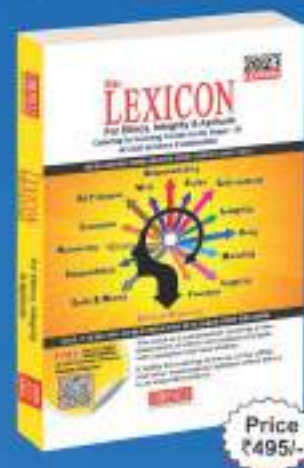


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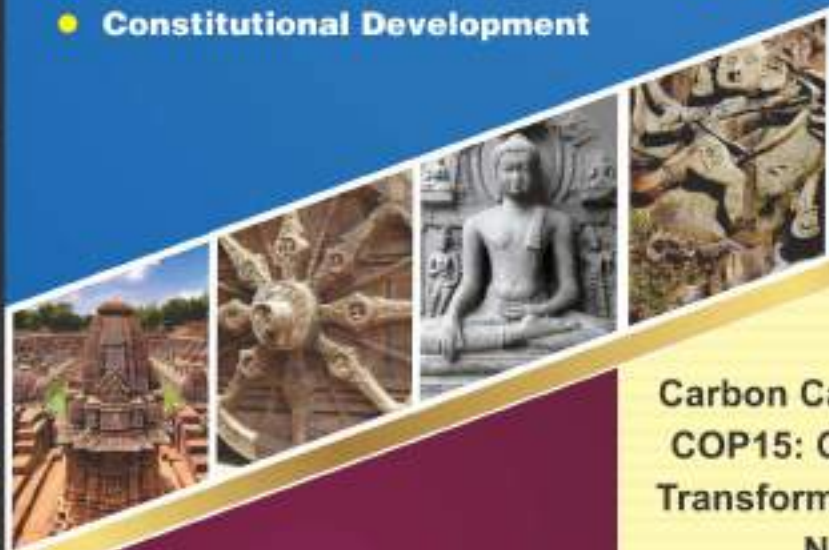


**Prelims 2023 Special-4**

**Interdisciplinary and Comparative  
History of India**

**Approach based on the changing pattern of  
Civil Services Examination during the past 3 years**

- Development of Civilization
- Religion & Philosophy
- Urbanization in India
- Architecture
- Arrival of European Companies
- Rebellions/Movements
- Constitutional Development
- Indian Society
- Development of Administration
- Development of Art in India
- Development of Science & Technology
- Socio-Religious Reform Movements
- Important Titbits in Tabular Form



**Tips to Prepare DAF  
Section for CSE Interview**

- Turning Waste into Wealth
- Carbon Capture, Utilization and Storage
- COP15: Global Biodiversity Framework
- Transformation of Global Food Systems
- National Geospatial Policy 2022
- Regenerative Agriculture
- World Bank Report on Air Pollution
- Social Progress Index 2022

## **PRELIMS 2023 SPECIAL-4**

# **INTERDISCIPLINARY AND COMPARATIVE History of India**

**81**

### **Articles**

#### **Big Issue**

- COP 15: Global Biodiversity Framework.....9

#### **Issue Analysis**

- Turning Waste into Wealth ..... 13
- Carbon Capture, Utilization and Storage (CCUS) ..... 18

#### **View Point**

- Transformation of Global Food Systems..... 22

### **In Focus**

- National Geospatial Policy 2022.....26
- Social Progress Index 2022 .....27
- Regenerative Agriculture .....29
- World Bank Report on Air Pollution.....31

### **Expert Advice**

- Tips to Prepare DAF Section for CSE Interview ....32

### **REGULAR COLUMNS**

#### **India Watch**

- Triple Test .....35
- EC proposes Remote Voting for Migrant Workers..... 35

- Delegated Legislation ..... 37
- Golden Jubilee of North-Eastern Council ..... 38
- Rule 267 of Rajya Sabha Rule Book ..... 38
- The Multi-State Co-operative Societies (Amendment) Bill 2022 ..... 39
- Jan Vishwas (Amendment of Provisions) Bill 2022 .... 39
- Revision of One Rank One Pension Scheme ..... 40

#### **Society Watch**

- CAG Audit Report on Assam's NRC.....42
- Ranganath Mishra Commission.....43
- Panda Task Force.....43
- Extension of PM SVANidhi Scheme .....44
- PM Virasat ka Samvardhan.....45
- New India Literacy Program.....45
- PM Adi Adarsh Gram Yojana.....46
- AYURSWASTHYA Yojana .....46
- World Malaria Report 2022 .....47

#### **Art & Culture**

- Geoglyphs: Ratnagiri's Prehistoric Rock Art.....48
- Dhokra Craft .....48
- Dhanu Yatra .....49
- Three New Cultural Sites added to UNESCO's Tentative List of World Heritage Sites .....49

- Palm-Leaf Manuscript Museum.....50
- Bepore Uru .....51
- Projects Development under PRASHAD Scheme...51
- National Archives of India.....52

## Economy Watch

- Biofloc Fish Farming Technology .....54
- GI Tag to Agricultural Products.....55
- Draft National Retail Trade Policy.....55
- ODOP merged with 'District as Export Hub' Initiative ..... 56
- Surety Bond Insurance ..... 57
- Share Buyback.....57
- Domestic Systemically Important Banks.....58
- Bharat Bill Payment System .....58
- Amrit Bharat Station Scheme ..... 59
- Strengthening Multimodal and Integrated Logistics Ecosystem Program.....60
- India's Startup Boom ..... 60
- KALYANI FERRESTA: India's First Green Steel Brand ..... 61

## Science & Technology

- SWOT Mission to Survey Earth's Water .....63
- HAKUTO-R Mission .....63
- 'Pralay' Ballistic Missile .....64
- New Gene Therapy for Cancer Treatment .....64
- New Artificial Nanostructures for Infrared Absorption Technologies .....65
- Nuclear Fusion: US Scientists Reach New Milestone .....66
- Brain-eating Amoeba .....66

## Ecology & Environment

- UN Recognition for Namami Gange Programme..68
- Cryomesh Technology to Freeze Corals .....68
- Tal Chhapar Blackbuck Sanctuary.....69
- National Energy Conservation Day .....70
- State of Finance for Nature 2022 .....70
- UN-Water GLAAS Report 2022 .....71

## World Watch

- 17th Asia Pacific Regional Meeting .....73
- Currency Swap Agreement with MMA.....73
- Ukraine's Peace Formula.....74

- EU Adopts Global Minimum Tax .....75
- UNSC Resolution on Myanmar.....75
- Urban-20 Event .....75
- United Nations-Water Summit on Groundwater...76

## State Watch

- 'E-Sushrut' Hospital Management Information System (HMIS) .....78
- Nijaat Campaign.....78
- Project Vanikaran .....78
- First Complete Library Constituency in India ...78
- Mental Health and Social Care Policy .....80
- Asia's First Drone Delivery Hub.....80
- Award for Best Practice in Advocacy, Communication and Social Mobilisation (ACSM).....80
- 'Friends of Library' Program .....80
- Aadhaar: Mandatory for Schemes .....80
- Nilgiri Tahr Project.....80
- Country's First Infantry Museum .....80

## Prelims 2023 Model MCQs

140

## News Notes

146

The **Current Affairs based MCQs** of the February 2023 Issue of Civil Services Chronicle Magazine is available at [www.chronicleindia.in](http://www.chronicleindia.in) under the **Free Resources** section

**Editor :** N.N. Ojha

**President :** Sanjeev Nandkeolyar

**Vice President :** Kirti Nandita

**Editorial:** Mob. 9582948817, cscenglish@chronicleindia.in

**Advertisement:** Mob. 9953007627, advt@chronicleindia.in

**Subscription :** Mob. 9953007628/29, Subscription@chronicleindia.in

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# COP 15: Global Biodiversity Framework

*Healthy, bio-diverse ecosystems sustain life on Earth. Despite the value nature provides, it is deteriorating worldwide – a decline projected to worsen under business-as-usual scenarios. From December 7-19, 2022 the world was gathered for the UN Biodiversity Conference (COP 15) in Montreal to strike a landmark agreement to guide global actions on biodiversity through 2030. The framework has laid out an ambitious plan to implement broad-based action across sectors addressing the key drivers of nature loss and ensure that by 2050, the shared vision of living in harmony with nature be fulfilled.*

■ **Ranjeet Shah**

**C**OP 15 in Montreal from **7-19 December 2022, Canada** was the second part of a landmark UN biodiversity summit which was originally supposed to take place in Kunming, China, in 2020, but was postponed several times due to the Covid-19 pandemic. The governments from around the world came together to agree on a new set of goals to guide global action and adopted a bold Global Biodiversity Framework to “halt and reverse” biodiversity loss by the end of the decade.

## Major Outcomes of COP 15

- The Kunming-Montreal Global Biodiversity Framework has clear, measurable goals and targets, with complete monitoring, reporting, and review arrangements to track progress.
- It is complemented by a robust resource mobilisation package.
- It commits the global community to actions to protect and restore nature and remove pollution in the form of 23 specific targets and four “overarching global” goals.

**Let us get acquainted with some major outcomes in brief:**

### Halting and Reversing Biodiversity Loss

- One of target key to achieving the mission is target 3, which aims to protect 30% of the Earth’s land and seas by 2030.
- While another target key to achieving the mission is target 2, which aims to ensure that at least 30% of land and sea areas are under restoration by 2030.
- Similarly, target 4, aims to halt the “human-induced extinction of known threatened species” by 2030.

### 30×30

- Target 3 of the GBF – commonly referred to as “30×30” – has even been likened to the 1.5°C temperature goal of the Paris Agreement.
- Protecting more of Earth’s land and seas will be key to

tackling both climate change and biodiversity loss. When left intact, ecosystems provide a haven for wildlife and help to soak up and store CO2 released by humans.

### Biodiversity Finance

- Target 19 deals with the biodiversity finance to mobilise “at least \$200bn per year” by 2030 from “all sources” – domestic, international, public and private.
- Developed countries –are expected to “substantially and progressively increase” their international finance flows for nature “to at least \$20bn per year by 2025, and to at least \$30bn per year by 2030”.
- GBF requests the GEF (Global Environment Facility) to establish a “Special Trust Fund” – called the Global Biodiversity Framework Fund (GBF Fund) – “in 2023, and until 2030” to support the framework.

### Harmful Subsidies

- Target 18, states incentives that have a negative impact on biodiversity.
- Aimed to identify – by 2025 – and then “eliminate, phase out or reform incentives, including subsidies” that are harmful for biodiversity.

### Turning Pledges to Action

- A lack of implementation was widely cited as one of the major factors behind the failure of the last set of global biodiversity rules, the Aichi targets.
- Since, Section J of the GBF specifies that countries should produce national biodiversity action plans in alignment with GBF’s goals and targets.

### Indigenous Rights

- According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), “at least a quarter of the global land area is traditionally owned, managed, used or occupied by Indigenous peoples”.

# Turning Waste into Wealth

## Role of Efficient Waste Management in Fostering India's Energy Security and Industrial Development

*An inevitable consequence of development and industrial progress is generation of waste. Therefore, efficient waste management is a matter of international concern and countries have set up robust regulatory waste management regimes for balancing the objectives of development and environment sustainability. In India, the National Environment Policy, 2006 while suggesting measures for controlling various forms of environmental pollution lays emphasis on the need for collection and treatment systems for recycling wastes and devising measures for environmentally safe disposal of residues.*

■ Satish Kumar Karna

Recently, the Comptroller and Auditor General of India (CAG) published Performance Audit Report on Waste Management in Urban Areas for the year ended March 2021. This report contains results of a Performance Audit of Waste Management in Urban areas in Odisha which was conducted with the objectives to assess whether the planning of waste management in ULBs were effective, efficient and economical; and monitoring and evaluation of waste management system including adequacy of awareness creation, citizen engagement for effecting behavioral change, complaint, redressal mechanism for citizens, assessment of environmental impacts and implementation of the internal control and monitoring mechanism was adequate and effective.

For a country like India, waste management bears great significance. In India, the Ministry of Environment, Forest and Climate Change, Government of India (MoEFCC) in conjunction with State Pollution Control Boards of different states (SPCBs) administers the gamut of waste management regulations.

### India's 'Waste to Energy' Potential

- The total waste generated in India is projected to touch 165 million tonnes by 2031. To tackle the challenge, the government is implementing a strategy to convert waste to energy, drawing heightened interest from global players
- The potential for power generation from waste in India has been touted at 2.5 GW, this is an easy solution for India's rising power consumption and waste generation
- The nation's waste collection and management industry is expected to reach a valuation of around US\$14 billion by 2025 with an annual growth of around 7 per cent
- 48 municipal solid waste-based power plants with an aggregate capacity of 412.5 MW are at various stages of construction under the Swachh Bharat Mission (SBM)

- Fuelled by the Government's Swachh Bharat Mission (SBM) and the subsequent modifications in solid waste management (SWM) regulations, investment interest has peaked in India's waste collection and management industry.
- Currently there are six waste-to-energy plants in India with combined power generation capacity of 66 MW. However, the potential for power generation from India's sewage and municipal solid waste sector has been estimated at around 2.5 GW, thus leaving behind a vast space for development.
- Last year, two UK-based firms – GJ Nature Care and GJ Eco Power – had announced plans to invest about US\$214 million over a period of five years in waste-to-energy projects in South India.
- Similarly, Nexus Novus, an urban waste solution company, is setting up a US\$51.6 million waste-to-energy project in Bengaluru backed by UAE based billionaire BR Shetty and the Netherlands government.
- Given India's soaring power consumption, waste to energy projects offer dual benefits of meeting power requirement while tackling the nation's waste management concerns.
- This explains the rising investment interest in the space that has targeted everything, from asset acquisition to technology development, involving both private and state-run enterprises.

### Role of Waste in India's Industrial Development

The **Budget for 2022-23** provides a roadmap to achieve circular economy. It recognizes that development and environmental conservation need to be aligned and not be treated as exclusive of each other.

- It supported for implementation of action plans in 10 important sectors, including electronic waste, end-of-life vehicles, used oil waste, and toxic and hazardous industrial waste.

# Carbon Capture, Utilization and Storage (CCUS) An Imperative to Reach Net Zero

*India is signatory to the Paris Agreement under which it has committed to restrict global warming to 2 degrees Celsius, and preferably to 1.5 degrees Celsius, over pre-industrial levels. Guided by this commitment, Indian government over the past few years has introduced multiple policies and actions to support and facilitate CCUS technologies across power and industries to reduce carbon emission and thereby reach net zero emission targets.*

■ Chandrakant Singh

Under the 2015 Paris Agreement, countries needed to prepare and submit two kinds of climate action plans — one for the short term, and another for long-term.

The short-term climate action plans, also called **Nationally Determined Contributions (NDCs)**, have to be submitted every five years, with specific actions being taken over 5- or 10-year periods. The NDCs of all countries currently contain the actions they are taking till 2030.

## India's NDC

In its revised NDC, India has promised **three main** targets for 2030 —

- (i) A 45 per cent reduction in emission intensity (emission per unit of GDP) from 2005 levels,
- (ii) 50 per cent share of renewables in electricity generation, and
- (iii) Creation of 2.5 to 3 billion tonnes of additional carbon sinks through forests.

Apart from NDCs, the Paris Agreement also asks countries to submit their long-term strategies to reduce emissions. There is no particular time frame for which these long-term strategies to be achieved fixed by the agreement.

Several nations in Glasgow, announced long-term target of achieving net-zero status. In the case of most developed countries, this is 2050. China has set 2060 as its target year, while **India said it would reach there in 2070.**

The commitment of net-zero emission status can only be achieved when the emissions are offset either by absorption of greenhouse gases by forests or physical removal of these gases through futuristic **Carbon Capture Utilization and Storage (CCUS)** technologies.

## India's Carbon Emission

India is the **3rd largest emitter** of CO<sub>2</sub> in the world after China and the US, with estimated annual emissions of about 2.6 gigatonne per annum (gtpa).

## What is CCUS?

The **International Energy Agency (IEA)** defines Carbon Capture, Utilization and Storage (CCUS) as a **group of**

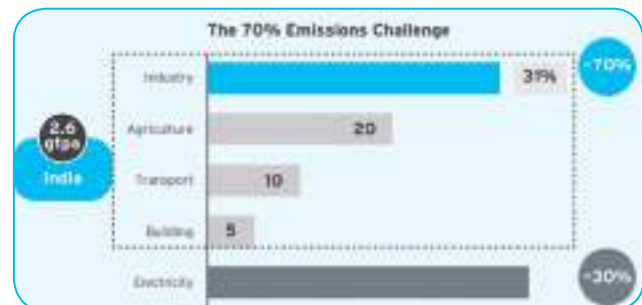
**technologies** for capturing of CO<sub>2</sub> from large and stationary CO<sub>2</sub> emitting sources, such as fossil fuel based power plants and other industries.

CCUS also involves the transport of the captured CO<sub>2</sub> (typically by pipeline and in certain situations by through shipping, rail or trucks also) to sites, either for utilization in different applications or injection into geological formations or depleted oil and gas fields for permanent storage and trapping.

CCUS also includes **Direct Air Capture (DAC)**, which involves the capture of CO<sub>2</sub> directly from the atmosphere; however, its scale of operations is costly.

## Decarbonisation Challenge for India and the Role of CCUS

The decarbonization challenge for India is to identify scalable and economically sustainable solutions for the decarbonization of sectors that contribute to 70% of emissions.



Carbon Capture Utilization and Storage (CCUS) has an important and critical role to play in decarbonizing the **industrial sector**, which is **hard to electrify and hard to abate**, due to the use of fossil fuels not only as a source of energy but within the process itself.

CCUS also has an important role to play in decarbonizing the **power sector**, given India's present reliance on coal for meeting over **70% of its electricity needs.**

## Global CCUS Landscape

Globally there are about **21 CCUS facilities**, with a capacity of capturing about 40 mtpa of CO<sub>2</sub> or only **0.1%** of the global annual GHG emissions.

# Transformation of Global Food Systems

*Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Over the past 100 years, more than 90 per cent of crop varieties have disappeared and today, just nine plant species account for 66 per cent of total crop production – contributing to ubiquitous health risks like diabetes, obesity and malnutrition. 10 percent of the world's population goes hungry due to unequal distribution and access to food. The situation is not set to get better: the global food demand is expected to increase by 50 percent by 2050 with negative impact on land and soil degradation. Transitioning back to nature-positive production practices will allow producers to increase food supplies while generating long-term returns for themselves and the planet.*

■ **Sharmila Senthil Kumar**

On 22<sup>nd</sup> October 2022, UNEP Event on Transformation of Global Food systems for an Environmentally Sustainable World was held in Nairobi, Kenya. It was highlighted in the event that transforming the food systems requires going beyond search for simple technological fixes – including market restructuring to enable better outcomes for people, planet & prosperity

Over several years, there have been numerous reports on food systems transformation highlighting key transitions, strategies and actions needed to shift towards healthy diets, promote sustainable production practices, protect and restore nature and reduce food waste and loss.

## The Context

As populations have grown, more people are consuming - and wasting more food – than ever before. Unsustainable food production and consumption patterns are a common thread, running through many of the greatest challenges facing humanity today.

Between 2000 and 2010, large-scale commercial agriculture accounted for 40 per cent of tropical deforestation; and local subsistence agriculture was not far behind, accounting for another 33 per cent. But human food systems depend on biodiversity to function, and conventional food systems reduce biodiversity – effectively destroying their own foundation.

Intensive farming also plays a role in the emergence of zoonotic diseases such as COVID-19. Clearing space for agriculture can reduce the natural buffers that protect humans from viruses and other pathogens circulating among wildlife. And pathogens spread even more easily among intensively-farmed flocks and herds with genetic similarities – particularly when they are kept in close proximity.

At the same time, antimicrobials are often used to accelerate livestock growth, can lead to resistance in microorganisms –

making antimicrobials less effective as medicine for humans. Currently, about 700,000 people die of resistant infections every year and by 2050, those diseases may cause more deaths than cancer.

Add to all of this the fact that our food systems account for a quarter of all man-made greenhouse gas emissions. According to the World Economic Forum, biodiversity loss and ecosystem collapse rank among the top five threats to humanity in the next ten years.

All these point to the fact that there is an urgent need to transform global food systems.

## What are Global Food Systems?

Food systems embrace all the elements (environment, people, inputs, processes, infrastructure, institutions, markets and trade) and activities that relate to the production, processing, distribution and marketing, preparation and consumption of food and the outputs of these activities.

A sustainable food system encourages local production and distribution infrastructures and makes nutritious food available, accessible, and affordable to all. Further, it is humane and just, protecting farmers and other workers, consumers, and communities.”

The massive global food systems generate a third of the world's GDP, but they are also the biggest contributor of biodiversity loss while creating more than a quarter of all greenhouse gas emissions. It employs 40% of the world's population, but its impact is uneven, and 65% of the adults employed in food and agriculture live in poverty.

## The Need to Change Food Systems

Global and local food systems transformation is necessary in order to ensure the delivery of healthy, safe, and nutritious foods in both sustainable and equitable ways. Food systems





- [National Geospatial Policy 2022](#)
- [Social Progress Index 2022](#)
- [Regenerative Agriculture](#)
- [World Bank Report on Air Pollution](#)

## National Geospatial Policy 2022

On 28<sup>th</sup> December, 2022, the Department of Science and Technology (DST) published the National Geospatial Policy, 2022.

### Vision

- To make India a world leader in Global Geospatial space with the best in the class ecosystem for innovation.
- To develop a coherent national framework in the country and leverage it to move towards digital economy and improve services to citizens.
- To enable easy availability of valuable Geospatial data collected utilizing public funds, to businesses and general public.
- To have a thriving Geospatial industry in the country involving private enterprise.

### Salient Features

#### Goals

##### Year 2025 Goals

- Put in place an enabling policy and legal framework that supports liberalization of Geospatial sector and democratization of data for enhanced commercialization with Value Added Services.
- Improve availability of and access to better location data across organizations and sectors to enable innovations and encourage enterprise.
- Redefinition of National Geodetic Framework using modern positioning technologies and provision of online access.
- High accuracy Geoid for the entire country.

##### Year 2030 Goals

- High resolution topographical survey and mapping & mapping (5-10 cm for urban & rural areas and 50-100 cm for forests and wastelands).
- High accuracy Digital Elevation Model (DEM) for the entire country (25 cm for plain, and 1-3 metre for hilly and mountainous areas).

- Enhance capabilities, skills and awareness to meet the future needs of the country.

#### Year 2035 Goals

- High resolution/accuracy bathymetric geospatial data for inland waters and sea surface topography of shallow/deep seas to support Blue Economy.
- Survey and mapping of sub-surface infrastructure in major cities and towns.
- National Digital Twins for major cities and Towns

#### Integrated Geospatial Information Framework (IGIF)

- The Policy seeks to draw on international best practices, such those of United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) including the IGIF, to strengthen national-level spatial information management arrangements across our country

#### Institutional Framework

- A Geospatial Data Promotion and Development Committee (GDPDC), will be a 17-member body) at the national level shall be the apex body for formulating and implementing strategies related to promotion of the Geospatial sector.
- GDPDC would replace and subsume the functions and powers of the National Spatial Data Committee (NSDC) constituted in 2006 and GDPDC constituted in 2021.
- Department of Science and Technology (DST) shall be the Nodal Department of the Government for the Policy.

#### Geospatial Infrastructures

##### Geospatial Data Infrastructure

- UN-GGIM recognizes 14 Global Fundamental Geospatial Data Themes considered fundamental to development of a country's Integrated Geospatial Information Infrastructure and supporting the Sustainable Development Goals. GDPDC will adopt and develop these Data Themes as National Fundamental Geospatial Data Themes in line with national priorities.



## Expert Advice

# Tips to Prepare DAF Section for CSE Interview

*DAF, which stands for Detailed Application Form, is a very crucial document, and it defines everything from the career of a candidate to their posting. Hence, extra care should be given while filling the DAF. Here we have discussed the very nitty-gritty of the same.*

### What details are to be filled in Detailed Application Form?

- ☑ Candidates who have been declared qualified in the written part of the Examination have to first get themselves registered before filling up the online Detailed Application Form (DAF) at the website [www.upsc.gov.in](http://www.upsc.gov.in).
- ☑ Under online Detailed Application form i.e., DAF, a qualified candidate has to provide information regarding his/her background such as home state, academics, etc. Along with their background details, candidate has to provide service and cadre preferences.

### Interview board specifically asks questions about home state. Therefore, what to prepare with respect to home state?

- ☑ Home state refers to state from where candidate originally belongs to. Candidate should preferably focus on history, geography, culture, speciality, present issues and challenges of home state and district.
- ☑ Along with the home state, candidate should also possess basic knowledge about present place of residence or place where he/she is working/ or worked most recently.

### With respect to your academic background, which aspects need to be paid attention?

- ☑ Revise very basic about the subject of your graduation, especially if not in touch with sometime.
- ☑ If you have not done well in your academic past or even work-profile wise, then accept it honestly before the interview board, without blaming any situation or family conditions, etc.
- ☑ Do say that you are a fast learner and have been trying to improve your-self. The fact that you are appearing before the interview board despite poor academic performance in the past, bears a testimony of your hard work and resolve.

### If you are working, which aspects should be prepared with respect to work profile?

- ☑ Thoroughly prepare about each and every aspect of your previous and present **job profiles** and **work experience**, in case you have worked or are working at present.

### What should be kept in mind if you have any gap year?

- ☑ Prepare an answer for **gap year**, between year of graduation/post-graduation and the present year (when you are appearing for interview), in case not working.

### What should be your stand to the board, if you were asked about not clearing the exam and future plan?

- ☑ Prepare an answer for a situation what would you do in case of not being able to clear this examination. Take this question positively and answer with firmness.

### What to be kept in mind regarding Optional paper and General Studies?

- ☑ Make a **list of standard books** of the optional paper you have and have a cursory glance of such books.
- ☑ Do not name notes of any coaching institute as the study material for preparing optional paper and general studies before the interview board.

### Which topics and areas should be prepared for interview?

- ☑ Prepare a list of topics which needs **opinion-based approach preferably on current issues** as such questions can turn your interview in either ways.
- ☑ While explaining on any issues do not keep your responses factual before the board. Try to keep it analytical and well thought-off, as a budding bureaucrat would be expected to do.



## Polity & Governance

- Triple Test
- EC proposes Remote Voting for Migrant Workers
- Delegated Legislation

- Golden Jubilee of North-Eastern Council
- Rule 267 of Rajya Sabha Rule Book
- The Multi-State Co-operative Societies (Amendment) Bill 2022
- Jan Vishwas (Amendment of Provisions) Bill 2022

## Plans/Policies

- Revision of One Rank One Pension Scheme

## News Snippets

## Polity & Governance

### Triple Test

Recently, the Allahabad High Court (HC) ordered the Uttar Pradesh (UP) government to hold urban local body elections without reservation for OBCs as the 'triple test' requirement for the quota had not been fulfilled.

In response, the UP government set up a five-member commission to conduct a survey to ensure that the OBCs are provided reservation on the basis of the triple test, as mandated by the Supreme Court.

#### About Triple Test

- The triple test requires the government to complete three tasks for finalisation of reservation to OBCs in the local bodies. These include:
  1. To set up a dedicated commission to conduct a rigorous empirical inquiry into the nature and implications of the backwardness in local bodies;
  2. To specify the proportion of reservation required in local bodies in light of recommendations of the commission, so as not to fall foul of overbreadth;
  3. To ensure reservation for SCs/STs/OBCs taken together does not exceed an aggregate of 50 per cent of the total seats.
- These triple test/conditions were outlined by the Supreme Court in the case of *Vikas Kishanrao Gawali vs. State of Maharashtra and others*, decided on March 4, 2021.

#### Why HC is insisting on Triple Test instead of Rapid Survey?

- The HC said that any inquiry or study into the nature and implications of the backwardness with respect to local bodies involves ascertainment of representation in such bodies.

- The court said such an exercise cannot be confined to counting of heads alone, as is being done through the rapid survey.
- Simply granting reservation on the basis of population misses a very crucial factor for determination of backwardness, and that factor is political representation of the class or group concerned.
- Further, the High Court quoted the Supreme Court's observation in the *K Krishna Murthy* case, which pointed out that the nature of disadvantages which restrict access to education and employment cannot be readily equated with disadvantages in the realm of political representation.

### K. KRISHNAMURTHY CASE

- In this case, the Supreme Court had interpreted Article 243D(6) and Article 243T(6), which permit reservation by enactment of law for backward classes in local bodies respectively.
- It held that barriers to political participation are not the same as that of the barriers that limit access to education and employment.
- However, for creating a level playing field, reservation may be desirable as mandated by the aforementioned conditions.
- Above articles provide a separate constitutional basis for reservation, as distinct from what are conceived under Article 15 (4) and Article 16 (4) which form the basis for reservation in education and employment.

### EC proposes Remote Voting for Migrant Workers

Recently, the Election Commission (EC) announced that it is ready to pilot remote voting for domestic migrants. For this, the commission has developed a prototype for a Multi-Constituency Remote Electronic Voting Machine (RVM).

# SOCIETY WATCH

## Indian Society

- CAG Audit Report on Assam's NRC

## Social Justice

- Ranganath Mishra Commission

- Panda Task Force

## Plans/Policies

- Extension of PM SVANidhi Scheme
- PM Virasat ka Samvardhan
- New India Literacy Program
- PM Adi Adarsh Gram Yojana
- AYURSWASTHYA Yojana

## Reports

- World Malaria Report 2022

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## Indian Society

### CAG Audit Report on Assam's NRC

On 24<sup>th</sup> December, 2022, Comptroller and Auditor-General of India (CAG) published a compliance report namely "Logistical Arrangements for NRC Update Project in Assam". The report has found several anomalies in the updating of the National Register of Citizens (NRC) in Assam.

#### Concerns Highlighted by the CAG

##### Huge Increase in Cost in implementation

- The deadline for completion of this project was February 2015 and the project cost was pegged at Rs 288.18 crore.
- A five-fold increase in the cost was seen till March 2022 due to additional time to complete it and changes in the update software.

##### Irregularities in Fund Utilisation

- A test check of records revealed irregularities in the utilisation of funds including excess and inadmissible payment to vendors.

##### Corruption in Wages Distribution

- The amount of wages paid to the outsourced staff was 45.59%-64.27% less than what was approved by the NRC coordination committee.

##### Absence of Secure Software

- Secure and reliable software was required for the Supreme Court directed exercise, but as many as 215 software utilities were added haphazardly to the core software.
- This was done without following the due process of software development and vendor selection via tendering.
- There might be a risk of "data tampering" in the NRC for Assam.
- CAG stated that the intended objective of preparing a valid and error-free NRC was not met despite incurring the excess expenditure.

## PRELIMS FACTS

### National Register of Citizens (NRC)

- NRC is an official record of those who are legal Indian citizens.
- It includes demographic information about all those individuals who qualify as citizens of India as per the Citizenship Act, 1955.
- The objective was to identify those born in India and migrants from erstwhile East Pakistan, now Bangladesh.

### Constitutional Provisions related to Comptroller and Auditor-General of India (CAG)

- **Article 148:** Broadly speaks of the CAG, his appointment, oath and conditions of service.
- **Article 149:** Broadly speaks of the Duties and Powers of the CAG.
- **Article 150:** The accounts of the Union and the States shall be kept in such form as the President may, on the advice of the CAG, prescribe.
- **Article 151:** Audit Reports: The reports of the Comptroller and Auditor-General of India relating to the accounts of the Union shall be submitted to the president, who shall cause them to be laid before each House of Parliament.
- **Article 279:** Calculation of "net proceeds" is ascertained and certified by the Comptroller and Auditor-General of India, whose certificate is final.
- **Third Schedule:** Section IV of the Third Schedule of the Constitution of India prescribes the form of oath or affirmation to be made by the Judges of the Supreme Court and the Comptroller and Auditor-General of India at the time of assumption of office.
- **Sixth Schedule:** According to this schedule, the District Council or Regional Council should be kept in such form as the CAG prescribes with the approval of the President. In addition these bodies account are audited in such manner as CAG may think fit, and the reports relating to such accounts shall be submitted to the Governor who shall cause them to be laid before the Council.



# Heritage Art & Culture

## Art & Culture

- Geoglyphs: Ratnagiri's Prehistoric Rock Art
- Dhokra Craft
- Dhanu Yatra

## Art & Culture

### Geoglyphs: Ratnagiri's Prehistoric Rock Art

Experts and conservationists have raised concerns over the proposed location for a mega oil refinery in Barsu village of Maharashtra's Ratnagiri district. They claim that the refinery might damage prehistoric geoglyphs found in the area.

#### About Geoglyphs

- Geoglyphs are a form of prehistoric rock art, created on the surface of laterite plateaus (Sada in Marathi).
- They are made by removing a part of the rock surface through an incision, picking, carving or abrading.
- They can be in the form of rock paintings, etchings, cup marks and ring marks.

#### Ratnagiri's Geoglyphs

- Ratnagiri district has more than 1,500 pieces of such art, also called "Katal shilpa," spread across 70 sites.
- Clusters of geoglyphs are spread across the Konkan coastline in Maharashtra and Goa.
- According to carbon dating, these sites are believed to be over 12,000–20,000 years old.

#### Figures Depicted in the Geoglyphs

- The figures depicted in the geoglyphs include humans and animals such as deer, elephant, tiger, monkey, wild boar, rhinoceros, hippopotamus, cattle, pig, rabbit, and monkey.
- They also include a high number of reptilian and amphibian creatures such as tortoises and alligators, aquatic animals such as sharks and stingrays, and birds like peacocks.

#### Significance of Ratnagiri's Geoglyphs

- Ratnagiri's rock art is evidence of the continued existence of human settlements from the Mesolithic (middle Stone Age) to the early historic era.

## Heritage

- Three New Cultural Sites added to UNESCO's Tentative List of World Heritage Sites
- Palm-Leaf Manuscript Museum
- Bepore Uru

## Plans/Policies

- Projects Development under PRASHAD Scheme

## Miscellaneous

- National Archives of India

## News Snippets

- The geoglyphs also show the existence of certain types of fauna that are no longer present in the region today.

- Imagery from these sites shows how people "adapted to

ephemeral wetlands in a dry-arid plateau having shallow rock pools, streams and watercourses".



#### Conservation

- The sites are protected by the state archaeology department and the Archaeological Survey of India (ASI).

#### Inclusion in UNESCO's Tentative List

- In April 2022, these sites in the Konkan region were added to a tentative list of UNESCO's world heritage sites.
- The UNESCO listing mentions "Konkan geoglyphs." However, elsewhere, the term petroglyph (literally, "rock symbol/character") is also used.
- UNESCO's tentative world heritage list mentions seven sites with petroglyphs in Ratnagiri district — Ukshi, Jambharun, Kasheli, Rundhe Tali, Devihsol, Barsu and Devache Gothane, one in Sindhudurg district — Kudopi village, and nine sites at Phansamal in Goa.

## Dhokra Craft

Bengal village Lalbazar is becoming a hub for an ancient metalcraft, dhokra.

#### About Dhokra Art

- It is a metalcraft popular in Bengal.
- In its original form, no painting or polishing is done.
- Most Dhokra artefacts are human or animal figurines.
- The term "Dhokra" has been named after the Dhokra Damar tribes, the traditional metalsmiths from West Bengal and Odisha.
- The Dhokra tradition's documented history is about 5,000 years old.

# ECONOMY WATCH

## Agriculture

- Biofloc Fish Farming Technology
- GI Tag to Agricultural Products

## Plans/Policies

- Draft National Retail Trade Policy
- ODOP merged with 'District as Export Hub' Initiative

## Banking & Finance

- Surety Bond Insurance
- Share Buyback
- Domestic Systemically Important Banks
- Bharat Bill Payment System

## Infrastructure

- Amrit Bharat Station Scheme
- Strengthening Multimodal and Integrated Logistics Ecosystem Program

## Industry

- India's Startup Boom
- KALYANI FeRRESTA: India's First Green Steel Brand

## News Snippets

## Agriculture

### Biofloc Fish Farming Technology

Giving a fillip to homestead aquaculture and nutritional security, a self-help group in Kochi (Kerala) has reaped a bumper harvest from biofloc fish farming, an innovative aquaculture practice.

#### About Biofloc Technology

- It is a technique of improving the quality of water by balancing carbon and nitrogen in the system.
- The principle of the technique is to maintain the higher C-N ratio by adding carbohydrate source and the water quality is improved through the production of high quality single cell microbial protein.
- In such condition, heterotrophic microbial growth occurs which assimilates the nitrogenous waste that can be exploited by the cultured species as a feed and also works as bioreactor controlling of water quality.
- Immobilization of toxic nitrogen species occurs more rapidly in biofloc because of the growth rate and microbial production per unit substrate of heterotrophs are ten-times greater than that of the autotrophic nitrifying bacteria.
- This technology is based on the principle of flocculation within the system.

#### Need for Biofloc Technology

- The global population is expected to reach 9.6 billion by year 2050 and as the demand for animal protein is increasing year by year it is a challenge to provide quality protein by safeguarding its natural resources for future generations.
- In this context, aquaculture plays a key role in promoting health by providing animal protein as well as generating employment and economic growth.

#### Advantages

- Eco-friendly culture system.
- It reduces environmental impact.
- Judicial use of land and water.
- Limited or zero water exchange system.
- Higher productivity (It enhances survival rate, growth performance, better feed conversion in the culture systems of fish).
- Higher biosecurity.
- Reduces water pollution and mitigate the risk of introduction and spread of pathogens. It reduces utilization of protein rich feed and cost of standard feed.
- It reduces the pressure on capture fisheries i.e., use of cheaper food fish and trash fish for fish feed formulation.

#### Disadvantages

- Reduce response time due to water respiration rates are elevated

### FISH SPECIES SUITABLE FOR BIOFLOC CULTURE

- Biofloc system works best with species that are able to derive some nutritional benefits from the direct consumption of floc.
- Biofloc system is most suitable for species that can tolerate high solids concentration in water and are generally tolerant of poor water quality.
- Some of the species that are suitable for BFT are:
  - ♦ Air breathing fish like Singhi (*Heteropneustes fossilis*), Magur (*Clarias batrachus*), Pabda (*Ompok pabda*), Anabas/Koi (*Anabas testudineus*), Pangasius (*Pangasianodon hypophthalmus*).
  - ♦ Non air-breathing fishes like Common Carp (*Cyprinus carpio*), Rohu (*Labeo rohita*), Tilapia (*Oreochromis niloticus*), Milkfish (*Chanos chanos*).
  - ♦ Shellfishes like Vannamei (*Litopenaeus vannamei*) and Tiger Shrimp (*Penaeus monodon*)



# SCIENCE & TECHNOLOGY

## Space Science

- SWOT Mission to Survey Earth's Water
- HAKUTO-R Mission

## Space Science

### SWOT Mission to Survey Earth's Water

Recently, National Aeronautics and Space Administration (NASA) launched the Surface Water and Ocean Topography (SWOT) satellite from Vandenberg Space Force Base in California. The spacecraft was launched atop a SpaceX Falcon 9 rocket.

#### Key Points

- **About:** SWOT is an advanced radar satellite jointly developed and operated by NASA and CNES, the French space agency, in partnership with the Canadian Space Agency (CSA) and UK Space Agency.
- **Technology:** It incorporates advanced microwave radar technology to collect high-definition measurements of oceans, lakes, reservoirs and rivers over 90% of the globe.
- **Mission Life:** Three years.
- **Aim:** The primary mission objectives are:
  - ◆ To make the first global survey of the Earth's surface water;
  - ◆ To observe the fine details of the ocean surface topography; and
  - ◆ To measure how terrestrial surface water bodies change over time.
- **Working:** SWOT will cover the entire Earth's surface between 78 degrees south and 78 degrees north latitude at least once every 21 days, sending back about one terabyte of unprocessed data per day.
- The scientific heart of the spacecraft is an innovative instrument called the Ka-band radar interferometer (KaRIn), which represents a major technological advance.
- KaRIn bounces radar pulses off the water's surface and receives the return signal using two antennas on either side of the spacecraft. This arrangement – one signal, two antennas – will enable engineers to precisely determine the height of the water's surface across two swaths at a time, each of them 30 miles wide.

## Defence Technology

- 'Pralay' Ballistic Missile

## New Technology & Innovations

- New Gene Therapy for Cancer Treatment
- New Artificial Nanostructures for Infrared Absorption Technologies

## Basic Sciences

- Nuclear Fusion: US Scientists Reach New Milestone
- Brain-eating Amoeba

## News Snippets

### Significance

- SWOT mission will provide a significantly clearer picture of Earth's freshwater bodies. It will provide data on more than 95% of the world's lakes larger than 15 acres and rivers wider than 100 meters across. Currently, freshwater researchers have reliable measurements for only a few thousand lakes around the world. SWOT will push that number into the millions.
- Along the coast, SWOT will provide information on sea level, filling in observational gaps in areas that don't have tide gauges or other instruments that measure sea surface height. Over time, that data can help researchers better track sea level rise, which will directly impact communities and coastal ecosystems.
- SWOT measurements will also help researchers, policy-makers, and resource managers better assess and plan for things, including floods and droughts.
- By having information on where the water is – where it's coming from and where it's going – researchers can improve flood projections for rivers and monitor drought effects on lakes and reservoirs.
- The data will enhance ocean-circulation models, bolster weather and climate forecasts and aid in managing scarce freshwater supplies in drought-stricken regions.
- The mission will explore how oceans absorb atmospheric heat and carbon dioxide in a natural process that moderates global temperatures and climate change. Oceans are estimated to have absorbed more than 90% of the excess heat trapped in Earth's atmosphere by human-caused greenhouse gas emissions.
- More precise data along tidal zones would help predict how far storm-surge flooding may penetrate inland, as well as the extent of saltwater intrusion into estuaries, wetlands and underground aquifers.

### HAKUTO-R Mission

Recently, Japanese space startup ispace Inc launched its own private lander M1 to the Moon under its HAKUTO-R mission. The launch was carried out by SpaceX in Cape Canaveral in the US state of Florida.





# ECOLOGY & ENVIRONMENT

## Sustainable Development

- UN Recognition for Namami Gange Programme

## Sustainable Development

### UN Recognition for Namami Gange Programme

Recently, the United Nations (UN) recognized Namami Gange initiative to rejuvenate India's sacred River Ganga as one of the top 10 World Restoration Flagships to revive the natural world.

#### Key Highlights

- The Award was received at a function during the 15th Conference of Parties (COP15) to the Convention on Biodiversity (CBD) in Montreal, Canada on 14<sup>th</sup> December, 2022, the World Restoration Day.
- Namami Gange was selected from over 150 such initiatives from 70 countries across the globe. They were selected under the banner of the United Nations Decade on Ecosystem Restoration, a global movement coordinated by the United Nations Environment Programme (UNEP) and the United Nations Food and Agriculture Organization (FAO). It is designed to prevent and reverse the degradation of natural spaces across the planet.
- The recognized initiatives, including Namami Gange, will now be eligible to receive UN support, funding or technical expertise.
- The recognition of Namami Gange as one of the top-10 ecosystem restoration initiatives in the world bears testimony to the concerted efforts being made by India for the restoration of the riverine ecosystem.

#### Namami Gange Programme

- **About:** Namami Gange Programme is an Integrated Conservation Mission, approved as a 'Flagship Programme' by the Union Government in June 2014 to accomplish the twin objectives of effective abatement of pollution and conservation and rejuvenation of National River Ganga.

## Biodiversity

- Cryomesh Technology to Freeze Corals
- Tal Chhapar Blackbuck Sanctuary

## Government Policies/Initiatives

- National Energy Conservation Day

## Reports

- State of Finance for Nature 2022
- UN-Water GLAAS Report 2022

## News Snippets

- **Nodal Agency:** The programme is being operated under the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti.
- **Implementation:** It is being implemented by the National Mission for Clean Ganga (NMCG) and its state counterpart organizations, i.e., State Program Management Groups (SPMGs).

**Focus Areas:** The main pillars of the programme are as follows:

- ♦ Sewage Treatment Infrastructure
- ♦ River-Front Development
- ♦ River-Surface Cleaning
- ♦ Biodiversity
- ♦ Afforestation
- ♦ Public Awareness
- ♦ Industrial Effluent Monitoring
- ♦ Ganga Gram
- **Working:** The initiative is rejuvenating, protecting and conserving the Ganga and its tributaries, reforesting parts of the Ganga basin and promoting sustainable farming.
- Under the project, efforts are being made to revive key wildlife species, including river dolphins, softshell turtles, otters, and the hilsa shad fish.
- The initiative, with an investment of up to \$4.25 billion so far, has the involvement of 230 organisations, with 1,500 km of river restored to date.
- Also, there have been 30,000 hectares of afforestation so far, with a 2030 goal of 134,000 hectares.

## Biodiversity

### Cryomesh Technology to Freeze Corals

Recently, scientists working on Australia's Great Barrier Reef successfully tested a new method for freezing and storing coral larvae. This new method could eventually help rewild reefs threatened by climate change.

# WORLD WATCH

## International Relations

- 17<sup>th</sup> Asia Pacific Regional Meeting
- Currency Swap Agreement with MMA

## International Relations

### 17<sup>th</sup> Asia Pacific Regional Meeting

Recently, the 17<sup>th</sup> Asia Pacific Regional Meeting (APRM) of the International Labour Organization (ILO) was held in Singapore.

- The meeting was held at an important juncture for the world of work as the region faces multiple challenges, including the continued impact of the COVID-19 pandemic compounded by the global food, energy and finance crises.
- It offers a timely opportunity to reconfirm decent work and social justice as the driving forces for a human-centred recovery that is inclusive, sustainable and resilient.

### Major Highlights

#### Thematic Areas

- The four key thematic areas of the 17<sup>th</sup> APRM included:
  - ✓ Integrated policy agenda for a human-centred recovery that is inclusive, sustainable and resilient;
  - ✓ Institutional framework to support transitions towards formality and decent work;
  - ✓ Strong foundations for social and employment protection and resilience; and
  - ✓ Revitalizing productivity growth and skills for more and better jobs.

#### Singapore Statement

Launched at the conclusion of the meeting, the Singapore Statement:

- Represents a **shared vision** of the region's priorities for national action among the ILO constituents and with ILO support in the coming years;
- Highlights the need to **ratify ILO fundamental conventions** and further strengthen the capacities of government, employer and worker representatives to carry out effective social dialogue;

## World Issues

- Ukraine's Peace Formula
- EU Adopts Global Minimum Tax
- UNSC Resolution on Myanmar

## Miscellaneous

- Urban-20 Event
- United Nations-Water Summit on Groundwater

## News Snippets

- Confirms the commitment of governments and social partners across the regions to engage in consultations towards the development of a **Global Social Justice Coalition**;
- Calls for action to **close gender gaps** and encourages ILO member countries to consider the ratification and effective **implementation of related international labour standards**, accelerate the **transition from the informal to formal economy** as well as strengthen governance frameworks to protect the rights of migrant workers; and
- Calls for a **just transition** that helps build environmentally sustainable economies and societies in the face of climate change.

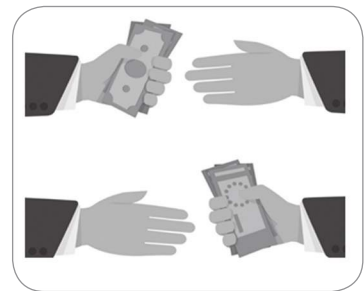
### Concerns Related to India

- It was highlighted that India's new labour codes violate the tripartite agreements between workers, employers and the government. They give a free hand to employers as the power of inspection has been left with employers.
- Declining productivity growth has a negative impact on workers, on the sustainability of enterprises (particularly MSMEs), and on the economy.
- 90% of the workforce in India belongs to the unorganised sector wherein low-paid jobs and poor working conditions are persistent challenges.

### Currency Swap Agreement with MMA

Recently, the Reserve Bank of India (RBI) signed a Currency Swap Agreement with the Maldives Monetary Authority (MMA) under the SAARC Currency Swap Framework.

- This is to provide swap support as a backstop line of funding for short term foreign exchange liquidity requirements.



## **PRELIMS 2023 SPECIAL-4**

### **Interdisciplinary and Comparative**

# **History of India**



*From the Editor's Desk*



*Dear Readers,*

Since over 30 years, Civil Services Chronicle has been providing unmatched guidance to civil services aspirants. All through these three decades, it has been our constant endeavour to provide you with comprehensive, relevant and updated content. Our sole aim is to help you clear the examination and realize your goals.

In the UPSC Civil Services Preliminary Examination, significant changes have been observed in the nature of questions being asked in the past few years.

***In the present scenario, most of the questions are statement based. The questions are not being asked directly; rather, the questions are based on the background of topics in news.***

Accordingly, in the current scenario, what the students need is quality mentorship. This is precisely what we have been providing to the aspirants.

Keeping in view the continuous changes in the nature of the examination, we have started the initiative of presenting content in a new and relevant format. We have been providing content with an interdisciplinary, multidisciplinary and comparative approach.

**As part of our renewed strategy, in the Prelims 2023 Special Series:**

- In **October 2022** issue of the magazine, we started with the **Beginners' Strategy Special**. It provided comprehensive guidance to beginners on all aspects of preparation for civil services.
- In **November 2022** issue (**Prelims 2023 Special-1**), we covered **Public Policies and Welfare Schemes**.
- In **December 2022** issue (**Prelims 2023 Special-2**), we covered **Bills, Acts & Amendments, SC Judgments, Reports & Indices, Committees and Commissions**.
- In **January 2023** issue (**Prelims 2023 Special-3**), we presented **Current Affairs Roundup**.

These are important sections of the UPSC syllabus as every year, many questions are asked from these topics in the Preliminary examination. Also, these sections form an important aspect of answer writing.

Continuing with this, we will be covering the static areas of the General Studies syllabus from this issue (**February 2023**) onwards. In this issue's Special Section (**Prelims 2023 Special-4**), we are covering **History of India**.

Instead of covering the entire syllabus in a traditional pattern, ***we have divided the entire content into 13 sections, covering all those topics from which most of the questions are being asked.*** Further, we have dealt with each topic with an interdisciplinary, multidisciplinary and comparative approach, highlighting the interlinkages.

We will cover the other subjects in the forthcoming issues.

The content presented in this section is intended to serve as a source of ready reference for the aspirants. We hope you find it helpful in your preparation.

We encourage you to send us your feedback at [cscenglish@chronicleindia.in](mailto:cscenglish@chronicleindia.in)

*Happy reading!*

*-N. N. Ojha*



## DEVELOPMENT OF CIVILIZATION

> Pre-Historic Civilization .....	83
> Indus Valley Civilization .....	83
> Vedic Period Society .....	84
> Mahajanapada Era .....	84
> Social Structure.....	85
> Food .....	85
> Dress .....	85

## INDIAN SOCIETY

> Marriage System .....	86
> Caste System.....	86
> Death Rituals .....	87
> Status of Women .....	87
> Forced Labour.....	87
> Feudal System.....	88
> Education System .....	88
> Development of Press .....	88
> Ancient Indian Philosophy .....	89

## RELIGION & PHILOSOPHY

> Religious System during Harappan Period.....	90
> Religious System during Vedic Period .....	90
> Religious System of Later Vedic Period .....	91
> Jainism .....	91
> Buddhism.....	92
> Religious System of Mauryan Period .....	93

## DEVELOPMENT OF ADMINISTRATION

> Religious System of Gupta and post-Gupta Period ..	94
> Medieval Philosophical System.....	94
> Local Administration .....	94
> Judicial Administration .....	95
> Key Officers .....	96
> Land Revenue System .....	97
> Tax System.....	98
> Development of Civil Service .....	98
> Harappan Period .....	99

## URBANIZATION OF INDIA

> Mahajanapada Period.....	100
> Urbanization in Medieval India .....	100
> Urbanization during the British Period.....	100
> Pottery in Ancient India .....	101
> Painting .....	101

## DEVELOPMENT OF ART IN INDIA

> Music .....	102
> Dance .....	103
> Indian Theatre/Drama .....	105

> Indian Puppetry.....	105
> Cave Architecture .....	105

## ARCHITECTURE 105

> Rock-cut Buddhist Caves .....	106
> Temple Building Style .....	106
> Delhi Sultanate Architecture.....	107
> Major Regional Kingdoms' Temple Architecture ..	108
> Mughal Period Architecture.....	108
> European Era Architecture.....	109

## DEVELOPMENT OF SCIENCE & TECHNOLOGY

> Buddhist Art.....	110
> Surgery & Ayurveda in Ancient Times .....	110
> Mathematics & Geometry.....	111
> Astronomy .....	111

## SOCIO-RELIGIOUS REFORM MOVEMENTS

> Major Social Reformers and Movements .....	112
> British Era Customary Laws.....	114
> Religious Reform Movements .....	115
> Bhakti and Sufi Movement .....	116

## ARRIVAL OF EUROPEAN COMPANIES

> Portuguese (1498-1961).....	118
> Dutch (1602-1825).....	118
> British (1612-1947) .....	118
> French (1664-1760) .....	118
> Peasant Movements .....	119

## REBELLIONS/MOVEMENTS

> Tribal Movements .....	120
> Major National Movements.....	121
> Revolutionary Activities & Organizations of Freedom Struggle.....	123
> Regulating Act, 1773 .....	125
> Pitts Act, 1784.....	125
> Charter Act, 1793.....	125
> Charter Act, 1813 .....	125

## CONSTITUTIONAL DEVELOPMENT

> Charter Act, 1833.....	126
> Charter Act, 1853.....	126
> Government of India Act, 1858 .....	126
> Indian Council Act, 1861 .....	126
> Indian Council Act, 1892.....	126
> Morley-Minto Reforms, 1909.....	126
> Montague-Chelmsford Reforms, 1919 .....	127
> The Government of India Act, 1935 .....	127

## IMPORTANT TITBITS IN TABULAR FORM

# Development of Civilization

## Pre-Historic Civilization

Pre-History generally refers to a period where there's no writing or development. In the absence of records, these periods are judged on the basis of artefacts (mostly tools).

**Pre-history period in India is divided into three different phases based on the tools used by the people:**

### 1. Palaeolithic Period: 2 million BC – 10,000 BC

- **General Features:** Palaeolithic Culture developed in the Pleistocene period. The Pleistocene period (about 2 million years ago) is the geological period referring to the last or the Great Ice Age. It was the period when ice covered the earth's surface.
- **Important Tools Used:** The tools of the Palaeolithic phase include mainly hand axes, cleavers, choppers, chopping tools, flakes, burins and scrapers.
- **Palaeolithic Sites in India:** Pahalgam (Kashmir Valley), The Potwar region (present-day West Punjab & Pakistan), Sohan Valley, Luni River (Rajasthan), Narmada (Narbada) terraces (Gulf of Cambay), River Raro (Singhbhum, Jharkhand), Ghatprabha Basin (Karnataka), etc.

### 2. Mesolithic Period: 10,000 BC – 8000 BC

- **General Features:** The Mesolithic Age began around 10000 BC. It was the transitional phase between the Palaeolithic Age and the Neolithic Age.
- **Climate:** There was rise in temperature and the climate became warm and dry. The climatic changes affected human life and brought about changes in fauna and flora.
- **Important Tools/Technology:** The tools during the period include – Blade (produced via fluting technique), Core, Point, Lunate, and Trapeze. The technology of producing tools also underwent change and the small stone tools were used.
- **Occupation:** Men were predominantly engaged in hunting and gathering occupation.
- **Mesolithic Sites in India:** Pachpadra basin, Sojat area and Tilwara in Rajasthan; Akhaj, Valasana, Hirpur and Langhnaj in Gujarat; Sarai Nahar Rai and Morhana Pahar in Uttar Pradesh; and Sangankallu in Karnataka, etc.

### 3. Neolithic Period: 8000 BC – 4000 BC

- **General Features:** Domestication of plants and animals has been considered as one of the main characteristic features of the Neolithic stage.

- **Occupation:** Agriculture was the predominant occupation, which helped Neolithic people to be self-sufficient food producing economy.
- **Tools:** The tools became much more sophisticated.
- **Social Life:** The emergence of community life was observed, and the domestication of animals was seen too.
- **Early Farming sites in Indian Subcontinent:** North-Western region (including Afghanistan and Western Pakistan particularly the Kachi plains in Baluchistan), Northern region (covering the Kashmir Valley), South-eastern U.P. (covering the Vindhyan outcrops in the districts of Prayagraj, Mirzapur, Reva and Sidhi-particularly the Belan Valley), Mid-eastern region (northern Bihar), North-eastern region-(covering Assam and adjacent sub-Himalayan region), Central-eastern-region-(covering Chota Nagpur plateau with extensions in Odisha and West-Bengal), and Southern region (covering the Peninsular India).

## Indus Valley Civilization

- The Harappan civilization was first discovered by Charles Mason in 1826, followed by Sir Alexander Cunningham in 1872. Neither of them thought the structures represented a civilization.
- It was only in 1924 that an archaeologist John Marshall studied the ruins and concluded the region as a long-forgotten civilization. He believed that this civilization was as old as the civilizations of Egypt and Mesopotamia.

### Geographical Features

- The areas of present-day Pakistan and North-Western India formed the core region of the Harappan civilization. These areas are characterised by dry weather and scanty rainfall.
- The areas of Punjab and Sind are dominated by the alluvial plains of the Indus River system whereas the areas of Baluchistan are characterised by steep craggy hills. In North-Eastern Baluchistan, the valley floor provides some possibilities of agriculture.
- (Note: Important IVC sites are mentioned in tabular form at the end of this special segment.)

### Decline of IVC

Some of the plausible theories for the decline of the Harappan civilization are:

- It was destroyed by massive floods.
- The decline took place because of the shift in the course of rivers and the gradual drying up of the Ghaggar-Hakra river system.