

## 17 Aug 2022: UPSC Exam Comprehensive News Analysis

“

By education I mean an all-round drawing out of the best in child and man-body, mind and spirit. Literacy is not the end of education or even the beginning.

- M.K. Gandhi

”



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**A. GS 1 Related**

*Nothing here for today!!!*

**B. GS 2 Related**

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**C. GS 3 Related**

**Category: ENVIRONMENT**

**1. Understanding ethanol blending**

*Syllabus: Conservation, environmental pollution and degradation*

*Prelims: Facts about ethanol blending*

*Mains: Ethanol blending programme of India and various challenges arising out of its implementation.*

**Context**

In the 76th Independence day speech, the Prime Minister announced that India has achieved its target of blending 10% ethanol in petrol.

**Ethanol blending**

- Ethanol is an agro-based product that is mainly produced from molasses which is a by-product of the sugar industry.
- Ethanol can also be obtained from other sources such as rice husk or maize or corn.
- Ethanol blending is nothing but the mixing of ethanol with petrol with an aim to conserve the fossil fuel in vehicles.
- The key objectives of ethanol blending are:
  - Cut down the share of oil imports which is causing a significant reduction in the foreign exchange reserves of the country.
    - According to NITI Aayog, India's net import of petroleum stood at 185 million tonnes which cost around \$55 billion in 2020-21 and ethanol blending can help save nearly \$4 billion per annum.
  - Increased ethanol output is also beneficial for increasing farmers' incomes.

## Generations of ethanol

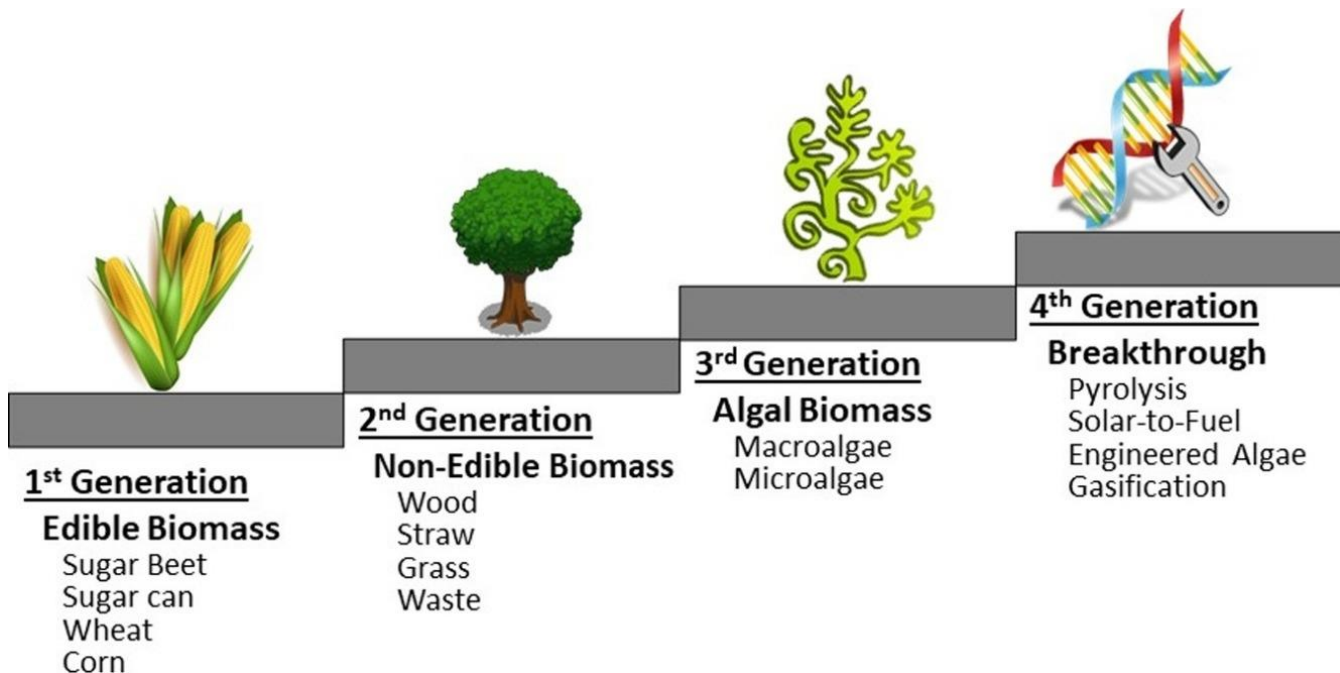


Image source: ScienceDirect

- **First generation ethanol or 1G:** ethanol which is produced from molasses from edible sources such as sugarcane, wheat, corn, maize, etc.
- **Second generation ethanol or 2G:** ethanol extracted from non-edible materials like rice straw, wheat straw, corn cobs, corn stover, bagasse, bamboo and woody biomass.
  - The key benefit of 2G ethanol is that the farmers can now sell the residual stubble to produce biofuels and thereby prevent [stubble burning](#) that causes air pollution.

### Ethanol blending in India

- At present 10% petrol has been blended with ethanol in India which is regarded as “E10”.
- India initially set targets of achieving 20% ethanol blending (E20) by 2030. However, in 2021 the NITI Aayog advanced the timeline to 2025.

Read more about - [Ethanol blending in India in CNA dated May 20, 2022](#)

### Ethanol blending worldwide

- The U.S. and Brazil produce about 84% of the global share which is followed by the European Union (EU), China, India, Canada and Thailand.
- Despite Brazil being a developing country, its achievements in ethanol blending are remarkable.

- Brazil had introduced laws to maintain ethanol blending in petrol in the 18-27.5% range, and it eventually reached its 27% target in 2021.

### Impact and challenges to the auto industry

- In order to facilitate ethanol blending, the vehicle materials must be ethanol compliant.
  - Vehicle parts like petrol points, plastics, rubber, steel and others must be compliant to store E20 fuel otherwise the fuel will cause rusting.
- Also to make vehicle E20 compliant, the engines of the vehicles must also be tweaked to process E20 petrol.
- According to NITI Aayog, the optimisation of the engine and monitoring the durability of such engines are the key challenges to the auto industry.
- Storage is also another key challenge if the E10 supply is continued along with the E20 supply as the storage must be separated, which increases costs and complexities.

### Key concerns against the transition towards ethanol blending

- The use of ethanol in fuels addresses the adverse effects of the release of carbon dioxide (CO<sub>2</sub>) but **does not reduce the emission of nitrous oxide** which is another harmful pollutant emitted due to the burning of fossil fuels.
- A report by the Institute for Energy Economics and Financial Analysis (IEEFA) points out **inefficiency in the land use patterns in ethanol production** and says that the land can be utilised more efficiently for producing renewable power for EV batteries.
  - Example: 187 hectares of ethanol produced from maize are required to match the annual travel distance of EVs recharged from one hectare of solar energy.
- There are also **concerns about the excessive use of water** for the production of ethanol.
  - 70 litres of ethanol can be obtained from a tonne of sugarcane which means that to produce a litre of ethanol from sugar 2,860 litres of water is required.
  - There have been efforts to shift toward waste-based extraction like coarse grains but their supply is still a challenge.
- There are also **concerns about food security** as there has been a push towards the cultivation of sugarcane and maize for ethanol production.
  - Experts point out that this has resulted in inadequate stocks of crops and grains for domestic food supply systems and export markets for grains as they are diverted for ethanol production.
  - This along with the ill effects of climate change such as the increased frequency of heatwaves pose a significant threat to food security which requires attention.
- Further, the 2021 Ethanol Roadmap estimates that **800 crore litres of additional ethanol** are required every year to meet the set targets and **not enough ethanol is produced currently**.

Know more about - [Ethanol Blended Petrol Programme](#)

**Nut graf:** Ethanol blending of fossil fuels plays a significant role in achieving atmanirbharta (self-sufficiency) in the energy sector of the country as India is one of the largest importers of fossil fuels in the world. However, various challenges arising out of achieving the set targets of ethanol blending must be continuously monitored.

#### D. GS 4 Related

*Nothing here for today!!!*

#### E. Editorials

#### Category: ENVIRONMENT

#### 1. Stepping back from an ecological abyss

**Syllabus:** GS-3, Environmental degradation, pollution, and conservation

**Mains:** Development vs ecology

#### Environmental Issues:

- Approximately 480 million Indian residents face extreme levels of air pollution.
- As per a NITI Aayog report, nearly 600 million Indians are reeling under extreme water stress. Moreover, about 70% of water is contaminated. India's rank is 120 out of 122 in the water quality index.
- [Desertification](#) and land degradation are occurring in over 30% of our land, as highlighted by the Indian Space Research Organisation.
- Pesticide residues in food items are far above human safety levels.
- The World Bank report of 2013 highlighted that India was losing 5.7% of its GDP owing to environmental damage.
- The global environmental ranking by Yale and Columbia Universities placed India at the bottom of the list among 180 countries.

#### Associated Concerns:

- A greater focus is given to economic growth, despite the realization that GDP is a poor indicator of human well-being and overlooks the natural environment.
- Despite the rising importance of the [Sustainable Development Goals \(SDG\)](#), the environment is persistently ignored.



- The Government is relaxing environmental policies to favour corporate sectors' access to natural resources and land, as evident from recent proposals to amend environment and forest laws, and the Environment Impact Assessment (EIA) notification.

**Reasons for the decreased focus on environmental sustainability:**

- The economic reforms of 1991 and globalization marked the entry of multinational corporations into various sectors.
- Increased exports of natural raw materials and imports of toxic substances further hampered environmental sustainability.
- Mining disturbed the wildlife-protected zones and tribal areas.
- Other socio-cultural impacts include the displacement of around 60 million people due to 'development' projects in the last few decades.
- Moreover, the new coal mining policy in central India displaced Adivasi communities and rendered them dependent on the government.
- The Climate Action Plan got a very low share of just ₹30 crores in the 2022-23 Budget.

**Implications:**

- Extreme climatic events like super-hot summer with extreme temperatures, erratic rainfall, [cyclones](#), and cloudbursts.
- Water scarcity caused by receding glaciers is evident in Ladakh, where many villages (e.g. in Zaskar) are being abandoned.
- A Lancet Planetary Health journal article reported that extremely high temperatures in India cause approximately 7,40,000 excess deaths annually.

**For more on climate change read here: [Climate Change In India](#)**

**Best practices for ecological sustainability:**

- Approximately 5000 Dalit women farmers of the Deccan Development Society have illustrated how organic, rainfed farming with traditional seed variety can ensure food security.
- In Kachchh (Gujarat) hundreds of handloom weavers showed that dignified, creative livelihood opportunities can be revived based on organic Kala cotton and a blend of traditional and new skillsets.
- Community-led ecotourism options like homestays in Ladakh, Uttarakhand, and Sikkim, have resulted in increased earnings and ecologically sensitive visits.

**Way Ahead:**

- Shifting focus from large infrastructure development and industrialization.

- Substitute mega-corporations with producer cooperatives.
- Ensure community rights over the land, forest, water, coasts, and knowledge.
- Provide decision-making powers to the gram-sabhas.
- Ensure collective mobilization of all stakeholders (industrial workers, activists, farmers, policymakers, fishers, craftspersons, urban and rural youth, women, the 'disabled', and the LGBTQ community).

***Nut Graf:** Fundamental restructuring of governance, economy and environmental concerns is required for sustainable development. Community conserved areas highlight a robust approach to wildlife conservation. Hence, collective efforts from all sections of the population will ensure inclusive development in the true sense.*

### Category: SCIENCE AND TECHNOLOGY

#### 1. High points in science, technology and innovation

*Syllabus: Science and technology developments and their effects.*

*Mains: Council of Scientific and Industrial Research (CSIR).*

#### Reasons for investing in Science and Technology post-independence:

- In 1947 India started as a poor country, with a GDP of just ₹2.7 lakh crore.
- The food-grain production was lowest at 50 million tonnes (MT).
- The challenges of educating and feeding the population along with advocating democracy, promoting trade and industry, and ensuring the country's security were immense.

#### Evolution of CSIR:

- The [Council of Scientific and Industrial Research \(CSIR\)](#) was established in 1942.
- The CSIR started 5 of its laboratories with the help of the government and industry and raised resources through crowdsourcing.
- Moreover, collaborating with the Sir Dorabji Tata Trust and the Government of Bombay, the CSIR established the Tata Institute of Fundamental Research, with the CSIR ensuring substantial financial support in the starting years.

#### Contribution of CSIR:

- Harmonization of varied systems of the calendar: Meghnad Saha Committee report published by the CSIR in 1955, led to its acceptance of the national calendar.

- Free and fair elections: In promoting democratic elections and preventing frauds, double voting, etc. the CSIR's National Physical Laboratory developed the indelible ink made up of silver nitrate. The indelible ink is used to date and even exported to many countries.
- Contribution to developing the leather industry: The making of finished leather products was difficult in the absence of relevant technologies. The CSIR-Central Leather Research Institute (CLRI) founded in 1948, developed technologies for manufacturing finished leather products transitioning from semi-finished ones. Moreover, it trained the manpower. As a result, more than 40% of personnel employed were trained by the CSIR-CLRI.
- The Green Revolution in the Agriculture sector: CSIR helped in the development of agrochemicals and machines. The indigenous manufacture of the Swaraj tractor at the CSIR-Central Mechanical Engineering Research Institute (CMERI), led to the emergence of Punjab Tractors Ltd. in 1970.
- In the pharmaceutical industry: The production of anti-HIV drugs by processes originated in CSIR laboratories giving the desired impetus to the generic pharmaceutical companies' growth.
- Food and nutrition sector: In the 1950s, while solving the infants' food issue, the CSIR developed technologies to transform buffalo milk into powder and commercialized it with the support of Amul Industries.
- The latest [Aroma Mission](#) of the CSIR is seen as transforming the lives of many farmers across the country. The lavender cultivation in Jammu and Kashmir attracted attention across the world as India's 'Purple Revolution'.

#### **Measures to be taken in the future:**

- Ensuring that all industrial processes are circular thus making technologies environmentally sustainable.
- Reducing dependency on natural resources.
- Integrating science and technology with ancient wisdom and spirituality.

**Nut Graf:** *There is a multitude of examples of science, technology, and innovation that have simplified life and helped India transcend the path of growth and self-reliance. The Council of Scientific and Industrial Research has played an important role in this field. However, even today the role of science and technology-led innovation cannot be overlooked as the future path is still full of challenges.*

## **2. The coming 75 years**

**Syllabus:** *GS-3, Science and technology developments and their effects.*

**Mains:** *Measures to strengthen research and development in the science and technology field.*



**Context:** The future course of action for the next 75 years in the field of science, technology, and innovation.

**Details:**

- India spends just 0.7% of its GDP on research and development (R&D), which is very less in comparison to global counterparts like Israel and South Korea.

**Issues with Science and Technology:**

- Lack of adequate staff at funding agencies.
- Inadequate transparency in fund disbursal.
- Inappropriate international standard review mechanism and feedback process.
- Excessive delay in disbursing funds.
- An outdated system of appraisal discourages scientists.

**Measures to be taken to boost scientific research and innovation:**

- Increase the science budget to 4% of the GDP, encouraging entrepreneurs and linking science with society.
- Design an appropriate macro-level policy framework to invest money. A portion of this must be earmarked for physical and intellectual infrastructure across the country, particularly in the universities.
- The infrastructure must be complemented by decently trained, globally competitive institutional processes and administrators.
- Standardized procedures should be adopted across institutions. For instance, in the case of public-private partnerships, every grant-receiving institution should have internal mechanisms to handle scientists' requests and ensure effective academia-industry linkage.
- Incorporation of global best practices from the industry like the Tata Consulting Services and its technology transformed passport services.
- Promote individual entrepreneurs thereby bringing science closer to the masses.
- There should be a robust system to connect the labs with the entrepreneurs so that creative ideas and solutions are evolved.

**Nut Graf:** *It must be realized that the next generation of war is economic and not military, and a science and technology-equipped economy will prepare us for that. Thus the time is ripe to increase our budget and ensure a robust ecosystem of industry-academia linkage.*

**F. Prelims Facts**

***Nothing here for today!!!***

### 1. Defence equipment given to Army

- The Defence Minister distributed various indigenously developed equipment and systems to the Army which include **Future Infantry Soldier as a System (F-INSAS)**, new generation anti-personnel mine “**Nipun**”, **rugged and automatic communication system** with enhanced capabilities, **upgraded sights system** for tanks, **advanced thermal imagers** and **high mobility infantry protected vehicles and assault boats**.
- These pieces of equipment have been jointly developed by the Army and the Defence Research and Development Organisation ([DRDO](#)).
- The Minister said that the infrastructural needs of the armed forces are constantly increasing in recent years and there is a need for infrastructural development based on advanced technology to help prepare the forces for future challenges.

### 2. Child mortality has dipped to 35 per 1,000 births: Minister

- According to the Union Minister of State for Health, India has taken significant strides in reducing child mortality and child mortality had dipped to 35 deaths per 1,000 live births in 2019 as compared to 45 per 1,000 live births in 2014.
- The “**Paalan 1000**” **National Campaign and Parenting App** was launched which focuses on the cognitive development of children in their first two years as the first two years (1000 days) are crucial for the overall health of an individual and require the right amount of nutrition, stimulation, love and support.
- The app will impart important advice to caregivers about the everyday routine and will help clear doubts.

### 3. India buys petcoke from Venezuela

- Indian companies are importing a significant amount of petroleum coke from Venezuela in the wake of increased global coal prices caused due to the Ukraine war.
- Petcoke is a carbon-rich solid material that is a residue from oil distillation and is known for its higher energy content and is cheaper than coal.

- India is one of the biggest consumers of petroleum coke in the world and used to import large quantities of pet coke from the US and Saudi Arabia and is importing from Venezuela for the first time.
- The quality of petcoke from Venezuela is said to be very good and it has very low sulphur.

### H. UPSC Prelims Practice Questions

#### Q1. Consider the following statements about petroleum coke (petcoke): (Level – Difficult)

1. It is solid fuel obtained during the drilling process of crude oil.
2. It has a higher calorific value than coal.
3. Having higher sulphur content its sulphur dioxide emission is higher compared to coal.

Which of the above statements is/are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Answer: b

Explanation:

- **Statement 1 is not correct**, Petcoke is a carbon-rich solid material that is obtained as a residue during the **oil distillation or refining process**.
- **Statement 2 is correct**, Petcoke ( $>7800$  Kcal/Kg) has a higher calorific value as compared to coal (3500-4500 Kcal/Kg).
- **Statement 3 is correct**, Petcoke has higher sulphur content and produces more sulphur dioxide emissions as compared to coal.

#### Q2. Which of the following statements is/are correct with respect to Gabon? (Level – Medium)

1. It is located on the west coast of Africa and the equator passes through it.
2. It is India's largest trade partner in the African continent.

Options:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Answer: a

Explanation:

- **Statement 1 is correct**, Gabon is located on the West coast of Africa and the equator passes through it.



Image source: WorldAtlas

- **Statement 2 is not correct, Nigeria** is India's largest trade partner in the African continent.

**Q3. Consider the following statements about child mortality: (Level – Medium)**

1. It is defined as the probability of a child dying between birth and exactly 3 years of age, expressed per 100 live births.
2. India has already achieved the UN Sustainable Development Goal Target set for child mortality.

**Which of the following statements is/are correct?**

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

**Answer: d**

**Explanation:**

- **Statement 1 is not correct**, Child mortality is defined as the probability of a child dying between **birth and exactly 5 years of age**, expressed per **1,000 live births**.
- **Statement 2 is not correct**, The proposed UN SDG target for child mortality aims to end preventable deaths of newborns and children under 5 years of age by 2030, with all countries aiming to reduce under-5 mortality to at least as **low as 25 deaths per 1,000 live births**.
- However, despite a significant reduction in recent years, **child mortality in India stands at 35 per 1,000 live births (2019)**.

**Q4. Which of the following statements about Nipun mine is/are correct? (Level – Difficult)**

1. These are anti-tank mines.
2. These have been procured from Israel on a technology transfer agreement.

**Options:**

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

**Answer: d**

**Explanation:**



- **Statement 1 is not correct**, “Nipun” is a new generation **anti-personnel mine**.
- **Statement 2 is not correct**, “Nipun” has been developed indigenously with the efforts of Armament Research and Development Establishment, Pune and the Indian industry.

**Q5. Consider the following statements: (Level – Medium) PYQ (2019)**

**A digital signature is:**

1. An electronic record that identifies the certifying authority issuing it.
2. Used to serve as a proof of identity of an individual to access information or server on internet.
3. An electronic method of signing an electronic document and ensuring that the original content is unchanged.

**Which of the statements given above is/are correct?**

- a. 1 only
- b. 2 and 3 only
- c. 3 only
- d. 1, 2 and 3

**Answer: c**

**Explanation:**

- **Statement 1 is not correct**, A **Digital Signature Certificate (DSC)** is an electronic record that identifies the certifying authority issuing it.
- **Statement 2 is not correct**, A **Digital Signature Certificate (DSC)** can be presented electronically to prove your identity, to access information or services on the Internet or to sign certain documents digitally manually.
- **Statement 3 is correct**, A digital signature is an electronic method of signing an electronic document and ensuring that the original content is unchanged.

### I. UPSC Mains Practice Questions

1. [For the next century to be India’s stepping stone into the future, the Government must increase its spending on research and development. Discuss. \(250 words; 15 marks\) \(GS III - Science & Technology\)](#)
2. [What are the key provisions of India’s biofuel policy? How does it attempt to tackle the debate between food security and biofuels? \(250 words; 15 marks\) \(GS III - Science & Technology\)](#)