

## The Hindu Important News Articles & Editorial For UPSC CSE

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Chief Election Commissioner Rajiv Kumar criticised the distortion caused by exit polls, highlighting the gap between expectations and actual results.

- ➔ He called for transparency in exit poll methodology and self-regulation by media bodies.
- ➔ He also condemned news channels for flashing voting trends prematurely, creating unnecessary public confusion before official results are declared.

# CEC slams exit polls, trends on TV channels; calls for corrective steps

News channels are displaying early leads even before vote counting has started, says CEC; he adds that the mismatch between exit poll figures and actual results could sometimes lead to serious issues; urges pollsters, media to self-regulate

**The Hindu Bureau**  
NEW DELHI

Exit polls are creating a huge distortion by raising expectations that do not match actual results, Chief Election Commissioner Rajiv Kumar said on Tuesday, and called for corrective measures. He also termed as “nonsense” the practice of news channels showing leads before counting begins.

Mr. Kumar, who announced the schedules for Assembly elections in Jharkhand and Maharashtra as well as 50 bypolls in 15 States, was responding to a query on the accuracy of exit polls. The pollsters and the press, particularly the electronic media, need to self-introspect and take corrective measures, he said.

“If we look at the whole picture, two-three things are happening concurrently. At first, exit poll results



Exit poll results are shown without declaring the sample size, the places where the survey was conducted, and how the results were arrived at. If the figures do not match with results, what is the pollster's responsibility

**RAJIV KUMAR**  
Chief Election Commissioner

are shown without declaring the sample size, the places where the survey was conducted, and how the results were arrived at. If the figures do not match with the actual results, what is the pollster's responsibility... There is an urgent need to look at these aspects stringently,” he said.

“There are self-regulatory bodies, like the News Broadcasters & Digital Association, which govern this. I am sure the time has come that these bodies

and associations will do some self-regulation, because it is linked to another important issue,” he said.

**Trends before counting**  
Vote counting is usually done three days after the polling day. “So on polling day, 6 p.m. onward, an expectation is built up via exit poll figures of what will be the actual outcome... No scientific basis is given in public disclosures. And then, on the counting day, leads are flashed as early as 8:05 a.m. or 8:10 a.m.,

which is a nonsense,” Mr. Kumar said.

He said that, in reality, vote counting itself only begins at 8:30 a.m. “This time, we have proof that leads were being shown 8:05 a.m. onwards. Does it happen because the exit poll results have to be justified through early trends, without caring for what will transpire later? The fact is that one round of counting takes about 20 minutes and, after following the set procedures, the figures are put up on the EC website around 9:30 a.m., then around 11:30 a.m. and then around 1:30 p.m...,” he said.

The CEC said the mismatch between the exit poll figures and actual results could sometimes lead to serious issues. “The gap between expectation and achievement is nothing but frustration. On this issue, our hands are tied. However, a brainstorming by the stakeholders is urgently re-

quired and I am sure self-correction will be done,” he said.

On the issue of Electronic Voting Machines (EVMs), the CEC reiterated that representatives of all political parties are involved at each and every step of the machine-handling process. He said even the EVM batteries are sealed and signed by the representatives.

In reply to a question on the use of Artificial Intelligence for influencing the elections, Mr. Kumar said that social media teams had been constituted and control rooms set up to monitor such materials, which are taken down and blocked. Legal action is also initiated whenever necessary.

He indicated that some social media users were on the EC radar for such activities, but added that they had not yet crossed the “red line” warranting penal measures.

## Analysis of the News

### ➔ Exit polls

- Exit polls in India are conducted after voters cast their ballots to predict election outcomes.

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## Daily News Analysis

- Various media agencies and survey organizations carry out these polls.
- Exit polls estimate trends by sampling voters across different regions and constituencies.
- They often provide insights into voting patterns but may not always be accurate.
- Exit polls have sometimes sparked debates due to discrepancies between their predictions and actual election results.

### ➔ Impact of Wrong Exit Polls

- **Creates False Expectations:** Mismatched exit poll results raise public expectations, leading to frustration when actual results differ.
- **Undermines Election Credibility:** Discrepancies between exit polls and real outcomes can cast doubt on the fairness and accuracy of the electoral process.
- **Influences Voter Perception:** Misleading polls might sway voter behaviour, altering their expectations of certain candidates or parties.
- **Erodes Trust in Polling Agencies:** Repeated inaccuracies reduce public confidence in pollsters and their methodologies.
- **Political Tension:** In cases of significant deviation, exit polls can fuel political unrest and disputes over election results.
- **Media Accountability:** Lack of transparency in polling methods weakens journalistic responsibility, potentially distorting public discourse.

### ➔ Use of Artificial Intelligence for Influence in Elections

- **Targeted Misinformation:** AI-driven bots can rapidly spread misinformation to manipulate voter opinions and decision-making.
- **Micro-targeting of Voters:** AI enables campaigns to precisely target specific voter groups with tailored ads, influencing electoral outcomes.
- **Deepfake Technology:** AI can generate deepfake videos, spreading false narratives or damaging reputations of political figures.
- **Data Mining:** AI uses vast voter data to predict preferences and devise strategies to exploit emotional and cognitive biases.
- **Social Media Manipulation:** AI can create and operate fake social media accounts to amplify biased content and sway public opinion.
- **Real-time Monitoring:** AI tools can monitor trends and adjust campaign strategies dynamically, affecting voter behaviour during critical phases of elections.



India and the U.S. finalised a \$3.5-billion deal for 31 MQ-9B armed drones, enhancing India's Intelligence, Surveillance, and Reconnaissance (ISR) capabilities.

- ➔ The procurement includes UAVs for the Navy, Army, and Air Force, with advanced missiles and logistics support.

## India, U.S. conclude \$3.5-billion deal for procurement of 31 armed UAVs

**Dinakar Peri**  
NEW DELHI

India and the U.S. on Tuesday concluded a \$3.5-billion deal for the procurement of 31 MQ-9B armed high-altitude long endurance (HALE) remotely piloted aircraft systems (RPAS) manufactured by General Atomics through an inter-governmental agreement, via the Foreign Military Sales programme of the U.S.

One contract was signed with the U.S. government for Tri-Service procurement of 31 MQ-9B Sky/Sea Guardian HALE systems, the Defence Ministry said. "Another contract has been signed with General Atomics Global India Pvt Ltd for performance based-logistics for these RPAS through Depot Level Maintenance, Repair & Overhaul in India," the Ministry said on X. The contracts were inked in the presence of Defence Secre-



These advanced UAVs can significantly augment India's Intelligence, Surveillance, and Reconnaissance capabilities. PTI

tary Girdhar Aramane.

The deal also includes 170 AGM-114R Hellfire missiles; 16 M36E9 Hellfire captive air training missiles; 310 GBU-39B/B laser Small Diameter Bombs (SDB); and 08 GBU-39B/B LSDB guided test vehicles with live fuses among others.

### Force multiplier

The deal for 31 MQ-9B UAVs, 15 Sea Guardians for the Indian Navy and 16 Sky Guardians— eight each for the Indian Army and Air

Force— was formally approved by the Cabinet Committee on Security last week along with another major deal for the indigenous construction of two Nuclear Attack Submarines (SSN).

These advanced UAVs, once inducted, will significantly augment India's Intelligence, Surveillance, and Reconnaissance (ISR) capabilities. For the Navy, it is a great force multiplier in keeping an eye over large swathes of the Indian Ocean Region and will re-

duce the wear and tear on its P-8I long-range maritime patrol aircraft.

As reported by *The Hindu* earlier, end-July the Defence Acquisition Council chaired by Defence Minister Rajnath Singh had approved amendments to the MQ-9B deal related to indigenous content and related aspects.

### 40-hour capacity

The MQ-9B is designed to fly over the horizon via satellite for up to 40 hours, depending on the configuration, in all types of weather, and safely integrate into civil airspace, according to its manufacturer. For instance, the Sea Guardian configuration can include a 360-degree surface-search maritime radar, automatic identification system, sonobuoy monitoring system, and sonobuoy dispensers for persistent anti-surface and anti-submarine warfare missions.

### MQ-9B Armed Drones:

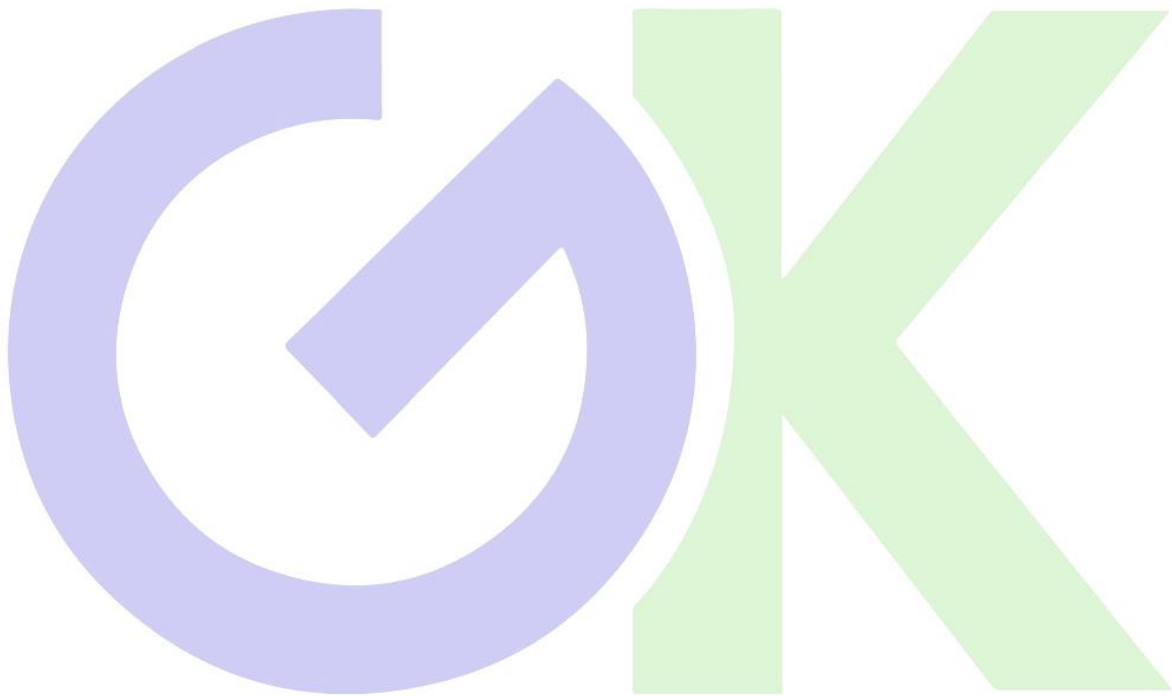
- ➔ **Manufacturer:** Developed by General Atomics.
- ➔ **Type:** Armed high-altitude long-endurance (HALE) remotely piloted aircraft system.
- ➔ **Purpose:** Designed for military applications, including Intelligence, Surveillance, and Reconnaissance (ISR) missions and precision strikes.
- ➔ **Payload Capacity:** Capable of carrying a variety of munitions, such as small missiles and Small Diameter Bombs.

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## Daily News Analysis

- **Endurance:** Can fly for up to 40 hours, allowing operations over extensive areas without refuelling.
- **Operational Conditions:** Functions effectively in all weather conditions.
- **Advanced Sensors:** Equipped with sophisticated sensors for maritime patrol and anti-submarine warfare missions.



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The 2024 Nobel Prize in Economics was awarded to Daron Acemoglu, Simon Johnson, and James A. Robinson for their work on the role of institutions in economic prosperity.

- ➔ Their research highlights how inclusive institutions contribute to long-term growth, while extractive institutions lead to poverty.
- ➔ This recognition emphasises the importance of institutional quality in economic development.

# A Nobel for explaining why nations fail

According to the three Nobel prize winners, why are some countries rich and some others poor? What is the difference between 'inclusive' and 'extractive' institutions? Why did colonial powers set up extractive systems in some colonies and inclusive ones in others?

## EXPLAINER

Prashanth Perumal

### The story so far:

The 2024 Economics Nobel prize was awarded to U.S. economists Daron Acemoglu, Simon Johnson and James A. Robinson on Monday "for studies of how institutions are formed and affect prosperity." The prize committee credited the winners for enhancing our understanding of the root causes of why countries fail or succeed.

### What is their work's significance?

Why are some countries rich while others are poor is a question that has been debated by economists for a long time now. According to the Nobel committee, the richest 20% of countries in the world today are 30 times richer in terms of average income than the poorest 20%. Ever since the Industrial revolution led to the "Great Divergence" in living standards between the East and the West, various theories have been proposed to explain the huge difference in living standards in rich versus poor countries.

Some blame Western colonialism as the primary reason for the Western world's prosperity even today. Other scholars have argued that disparities in natural resource endowment explains differences in economic prosperity across countries. Some others have argued that intelligence and even historical accidents could explain a nation's fate.

The 2024 Nobel laureates, however, have argued that differences in the quality of economic and political institutions is what best explains the divergence in the economic fates of countries. This thesis is most famously elaborated in the 2012 book *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* written by Daron Acemoglu and James A. Robinson, and also in the 2004 paper 'Institutions as a Fundamental Cause of Long-Run Growth', written together by all three of



**Rules of the game:** Members of the Nobel Assembly announce the Swedish Riksbank's prize in economic sciences in memory of Alfred Nobel 2024 in Stockholm, Sweden on October 14. REUTERS

this year's Nobel laureates.

### Why is the quality of institutions so important?

According to Douglass North, a Nobel laureate and a pioneer of New Institutional Economics, institutions are the "rules of the game" that define the incentives of human individuals. For example, institutions that stop the state from seizing the property of honest citizens would give ordinary citizens the incentive to work hard without the fear of expropriation and that in turn would lead to general economic prosperity. Institutions that legalise expropriation, on the other hand, would affect individual incentives negatively and cause economic

stagnation.

Now, Acemoglu and Johnson argued in their book that institutions can either be "inclusive" or "extractive". Inclusive institutions are characterised by secure private property rights and democracy while extractive institutions are marked by insecure private property rights and the lack of political freedom. They tried to empirically demonstrate that inclusive institutions lead to long-run economic growth and higher living standards while extractive institutions lead to economic degradation and poverty.

To this end, they studied the kinds of institutions that colonists set up in different colonies and the impact that this had on the long-term economic fate of

these colonies. When a colonial power did not want to settle in a certain country for various reasons (such as higher mortality rates due to geography), it set up institutions that were extractive in nature and inimical to long-term economic growth. This may have been the case in India where the British set up institutions that were mostly devised to plunder resources within a short span of time rather than promote long-term economic growth. But in countries where colonists wanted to settle for the long-run, they set up inclusive institutions that encouraged investment and long-term economic growth over short-term plunder. This may have been the case in the U.S. where the British set up inclusive institutions that promoted long-term economic prosperity.

It should be noted that institutions can also include factors like culture, which influence the more explicit "rules of the game" expressed by political and economic institutions.

### Why don't we have more inclusive institutions?

The Nobel laureates have also shed light on why inclusive institutions, which are found to be extremely important for long-term economic growth, have not been adopted by more countries in the world. They attribute this to the different choices that rulers face in their respective countries. When the rulers of a country are able to safely extract sufficient resources for their personal gains through extractive institutions, the laureates argue, they have little reason to bring in political and economic reforms (or inclusive institutions) that can benefit the wider population over the long run. In such cases, extractive institutions may prevail for a really long time as long as the masses do not revolt against the status quo. But if there is a real threat of a popular uprising against extractive institutions, at least some rulers may decide to yield to popular demand and reluctantly set up more inclusive institutions which aid economic growth.

## THE GIST

According to the Nobel committee, the richest 20% of countries in the world today are 30 times richer in terms of average income than the poorest 20%.

Inclusive institutions are characterised by secure private property rights and democracy while extractive institutions are marked by insecure private property rights and the lack of political freedom.

The Nobel laureates have shed light on why inclusive institutions, which are found to be extremely important for long-term economic growth, have not been adopted by more countries in the world.

## Understanding Economic Disparities

- ➔ The question of why some countries are rich and others are poor has puzzled economists for a long time.
- ➔ Currently, the richest 20% of countries have an average income that is 30 times greater than that of the poorest 20%.

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- Since the Industrial Revolution caused a significant gap in living standards between the East and West, various theories have emerged to explain these differences.

### Theories Behind Economic Success

- Some theories attribute wealth in the West to the effects of colonialism, while others cite disparities in natural resources.
- Some scholars even suggest that intelligence or random historical events could determine a nation's economic fate.

### Importance of Institutions

- Acemoglu, Johnson, and Robinson argue that the quality of economic and political institutions is the main factor explaining the economic outcomes of countries.
- This idea is extensively detailed in their 2012 book, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, and their 2004 paper, "Institutions as a Fundamental Cause of Long-Run Growth."
- Institutions that protect property rights encourage hard work, leading to economic growth, while those that permit expropriation can cause stagnation.

### Types of Institutions

- The Nobel laureates categorise institutions as either "inclusive" or "extractive."
- Inclusive institutions promote secure property rights and democracy, while extractive institutions are characterised by insecurity and lack of political freedom.
- They demonstrated that inclusive institutions foster long-term economic growth, whereas extractive ones result in poverty.

### Historical Context of Institutions

- The researchers studied how colonisation influenced the types of institutions established in different regions.
- In areas where colonists were unwilling to settle due to high mortality risks, extractive institutions were created, leading to long-term economic challenges.
- In contrast, colonists who settled aimed to establish inclusive institutions that supported investment and economic growth, as seen in the U.S.

### Challenges in Implementing Inclusive Institutions

- The Nobel laureates explored why more countries have not adopted inclusive institutions.
- They argue that rulers may prefer extractive institutions that allow for personal gain, thereby resisting reforms that would benefit the broader population.
- These extractive institutions can persist until there is a significant threat of rebellion, prompting some rulers to create more inclusive systems to promote growth.



The International Monetary Fund (IMF) has projected that global public debt will reach \$100 trillion in 2024, nearing 100% of global GDP by 2030.

- ➔ This rise is attributed to increased spending pressures and overly optimistic debt forecasts following the COVID-19 pandemic.

**Analysis of the news:**

- ➔ Global public debt is projected to reach a record \$100 trillion in 2024, according to the IMF.
- ➔ The IMF reports that global public debt will be approximately 93% of global GDP this year and could approach 100% by 2030.
- ➔ This figure is 10 percentage points higher than in 2019, prior to the COVID-19 pandemic.
- ➔ IMF deputy director, warns that the debt outlook could be worse than expected due to spending pressures from climate change and overly optimistic debt projections.
- ➔ A worst-case scenario could see global public debt rise to 115% of GDP by 2026.
- ➔ Fiscal adjustments needed to control global public debt range from 3.0% to 4.5% of GDP, nearly double past adjustments.

## 'Global public debt to hit \$100 trillion'



**Unprecedented task:** The size of fiscal adjustment required is twice the size of past adjustments. REUTERS

**Agence France-Presse**  
WASHINGTON

Global public debt is expected to reach a record \$100 trillion this year, the IMF said Tuesday, warning that the fiscal outlook for many countries may be even "worse than expected."

In its latest report on fiscal policy, the International Monetary Fund said it expects global public debt to hit 93% of global gross domestic product (GDP) this year, and to approach 100% of GDP by 2030—10 percentage points higher than in 2019, before the Covid-19 pandemic hit.

"Global public debt is very high," Era Dabla-Norris, the deputy director of the IMF's Fiscal Affairs Department, told reporters.

"There are very good reasons to believe that the debt burden—or the debt outlook—could be worse than expected," she said, pointing to current spending pressures to address issues like climate change, overly-optimistic debt projections, and the possibility of large amounts of unidentified debt. "So the bottom line is that it's time for countries to get their fiscal house in order," she said.

It estimated that, in a worst-case scenario, global public debt could hit 115% of GDP by 2026—almost 20 percentage points higher than the Fund's baseline estimate.

The size of the fiscal adjustment needed to bring global public debt back under control was between 3.0 and 4.5% of GDP, on average, the International Monetary Fund said—almost twice the size of past adjustments.



**Location In News : Mount Adams**

Mount Adams, Washington's largest volcano, has recently shown a surge in seismic activity after remaining largely dormant for thousands of years.



**About Mount Adams:**

- It is a stratovolcano located in Washington State, United States.
- At 12,277 feet (3,742 meters) high and 18 miles (29 kilometers) wide, Mount Adams is the largest active volcano in Washington, surpassing Mount Rainier — the state's highest peak — by volume.
- Mount Adams lies in the middle of the Mount Adams volcanic field—a 1,250 sq. km area comprising at least 120, mostly basaltic volcanoes that form spatter and scoria cones, shield volcanoes, and some extensive lava flows.
- Mount Adams supports over 10 active glaciers that provide water to the forests, streams, and meadows below.
- The most recent eruption at the site occurred sometime between 3,800 and 7,600 years ago when humanity was still in the Stone Age.

**What is a Stratovolcano?**

- Stratovolcanoes (also known as composite volcanoes) are tall, steep, and cone-shaped types of volcanoes.

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## Daily News Analysis

- Unlike flat shield volcanoes, they have higher peaks.
- They are built of successive layers of ash and lava.
- The magma (molten rock) within the volcano is viscous and often contains trapped gas, causing explosive eruptions.
- Stratovolcanoes occur at the margins of tectonic plates, large sections of Earth's crust that move together.
- The continental plates, composed of less dense material, override the oceanic plates.
- Magma generated from the subducting plate rises and squeezes into cracks, eventually reaching the surface in a volcanic eruption.
- They comprise the largest percentage (~60%) of the Earth's individual volcanoes.
- Approximately 85% of stratovolcanoes are located around the Pacific Ocean, forming what is called the "Ring of Fire."



# 'Yield' can't be the sole indicator for agriculture

India, like most countries, understands agriculture through the golden metric of 'yield' – the kilogramme of output produced per unit of land, usually counted as kg/hectare. This needs to change.

In independent India, the focus on yield ensured food for a growing population. Historically, the emphasis on yield stemmed from the fact that land is usually considered the most scarce resource among all the inputs essential for agriculture. Now, the other inputs, such as water, plant nutrition, and labour, are also becoming scarce. Moreover, solely maximising yield adversely impacts the health and economic well-being of the producers and consumers at times – the very outcomes that yield maximisation should contribute to.

## High yield, many losses

This doubling down on yield has led to a singular emphasis on enhancing the quantity of output with little attention to the nutritional profile of the food being grown. A recent study by the Indian Council for Agricultural Research (ICAR) found that the chase for high-yielding varieties of rice and wheat has reduced micronutrient densities, with zinc levels dropping by 33% in rice and 30% in wheat, and iron dropping by 27% in rice and 19% in wheat. Plant breeders developing newer varieties of grains are not even mandated to publish the nutritional profile of the variety. This lack of nutrition in Indian food leads to micronutrient deficiencies. According to the latest National Family Health Survey report, a third of Indian children under five are stunted, and two-thirds are anaemic.

Conventional wisdom is that maximising yields maximises farmers' net income. Not always. The marginal cost at which the additional yield comes is important to consider. With crops' response to fertilizer declining by more than 80% since the 1970s, farmers are putting more fertilizers to get the same yield.



**Abhishek Jain**

Fellow and Director at the Council on Energy, Environment and Water (CEEW). Views are personal



**Anjaly John**

Former Programme Associate at CEEW. Views are personal

It is time to champion a new paradigm where agricultural success is measured by its ability to nourish people, sustain livelihoods, and protect our planet for future generations

Additionally, a singular focus on maximising yield may help with seasonal outputs but may not maximise output the whole year round. Agricultural scientists, while designing seed varieties, pay little regard to the on-field symbiotic relations between crops within and across seasons. Often, the combination of crops in a season and across seasons may not maximise yield in one

season but may maximise overall nutritional output and profit over the year (across seasons). A study from Andhra Pradesh highlights the economic benefits of intercropping sugarcane with chilli, eggplant, tomato, and coriander, providing year-round stable farm income while enhancing profitability.

Moreover, a singular focus on yield maximisation structurally promotes only a few high-yielding varieties of seeds everywhere, leading to biodiversity loss. For instance, India has lost about 1,04,000 varieties of rice since the Green Revolution. This has undermined agricultural resilience, especially in the wake of intensifying floods, droughts, and heatwaves due to climate change. Many local varieties have proven to be more resilient to such extreme conditions.

The chase for high-yielding crops has also led to the decline of resilient and nutritious ones. For instance, the area sown under coarse cereals such as millets has dropped by 10 million hectares since the 1950s, whereas the share of rice and wheat has gone up by 13 million hectares and 21 million hectares, respectively. This diversity loss in production reduces the diversity in the Thali of an average Indian.

## Looking at better indicators

A few principles can help us shape better indicators for India's agriculture system. First, our food system impacts the health of our nation and is dependent on critical natural resources. Thus,

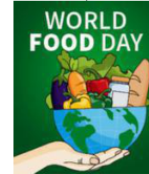
agriculture indicators should not be determined only by the Ministry of Agriculture or its associated ICAR institutions, but collectively by the Ministries of Health, Agriculture, Water, and Environment.

Second, the indicators should directly address the outcomes. If nutritional security is the goal, the indicator could be nutritional output per hectare per year (and over the years).

Third, metrics such as soil biological activity, water-use efficiency, and farm biodiversity must be mainstreamed. For example, the inclusion of soil organic carbon in soil health cards is a good step. Similarly, the AI-powered 'Saagu Baagu' pilot project in Telangana's Khammam district focuses on improving water-use efficiency and enhancing farm biodiversity by providing farmers with real-time data and recommendations for optimal irrigation and crop management practices.

Fourth, we must measure not only crop diversity at the farm level but also capture a 'Landscape Diversity Score' (assessing the regional diversity of crops) and degree of income diversification (tracking economic resilience through multiple income streams, like intercropping and livestock rearing). For instance, a region with only one dominating crop is much more susceptible to price shocks and pest attacks.

A single indicator cannot do justice to the multiple outcomes that the agriculture system is supposed to serve. Chasing yields has pulled India away from devastating famine. But that cannot be the only goal going forward, with increasing climate threats and declining natural resources making our food systems vulnerable. It is time to champion a new paradigm where agricultural success is measured by its ability to nourish people, sustain livelihoods, and protect our planet for future generations.





## **GS Paper 03 : Indian Economy : Agriculture**

**PYQ (UPSC CSE (M) GS-3 2017)** What are the major reasons for declining rice and wheat yield in the cropping system? How crop diversification is helpful to stabilise the yield of the crop in the system?

**(UPSC CSE (M) GS-3 2022):** Discuss the challenges posed by India's traditional focus on agricultural yield maximisation. How can integrating new agricultural indicators help promote sustainability and improve nutritional security?

### **Context :**

- ➔ India's agricultural focus on maximising yield has led to negative consequences like reduced nutritional value, biodiversity loss, and declining farm profitability.
- ➔ The current approach needs to shift toward sustainability by incorporating new indicators such as nutritional output, water efficiency, and biodiversity.
- ➔ A holistic strategy is crucial for ensuring food security and environmental resilience.

### **Introduction: Yield as the Golden Metric**

- ➔ In India, agriculture has historically been measured by yield—output per unit of land.
- ➔ The emphasis on yield helped feed the growing population post-independence.
- ➔ However, inputs like water, nutrition, and labour are becoming scarce, and focusing solely on yield now harms the health and well-being of both producers and consumers.

### **High Yield, Nutritional Losses**

- ➔ The drive for higher yield has prioritised quantity over quality.
- ➔ An ICAR study revealed that high-yielding varieties of rice and wheat have led to a decline in micronutrient density, with significant drops in zinc and iron content.
- ➔ This has contributed to micronutrient deficiencies in India, with a third of children under five stunted and two-thirds anaemic, according to the National Family Health Survey.

### **The Misconception of Yield and Income**

- ➔ Conventional belief links maximised yield with maximised farmer income, but this isn't always true.
- ➔ Farmers face diminishing returns from fertilisers, requiring more input for the same yield.
- ➔ Moreover, maximising yield in a single season doesn't always lead to year-round maximised output.

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- ➔ Crop combinations and intercropping strategies, such as sugarcane with chilli or coriander, can provide stable income and higher profitability across seasons.

### **Yield Focus Leading to Biodiversity Loss**

- ➔ Yield maximisation has also caused a loss of biodiversity, particularly with the promotion of high-yield varieties.
- ➔ India has lost about 1,04,000 varieties of rice since the Green Revolution.
- ➔ This biodiversity loss undermines agricultural resilience in the face of climate change challenges like floods and droughts.
- ➔ Traditional and local varieties of crops have been proven more resilient, but they have been neglected in favour of high-yielding ones.

### **Decline of Nutritious Crops and Impact on Diet**

- ➔ The focus on rice and wheat has caused a decline in the cultivation of nutritious crops like millets.
- ➔ Since the 1950s, the area under coarse cereals has decreased by 10 million hectares, while rice and wheat cultivation has increased.
- ➔ This has reduced dietary diversity for the average Indian, which negatively affects overall nutrition.

### **Metrics for Sustainability**

- ➔ Important metrics like soil biological activity, water-use efficiency, and biodiversity must be mainstreamed.
- ➔ Examples include the inclusion of soil organic carbon in soil health cards and Telangana's AI-powered 'Saagu Baagu' project, which provides real-time data to improve farm management.

### **Measuring Diversity and Resilience**

- ➔ New metrics should also measure farm and landscape diversity, as well as income diversification.
- ➔ A diverse crop landscape is more resilient to economic and environmental shocks than monoculture farming.

### **Conclusion: Moving Beyond Yield**

- ➔ While yield maximisation helped India overcome famine, it cannot remain the sole focus in today's context.
- ➔ With increasing climate threats and depleting natural resources, agriculture should focus on nourishing people, sustaining livelihoods, and protecting the environment.
- ➔ A new paradigm in agriculture is needed, focusing on multiple outcomes that address nutrition, sustainability, and resilience for future generations.