

P2. NATIONAL



Passport a travel document, not proof of citizenship: MEA - highlighting India's legal framework for determining citizenship, the distinction between passport and citizenship law, and the absence of a universal citizenship document.

P4. SCIENCE



From Biomass Moisture to Sustainable Agriculture - India's dependence on foreign-controlled digital infrastructure has emerged as a strategic vulnerability affecting economic security, defence preparedness and technological autonomy.

P7. INTERNATIONAL



After Op Sindoor strain, how India and Turkey brought their ties back from the brink - from prolonged diplomatic tensions over Kashmir and Pakistan to a new phase of cautious, interest-driven rapprochement, India-Turkey relations have evolved

P8. ECONOMICS



AI coding costs to cross developer pay - AI-assisted coding is expected to become more expensive than employing an average software developer by 2028, raising questions on the changing labour dynamics in IT sector.

Editor's Note

As we turn another page, the world continues to evolve through a series of interconnected developments. In today's edition of the Pala Civil Times, we bring together some of the most significant events shaping governance, economy, science, environment and international relations, while exploring their wider implications for India and the world. We begin with the Ministry of External Affairs' clarification that an Indian passport is a travel document rather than conclusive proof of citizenship, prompting a deeper examination of what citizenship means under the Constitution and the legal framework governing it. We then turn to the encouraging progress of the PM Surya Ghar: Muft Bijli Yojana, where rooftop solar adoption is reducing household electricity bills, generating employment and accelerating India's transition towards clean and sustainable energy.

On our Science page, we explore the growing importance of biochar, including recent scientific findings that could improve its production and strengthen its role in sustainable agriculture and carbon sequestration. Our Decoded Editorial analyses examine the emerging monsoon deficit and the influence of climatic phenomena such as El Niño and the Indian Ocean Dipole, highlighting their far-reaching consequences for agriculture, food security, inflation and water governance. On the International Affairs page, we trace the changing trajectory of India-Turkey relations, from strategic cooperation to diplomatic tensions and the recent signs of pragmatic rapprochement driven by trade, connectivity and geopolitical realities. Our Economy section looks beyond the headlines surrounding AI-assisted coding, explaining why rising token consumption and new pricing models are reshaping the economics of software development. We also examine the next phase of India's nuclear energy programme, where the SHANTI Act has opened the sector to private participation, signalling a significant shift in the country's pursuit of clean, reliable and long-term energy security.

As always, we encourage our readers to approach each development with curiosity and a critical perspective. Beyond the headlines lie larger questions of public policy, governance, scientific progress and strategic decision-making. It is these deeper connections that transform daily news into lasting understanding.

Editorials Decoded

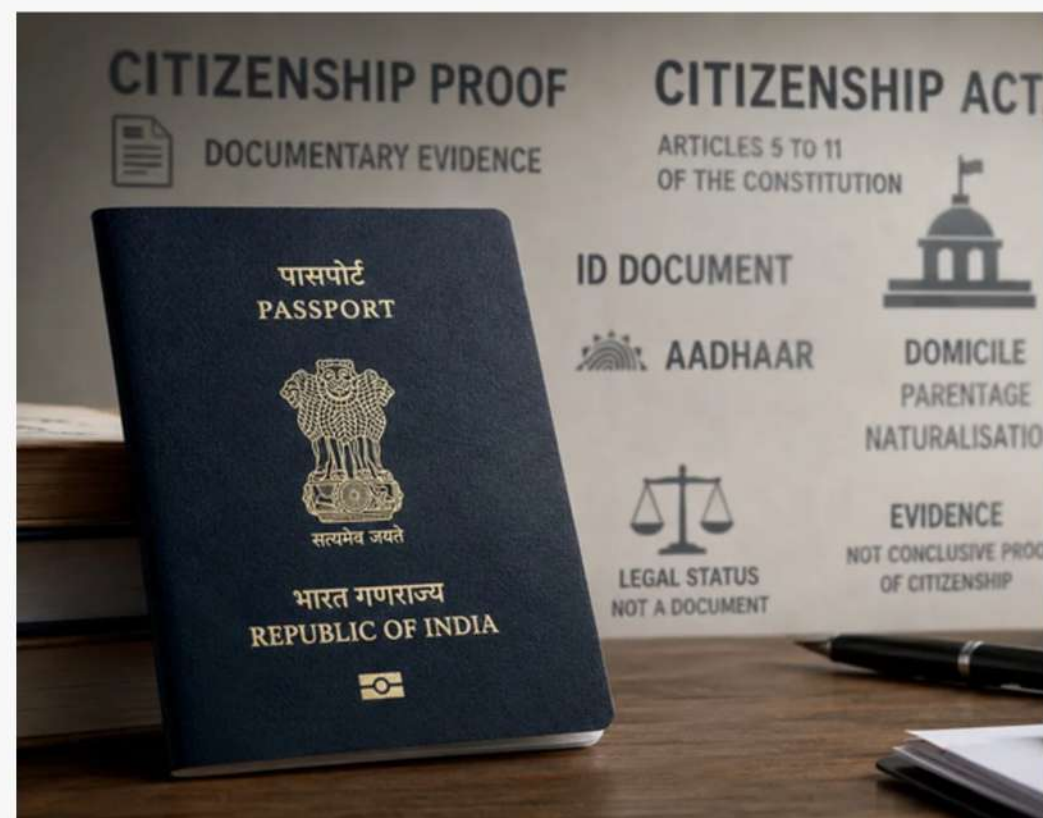
 On Western Ghats, South must breakimpasse  Western Ghats ESA Implementation Deadlock and the Long-Term Ecological, Developmental and Disaster Implications of Delayed Conservation Measures.	 Razor's edge  West Asia crisis has exposed India's underlying economic vulnerabilities, including weak domestic demand, declining energy self-sufficiency, sluggish industrial growth, and inflation-induced pressure on household consumption.
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Passport a travel document, not proof of citizenship: MEA

The Ministry of External Affairs (MEA) has clarified that an Indian passport is primarily a travel document and not a standalone legal proof of Indian citizenship, even though it is ordinarily issued only to Indian citizens after due verification. The clarification follows recent public and judicial debates on documents establishing citizenship, including Supreme Court observations that documents such as Aadhaar establish identity but not citizenship. A passport therefore reflects the government's satisfaction regarding an applicant's citizenship at the time of issue but does not itself create or conclusively determine citizenship if that status is challenged before a court.

How Indian Law Determines Citizenship

Indian law treats citizenship as a legal status rather than a document. The constitutional framework under Articles 5-11 and the Citizenship Act, 1955 governs who is an Indian citizen and the various modes through which citizenship may be acquired—by birth, descent, registration, naturalisation, or incorporation of territory. Citizenship is therefore determined through statutory conditions relating to birth, parentage, domicile or naturalisation, rather than by possession of any single government-issued document.



Documents Related to Citizenship: Evidence, Not Conclusive Proof

Since citizenship arises from legal facts, government documents merely serve as evidence supporting those facts and do not independently confer citizenship. Documents such as passports, birth certificates, Aadhaar, voter ID, PAN card, electoral rolls, school certificates and land records may collectively help establish an individual's claim, but none is recognised as a universally conclusive proof of citizenship. Judicial decisions have consistently held that citizenship disputes must be resolved by applying the provisions of the Constitution and the Citizenship Act, with the burden of proving citizenship resting on the person asserting the claim.

RELEVANCE GS III : Science and Technology

Why Can Some Non-Citizens Be Issued Indian Passports?

The distinction between passport law and citizenship law is reflected in **Section 20 of the Passports Act, 1967**, which empowers the Central Government to issue a passport or travel document to a non-citizen in the public interest. This exceptional provision has been invoked for stateless persons and displaced communities, including certain **Tibetan refugees and Sri Lankan Tamil refugees**, enabling them to travel abroad despite not being Indian citizens. These rare cases reinforce that a passport facilitates international travel but does not by itself determine citizenship.

India's Citizenship Documentation Gap and Passport Reforms

The present debate highlights a structural feature of India's legal framework: India has no universal citizenship certificate for citizens by birth. While persons acquiring citizenship through registration or naturalisation receive formal citizenship certificates, most Indians establish citizenship through a combination of documentary records rather than a single definitive credential. Although the Citizenship Rules, 2003 envisaged a National Register of Indian Citizens (NRC) and citizenship identity cards, the proposal was never implemented nationwide.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. With reference to India, consider the following statements: (2021)

1. There is only one citizenship and one domicile.
2. A citizen by birth only can become the Head of State.
3. A foreigner once granted citizenship cannot be deprived of it under any circumstances.

Which of the statements given above is / are correct?

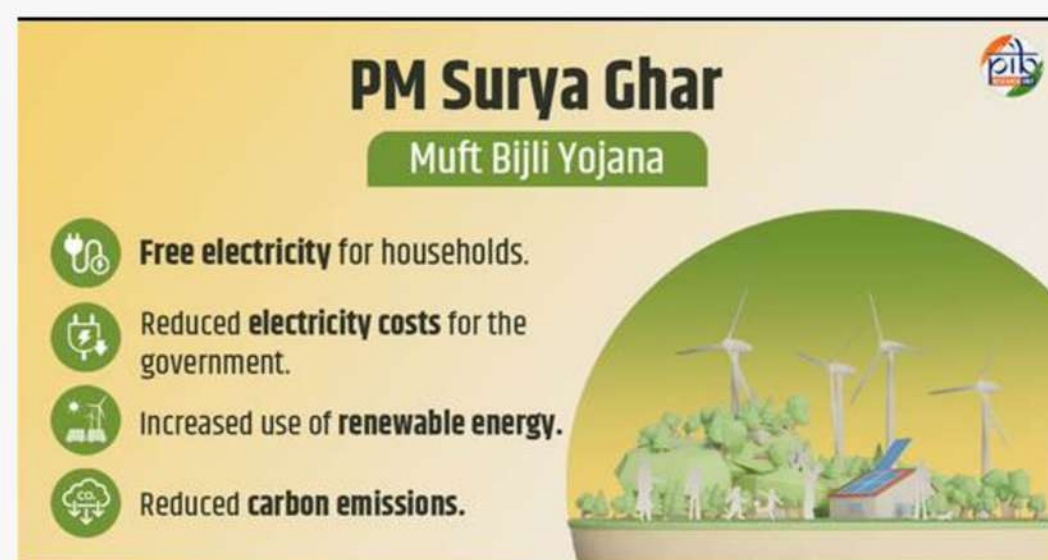
- (a) 1 only
- (b) 2 only
- (c) 1 and 3
- (d) 2 and 3

Solar rooftops slash power bills to zero for 50% Kerala homes, 42% in Rajasthan

The PM Surya Ghar: Muft Bijli Yojana (PMSGMBY) is beginning to translate rooftop solar adoption into measurable financial benefits for households. Recent programme data show that more than half of the beneficiaries in Kerala and over 42% in Rajasthan paid zero monthly electricity consumption charges, demonstrating that rooftop solar generation is increasingly meeting household electricity demand. Across India, nearly one in four beneficiaries recorded zero electricity bills during a recent billing cycle, indicating that distributed solar energy is reducing dependence on conventional grid power while lowering household electricity expenditure.

PM Surya Ghar: Muft Bijli Yojana

Launched as the *world's largest residential rooftop solar programme*, the PM Surya Ghar: Muft Bijli Yojana aims to *install rooftop solar systems in one crore households by 2026-27* while making clean electricity affordable for ordinary citizens. The scheme had already crossed the milestone of **10 lakh solar-powered homes by March 2025**, reflecting rapid implementation across the country. States such as **Chandigarh and Daman & Diu have achieved 100% rooftop solar installation** targets on government buildings, while Rajasthan, Gujarat, Maharashtra and Tamil Nadu have emerged as leading performers in residential solar adoption.



The Role of Net Metering

The principal driver behind the zero-bill phenomenon is net metering, under which electricity generated by rooftop solar panels is first used to meet household demand, while any surplus power is exported to the electricity grid. The exported electricity is credited against future consumption, enabling households to offset or even eliminate their electricity bills. This mechanism transforms households from passive electricity consumers into "prosumers" who both consume and generate electricity, improving energy efficiency while promoting decentralized renewable energy generation.

RELEVANCE

GS III : Indian Economy

Expected Outcomes of the Scheme

- Lower electricity bills: Many households are already recording zero monthly power charges.
- Additional income: Surplus solar power can be sold to DISCOMs through net metering.
- Greater renewable capacity: Expected addition of 30 GW of rooftop solar capacity.
- Environmental gains: Around 1,000 BU of clean electricity and 720 million tonnes of CO₂ emissions avoided over 25 years.
- Employment generation: Approximately 17 lakh direct jobs across manufacturing, installation, maintenance and allied sectors.

Contribution to India's Sustainable Development Goals

The success of rooftop solar reflects India's broader progress in achieving Sustainable Development Goal 7 (Affordable and Clean Energy). India ranked 94th among 169 countries in the UN Sustainable Development Report 2026, recording one of the largest improvements among major economies. This progress has been supported by expansion of electricity grid infrastructure, increasing integration of renewable energy, development of hybrid and round-the-clock renewable power projects, and stronger policy support from the Ministry of New and Renewable Energy (MNRE) and State Governments.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. 'Net metering' is sometimes seen in the news in the context of promoting the: (2016) a) production and use of solar energy by the households/consumers b) use of piped natural gas in the kitchens of households c) installation of CNG kits in motor-cars d) installation of water meters in urban households

SCIENCE

From Biomass Moisture to Sustainable Agriculture

A recent study has challenged the conventional view that moisture is merely an obstacle during pyrolysis of biomass to form biochar. It shows that the water naturally present in biomass actively influences the chemical reactions occurring during pyrolysis, thereby affecting biochar yield and quality. Instead of completely drying biomass before processing, carefully managing its moisture content may become an important strategy for optimizing biochar production.

How Water Influences Biochar Formation during Pyrolysis

Biochar is a carbon-rich material produced by heating biomass under oxygen-limited conditions through pyrolysis. The latest study distinguishes between free water (evaporates easily) and bound water (stays attached to plant polymers through hydrogen bonding). Both forms moderate the intensity of pyrolysis and increase biochar yield, but they influence biomass components differently. Water also promotes the formation of highly condensed aromatic carbon structures that improve the stability of biochar. Although higher moisture increases energy consumption because additional heat is required for evaporation, the study identifies **a biomass moisture content of about 30% as an effective balance between higher biochar yield and energy efficiency.**

Biochar in Context: Distinguishing it from Charcoal and Activated Carbon

Biochar, charcoal, and activated carbon are all carbon-rich solids produced primarily through pyrolysis, but they differ in purpose and application. Biochar is intended mainly for agricultural use as a soil amendment that enhances soil fertility, moisture retention, and long-term carbon storage. Charcoal is produced primarily as a fuel for cooking and heating. Activated carbon is manufactured by further activating carbon-rich materials to create an extremely high surface area with exceptional adsorption capacity, making it suitable for water purification, air filtration, pollution control, and industrial remediation.

Why Biochar Matters for India: Agriculture, Climate and Circular Economy

Large quantities of crop residues, particularly paddy straw in Punjab and Haryana, are currently burnt, causing severe air pollution and greenhouse gas emissions while wasting valuable biomass resources. Converting these residues into biochar can reduce stubble burning, improve soil organic carbon, enhance water-holding capacity, increase nutrient-use efficiency, and improve crop productivity. Field studies from Maharashtra and Kerala have demonstrated improvements in soil fertility using biochar derived from locally available biomass. **International experiences from Kenya, Thailand, and Brazil further show that biochar supports soil restoration while generating carbon credits and strengthening climate-resilient agriculture.**

Future Potential and the Way Forward

The potential feedstock for biochar extends beyond agricultural residues to include municipal organic waste, sewage sludge, and other biodegradable materials, creating opportunities for integrated waste management alongside sustainable agriculture. India generates enormous quantities of biodegradable municipal waste that could be converted into biochar instead of being disposed of in landfills. However, large-scale adoption remains constrained by limited farmer awareness, inadequate decentralized pyrolysis infrastructure, weak measurement and verification systems, and underdeveloped carbon-market linkages.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. Consider the following statements:

Statement I: Activated carbon is a good and an attractive tool to remove pollutants from effluent streams and to remediate contaminants from various industries.

Statement II: Activated carbon exhibits a large surface area and a strong potential for adsorbing heavy metals.

Statement III: Activated carbon can be easily synthesized from environmental wastes with high carbon content.

Which one of the following is correct in respect of the above statements?

- Both statement II and Statement III are correct and both of them explain Statement I
- Both Statement II and Statement III are correct but only one of them explains Statement I
- Only one of the Statements II and III is correct and that explains Statement I
- Neither Statement II nor Statement III is correct.

On Western Ghats, South must break impasse (Indian Express : 25-06-2026)

More than twelve years after the K. Kasturirangan Committee recommended declaring nearly 60,000 sq km (about 37% of the Western Ghats) as an Ecologically Sensitive Area (ESA), implementation remains incomplete due to prolonged opposition from the six Western Ghats States. The Committee had proposed restrictions on mining, quarrying, red-category polluting industries, thermal power plants and large construction projects to protect ecologically fragile landscapes. While Gujarat, Maharashtra and Goa have now accepted the proposal for about 19,000 sq km, consensus continues to elude Karnataka, Kerala and Tamil Nadu, delaying comprehensive ecosystem protection.

Ecological Significance of the Western Ghats

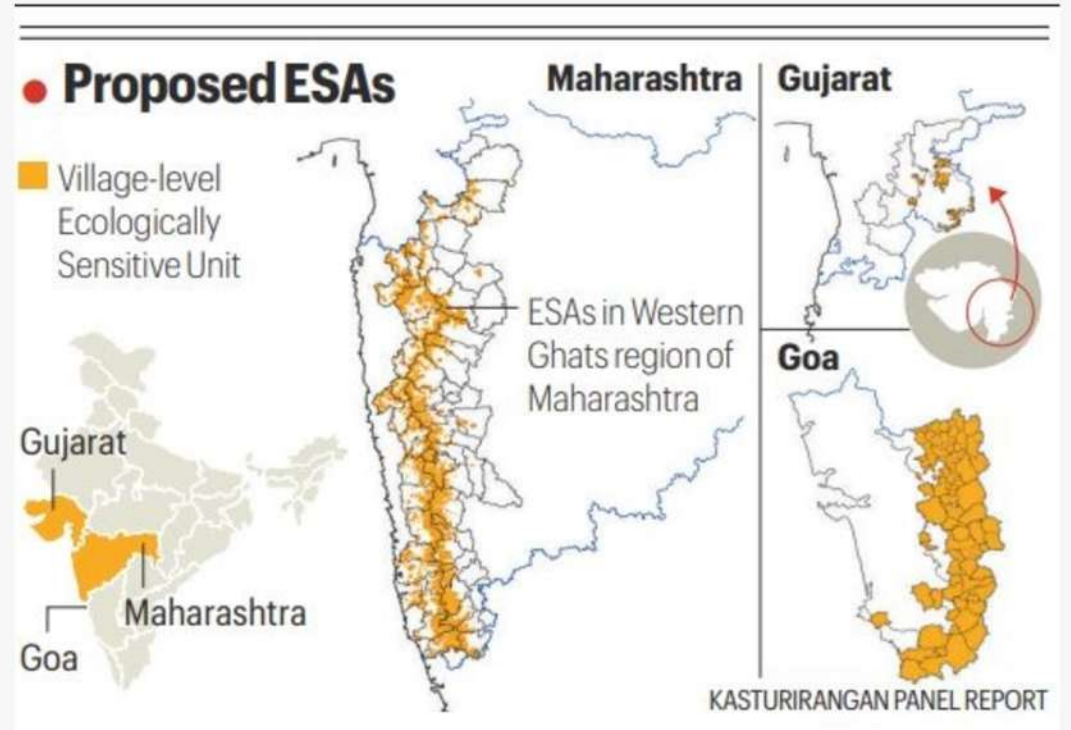
The Western Ghats constitute one of the world's eight "hottest hotspots" of biodiversity and perform irreplaceable ecological functions extending well beyond the region. The mountain chain intercepts moisture-laden monsoon winds, sustaining rainfall along the western coast, and serves as the source of major peninsular rivers including the Godavari, Krishna, Cauvery and Periyar. It also provides critical ecosystem services such as water security, biodiversity conservation, carbon sequestration and climate regulation, making its conservation a matter of national environmental and economic importance rather than merely a regional concern.

Consequences of Continued Inaction

The prolonged delay in ESA implementation has increased ecological and disaster-related vulnerabilities. Events such as the 2018 Kerala floods and the 2024 Wayanad landslide demonstrate the consequences of ignoring the ecological fragility of the Western Ghats. Continued expansion of environmentally harmful activities in sensitive landscapes can accelerate habitat degradation, increase disaster risks, weaken river catchments and reduce the ecosystem's capacity to regulate climate and water resources, thereby affecting both ecological sustainability and long-term economic resilience.

Development-Conservation Dilemma

Unlike many other ecologically sensitive regions, the Western Ghats are densely populated and support extensive agriculture and plantation-based livelihoods. This has intensified concerns that ESA regulations could restrict economic activities and local development. However, ecologists have consistently argued that ESA protection targets environmentally destructive activities rather than conventional agriculture and that conserving forests, watersheds and slopes ultimately safeguards farming communities against increasing climate variability and natural disasters.



Way Forward

Recent developments indicate gradual progress, with three States accepting ESA protection, but implementation across the ecologically critical southern stretches remains essential. The debate has increasingly shifted towards developing mechanisms that reconcile conservation with local economic interests. One proposal gaining support is financial remuneration for ecosystem services, recognising that communities living in and protecting the Western Ghats generate ecological benefits that extend far beyond the region. Such an approach could reduce resistance, strengthen cooperative federalism and facilitate long-pending implementation of ESA protection while ensuring sustainable livelihoods.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. 'Gadgil Committee Report' and 'Kasturirangan Committee Report', sometimes seen in the news, are related to: (2016)

- Constitutional reforms
- Ganga Action Plan
- Linking of rivers
- Protection of Western Ghats

RELEVANCE

GS III : Environmental Conservation

Razor's edge (The Hindu : 25-06-2026)

The ongoing West Asia crisis has brought renewed attention to several underlying weaknesses in the Indian economy that existed even before the conflict began. Recent economic indicators suggest that growth momentum has weakened considerably, with the performance of key industrial sectors remaining subdued throughout the previous financial year. The crisis has therefore acted more as a stress test that has exposed pre-existing vulnerabilities rather than being the sole cause of the slowdown.

Climatic Drivers Behind the Weak Monsoon

Large-scale climate drivers such as the El Niño–Southern Oscillation (ENSO) and the Indian Ocean Dipole (IOD) strongly influence India's monsoon. El Niño develops in the tropical Pacific Ocean and is associated with warming of the eastern Pacific, weakening of the easterly trade winds, and reduced atmospheric convection, thereby suppressing rainfall over the Indian subcontinent. The Indian Ocean Dipole (IOD) refers to the difference in sea surface temperatures between the western and eastern Indian Ocean; a positive IOD often helps compensate for El Niño-induced rainfall deficits. At present, however, the IOD remains too weak to offset El Niño, while the Madden–Julian Oscillation (MJO) is also in an unfavourable phase. Beyond rainfall, these climate drivers can influence agriculture, economic activity, food security, migration, public health and even conflict across the Indo-Pacific region.



Implications for Agriculture

A prolonged rainfall deficit poses significant risks to India's agriculture, particularly during the kharif season. Delayed or deficient rainfall can disrupt the sowing of rice, pulses and oilseeds, reduce soil moisture, and lower agricultural productivity. Plantation crops, including cardamom in Kerala's Idukki district, are already facing stress due to prolonged heat and inadequate rainfall, while extreme temperatures are reducing farm labour productivity. Fertilizer availability may also come under pressure because of Chinese export restrictions and geopolitical tensions in West Asia. Recognising these vulnerabilities, the Agriculture Ministry has prioritised 111 districts with limited irrigation coverage for contingency planning.

RELEVANCE

GS III : Indian Economy

Wider Economic and Fiscal Consequences

Weak monsoons extend beyond agriculture to affect the broader economy and public finances. Lower agricultural output can reduce rural incomes and demand, contributing to fiscal stress in agriculture-dependent States. Reduced food production may increase prices of vegetables, pulses and other essentials, complicating inflation management and monetary policy. Climate-related shocks such as droughts and floods also create sudden revenue-expenditure mismatches for governments by increasing relief and reconstruction spending while reducing economic activity.

The Need for Structural Reforms

The recurring impact of climate variability highlights the need to shift India's rural economy from a rainfall-centric to a water-centric model of agricultural development. This includes reducing dependence on water-intensive crops, promoting efficient water management, diversifying cropping patterns and strengthening climate resilience through flexible sowing windows and climate-resilient seed varieties. Effective implementation of contingency plans at the grassroots level remains essential.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. "Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)." Comment on the progress made in India in this regard. (GS III – 2018)

Q. "Industrial growth rate has lagged behind in the overall growth of Gross-Domestic-Product (GDP) in the post-reform period" Give reasons. How far the recent changes in Industrial Policy are capable of increasing the industrial growth rate? (GS III – 2017)

After Op Sindoor strain, how India and Turkey brought their ties back from the brink

India and Turkey are witnessing a cautious diplomatic reset after several years of strained relations driven primarily by differences over Kashmir and Turkey's close strategic partnership with Pakistan. While political disagreements persist, both countries increasingly recognise the strategic and economic value of engagement, leading to renewed diplomatic dialogue, security cooperation and efforts to restore bilateral ties.

Phase I (2002–2019): Expanding Strategic and Economic Engagement

India and Turkey witnessed a significant improvement in bilateral relations after Recep Tayyip Erdoğan assumed office in 2002. The period was marked by frequent high-level political exchanges, expanding business and cultural interactions, and growing people-to-people ties. Bilateral merchandise trade increased from around **US\$700 million in 2002 to nearly US\$13.8 billion by 2022**, reflecting strong economic complementarities. Despite differences on some international issues, the relationship remained largely pragmatic and centred on trade, investment and cooperation.

Phase II (2019–2025): Strategic Mistrust and Diplomatic Breakdown

Relations deteriorated sharply following India's **abrogation of Article 370 in Jammu & Kashmir in 2019**, which Turkey repeatedly criticised while supporting Pakistan's position on Kashmir. Bilateral tensions reached their lowest point after the Pahalgam terrorist attack and Operation Sindoor, when Turkey condemned India's military response and reports emerged of Pakistan using Turkish-origin military equipment. India responded by strengthening engagement with Cyprus, reaffirming support for its sovereignty and reunification, reducing official engagement with Ankara, cancelling commercial contracts, restricting certain Turkish business operations on national security grounds, and witnessing a decline in bilateral trade and tourism.

Phase III (2026 Onwards): Beginning of a Diplomatic Thaw

Relations have begun to improve through a cautious diplomatic reset driven by sustained dialogue and practical cooperation. The resumption of foreign office consultations after a four-year gap, cooperation in extraditing wanted criminals, and renewed discussions on trade, investment, technology, energy, tourism and counter-terrorism reflect the willingness of both countries to stabilise ties. Turkey has sought to reassure India that it has no bilateral dispute with New Delhi and that its defence engagement with Pakistan stems from long-standing ties rather than recent military support. India has similarly indicated that continued dialogue is preferable to prolonged diplomatic disengagement.



Pragmatism Driving the Future Relationship

The ongoing rapprochement is driven less by a convergence of strategic positions than by shared economic and geopolitical interests. Turkey seeks to preserve access to India's large market, investment opportunities and expanding role in Asia while diversifying its foreign partnerships beyond the West. India, in turn, values engagement with Turkey as a gateway to Europe, West Asia and Central Asia, an important trading partner, and a key regional actor in connectivity initiatives. Both countries have clarified that their respective relations with Pakistan, Cyprus and Greece are not intended to be directed against each other. Although differences over Kashmir remain, sustained dialogue, expanding economic cooperation and pragmatic diplomacy are likely to shape the future trajectory of India–Turkey relations.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. Terrorist activities and mutual distrust have clouded India – Pakistan relations. To what extent the use of soft power like sports and cultural exchanges could help generate goodwill between the two countries? Discuss with suitable examples. (2015)

AI coding costs to cross developer pay

AI-assisted coding is expected to become more expensive than employing an average software developer by 2028 because of the rapid rise in Large Language Model (LLM) token consumption and the industry's shift towards consumption-based pricing. AI models process information through **tokens—small units of text or data**—which determine the computational work performed and, consequently, the cost of using AI coding tools. As organisations move from experimental use to enterprise-wide deployment of AI coding agents, token usage is increasing sharply, causing operational costs to rise. Developers also tend to prioritise speed and convenience over token efficiency, leading to excessive consumption. Without strong governance mechanisms to regulate AI usage and optimise token expenditure, the cost of AI-assisted coding could increase faster than the productivity gains it generates, eventually surpassing the cost of human developers.

The growing cost of AI coding is closely linked to the economics of AI infrastructure. Every AI application relies on massive computational resources that process billions of tokens inside specialised AI factories—next-generation data centres designed to accelerate AI workloads. Since token processing directly determines infrastructure expenditure, reducing the cost per token has become a major focus for AI companies through better software optimisation and advanced hardware such as newer-generation GPUs.

Adani eyes 10 GW nuclear power plan



India's nuclear energy sector has entered a new phase following the enactment of the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025, which opens the sector to private participation across nuclear power generation, reactor supply and operation, nuclear fuel mining, and research and development throughout the nuclear fuel cycle. Reflecting this policy shift, the Adani Group has announced plans to develop 10 GW of nuclear power capacity by 2035, while companies such as Reliance Industries, NTPC, Tata Power (with an interest in Small Modular Reactors), and Lalitpur Power Generation Company have also expressed interest in the sector. The reforms are expected to accelerate investment, technology development and capacity expansion while complementing India's clean energy transition.

Significance of Nuclear Energy for India

The renewed emphasis on nuclear power reflects its growing importance in meeting India's rising electricity demand through a low-carbon, reliable and round-the-clock source of baseload power, thereby supporting energy security, climate commitments and long-term economic growth. India's indigenous nuclear programme—including its three-stage strategy and Fast Breeder Reactor (FBR) programme—aims to maximise the utilisation of limited uranium resources and abundant thorium reserves, strengthening long-term energy self-reliance. However, large-scale expansion must continue to address concerns relating to high capital costs, reactor safety, radioactive waste management, regulatory oversight and public acceptance, making technological advancement and robust governance essential for the sustainable growth of the sector.

PYQ Compass

UPSC questions previously asked from the themes discussed on this page.



Q. Which of the following statements with regard to Large Language Models (LLMs) used in machine learning is/are correct?

1. LLMs assign probabilities to the next possible words and then pick the one with the highest probability.
2. LLMs process data through mathematical optimization to minimise prediction errors.
3. LLMs produce unbiased outputs.

Select the answer using the code given below:

- (a) 1 only
- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

RELEVANCE

GS III : Indian Economy

PYQ Compass

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Q. With reference to India, consider the following statements: (2021)

1. There is only one citizenship and one domicile.
2. A citizen by birth only can become the Head of State.
3. A foreigner once granted citizenship cannot be deprived of it under any circumstances.

Which of the statements given above is / are correct?

- (a) 1 only
- (b) 2 only
- (c) 1 and 3
- (d) 2 and 3

Ans: a

Statement 1 is correct: India has a system of single citizenship, meaning all Indians are citizens of India, irrespective of the state or union territory they reside in. There is also a single domicile under Indian law.

Statement 2 is incorrect: There is no such restriction in India that only a citizen by birth can become the Head of State (President). A naturalized citizen is also eligible.

Statement 3 is incorrect: A foreigner granted Indian citizenship can be deprived of it under certain circumstances, such as if the citizenship was obtained fraudulently or if the person acts against the sovereignty and integrity of India (as per the Citizenship Act, 1955).

Q. 'Net metering' is sometimes seen in the news in the context of promoting the: (2016) a) production and use of solar energy by the households/consumers

- b) use of piped natural gas in the kitchens of households
- c) installation of CNG kits in motor-cars
- d) installation of water meters in urban households

Ans : a

Net metering is a system that allows consumers who generate their own electricity (often through solar panels) to feed the surplus electricity back into the grid. In return, they receive credit for the electricity they supply. The credits can be used to offset the cost of the electricity they consume from the grid when their own generation is insufficient (for example, at night or on cloudy days). This system promotes the production and use of solar energy by households and consumers because it makes it more financially attractive to invest in solar panels. Consumers can generate their own electricity, reduce their bills, and potentially earn money from excess energy production.

Q. 'Gadgil Committee Report' and 'Kasturirangan Committee Report', sometimes seen in the news, are related to: (2016)

- a) Constitutional reforms
- b) Ganga Action Plan
- c) Linking of rivers
- d) Protection of Western Ghats

Ans: d

Both the Gadgil Committee Report and the Kasturirangan Committee Report are related to the protection of the Western Ghats.

The Gadgil Committee was formed in 2010 under the chairmanship of Prof. Madhav Gadgil, an ecologist, to assess the environmental status of the Western Ghats. The committee's report emphasized the importance of conserving the Western Ghats due to its rich biodiversity and ecological significance. The report recommended that the entire Western Ghats should be declared as a Heritage Site and categorized into ecologically sensitive zones (ESZs), with restrictions on certain activities in these zones to protect the environment.

PYQ Compass

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Q. Consider the following statements:

Statement I: Activated carbon is a good and an attractive tool to remove pollutants from effluent streams and to remediate contaminants from various industries.

Statement II: Activated carbon exhibits a large surface area and a strong potential for adsorbing heavy metals.

Statement III: Activated carbon can be easily synthesized from environmental wastes with high carbon content.

Which one of the following is correct in respect of the above statements?

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- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct.

Ans : a

Activated carbon is a popular and effective method for removing pollutants from water, particularly in wastewater treatment and industrial processes. Activated carbon is produced from environmental wastes with high carbon content. Lignocellulosic and coal materials have been used as raw materials planned for manufacturing of activated carbons. There are two approaches for preparing activated carbon that can be used in water purification processes: physical activation and chemical activation. Activated carbon has good potential for adsorbing heavy metals because of its greater surface area, microporous ability, and chemical complexity of its external area. Activated carbon can be made relatively easily at home using materials like coconut shells or wood and is therefore an attractive tool to remove pollutants.

Hence, Both statement II and Statement III are correct and both of them explain Statement I.

Q. Which of the following statements with regard to Large Language Models (LLMs) used in machine learning is/are correct?

- 1. LLMs assign probabilities to the next possible words and then pick the one with the highest probability.
- 2. LLMs process data through mathematical optimization to minimise prediction errors.
- 3. LLMs produce unbiased outputs.

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- (b) 1 and 2 only
- (c) 2 and 3 only
- (d) 1, 2 and 3

Ans : b

Large Language Models (LLMs) like GPT work by predicting the next token/word in a sequence. They assign probability distributions over possible next words and typically select based on highest probability (or use sampling strategies).

Statement 1 is correct. This is the core mechanism of autoregressive language models, which generate text by predicting the most likely next token.

Statement 2 is correct. During training, LLMs use optimization algorithms like stochastic gradient descent to minimize the cross-entropy loss (prediction error).

Statement 3 is incorrect. LLMs are well-documented to produce biased outputs reflecting biases present in their training data. This is a widely recognized limitation of current LLM technology. The 'bias' in LLMs is one of their major demerits.

Practice Questions and answers

Q. Consider the following statements regarding Indian citizenship:

1. An Indian passport is itself conclusive legal proof of citizenship.
2. Indian citizenship is governed by the Constitution and the Citizenship Act, 1955.
3. Under exceptional public-interest circumstances, passports may be issued to certain non-citizens.

- (a) 2 only
 (b) 2 and 3 only
 (c) 1 and 2 only
 (d) 1, 2 and 3

Answer: (b)

- **Statement 1: Incorrect** — A passport facilitates travel but does not conclusively establish citizenship.
- **Statement 2: Correct** — Citizenship is determined under Articles 5–11 and the Citizenship Act.
- **Statement 3: Correct** — Section 20 of the Passports Act permits exceptional issuance.

Q. Consider the following statements regarding PM Surya Ghar: Muft Bijli Yojana:

1. The scheme promotes rooftop solar installations in households.
2. Net metering allows surplus electricity generated by households to be adjusted against grid consumption.
3. The scheme is expected to add nearly 30 GW of rooftop solar capacity.

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2 and 3

Answer: (d)

Explainer

- **Statement 1: Correct** — It is the world's largest residential rooftop solar programme.
- **Statement 2: Correct** — Net metering enables adjustment of surplus electricity.
- **Statement 3: Correct** — The scheme targets around 30 GW of rooftop capacity.

Q. Consider the following statements regarding India's nuclear energy sector:

1. The SHANTI Act, 2025 enables private participation in nuclear power generation.
2. India's Fast Breeder Reactor programme seeks to improve utilisation of uranium and thorium resources.
3. Nuclear energy is an intermittent source of electricity like solar and wind power.

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2 and 3

Answer: (a)

- **Statement 1: Correct** — The SHANTI Act expands private participation across the nuclear fuel cycle.
- **Statement 2: Correct** — FBRs are central to India's long-term three-stage nuclear programme.
- **Statement 3: Incorrect** — Nuclear energy provides continuous baseload power, unlike intermittent renewables.