rich mist**,
- **No soil at all**.

4. Temperature, Light & CO_2 Automation

The system controls:

- Day and night temperatures
- Humidity levels
- Sunlight intensity
- Carbon dioxide levels
- Artificial lighting cycles for germination, plant growth & flowering

The entire system runs via a **mobile application**, reducing manual labour.

5. Successful Mid-Air Saffron Bloom

- Saffron flowers have started appearing after **two months** of cultivation.
- A **200 sq. ft area** produced organic saffron.
- Principal Investigator **Prof. Pidigam Saidaiah** confirmed that saffron can now

be grown in Telangana under controlled conditions.

Institutional Support: SKLTSHU and NABARD

- SKLTSHU Vice-Chancellor **Dr. Danda Rajireddy** said the university aims to transfer this technology to farmers by setting up saffron model labs in colleges.
- **NABARD** funded the project.
- NABARD CGM **B. Uday Bhaskar** stated that initiatives are underway to provide farmers with new knowledge and technologies to improve incomes.

Benefits & Applications

- Climate-independent saffron cultivation
- Higher precision and quality
- Minimal labour requirement
- No soil-borne diseases
- Possibility of high-value cash crop cultivation in non-traditional areas
- Supports farmer income diversification

Challenges

- High initial cost of setting up aeroponic labs
- Technical expertise required
- Scaling from pilot to commercial-level production
- Energy requirements for temperature and light control

Way Forward

1. Expand controlled environment facilities across the State.
2. Provide farmer training in aeroponics and climate-controlled systems.
3. Offer NABARD-backed subsidies and soft loans.
4. Create model saffron labs in horticulture colleges.
5. Conduct further research on cost-effective large-scale production.

Conclusion

The success at SKLTSHU demonstrates that **technological innovation can overcome climatic limitations**.Growing saffron — a crop once restricted to Kashmir — in a Telangana laboratory highlights the potential of aeroponics to revolutionize Indian horticulture and enhance farmers' incomes through climate-resilient, high-value cultivation.

SAFFRON (RED GOLD)

Origin & Etymology

- The word **"Saffron"** comes from the **Arabic word** *zafaran* → meaning **yellow**.

Botanical Information

- **Wild saffron** → *Crocus cartwrightianus*
- **Commercially cultivated saffron** → *Crocus sativus*
- *Crocus sativus* is also the **name of the flower**.

Historical Importance

- One of the **most expensive spices in the world**.
- Also known as **"Red Gold"**.
- Cultivation history spans **over 3500 years**.
- **Romans** → used as a deodorizer.
- **Egyptian healers** → used it for **gastrointestinal ailments**.

- **Cleopatra** → used saffron for **cosmetic purposes**.

Major Cultivation Regions

- Predominantly grown in:
  - **Iran**
  - **Kashmir (India)**

Key Characteristics

- Extremely **labour-intensive crop**.
- Highly coveted and often considered **more valuable than gold**.

Harvest requires delicate handling of **stigmas** of the saffron flower

Shivvaram Sanctuary Poised to Become Major Ecotourism Hub: Experts

Source: Telangana Today

Relevance: **TSPSC Group–I & II: Telangana Geography, Ecology, Tourism Development**

Important Key Concepts for Prelims and Mains

For Prelims

- Shivvaram Crocodile Sanctuary (Mancherial District)
- Freshwater / Marsh Crocodile (*Crocodylus palustris*)
- Madras Crocodile Bank Trust (MCBTH) Visit

For Mains

- Telangana ecotourism development
- Conservation of freshwater ecosystems
- Role of Forest Department in wildlife protection
- Tourism–biodiversity balance in Telangana

Why in News

A delegation from the **Madras Crocodile Bank Trust (MCBTH)** recently visited the **Shivvaram Crocodile Sanctuary in Mancherial, Telangana**, praising its rich biodiversity and calling it a potential **major ecotourism hotspot** for the State. Their visit has revived long-pending proposals to develop the sanctuary as a premier wildlife destination.

Image source: Telangana Today

Background:

- The **Shivvaram Sanctuary**, established in **1978**, spans **36.29 sq. km** in **Jaipur Mandal, Mancherial district**.
- It is one of Telangana's oldest sanctuaries dedicated to the protection of **freshwater/marsh crocodiles**.
- Around **100 crocodiles** inhabit the area, along with:
  - Smooth-coated **otters**,
  - Endangered **aquatic bird species**,
  - Diverse wetland fauna.

Despite its ecological richness, the sanctuary has remained low-profile due to **funding gaps** and lack of developed tourist facilities.

Expert Team Visit and Observations

MCBTH experts **Dr. Shafeeq Ahmed** and **Ganesh Muthaiah** inspected the habitat and expressed surprise at Telangana's **hidden biodiversity gem**.

Key findings:

1. Healthy habitat for freshwater crocodiles.
2. Strong otter presence—rare in many Indian states.
3. Potential for wetland bird conservation.
4. High tourism potential due to scenic landscapes.

The team offered to work with the **Telangana Forest Department** on conservation and ecotourism strategies.

Ecotourism Development Plans

1. Trekking Trail Already Developed

- In 2023, trainee IAS officer **P. Gowthami** created a **2.2 km guided trekking route** inside the sanctuary.

2. Proposed Tourism Infrastructure

Telangana Forest Department earlier considered:

- **Boat rides**
- **Eco-cottages**
- **Interpretation centre**
- **Visitor amenities**

These plans were stalled due to insufficient funds but will be revived.

3. Collaboration with MCBTH (Madras Crocodile Bank Trust)

Experts will work with the State to frame:

- Crocodile conservation guidelines
- Wetland protection plans
- Ecotourism models for Mancherial district

Challenges for Telangana

- Limited budget for PA development
- Need for trained local eco-guides
- Risk of tourism disturbing wildlife
- Connectivity gaps for remote visitors
- Lack of publicity for Telangana's non-Tiger sanctuaries

Way Forward

1. **Allocate dedicated funds** through CAMPA/TSTS eco-development.
2. Establish **eco-friendly cottages & walkways** with minimal footprint.
3. Promote Mancherial as a **North Telangana ecotourism circuit** with Kawal Tiger Reserve.
4. Train local youth as **nature guides**, generating rural jobs.
5. Start collaborative conservation programmes with **MCBTH**.
6. Improve road connectivity and signage from **Mancherial–Chennur–Jaipur**.

Conclusion

Shivvaram Sanctuary is a **unique wildlife asset for Telangana**, hosting crocodiles, otters, and rare wetland birds. The renewed interest from MCBTH experts provides an opportunity for the State to transform this hidden sanctuary into a **national-level ecotourism and conservation landmark**, boosting local livelihoods while preserving biodiversity.

Time for a Re-Look at Road Engineering in Telangana

Source: The Hindu

Relevance: Mains Paper-III (Governance, Social Issues)

Important Key Concepts for Prelims and Mains

Prelims

- Road Engineering
- Footpath Encroachment
- Vulnerable Road Users (VRUs)
- NCRB Road Accident Data (2023)
- Stockholm Declaration on Road Safety

(2020)
- Potholes & Road Maintenance

Mains
- Systemic causes of road accidents
- Neglect of pedestrian infrastructure
- Infrastructure deficit in urban Telangana
- Impact of poor road engineering on vulnerable groups

Why in News

A spate of devastating road accidents in Telangana — including the Kurnool sleeper bus fire that killed **19 passengers** and the Chevella collision that also claimed **19 lives** — has triggered nationwide concern. The incidents prompted the **Supreme Court Committee on Road Safety** to hold urgent meetings with stakeholders in Hyderabad. The tragedies have reopened debate on an often-ignored but critical factor: **road engineering and infrastructure quality**.

Background

India records one of the world's highest road accident casualties, and Telangana mirrors this trend, especially in urban belts.

Public discussions after accidents usually focus on:

- rash driving,
- traffic violations,
- unpaid challans,

but these explanations overlook deeper systemic failures in how Indian roads are designed, expanded, and maintained.

Despite rapid urbanisation, the essential components of safe road design — **footpaths, dividers, shoulders, traffic-calming systems, signage** — continue to be neglected in Telangana's cities.

The Overlooked Factor: Poor Road Engineering

1. Vanishing Footpaths

- During road-widening projects, the *first casualty is the pedestrian*.
- Hyderabad — like most Indian cities — offers few accessible**, continuous, safe footpaths**, forcing pedestrians to walk on carriageways.

2. Vulnerable Road Users Most at Risk

The **World Bank's 2022 Environmental and Social Systems Assessment** found that:

- More than **50% of India's crash victims** are **pedestrians, cyclists, and motorcyclists**,
- Most belong to **poorer households**,
- Rural families suffer disproportionate long-term economic distress after accidents.

Obstructed, broken, or encroached footpaths are a major reason for pedestrian deaths.

3. Encroachments and Political Pressure

Pedestrian spaces are routinely occupied by:

- parked cars,
- two-wheelers,
- street vendors,
- food kiosks.

Efforts to relocate hawkers often collapse into political confrontation, resulting in the continued sacrifice of **road safety for political convenience**.

4. NCRB Data Signals a Deep Crisis

According to **NCRB 2023**:

- **27,586 pedestrians** died in India due to road accidents.
- **1,554 pedestrian deaths** occurred in Telangana alone.

This accounts for:

- **16**% of India's road fatalities,
- **20**% of Telangana's road fatalities.

Yet NCRB does not provide detailed data on engineering-related failures.

Road Maintenance: A Critical Gap

The Chevella accident underscored failures in road upkeep:

- A lorry swerved to avoid a pothole, leading to a frontal collision.
- Poor road surface quality is a recurring cause of accidents.

Despite this, conversations usually revolve around "black spots" rather than **holistic maintenance**, which includes:

- pothole-free roads,
- proper shoulders,
- functioning drainage,
- periodic audits.

A dedicated fund for *mapping, repairing and maintaining* roads is urgently needed.

Global Commitments and Local Reality

India is signatory to the **Stockholm Declaration on Road Safety (2020)**, which commits countries to **halve road deaths by 2030**.

The Declaration urges the inclusion of:

- safe system design,
- urban land-use integration,
- stronger enforcement,
- safer vehicles,
- improved post-crash care.

However, halfway to 2030, **India and Telangana remain far from meeting these targets**.

Impact: What Is at Stake

If road engineering continues to be neglected:

- Vulnerable road users will remain at the highest risk.
- Pedestrian fatalities will stay disproportionately high.
- Urban congestion and pollution will worsen.
- Public trust in transport systems will erode.
- Telangana's economic productivity will suffer due to accident-related losses.

Road safety is not merely a traffic issue — it is a **public health, socio-economic, and governance challenge**.

Conclusion

A road safety turnaround requires more than penalising drivers—it demands urgent upgrades in road engineering, maintenance, governance, and community awareness. Telangana and India need a coordinated, sustained effort to protect vulnerable road users and prevent avoidable deaths.

IITH & Hyderabad Start-Up Build India's First 3D-Printed Military Insignia Arch

Source: Telangana Today

Relevance: Paper-V: Science & Technology

Important Key Concepts for Prelims and Mains

Prelims

- 3D Concrete Printing, Robotic Arm Construction, Simpliforge, IIT Hyderabad (IITH),

Mains

- Significance of 3D-printed infrastructure for defence,, Role of start-ups and premier institutes in defence-tech collaboration

Why in News

A Hyderabad-based deeptech firm, **Simpliforge**, in collaboration with **IIT Hyderabad**, has constructed India's **first and largest 3D-printed Military Insignia Entrance Arch**. Installed at the **Jhansi Cantonment**, the arch represents a major leap in India's defence-focused construction technologies.

Image source: Telangana Today

About the 3D-Printed Military Insignia Arch

The structure is designed in the form of a **tiger face**, symbolising the bravery, strength, and indomitable spirit of the **Indian Armed Forces**.
Key features:

- **Dimensions:** 5.7 m (height) × 3.2 m (breadth) × 5.4 m (depth)
- **Technology:** SimpliForge's **robotic arm–based 3D concrete printing**
- **Material:** High-performance printable concrete
- **Location:** Jhansi Cantonment
- **Function:** Entrance to an indoor sports arena within the cantonment

The arch integrates **symbolic military architecture** with modern defence infrastructure design.

About 3D Printing

- A digital manufacturing method where objects are created **layer-by-layer** using materials like plastics, metals, resins, or concrete.
- Enables **complex designs**, **minimal material wastage**, **rapid prototyping**, and localised production.
- Increasingly used in **defence, aerospace, healthcare, automotive, and construction**

How 3D Printing Works

1. **Design Creation:** A digital 3D model is designed using **CAD software** and sliced into thin layers.
2. **Printer Setup:** The printer is prepared with raw materials such as **plastic filament, resin, metal powder**, etc.
3. **Material Deposition:** Unlike inkjet/laser printers, 3D printers deposit **molten plastic**, **metal wire**, or **powder**—fused using heat, adhesives or UV light.
4. **Layer-Wise Building:** The machine prints each layer sequentially as the platform moves, forming the final 3D object.
5. **Post-Processing:** The object may undergo **cleaning, curing, polishing, surface finishing**, and removal of support structures.
6. **Quality Checks:** Printed components are tested for accuracy; defective prints may need redesign or re-printing.
7. **End Use:** Final parts are deployed for **prototyping, industry applications, medical use, construction**, or consumer products.

Materials Used: Plastics (PLA, ABS, nylon), metals (titanium, aluminium, steel), ceramics, wax, resins, food materials (chocolate), and emerging bio-materials.

Major 3D Printing Technologies

- **Inkjet Printing:** Deposits liquid photopolymers, cured by UV light; produces high-resolution parts.
- **Fused Deposition Modelling (FDM):** Melts and extrudes plastic filament layer-by-layer.
- **Stereolithography (SLA):** Uses a laser to cure liquid resin.

- **Selective Laser Sintering (SLS):** Fuses plastic, ceramic, or metal powder with a laser.
- **Electron Beam Melting (EBM):** Melts metal powders in a vacuum using an electron beam; ideal for aerospace alloys.
- **Laminated Object Manufacturing (LOM):** Bonds sheet materials layer-wise and cuts them into shape.
- **Digital Light Processing (DLP):** Uses projected light to cure resin faster than SLA.

Applications Across Key Sectors

1. Aerospace

- Lightweight aircraft/spacecraft components reduce fuel costs.
- HAL–Wipro 3D printed blower for **TEJAS**, achieving **50% weight reduction**.
- GE's 3D-printed fuel nozzle improved life and thermal performance.

2. Automotive

- Used for rapid prototyping and low-volume specialised parts.
- **Mahindra:** 200+ polymer prototype parts annually.
- **Tata Motors:** Uses SLS to mass-produce rubber/plastic spares with **80–90% cost reduction**.

3. Construction

- 3D-printed houses and structures using concrete extrusion.
- **India's first 3D-printed house** by Tvasta built in **2 weeks**.
- Kerala's **Amaze 28** printed in 28 days with **75% less labour**.
- Post offices, bridges, and defence structures (e.g., 3D-printed tiger-arch at Jhansi Cantonment).

4. Healthcare

- Customised **prosthetics, implants, surgical models**.
- Yaantra's skull implant enabled precision tumour removal.
- Ossio's Ossioglass implants mimic natural bone properties.

5. Consumer Goods

- Jewellery design using 3D printing (Imaginarium Rapid).
- Custom footwear by Dochub and Carbon Heel.

6. Public Infrastructure

- **India's first 3D-printed post office** by L&T + IIT Madras in 45 days.

Biomimicry in 3D Printing

Nature-inspired designs (lotus effect, spider web strength) allow **stronger, lighter, more sustainable** structures.

Advantages of 3D Printing

- **Mass Customisation:** Tailor-made products without heavy tooling.
- **Complex Geometries:** Lattice, honeycomb, and organic shapes that are impossible traditionally.
- **Material and Cost Efficiency:** Uses only required material, reducing waste.
- **On-Demand Production:** Minimises inventory and supply chain dependence.
- **Faster Innovation Cycles:** Rapid prototyping accelerates R&D.
- **Democratisation of Manufacturing:** Startups and small firms can manufacture without heavy machinery.
- **Resilient Supply Chains:** Local printing reduces disruptions due to global crises.

Challenges and Concerns

- **Low Scalability:** Not suitable yet for mass manufacturing.
- **High Cost of Industrial Printers:** Metal

AM machines > ₹1 crore.

- **Material Limitations:** Restricted multi-material capability.
- **Quality Issues:** Layer defects, porosity, and structural inconsistencies.
- **Lack of Standards:** No uniform design/quality norms.
- **Legal Risks:** Unregulated printing of weapons or proprietary designs.
- **Skill Gaps:** Requires advanced design and technical skills.

Conclusion

The 3D-printed Military Insignia Arch is more than an architectural landmark—it represents India's expanding capabilities in **digital construction, defence innovation, and indigenous deeptech**. With institutions like IIT Hyderabad and start-ups leading such advancements, India is poised to integrate rapid, cost-effective, and resilient technologies into its defence infrastructure landscape.

Ancient Numismatics as a Source for Reconstructing Early Indian History

Source: *Deccan Chronicle*

Relevance: TGPSC Paper-II – History, Culture and Geography

Important Key Words

Prelims

- Numismatics, Punch-Marked Coins, Satavahana Coins – 99.3% Purity, Indo-Greek Bilingual Coins

Mains

- Coins as Primary Archaeological Sources, Reconstructing Political Genealogy through Numismatics, Satavahana Monetary System

Why in News?

During World Heritage Week, noted numismatist **Dr. D. Raja Reddy** delivered a lecture at the Telangana State Museum highlighting how **coins and inscriptions reconstruct nearly 80% of India's early history**, especially for periods lacking written records. His talk traced key numismatic discoveries from **Kotilingala, Satavahana-era issues, Indo-Greek coins**, and regional hoards in Telangana.

Small metal fragments that once changed many hands became the focus of an engaging lecture on early Indian history delivered by numismatist Dr D. Raja Reddy during World Heritage Week.(File Photo)

Image source: *Deccan Chronicle*

Coins as Historical Sources

- Dr. Reddy emphasised that coins hold **names, titles, symbols, religious marks, metal purity, and trade patterns**, making them reliable tools for reconstructing political and socio-economic history.

Key Contributions of Numismatics

- Establishing **genealogies and succession** of early rulers.
- Decoding **scripts** such as Brahmi and Kharoshthi.
- Identifying **trade networks** through foreign coins.
- Revealing **religious affiliations** via symbols and motifs.
- Determining **metallurgical technology** and resource extraction.

Satavahanas

Political Facts

- **Founder:** *Simuka* (Sri Mukha)
- **Original Progenitor Mention:** *Satavahana* (eponymous ancestor)
- **1st Capital:** *Kotilingala* (Jagitial district, Telangana)
- **2nd Capital:** *Pratishthana* (Paithan, Maharashtra)
- **3rd Capital:** *Dhanyakataka* (Amaravati, Andhra Pradesh)

Administration & Society

- **Official Language:** *Prakrit*
- **Ruling / Administrative Language:** *Prakrit* (language of royal inscriptions)
- **Naming Tradition:** *Matronymic pattern* (kings named after mothers)
  - Example: *Gautamiputra* Satakarni → son of Gautami
- **Succession:** *Generally patrilineal* (despite matronymic names)

Important Rulers

- **Simukha:** Founder
- **Gautamiputra Satakarni:** Greatest ruler (23rd king)
  - Defeated Saka ruler Nahapana
  - His achievements recorded in *Nasik inscription* by his mother Gautami Balashri

Foreign Accounts

- **Foreign Traveller Mention:** *Megasthenes* (indirect reference to Deccan region used in exam options)

Kotilingala: Telangana's Earliest Minting Centre

Excavations at Kotilingala unearthed **punch-marked coins** and early inscribed issues of rulers such as:

- **Gobada**
- **Narana**
- **Kamvayasa**
- **Sirivayasa**
- **Samagopa**

These names were unknown until their coins were discovered, proving:

- A **pre-Satavahana lineage** of local chiefs.
- **Samagopa precedes Chimuka Satavahana**.
- Use of **countermarks** to establish ruler succession.

Kotilingala thus emerges as a significant site for understanding early state formation in the Deccan.

Satavahana Monetary System: Purity and Symbolism

Satavahana coins were notable for:

- **99.3% silver purity**, indicating advanced metallurgy and access to rich ore sources.
- Distinctive religious symbols:
  - **"Namam"** for Vaishnava rulers.
  - **Buddhapada coins** found in Mahbubnagar, suggesting Buddhism's continued local presence even after its wider decline.

These coins help trace political geography, religious change, and administrative spread across Telangana.

Trade Networks: Roman and Regional Links

Finds such as the **Akkannagurlli hoard** and Roman coins show:

- Telangana's integration into **long-distance trade routes** running along the Musi valley.
- Links with **Indo-Roman commerce** and Deccan mercantile circuits.

Indo-Greek Coins and Script Decipherment

A major highlight was the role of **bilingual Indo-Greek coins**—especially of **Agathocles and Menander**—in helping **James Prinsep decipher Brahmi and Kharoshthi**.

- These coins provided "**eight alphabets at a time**," enabling comparative analysis.
- Connections were drawn to the **Jonagiri inscription**, reinforcing Indo-Greek presence and cultural interaction.

Thus, numismatics played a foundational role in unlocking ancient Indian scripts.

Conclusion

Coins, often overlooked as small metal fragments, are **critical archaeological sources** that illuminate political history, religious shifts, economic systems, and long-distance trade. Telangana's numismatic findings—from Kotilingala to Satavahana and Indo-Greek issues—significantly enrich our understanding of early Indian history. Strengthened preservation, museum digitisation, and public awareness are essential to safeguard these invaluable artefacts.

Telangana–North East Connect: Strengthening Cultural Unity and National Integration

Source: The Hindu

Relevance: Paper-II – History, Culture and Geography

Important Key Concepts for Prelims and Mains

Prelims

- North East Annexe, Bharat Future City, Techno-Cultural Diplomacy,

Mains Key Themes:

- Cultural integration, sub-national diplomacy, inclusive development, federal cooperation.

Why in News?

Telangana hosted the first **"Telangana–North East Connect: Techno Cultural Festival"** on **20 November 2025** at HITEX, Hyderabad, marking a major step in strengthening socio-cultural and developmental ties between Telangana and the North Eastern states.

Telangana Governor Jishnu Dev Varma felicitating Chief Minister A. Revanth Reddy at the inaugural of the Telangana–North East Connect: A techno cultural festival bringing together the best of North East and Telangana on one platform to forge meaningful ties for a Viksit Bharat, in Hyderabad on Thursday (November 20, 2025). | Photo Credit: NAGARA GOPAL

Image source: The Hindu

Major Announcement: India's First North East Annexe

At the inaugural, CM Revanth Reddy declared that **each North Eastern State will be given free land** inside the planned **30,000-acre Bharat Future City** to construct its own **North East Bhavan**.

Key features include:

- Dedicated Annexe for all 8 NE states
- Government-backed land & infrastructural support
- Telangana–Union Govt coordination for operationalisation
- Promotion of tourism, culture, trade, education, and technology linkages

The project is envisioned as a long-term

Perini Śivatandavam

Origin & Historical Background

- **Ancient dance form of Telangana**, also called **Perini Śivatandavam**.
- Flourished during the **Kakatiya dynasty** (11th–13th century CE).
- Reached its **pinnacle under King Ganapati Deva** of the Kakatiya Empire.
- Dance sculptures depicting Perini can be seen near the **Garbha Gudi of the Ramappa Temple (UNESCO site)**.

Nature & Characteristics

- **Performed traditionally by males** → *"Nara Nartanam."*
- Known as the **"Dance of Warriors."**
- Performed by **soldiers before going to battle**, in front of the **idol of Lord Shiva**.
- Purpose: to invoke **'Prerana' (divine inspiration)** and channel the energy of **Lord Shiva**.
- Dancers enter a **trance-like state**, feeling Shiva's power within them.

Religious & Cultural Significance

- Deeply associated with **Shaivism**; dedicated to **Lord Shiva – the supreme dancer (Nataraja)**.

Evidence in Temples

- Iconographic proof found in:
  - **Ramappa Temple (Warangal) –** carvings showing Perini postures.
- A major cultural identity of **Telangana's classical dance heritage**.

Decline & Revival

- Declined after the **fall of the Kakatiya dynasty** in the 14th century.
- Nearly disappeared for centuries.
- **Revived in modern times** by:
  - **Padma Shri Dr. Nataraja Ramakrishna,**
  - Who researched, reconstructed, and popularised the art form across Telangana.

institutional mechanism for North East–Telangana integration under the broader national vision of *Viksit Bharat*.

Festival Highlights: Cultural Diplomacy in Action

The festival began with a grand cultural parade

showcasing the heritage of Telangana and all North Eastern states. Key performances:

- **Perini Shivatandavam** (Telangana)
- **Pung Cholom** (Manipur)
- **Sattriya dance** (Assam)
- **Music by Guru Rewben Mashangva** (Nagaland)

The inaugural evening concluded with a **qawwali** by the renowned Warsi Brothers.

Role of Institutions and Leadership

- **Telangana Government** provided full institutional support, logistics, and cultural coordination.
- **NE State Governments** participated as full partners, showcasing arts, tourism, and heritage.
- **Raj Bhavan** will host Phase-II of the festival (Nov 25–27), emphasising state-level diplomacy.

Governors highlighted how Hyderabad's cultural and economic inclusivity makes it an ideal hub for national integration efforts.

Way Forward

- Fast-track establishment of North East Bhavans with cultural & trade centres
- Launch Telangana–NE student and entrepreneur exchange programs
- Promote GI-tagged products and handicrafts through joint platforms
- Strengthen tourism circuits (Hyderabad–NE cultural corridor)
- Integrate NE start-ups into Hyderabad's tech ecosystem
- Establish annual cultural, business, and academic summits

Conclusion

The Telangana–North East Connect Festival and the announcement of India's first **North East Annexe** mark a transformative step in strengthening India's cultural federalism. By offering institutional space, cultural respect, and long-term cooperation, Telangana positions itself as a bridge between the South and the North East.If executed with continuity and depth, this initiative can become a national model for inclusive growth, cultural diplomacy, and inter-regional collaboration

First Telugu Wildlife Documentary on Ramnathgudpalle Grasslands to Premiere Soon

Source: Telangana Today

Relevance: Paper-II: History, Culture & Geography

Important Key Words

Prelims

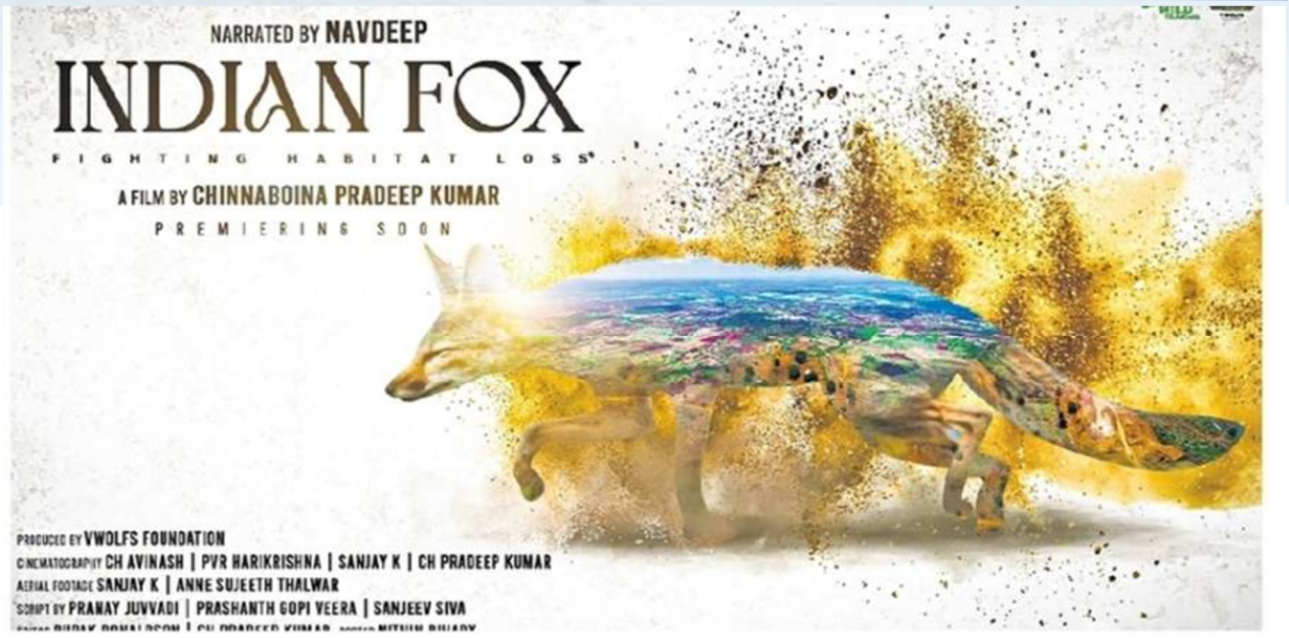
- Ramnathgudpalle Grassland, Indian Fox (Vulpes bengalensis), Blackbuck (Antilope cervicapra), Indian Wolf (Canis lupus pallipes), Grassland Biodiversity.

Mains

- Threats to Grasslands in Telangana, Habitat Loss & Anthropogenic Pressure, Conservation Gaps in Non-Forest Ecosystems

Why in News?

A new Telugu wildlife documentary titled **"Indian Fox – Fighting Habitat Loss"**—the first of its kind focusing on Telangana's grasslands—is set to premiere soon. It highlights the ecological significance and growing threats faced by the **Ramnathgudpalle Grassland** near Mominpet in Vikarabad district.



The film is narrated in Telugu by actor Navdeep.

Image source: Telangana Today

About the Ramnathgudpalle Grassland

- One of the **largest grassland ecosystems** remaining in Telangana.
- Habitat for key species such as:
  - **Blackbuck**
  - **Indian wolf**
  - **Indian fox**
  - Migratory and resident birds
- Under increasing pressure from **habitat fragmentation, grazing pressures, and non-resident human activities**.

About the Documentary

The film follows the journey of a **male Indian fox**, showcasing its behaviour, pup-rearing, hunting strategies, and interactions with pastoral communities.

Narration & Film Team

- **Narrator:** Actor **Navdeep**
- **Director: Chinnaboina Pradeep Kumar**
- **Editing: Pradeep Kumar** and **Rupak Ronaldson**
- **Cinematography:**
  - Ch. Avinash
  - PVR Harikrishna
  - Sanjay K
  - Pradeep Kumar
- **Aerial Footage:**
  - Sanjay
  - Sujeeth Thalwar
- **Script:**
  - Pranay Juvvadi
  - Prashanth Gopi Veer
  - Sanjeev Siva

The documentary will be **released as a series**, with support from **VWOLFS Foundation** and **Wild Telangana**.

Conservation Significance

The filmmaking team has submitted multiple proposals over the past three years to the **Forest Department** and **Telangana State Biodiversity Board** seeking **legal protection** for the grassland. The documentary aims to:

- Raise awareness about **grassland degradation**, a severely under-protected ecosystem in India.
- Highlight threats such as **habitat loss, human encroachment, and declining prey availability**.

- Promote community-driven conservation and scientific habitat management.

Conclusion

The upcoming Telugu documentary *"Indian Fox – Fighting Habitat Loss"* serves as an important milestone in highlighting Telangana's often-overlooked grassland ecosystems. By documenting the life of the Indian fox and the ecological richness of the Ramnathgudpalle Grassland, the film brings public attention to an endangered landscape facing rapid fragmentation, human encroachment, and biodiversity decline. Its grassroots conservation message, backed by scientific visuals and community voices, reinforces the urgent need to legally recognise and protect grasslands as vital ecological assets rather than viewing them as wastelands. The documentary thus not only showcases Telangana's natural heritage but also strengthens the case for sustainable, community-inclusive conservation practices in the state.

University of Hyderabad Develops Biochar from Geranium Leaves

Source: Telangana today

Relevance: Paper- V – Science & Technology

Important Key Words

Prelims:

- Biochar, Carbon Sequestration, Geranium Leaves, Soil Amendment, Circular Bioeconomy, Pyrolysis

Mains:

- Waste-to-Wealth, Sustainable Agriculture, Soil Fertility, Carbon-Rich Biomass, Low-Cost Biochar Production, Bioeconomy Innovation

Why in News?

Researchers at the **University of Hyderabad (UoH)** have developed a novel method to convert **waste geranium leaves**—a by-product of essential oil extraction—into **biochar**, a carbon-rich, affordable soil-enhancing product.

What is Biochar?

Biochar is a **carbon-rich solid** produced from biomass via **pyrolysis** (thermal decomposition in limited oxygen). It improves soil quality, enhances water retention, and sequesters carbon for hundreds of years, making it a climate-friendly soil amendment.

Pyrolysis is the **heating of organic material in little or no oxygen so it doesn't burn but breaks down**. This process turns things like wood or coal into **solid fuel (biochar or coke), tar-like liquids, and gases**, instead of ash and flame like normal burning.

Soil fertility is the **ability of soil to support healthy plant growth** by

- supplying essential nutrients (macro: N, P, K, S, Ca, Mg; micro: B, Cl, Cu, Fe, Mn, Mo, Zn), and maintaining favourable **chemical, physical, and biological conditions** for roots.

Fertilizers (chemical, mineral, or organic like manure/compost) are materials added to soil, water, or sometimes foliage to **replenish these nutrients and sustain soil fertility.**

Key Findings of the University of Hyderabad Research

The study, *"Upcycling of Waste Geranium Leaves into Biochar for Soil Amendment"*, revealed that:

- Geranium leaf biochar contains ~**65% carbon**.
- Rich in essential nutrients:
  - **Calcium, potassium, magnesium, sodium, phosphorus**
- Exhibits **alkaline properties**, improving soil fertility.
- Production cost per kg is **far lower** than commercially available biochar

Benefits to Agriculture

1. Enhances Plant Growth

Amendment with the biochar:

- Improved **growth and vigour** of the Rosa damascena (Rosemary) plant
- Enhanced **nutrient assimilation**
- Better moisture retention

2. Reduces Chemical Inputs

The biochar reduces dependence on chemical fertilizers by improving soil health naturally.

3. Supports Circular Bioeconomy

- Converts **industry waste** (geranium residues) into valuable soil input
- Reduces waste disposal burden
- Creates sustainable, low-cost agricultural solutions

Environmental Significance

- **High carbon sequestration** potential
- Can help mitigate climate change by locking carbon in soils
- Promotes sustainable management of aromatic plants industry waste

Interdisciplinary Collaboration

The project involved:

- **School of Life Sciences** – Appa Rao Podile
- **School of Engineering Sciences** – VSS Srikanth
- Collaboration between **chemical engineering** and **plant science**, enabling practical green innovation

Conclusion

The UoH breakthrough demonstrates how locally available biomass waste, such as geranium leaves, can be transformed into a **cost-effective, eco-friendly biochar**. This innovation strengthens India's waste-to-wealth initiatives, enhances soil health, and offers a promising strategy for sustainable agriculture and carbon sequestration.

GHMC Launches Eco-Friendly Model Footpath Project in Filmnagar, Hyderabad

Source: Deccan Chronicle

Relevance: Paper -III (Urban governance) Paper-V (Science & Technology)

Important Key Words

Prelims

- **GHMC (Greater Hyderabad Municipal Corporation), Solar Grid System (10 kWp), HDPE, PET, MLP, LDPE, LLDPE (Plastic Types)**

Mains

- **Sustainable Urban Infrastructure, Eco-friendly Construction Technologies, Waste-to-Resource Innovations (Plastic Recycling)**

Why in News?

The Greater Hyderabad Municipal Corporation (GHMC) has launched a **Model Footpath Project** along a major pedestrian corridor in Jubilee Hills—from Ramanaidu Studio Junction to BVB Junction. The project aims to improve

pedestrian safety and accessibility through eco-friendly, sustainable infrastructure.

Project Overview

- **Implementing Agency:** GHMC,
- **Project Cost:** ₹1.68 crore
- **Purpose:**
  - Improve walkability
  - Enhance road safety
  - Promote eco-friendly, non-motorized mobility
  - Modernize urban streetscapes

Eco-Friendly Construction: Recycled Plastic Paver Blocks

A major innovation of this project is the use of **recycled plastic paver blocks** instead of conventional concrete tiles.

Key Features

Composition:

- 65–70% post-consumer plastic waste (MLP, LDPE, LLDPE)
- Remaining: fillers + mineral additives

Specifications:

- Zig-zag modular design (225 mm × 112 mm × 50 mm)
- Compressive strength ≥ 35 MPa
- Made using recycled HDPE and PET

Environmental Benefits

- Diverts large quantities of plastic waste from landfills
- Encourages circular economy in urban construction
- Reduces carbon footprint compared to cement tiles

Post-consumer plastic waste refers to plastic materials that are discarded after their intended use by consumers. This category of waste mainly includes packaging and single-use plastic items commonly used in households and commercial spaces.It typically comprises a wide range of numbered plastic products such as food packaging materials, detergent and shampoo bottles, disposable cups and plates, plastic bags, multilayered packaging (MLP), and beverage containers. Among these, **multilayered plastics (MLPs)** form the largest share of post-consumer waste due to their extensive use in packaged food and fast-moving consumer goods.

Smart Infrastructure: Solar-Powered Pedestrian Corridor

The footpath will house a **10 kWp Solar Grid System**, adding a green energy component to urban mobility.

Main Components

- 600 Wp+ solar panels (Renewsys / Saatvik / Emmvee)
- 10 kW grid-tied inverter (Solis / GoodWe / Sungrow)
- 8–10 ft MS mounting structures
- Automated cleaning system
- AC & DC distribution boxes with protection
- Lightning arrestor and earthing

Benefits

- Generates clean electricity
- Provides shaded areas along the footpath
- Reduces urban heat impact
- Supports GHMC's smart city and sustainability goals

Inclusive Design: Accessibility for All

To ensure universal access, the footpath includes:

- **Tactile pavers & guiding strips** for the visually impaired
- Barrier-free pathways promoting safe

movement
- Compliance with *Rights of Persons with Disabilities Act (RPwD), 2016*

This reinforces GHMC's emphasis on **inclusive urban infrastructure**.

GHMC's Broader Vision for Urban Transformation

The Model Footpath Project is part of GHMC's strategy to:

- Enhance walkability across Hyderabad
- Improve **non-motorized transport (NMT)** systems
- Adopt eco-conscious materials in public projects
- Strengthen safe, accessible pedestrian networks
- Modernize and beautify public spaces in high-density zones

The Corporation aims to complete the project on time and set a **replicable model for other corridors** in Hyderabad.

Conclusion

GHMC's Model Footpath Project in Filmnagar marks a significant step in **sustainable, people-centric urban transformation**. By integrating recycled materials, solar energy, and accessibility features, Hyderabad is moving toward a **modern, greener, and more inclusive urban mobility framework**, setting an example for other Indian cities aiming to upgrade their pedestrian infrastructure.

Telangana Hosts First Conference on Animal-Inclusive Disaster Planning

Source: *Deccan Chronicle*

Relevance: TGPSC Paper-III: Indian Society, Constitution & Governance

Important Key Words

Prelims:

- UNICEF • Humane World for Animals India • Telangana State Disaster Management Authority (TSDMA) • Disaster Risk Reduction (DRR)

Mains:

- Animal-inclusive DRR • Livelihood vulnerability • Multi-sector disaster coordination • Role of livestock in rural resilience • Integrating animal welfare into disaster protocols • Gap analysis in current disaster management systems

Why in News?

Telangana convened its first-ever **animal-inclusive disaster risk reduction (DRR) conference** in Hyderabad, marking an important milestone in integrating animal welfare into disaster preparedness. The event was jointly organised by **UNICEF**, **Humane World for Animals India**, and the **Telangana State Disaster Management Authority (TSDMA)**.

UNICEF & Humane World for Animals India Conference Held In Hyderabad

Image source: Deccan Chronicle

Why Animal-Inclusive Disaster Planning Matters

- Telangana faces recurring disasters—**floods, droughts, heatwaves, lightning,**

and cyclones—severely impacting rural households. With **over 35 million farm animals**, livestock losses translate into economic distress, emotional trauma, and long-term livelihood setbacks. Speakers emphasized that **protecting animals strengthens community resilience**, safeguards livelihoods, and reduces post-disaster recovery time.

Highlights of the Conference

1. Multi-Sector Participation

- Policy-makers, veterinary experts, disaster managers, humanitarian organisations, and field-level officials discussed a coordinated strategy to integrate animal welfare into the state's disaster planning.

2. Government Support

- Animal Husbandry Minister **Vakiti Srihari** assured full cooperation, stating that the government would uphold all procedures to protect both animals and wildlife and work with agencies to implement effective DRR strategies.

3. Insights from Humane World for Animals India

- Emphasized the need to "think beyond the norm" and redesign policies so "no one is left behind," including animals.
- Highlighted that **animal protection = human protection**, especially for vulnerable rural families.

4. UNICEF's Perspective

- UNICEF stressed that protecting animals ultimately protects **children's well-being**, schooling, and family stability, as livestock loss pushes households deeper into poverty.

5. Key Issues Discussed

- Gaps in current disaster protocols for farm animals, pets, and wildlife
- Lessons from recent disasters and Post-Disaster Needs Assessment (2024)
- Challenges in evacuation, sheltering, veterinary support, and community awareness
- Need for disaster plans aligned with **child- and family-centred response models**

Outcomes & Way Forward

The conference laid the groundwork for developing a **state-level animal-inclusive disaster management model**, focusing on:

- Stronger policy alignment
- Capacity-building of district agencies
- Cross-sector coordination
- Community-based resilience programmes
- Integrating animal safety into DRR manuals and early warning systems

The initiative signals Telangana's leadership in adopting **holistic, inclusive, and humane** disaster-management practices—recognizing that **resilient communities must include both people and animals**.

Conclusion

Telangana's first animal-inclusive disaster planning conference marks a shift toward holistic disaster management. By integrating animal welfare into preparedness systems, the State acknowledges animals' vital role in rural livelihoods. With coordinated efforts by UNICEF, Humane World for Animals India, and TSDMA, Telangana is now positioned to strengthen policies and become a leader in inclusive disaster risk reduction—protecting both communities and the animals they rely on.