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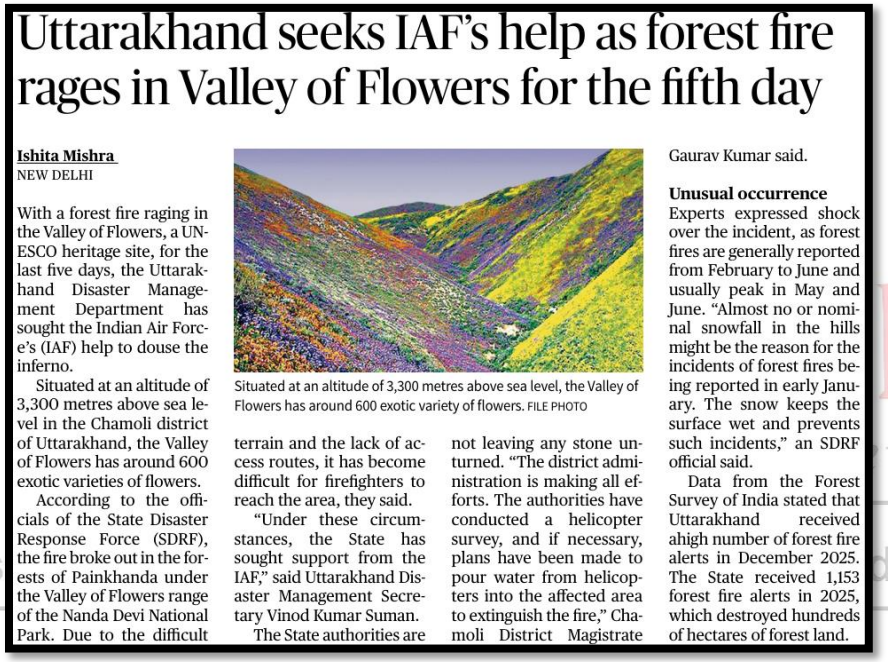
Page 01 : GS III : Environment & Disaster Management / Prelims Exam

The recent forest fire in the Valley of Flowers, a UNESCO World Heritage Site in Uttarakhand, highlights the increasing vulnerability of ecologically fragile Himalayan ecosystems to climate variability and governance challenges. With the fire continuing for five days in extremely inaccessible terrain, the State's request for assistance from the Indian Air Force underlines the seriousness of the situation and the limits of conventional disaster response mechanisms in high-altitude regions.



Uttarakhand seeks IAF's help as forest fire rages in Valley of Flowers for the fifth day

Ishita Mishra
NEW DELHI

With a forest fire raging in the Valley of Flowers, a UNESCO heritage site, for the last five days, the Uttarakhand Disaster Management Department has sought the Indian Air Force's (IAF) help to douse the inferno.

Situated at an altitude of 3,300 metres above sea level in the Chamoli district of Uttarakhand, the Valley of Flowers has around 600 exotic varieties of flowers.

According to the officials of the State Disaster Response Force (SDRF), the fire broke out in the forests of Painkhanda under the Valley of Flowers range of the Nanda Devi National Park. Due to the difficult terrain and the lack of access routes, it has become difficult for firefighters to reach the area, they said.

"Under these circumstances, the State has sought support from the IAF," said Uttarakhand Disaster Management Secretary Vinod Kumar Suman.

The State authorities are not leaving any stone unturned. "The district administration is making all efforts. The authorities have conducted a helicopter survey, and if necessary, plans have been made to pour water from helicopters into the affected area to extinguish the fire," Chamoli District Magistrate Gaurav Kumar said.

Situated at an altitude of 3,300 metres above sea level, the Valley of Flowers has around 600 exotic variety of flowers. FILE PHOTO

Unusual occurrence

Experts expressed shock over the incident, as forest fires are generally reported from February to June and usually peak in May and June. "Almost no or nominal snowfall in the hills might be the reason for the incidents of forest fires being reported in early January. The snow keeps the surface wet and prevents such incidents," an SDRF official said.

Data from the Forest Survey of India stated that Uttarakhand received ahigh number of forest fire alerts in December 2025. The State received 1,153 forest fire alerts in 2025, which destroyed hundreds of hectares of forest land.

Key Issues and Analysis

Ecological Significance at Risk: Located at about 3,300 metres above sea level in Chamoli district, the Valley of Flowers is globally renowned for its biodiversity, hosting nearly 600 species of alpine flowers and forming part of the larger Nanda Devi National Park ecosystem. Forest fires in such zones can cause irreversible damage to endemic flora, soil fertility, and associated fauna, undermining conservation objectives.

Climate Change and Altered Fire Regimes: Experts have termed the incident "unusual" as forest fires in Uttarakhand typically peak between February and June. The near absence of snowfall in early winter points to changing climatic patterns. Reduced snow cover keeps forest floors dry, increasing flammability even in months traditionally considered low-risk. This reflects broader climate-induced shifts in disaster patterns in the Himalayas.

Governance and Disaster Response Constraints: The fire originated in the Painkhanda forests, an area with steep slopes and poor accessibility. Ground-based firefighting is severely constrained, necessitating aerial reconnaissance and potential water bombing by helicopters. This episode exposes the need for:

- Better early warning systems
- Pre-positioned resources for remote areas
- Enhanced coordination between civil authorities, forest departments, and defence forces

Data and Trends: According to the Forest Survey of India, Uttarakhand recorded a high number of forest fire alerts in December 2025. With over 1,153 alerts in 2025 and hundreds of hectares affected, the trend signals a systemic problem rather than isolated incidents, raising concerns for long-term forest governance and climate resilience.

Federal Support and Civil–Military Cooperation: The request for IAF support illustrates the growing role of civil–military cooperation in disaster management. While such support is crucial during crises, it also indicates the necessity of strengthening State-level capacity to handle environmental disasters independently and sustainably.

Way Forward

- Integrating climate adaptation strategies into forest management
- Expanding satellite-based fire detection and rapid response mechanisms
- Promoting community-based forest fire prevention
- Strengthening institutional coordination under the Disaster Management Act, 2005

Conclusion

The forest fire in the Valley of Flowers is not merely an environmental accident but a warning signal of deeper structural and climatic stresses affecting the Himalayan region. Protecting ecologically sensitive and globally significant sites requires proactive governance, climate-sensitive planning, and robust disaster preparedness. For India, balancing conservation imperatives with effective disaster response will be critical in safeguarding its natural heritage in an era of increasing climate uncertainty.

UPSC Prelims Exam Practice Question

Ques: The Forest Survey of India (FSI) primarily uses which of the following for forest fire alerts?

(a) Manual ground surveys

(b) Drone-based surveillance only

(c) Satellite-based remote sensing

(d) Reports from State Forest Departments only

Ans : c)

UPSC Mains Exam Practice Question

Ques: Forest fires in ecologically sensitive Himalayan regions are increasingly being reported outside the traditional fire season. Discuss the role of climate change and governance challenges in this context. **(250 Words)**

Page 06 : GS II : Indian Polity / Prelims Exam

In a significant reaffirmation of the constitutional vision of social justice, the **Supreme Court of India** has held that equality in society must begin within the classroom. Emphasising the transformative role of education, the Court underlined that schools should function as shared social spaces where children from diverse socio-economic backgrounds learn together, thereby laying the foundation for substantive equality.

Equality in society has to start in school, says Supreme Court

Krishnadas Rajagopal
Aaratrika Bhaumik
NEW DELHI

The Supreme Court, in a judgment on Tuesday, said that equality in society had to start in school, where the child of a multi-millionaire or a Supreme Court judge had to sit shoulder-to-shoulder with a child of an autorickshaw driver or a street vendor.

A Bench headed by Justice P.S. Narasimha elaborated that the obligation of the government under the Right to Education Act (RTE) to ensure that neighbourhood schools admit children belonging to weaker and disadvantaged sections has an "extraordinary capacity to transform the social structure of our society".

"The statutory design [of the RTE Act] is normatively ambitious. It envisages elementary education for all children, across the spectrum of class, caste, gender and economic position, in a shared institutional space. It makes it possible, normatively and structurally, for the child of a multimillionaire or even of a judge of the Supreme Court of India to sit in the same classroom and at the same bench as the child of an autorickshaw driver or a street vendor," Justice Narasimha, who authored the judgment, wrote.

> The statutory design [of the RTE Act] is normatively ambitious. It envisages elementary education for all children, across the spectrum of class, caste, gender and economic position, in a shared institutional space. It makes it possible... for the child of a multi-millionaire or even of a judge of SC to sit in the same classroom... as the child of an autorickshaw driver or a vendor
> **SUPREME COURT JUDGMENT**

The top court's judgment rose from the bitter experience of the petitioner, Dinesh Biwaji Ashtikar, who was quietly snubbed off when he had approached a neighbourhood school to admit his children for free and compulsory elementary education in 2016.

"It is his case that, even though information through RTI indicated that seats were available, the neighbourhood school did not respond," Justice Narasimha narrated.

The judge observed that educating "young India" and achieving "equality of status" demanded an earnest implementation of the constitutional right under Article 21A to free and compulsory education, followed by the statutory mandate of the 2009 Act.

'National mission'

"Ensuring admission of such students must be a national mission and an obligation of the appropriate government and the local authority. Equally, courts, be it constitutional or civil, must walk that extra mile to provide easy access and efficient relief to parents who complain of denial of the right," the Supreme Court declared.

Core Issues and Analysis

Constitutional and Statutory Basis: The judgment strongly anchors itself in **Article 21A** of the Constitution, which guarantees free and compulsory education to all children, and the **Right of Children to Free and Compulsory Education Act, 2009**. The Court clarified that the RTE Act is not a mere welfare measure but a normatively ambitious instrument designed to dismantle entrenched social hierarchies.

School as a Site of Social Transformation: Justice P.S. Narasimha highlighted that the statutory design of the RTE Act envisages children from all classes, castes, and economic positions sharing the same institutional space. Such early

socialisation has an "extraordinary capacity" to alter social attitudes, reduce prejudice, and promote equality of status—an objective enshrined in the Preamble.

Implementation Deficit and Ground Reality: The case arose from the lived experience of a parent whose children were denied admission despite the availability of seats, reflecting persistent gaps between legal mandate and administrative practice. The judgment exposes how procedural opacity, reluctance of private schools, and weak local oversight undermine the intent of the RTE framework.

Role of the State and Judiciary: The Court characterised the admission of children from weaker and disadvantaged sections as a "national mission", placing a proactive obligation on governments and local authorities. Importantly, it also expanded the role of courts, urging them to provide accessible and effective remedies to parents facing denial of this fundamental right.

Broader Social Implications: By stressing "equality of status" rather than merely equality of opportunity, the judgment advances the idea of substantive equality. It recognises education as a long-term social investment that can break intergenerational cycles of exclusion and inequality.

UPSC-Relevant Takeaways

Education as an instrument of social justice and equality
Substantive equality versus formal equality
Judicial reinforcement of socio-economic rights
Implementation challenges of welfare legislation

Conclusion

The Supreme Court's ruling reiterates that the promise of equality cannot be realised through abstract constitutional ideals alone but must be cultivated through everyday institutions like schools. By strengthening the enforceability of the RTE Act and emphasising shared educational spaces, the judgment aligns constitutional morality with social reality. In the long run, effective implementation of this vision can contribute significantly to building a more egalitarian and cohesive Indian society.

UPSC Prelims Exam Practice Question

Ques: The Supreme Court recently observed that "equality in society has to start in school". This observation primarily relates to the enforcement of:

(a) Article 14 of the Constitution
(b) Article 15(4) of the Constitution
(c) Article 21A of the Constitution
(d) Article 46 of the Constitution

Ans: c)

Ques : Discuss how Article 21A and the Right of Children to Free and Compulsory Education Act, 2009 together aim to transform India's social structure. Highlight the challenges in their effective implementation. **(250 words)**

Page 06 : GS III : Internal Security & Technology

In response to the rising menace of so-called "digital arrest" scams, the Union government has informed the **Supreme Court of India** about the constitution of a high-level Inter-Departmental Committee (IDC). These scams, which disproportionately target senior citizens and vulnerable groups, have resulted in large-scale financial losses and raised serious concerns about cyber security, regulatory coordination, and citizen protection in India's digital ecosystem.

Inter-departmental panel formed to combat 'digital arrests': govt. to SC

Krishnadas Rajagopal
NEW DELHI

The Union government has swung into action to combat digital arrests, which has deprived citizens, mostly elderly and the vulnerable, of thousands of crores of hard-earned money, by forming an inter-departmental committee chaired by its Special Secretary (Internal Security) Ministry of Home Affairs. The committee has held multiple meeting, and representatives of the online platforms Google, WhatsApp, Telegram and Microsoft attended the latest.

The government has informed the Supreme Court, which is hearing the case on January 13, in a status report that inputs to combat digital arrest scams have been received from the Department of Telecom (DoT) and the Reserve Bank of India (RBI).

The committee would guide enforcement agencies examine real-time issues and provide inputs. REPRESENTATIVE IMAGE

The high-level inter-departmental committee (IDC) was formed on December 26, and has officials from multiple agencies to "comprehensively examine all facets of the issue of digital arrests".

Chaired by the Special Secretary (Internal Security), the IDC has representations at the level of Joint Secretary and and above, officers from the Ministry of Electronics and Information Technology(MeitY), DoT, Ministry of External Affairs, Department of Financial Services, Ministry of Law & Justice, Ministry of Consumer Affairs, RBI, Central Bureau of Investigation, National Investigation Agency, Delhi Police, and Indian Cyber Crime Coordination Centre (I4C), with its Chief Executive Officer acting as the member-secretary.

Attorney-General R. Venkataramani would attend the meetings of the IDC on a regular basis.

The IDC was formed after a Bench headed by Chief Justice of India Surya Kant had directed inter-departmental Ministerial consultations, under the guidance of the Attorney General, to clear the way to end the bane which has affected a large populace.

The Centre said the IDC would examine and guide enforcement agencies examine "real-time issues"; identify relevant legislations, rules, circulars and implementation gaps, suggest corrective measures and provide inputs for further directions, as may be required, by the Supreme Court.

Understanding the Issue: 'Digital Arrest' Scams

"Digital arrests" refer to cyber frauds where criminals impersonate law-enforcement or regulatory authorities through video calls, messaging platforms, or spoofed communications, coercing victims into transferring money under the threat of arrest or legal action. The phenomenon exploits:

Low digital literacy, especially among the elderly

Trust in state institutions

Gaps in real-time cybercrime response and inter-agency coordination

Key Features of the Government's Response

Inter-Departmental Committee (IDC): The IDC is chaired by the Special Secretary (Internal Security), Ministry of Home Affairs, and includes senior representatives from multiple ministries and agencies. Its broad-based composition reflects the cross-sectoral nature of cybercrime, which spans internal security, financial regulation, technology governance, and international cooperation.

Institutional Coordination: The committee brings together stakeholders such as the Ministry of Electronics and Information Technology (MeitY), Department of Telecommunications (DoT), Ministry of External Affairs, Department of Financial Services, and law-enforcement agencies, along with financial regulators like the **Reserve Bank of India**. This signals recognition that cyber fraud cannot be tackled by siloed responses.

Role of Technology Platforms: Participation of major digital platforms such as Google, WhatsApp, Telegram, and Microsoft indicates an emphasis on platform accountability, faster takedown of fraudulent accounts, and improved cooperation in tracing digital footprints.

Judicial Oversight and Constitutional Dimension: The IDC was constituted following directions of a Bench headed by Chief Justice Surya Kant, under the guidance of the Attorney-General. This reflects judicial concern for protecting citizens' rights in the digital domain and ensuring effective enforcement of existing laws.

Mandate of the Committee: The IDC will:

- Examine real-time cyber fraud issues
- Identify gaps in existing laws, rules, and circulars
- Suggest corrective administrative and legal measures
- Provide inputs for further directions by the Supreme Court

The inclusion of the Indian Cyber Crime Coordination Centre highlights the operational focus on prevention, investigation, and coordination.

Conclusion

The formation of the Inter-Departmental Committee marks a shift from fragmented responses to a coordinated, institutional approach in tackling cyber frauds like digital arrests. However, its effectiveness will depend on timely implementation, regulatory clarity, platform compliance, and public awareness. In an era of rapid digitalisation, safeguarding citizens from cyber coercion is not merely a law-and-order issue but a core governance and trust-building imperative for the Indian State.

UPSC Prelims Exam Practice Question

Ques: The primary role of the Inter-Departmental Committee is to:

A) Enact new cyber laws through Parliament

B) Examine real-time cyber fraud issues and suggest corrective measures

C) Conduct cybercrime investigations independently

D) Replace existing law-enforcement cyber units

Ans: B)

UPSC Mains Exam Practice Question

Ques: Discuss the role of technology platforms and financial regulators in preventing large-scale cyber frauds in India. How can regulatory coordination be improved? **(150 words)**

Page 07 : GS II : Social Justice

An edible insects stall at a food mela hosted by the **Science Gallery Bengaluru** offers a sociological and policy-relevant lens to examine changing food cultures in India. The public reactions—ranging from curiosity to discomfort—highlight how notions of "normal" food are shaped not only by nutrition or taste, but by class, urbanisation, and cultural distance.

What an edible insects stall revealed about acceptance, 'normal' food

Despite their nutritional and environmental benefits, people are increasingly moving away from insect-based foods; urbanisation has created both physical and cultural distance from such practices; many younger generations that have grown up or settled in cities are often unaware that insects are eaten across several parts of India

Sahanashree R.
BENGALURU

Why does the idea of eating insects provoke discomfort, even before taste or nutrition enters the conversation? At an edible insects stall during a food mela at the Science Gallery, Bengaluru, this question surfaced repeatedly as visitors negotiated curiosity, disgust, and the boundaries of what they considered "normal" food.

Many assumed they were encountering a foreign idea. "This is eaten in other countries, right?" was a common question at the stall, curated under the exhibition theme 'Calorie'. Few realised that eating insects has long been part of food cultures within India itself.

Entomophagy, the practice of eating insects, is often imagined as something that happens elsewhere, outside India. Yet insects have been consumed across several Indian States for generations. This is particularly visible in parts of Northeast India, such as Nagaland and Arunachal Pradesh, where insects are eaten seasonally and sold in markets like Dimapur's Mava Market.

At the stall, visitors were offered cricket cookies, chilli garlic crickets, and fried silkworms. Curiosity often preceded commitment: nearly 60% of those who tasted the insects were trying for the first time. For many, the experience was marked by uncertainty followed by surprise. "It was my first time eating insects, so I didn't know what to expect," said a student who tried the fried silkworms. "But it turned out to be a good experience."

Taste makes a difference

Taste, more than curiosity, seemed to shift perception. One visitor described the silkworm as tasting "like overcooked kidney beans", while another, who tried both chilli garlic crickets and silkworms, noted the contrast clearly: "The cricket had more flavour. The silkworm had a more eggy texture."

Beyond perception, insects are often framed as an efficient source of calories and protein in a world facing growing food demands. As populations increase and food systems strain under climate and resource pressures, edible insects are frequently cited as a sustainable alternative protein source.

Many insect species are rich in protein, vitamins and micronutrients, with a much higher proportion of their body mass being edible, around 80%, compared to about 55% for poultry. They also require significantly less land, water and feed to produce the same amount of protein. For instance, crickets need far fewer resources than conventional livestock such as sheep or broiler chickens, making them an efficient source of protein from a production standpoint.

Yet despite these nutritional and environmental benefits and despite insects being part of many food cultures, people are increasingly moving away from them. Urbanisation has created both physical and cultural distance from such practices. Many younger generations who have grown up or settled in cities are often unaware that insects are eaten across several parts of India, sometimes even within their own home States.

Protein source: Entomophagy, the practice of eating insects, is often imagined as something that happens elsewhere, outside India. Yet insects have been consumed across several Indian States for generations. SAHANASHREE R

Insects are often framed as an efficient source of calories and protein in a world facing growing food demands. as populations increase and food systems strain under climate and resource pressures, edible insects are frequently cited as a sustainable alternative protein source

Distance and disconnect

During conversations at the stall, insect-eating was frequently framed as something "indigenous" acknowledged but distanced. It was seen as belonging to rural communities rather than to urban food cultures. In this framing, eating insects became less about nutrition and more about class: it did not fit into dominant ideas of modern, aspirational food.

Ironically, in the regions where these practices continue, insect-based foods are neither novel nor marginal. They are seasonal, familiar, and often tied to specific occasions and generations. Yet from an urban lens, these foods are frequently dismissed as backward, revealing how ideas of progress shape what is considered acceptable to eat.

Some visitors recognised this disconnect. "People should start overlooking the typical stereotypes and experiment more," said a working professional, reflecting on how discomfort often precedes experience. Others framed the hesitation against sustainability concerns. "It's a sustainable protein source that is cost-effective to produce and with low environmental impact," noted another visitor, pointing to the gap between environmental awareness and everyday food choices.

Even among visitors who were open to the idea, acceptance was often accompanied by hesitation. Questions emerged not just about taste or sustainability, but about sufficiency and substitution. "I'm wondering how filling this would be as a complete meal," one visitor said. "I don't know if it can really replace the food groups we have now."

Others echoed this caution. "I don't see it becoming a staple food," a student visitor noted, while still describing the stall as "a good initiative for public health." Alongside this, some visitors raised ethical questions about knowledge and credit. "If this practice is being promoted," one remarked, "it's important to acknowledge the communities and regions it comes from."

Low-pressure spaces

The stall did not resolve these questions; it was not meant to. Instead, it made visible the assumptions, hesitations and hierarchies that shape what we call food. It raised quieter, more uncomfortable questions: why some foods are embraced while others are dismissed, why sustainability is easier to discuss than to practise, and why foods familiar to many communities still feel unfamiliar in urban spaces.

From my perspective, making insect-based foods more acceptable is as much about form and familiarity as it is about nutrition. At the stall, insects were intentionally offered in different formats, both ground into cookies and served whole, flavoured with garlic and chilli. Presenting insects in processed forms appeared to lower psychological barriers, allowing visitors to engage with taste and texture without the immediate discomfort often associated with whole insects. Public-facing experiments like food stalls can play an important role in this process by creating low-pressure spaces where curiosity can precede judgement.

As Priyadarsanan Dharma Rajan, who works on edible insects, noted, his lab, the Insect Biosystematics and Conservation (IBC) Laboratory at ATREE, is increasingly focusing on developing sustainable ways of rearing insects. Establishing standardised rearing protocols allows insects to be produced at scale rather than harvested from the wild, reducing pressure on natural populations while ensuring consistency, safety and nutritional quality. In this sense, changing how insects are produced may be as important as changing how they are perceived.

(Sahanashree R. is Project Associate, IBC Laboratory, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru. sahana.shree@atree.org)

THE GIST

- Many insect species are rich in protein, vitamins, and micronutrients, with a much higher proportion of their body mass being edible
- They also require significantly less land, water, and feed to produce the same amount of protein as from poultry
- Insect-based foods are seasonal, familiar, and often tied to specific occasions and generations in the areas where it is consumed
- Making insect-based foods more acceptable is as much about form and familiarity as it is about nutrition

Core Issues and Analysis

Entomophagy in the Indian Context: Entomophagy (the practice of eating insects) is often perceived as a foreign or exotic practice. However, insects have traditionally been consumed across several Indian regions, particularly in parts of **Nagaland** and **Arunachal Pradesh**, where they are seasonally eaten and sold in local markets. The stall revealed a widespread lack of awareness among urban populations about these indigenous food practices.

Urbanisation and Cultural Disconnect: Rapid urbanisation has created both physical and cultural distance from traditional food systems. For many urban residents, insect-based foods are framed as "rural" or "indigenous" and therefore incompatible with modern, aspirational diets. This reflects how food choices are closely tied to class identity and ideas of progress rather than objective nutritional value.

Nutrition and Sustainability Dimension: Edible insects are increasingly discussed globally as a sustainable protein source. They are rich in protein and micronutrients, have a higher edible biomass (around 80%) compared to poultry, and require significantly less land, water, and feed. In a country facing challenges of malnutrition, climate change, and pressure on food systems, insect-based foods present a potential supplementary solution rather than a wholesale replacement of existing diets.

Perception versus Practice: The stall demonstrated that taste and form play a crucial role in acceptance. Processed forms such as cricket cookies lowered psychological barriers compared to whole insects. This indicates that behavioural change in food habits often depends on familiarity and presentation, not merely awareness campaigns.

Indigenous Knowledge and Ethical Concerns: Some visitors raised concerns about recognising and crediting the communities that have historically practised entomophagy. This aligns with broader debates on the appropriation of indigenous knowledge and the need for inclusive policy frameworks that respect traditional food cultures.

Research and Policy Linkages: Work being carried out by institutions such as the **Ashoka Trust for Research in Ecology and the Environment** focuses on developing standardised and sustainable insect-rearing protocols. Such efforts aim to reduce pressure on wild populations while ensuring food safety, scalability, and nutritional consistency—key prerequisites for any policy-level adoption.

Relevant Takeaways

- Nutrition security and alternative protein sources
- Impact of urbanisation on traditional knowledge systems
- Sustainability and climate-resilient food systems
- Social attitudes, class, and cultural hierarchies in policy implementation

Conclusion

The edible insects stall did not merely introduce a novel food item; it exposed deeper social hierarchies and assumptions embedded in India's food culture. While insects offer clear nutritional and environmental advantages, their acceptance depends on addressing cultural perceptions, urban–rural divides, and ethical recognition of indigenous practices. For India, integrating such alternative food sources into broader discussions on sustainability and public health requires not only scientific innovation but also social sensitivity and inclusive policymaking.

UPSC Mains Exam Practice Question

Ques : Discuss how urbanisation and class perceptions influence the acceptance of traditional food practices in India. Illustrate your answer with reference to entomophagy. **(250 words)**

Page 10 : GS I : Indian Society

India's urbanisation narrative has long been dominated by megacities and metropolitan growth corridors. However, a quieter yet structurally significant transformation is underway in the country's small towns. With nearly 9,000 census and statutory towns—most with populations below one lakh—India's urban future is increasingly being shaped outside its metros.

This trend raises a critical question for policymakers and planners: are small towns emerging as viable alternatives to overburdened metropolitan cities, or are they becoming new sites of uneven and precarious urbanisation?

Are India's small towns being increasingly urbanised?

Are small towns an alternative to the over-accumulation witnessed in the country's metro cities?

Tikender Singh Panwar

The story so far:

India continues to narrate its urban future through the loud vocabulary of megacities. But a quieter and far more consequential transformation is unfolding. Of India's nearly 9,000 census and statutory towns, barely 500 qualify as large cities. The overwhelming majority are small towns, with populations below 1,00,000. This proliferation of small towns is a structural product of India's capitalist development – and of its crisis.

How have small towns proliferated?

From the 1970s through the 1990s, capital accumulation was organised through metropolisation. Large cities became the primary sites for industrial production, state investment, infrastructure, and labour absorption. Delhi, Mumbai, Chennai, Kolkata and later Bengaluru and Hyderabad became spatial fixes for capitalism by absorbing surplus labour; concentrating consumption; and by creating conditions for accumulation. However, today, India's metros have run into the classic problem of over-accumulation. Land prices have detached from productive use, infrastructure systems are stretched beyond repair, and rising costs have become unbearable for working groups.

It is in this moment that small towns have emerged. Across India, one can see this shift. Towns like Sattenapalle in Andhra Pradesh, Dhamtari in Chhattisgarh, Barabanki in Uttar Pradesh, Hassan in Karnataka, Bongaigaon in Assam, or Una in Himachal Pradesh are now logistics nodes, agro-processing hubs, warehouse towns, construction economies, service centres and consumption markets. They absorb migrant workers pushed out of metros and rural youth with few agrarian options. These small towns are not outside the urban process; they are fully inside it. Small towns are urbanised under conditions of capitalist stress – cheaper land, pliable labour, weaker regulation, and minimal political scrutiny.

Are small towns a better alternative?

They offer no inherent emancipatory promise. What is unfolding is not inclusive growth but the urbanisation of rural poverty. Informal labour dominates – construction workers without contracts, women in home-based piecework, and youth trapped in platform economies with no security. In towns like Shahdol in Madhya Pradesh or Raichur in Karnataka, one sees new hierarchies hardening: real estate brokers, local contractors, micro-financiers and political intermediaries are controlling land and labour. This is where policy failure becomes glaring. India's flagship urban missions remain deeply metro-centric. AMRUT, even in its expanded version, effectively excludes most small towns from meaningful infrastructure investment. Water supply and sewerage projects are designed for large cities, while small towns survive on fragmented schemes and temporary fixes. The result is predictable: tanker economies flourish, groundwater is mined indiscriminately, and ecological stress deepens. Moreover, governance remains the weakest link. Small-town municipalities are underfunded and understaffed. Planning is outsourced to consultants unfamiliar with local realities and participation is reduced to procedural hearings.

What next?

The first step is political recognition. Small towns must be acknowledged as the primary frontier of India's urban future. Second, planning must be reimagined. Town-level plans must integrate housing, livelihoods, transport and ecology, rather than replicate metropolitan templates. Third, small towns need empowered municipalities, transparent budgets, and institutional space for workers' collectives, environmental actors and cooperatives. Finally, capital must be disciplined. Platform economies and digital infrastructures need regulation to ensure labour rights, local value retention and data accountability.

Tikender Singh Panwar is a member of the Kerala Urban Commission.

THE GIST

- Delhi, Mumbai, Chennai, Kolkata and later Bengaluru and Hyderabad became spatial fixes for capitalism by absorbing surplus labour; concentrating consumption; and by creating conditions for accumulation.
- India's flagship urban missions remain deeply metro-centric. AMRUT, even in its expanded version, effectively excludes most small towns from meaningful infrastructure investment.
- Small towns must be acknowledged as the primary frontier of India's urban future.

Why Are Small Towns Proliferating?

From the 1970s to the 1990s, India's capitalist development relied heavily on metropolisation. Large cities acted as centres of industrial production, infrastructure investment, and labour absorption. Over time, however, these metros have encountered the problem of over-accumulation—manifested in soaring land prices, strained infrastructure, environmental stress, and rising costs of living.

Against this backdrop, small towns have emerged as new spaces for capital deployment. Lower land costs, relatively weaker regulation, and readily available labour have made them attractive for logistics, agro-processing, warehousing, construction, services, and consumption-led growth. Importantly, these towns are not "pre-urban" or transitional; they are deeply embedded in the urbanisation process, absorbing migrants displaced from metros and rural youth facing agrarian distress.

Are Small Towns a Better Alternative to Metros?

The evidence suggests caution. Small-town growth has not automatically translated into inclusive or equitable development. Instead, many towns are witnessing the **urbanisation of rural poverty**, characterised by:

- Predominance of informal and insecure employment
- Expansion of construction and platform-based work without social protection
- Emergence of new local elites controlling land, credit, and labour

Governance and policy failures exacerbate these trends. Flagship urban programmes remain metro-centric. For instance, **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**, even in its expanded form, largely sidelines smaller towns from sustained infrastructure investment. As a result, water scarcity, tanker economies, groundwater depletion, and ecological stress are becoming defining features of small-town urbanisation.

- Municipal institutions in these towns are typically under-resourced and understaffed. Planning processes are often outsourced, technocratic, and disconnected from local socio-economic realities, limiting democratic participation and accountability.

What Should Be the Way Forward?

- **Political recognition** of small towns as the central arena of India's future urban growth
- **Context-sensitive planning**, integrating housing, livelihoods, transport, and ecology rather than replicating metropolitan models
- **Empowered local governance**, with adequate finances, staffing, and participatory institutions
- **Regulation of capital and platforms**, to protect labour rights, ensure local value capture, and promote data accountability

Such an approach would align urbanisation with social justice and sustainability rather than mere spatial expansion.

Conclusion

India's small towns are not a solution to metropolitan over-accumulation by default; they are its extension under new spatial conditions. Without deliberate policy correction, they risk becoming zones of informalisation, ecological stress, and weak governance. Recognising small towns as the primary frontier of urban transformation—and planning for them accordingly—is essential if India's urban future is to be equitable, resilient, and sustainable. This perspective, articulated by voices such as members of the **Kerala Urban Commission**, is critical for reframing India's development discourse beyond the megacity paradigm.

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Daily News Analysis

UPSC Mains Exam Practice Question

Ques : "India's urban future is increasingly being shaped by small towns rather than megacities." In this context, critically examine whether the rapid urbanisation of small towns in India offers a sustainable alternative to the over-accumulation and congestion witnessed in metropolitan cities. Discuss the associated socio-economic, governance, and ecological challenges. (250 words) (250 words)

Page : 08 : Editorial Analysis

India must focus on AI and its environmental impact

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There are several AI sustainable practices that India can adopt

The use of Artificial Intelligence (AI) takes up much discussion in sectors that range from health care to agriculture. But concerns about its impact on the environment have not attracted much discussion. According to an OECD working paper, "Measuring the Environmental Impacts of Artificial Intelligence Compute and Applications", the development of AI algorithms comes with certain environmental costs such as an increased carbon footprint which exacerbates climate change-related challenges. The report says that the global ICT industry (including hardware such as televisions) is estimated to be responsible for 1.8%-2.8% of global greenhouse gas (GHG) emissions; other calculations have a figure as high as 2.1%-3.9%.

It is worth noting that data about the carbon footprint of AI models and their use are not always authentic. A Google report (August 2025) claims that a single text AI prompt consumes electricity of only 0.24 watt-hours. What may seem to be low levels of electricity consumption has also drawn criticism for the report's incomplete and misleading conclusions.

Impact on the environment

In September 2024, an issue note by the United Nations Environment Programme (UNEP), on the environmental impact of the full AI life cycle, said that house AI servers may utilise 4.2 billion cubic meters (bcm) to 6.6 bcm of water in 2027, leading to water scarcity. The note also refers to a study which indicates that training a single Large Language Model (LLM) can generate almost 3,00,000 kilograms of carbon emissions.

Similarly, a study, "Energy and Policy Considerations for Deep Learning in NLP" (June 2019), has assessed that the training of a single large AI model entails the emission of over 6,26,000 pounds of carbon dioxide. This is equivalent to emissions caused by five cars in their lifespan. A look at the energy consumption in the use of ChatGPT, a widely used AI virtual Assistant, helps understand how AI algorithms impact the environment and contribute towards climate change. According to a study, "Navigating New Horizons" (UNEP, July 15, 2024), any request made through ChatGPT leads to energy consumption that is 10 times more than what it would be through a Google search.

Solutions, the world versus India

In 2021, UNESCO released its "Recommendation on the Ethics of Artificial Intelligence", which emphasised recognising the "negative impacts of AI on societies, environment". These non-binding recommendations were adopted by around 190 countries. The United States and the European Union (EU) appear to be the prominent jurisdictions that have proposed legislation dealing with the environmental impact of AI, as the Artificial Intelligence Environmental Impacts Act of 2024 and The European Union's resolution on harmonized AI rules.

Since there are global conversations about the carbon cost of AI use and deployment, India also needs to recognise the environmental costs of developing AI models. Current discussions now on AI and climate change are on how AI can help protect the environment, but without going into the demerits of developing large AI algorithms.

The first step to address this challenge is to carry out an exercise to measure the environmental impacts of developing and deploying AI models. In India, an Environmental Impact Assessment (EIA) is mandatory as in the EIA Notification, 2006. While an EIA is often conducted to evaluate projects concerning the environment such as river water projects, its scope can be extended to include assessing the impact of development of AI algorithms on the environment.

The government could also focus on the establishment of measuring standards in order to assess AI's impact. It can be done by involving stakeholders such as tech companies that are developing large-scale AI algorithms, think tanks, and non-governmental organisations that are working toward reducing carbon footprints and mitigating other environment-related challenges. This will help in building consensus on terminology, standards, and consistent indicators and reporting requirements, ultimately leading to informed policy decisions.

Another essential exercise is data collection which can be done by deploying sustainability metrics such as GHG emissions, energy, water and natural resources consumption that are utilised by AI algorithms. Environmental costs beyond energy, such as the impacts on freshwater and land use, could also be evaluated.

As a part of disclosure standards

The government can also explore the possibility of making the environmental impact of developing and deploying AI models as part of environmental, social and governance (ESG) disclosure standards by the Ministry of Corporate Affairs and Security and the Securities and Exchange Board of India. It can take inspiration from the EU, as its Corporate Sustainability Reporting Directive (CSRD) framework requires the disclosure of emissions data from data centres and high compute activities, which includes training of LLMs.

The focus should shift to including AI as a part of solutions toward global sustainability goals. There are several AI sustainable practices that can be adopted to mitigate the adverse impact of AI on the environment such as deploying pre-trained models, using renewable resources to power data centres, and reporting AI-specific estimates.

GS Paper III : Science & Technology & Environment

UPSC Mians Practice Question: Data centres and large language models have emerged as new sources of carbon and water stress.Discuss in the context of India's climate commitments and sustainable development goals. (250 Words)

Context :

Artificial Intelligence (AI) is increasingly shaping sectors such as healthcare, agriculture, governance, and industry in India. However, as highlighted by Amar Patnaik, an often-overlooked dimension of this technological transition is its environmental cost. Global evidence now suggests that the rapid expansion of AI—especially large language models (LLMs) and data centres—has significant implications for carbon emissions, energy consumption, and water use. This raises critical questions for India's climate commitments and sustainable development pathway.

Environmental Costs of AI

Studies by international institutions underscore the scale of the challenge. According to the Organisation for Economic Co-operation and Development (OECD), the global ICT sector contributes between 1.8% and 2.8% of total greenhouse gas emissions, with some estimates going as high as 3.9%. AI development forms a rapidly growing component of this footprint.

An issue note by the United Nations Environment Programme (UNEP) warns that AI data centres could consume between 4.2 and 6.6 billion cubic metres of water annually by 2027, intensifying water stress. Further, training a single large AI model can emit hundreds of thousands of kilograms of carbon dioxide—comparable to the lifetime emissions of several automobiles. Even AI usage, such as queries on ChatGPT, is estimated to consume significantly more energy than conventional internet searches.

Global Regulatory Responses

At the international level, ethical and regulatory concerns are beginning to translate into policy. The UNESCO adopted the Recommendation on the Ethics of Artificial Intelligence in 2021, recognising AI's negative environmental impacts. The European Union has gone further by embedding sustainability reporting for high-compute activities within its Corporate Sustainability Reporting Directive, while the United States has proposed legislation such as the Artificial Intelligence Environmental Impacts Act, 2024.

India's Policy Gap

In India, AI discourse remains largely focused on its potential to aid climate mitigation rather than on the environmental costs of AI development itself. This represents a policy blind spot. While Environmental Impact Assessments (EIAs) are mandatory under the EIA Notification, 2006 for physical infrastructure projects, digital infrastructure such as data centres and AI model development largely escapes systematic environmental scrutiny.

Way Forward for India

Measurement and Assessment: Extend the EIA framework to include AI development and large-scale data infrastructure.

Standard Setting: Develop national standards for measuring AI-related emissions, energy, water, and land use in collaboration with industry, think tanks, and civil society.

Data and Disclosure: Incorporate AI-related environmental impacts into ESG disclosure norms through bodies such as the Securities and Exchange Board of India and the Ministry of Corporate Affairs.

Sustainable AI Practices: Promote energy-efficient algorithms, use of pre-trained models, renewable-powered data centres, and transparent reporting of AI-specific footprints.

Conclusion

As India positions itself as a global AI hub, it must confront the environmental externalities embedded in AI development and deployment. Ignoring these costs risks undermining climate commitments and exacerbating resource stress, particularly water scarcity. A balanced approach—one that combines technological innovation with environmental accountability—will be essential to ensure that AI becomes not a contradiction but a contributor to India's long-term sustainability goals.