

INDIAN ECONOMY**Difference in rural and urban consumption: Not as big as it seems**

As per the government's latest data on household consumption expenditure, the per-person monthly spending in urban areas of India in 2022-23 was 1.72 times that in rural areas. The article highlights the fact that there is not much difference in rural and urban consumption. The increase in spending in rural areas indicate their rising aspirations.

categories that create the gap in rural-urban consumption

- 1) Rent-The average monthly rent spending is only ₹30 in rural areas, whereas it is ₹423 in urban areas. This is because most families live in their own homes in rural areas.
- 2) Conveyance-In rural areas, it is ₹285, while in urban areas, it is ₹555.
- 3) Beverages and processed food-The average rural spending was ₹363 and nearly double that in urban areas. Similarly, the rural-urban gap in spending on entertainment and other goods is also high.
- 4) Impact of government transfer-As per the survey result, the average government transfers are higher in rural areas as compared to urban areas. Additionally, the large difference in education and healthcare spending between rural and urban areas may decrease once government subsidies are taken into consideration.

Differences In The Quality Of Consumer Spending Between Rural And Urban Areas In Food And Non-Food Categories

In order to calculate the real consumption levels, there is a need to remove the impact of inflation in rural and urban areas over the last decade.

- 1) Food categories–
 - a. Rural areas spend slightly more per person each month on vegetables compared to urban areas. The difference in spending on pulses and pulse products between rural and urban areas is also small. In the main protein-rich foods like eggs, fish, and meat, the rural-urban gap in average monthly spending is only about ₹21.
 - b. In consumption of sugar, salt, and spices, the gap in real consumption between rural and urban areas is marginal.
 - c. Fruits and milk products-Two nutritious item groups are fruits and milk and milk products. The average monthly urban real spending on fruits is about 1.7 times that in rural areas and about 1.5 times that of milk and milk products. However, spending levels alone doesn't indicate if the gaps between rural and urban consumptions is due to lack of affordability or lack of accessibility.

For ex- in rural areas, there are probably fewer cold storage facilities for perishable items like fruits and milk compared to urban areas.

- 2) Non-food categories-In consumption of paan, tobacco and other intoxicants, rural-urban gap is smaller and almost negligible.

Once all government transfers are considered, spending in rural India will resemble that of urban India more closely.

Way forward

In order to experience real welfare gains by householders, it is important to ensure that family members don't have to separate in search of jobs. So, to achieve this objective, there is a need to create non-farm jobs in rural areas and minimise relative cost of housing in urban areas by providing affordable housing.

Voting process reforms in India

The Supreme Court has decided to hear petitions asking for 100% cross-verification of Voter Verifiable Paper Audit Trail (VVPAT) slips against the electronic vote count from Electronic Voting Machines (EVMs).

Evolution of voting process in India since its first general election

- 1) First two elections-In the first two general elections of 1952 and 1957, there was a separate box for each candidate with their election symbol. Voters had to put a blank ballot paper into the box of the candidate they wanted to vote for.
- 2) Third election-Starting from the third election, ballot papers with candidate names and symbols were introduced, and voters put a stamp on the candidate of their choice.

- 3) Introduction of EVM-The EVM was introduced on a trial basis in 1982 in the Assembly constituency of Paravur in Kerala. They were deployed in all booths during the Assembly elections of Tamil Nadu, Kerala, Puducherry and West Bengal in 2001. In the 2004 general elections to the Lok Sabha, EVMs were used in all 543 constituencies.
- 4) Introduction of VVPAT- The Supreme Court In Subramanian Swamy versus Election Commission of India (2013) held that a paper trail is an indispensable requirement for free and fair elections. From 2019 general elections, EVMs backed with 100% VVPAT in all constituencies were introduced.

Benefits Of Evms

- 1) It has eradicated booth capturing by limiting the rate of vote casting to four votes a minute and thus significantly increasing the time required for stuffing false votes
- 2) It has eliminated the problems of invalid votes in the elections.
- 3) It is eco-friendly as it reduces the consumption of paper.
- 4) It provides administrative convenience for the polling officers on the day of the poll and has made the counting process faster and error-free.

Mechanisms to uphold the integrity of EVM and VVPAT process

- 1) There is random allocation of EVMs to booths before polls
- 2) Mock polls are conducted before the actual poll to display the correctness of EVMs and VVPAT.
- 3) EVM serial numbers and total votes cast are shared with candidates' agents during vote counting for verification.
- 4) As per the Election Commission of India, EVM is a standalone device like a calculator with no connectivity to any external device and hence free from any kind of external hack

Issues Associated With Evms

- 1) EVMs are susceptible to hacking as it is an electronic device.
- 2) Currently, the sample size for checking EVM counts with VVPAT slips is five per assembly constituency/segment. This isn't based on scientific criteria and may not detect faulty EVMs during counting.
- 3) In the present process, booth-wise polling behaviour is identified by various parties. This may result in profiling and intimidation.

Way forward

- 1) Scientific approach-The sample for comparing EVM count and VVPAT slips should be determined scientifically by dividing each state into larger regions. If there's even one mistake, all VVPAT slips for that area should be counted fully, and they should decide the results.
- 2) Introduction of Totaliser machines-Totaliser machines that are equipped to aggregate votes in 15-20 EVMs before revealing the candidate-wise, count can be introduced. This would minimise the possibilities of profiling and intimidation.

PRELIM FACT**1.Three new fish species spotted using tools in the Laccadive Sea**

Three fish species in the Laccadive Sea have been spotted using tools. All three species used live or dead coral structures as anvils to break the hard shells of sea urchins, so they could get to the edible bits inside.

- Tool usage among fish has predominantly been observed in just 18 species of the wrasse family (Labridae), which vary in size, prey, and location.
- Reports of chimpanzees using straws to drink water and crows using leaves to retrieve insects from crevices are well-documented. However, there are rare instances of aquatic animals using tools and there is a common perception that fish possess lower intelligence.
- This study underscores the need for thorough and frequent underwater observations. Such insights are vital for exploring broader questions about animal intelligence and ecological dynamics.

Laccadive Sea

1. The Laccadive Sea, also known as the Lakshadweep Sea, is a body of water bordering India (including its Lakshadweep islands), the Maldives, and Sri Lanka.

2. It is located to the southwest of Karnataka, to the west of Kerala, and to the south of Tamil Nadu.
3. There are numerous coral reefs in the Laccadive Sea, including the Lakshadweep islands, which host an impressive 105 coral species.
4. The Gulf of Mannar, within the Laccadive Sea, has been renowned for its pearl banks of *Pinctada radiata* and *Pinctada fucata* for over two thousand years.
5. The sea also supports the collection of Shankha mollusks (*Xancus pyrum*), whose shells hold ritual and religious significance.

2. India and Brazil working to harmonize their certification systems

India and Brazil are working to harmonize their certification systems for the trade in biological genetic material as well as certificates for pork and fish.

About the Integrated certification

- The 'integrated certification' will involve authorization by the Food Safety and Standards Authority (FSSAI) and the Department of Animal Husbandry and Dairying (DAHD).
- The idea of the new certificates is to facilitate the imports. A health certificate is an official document issued by the exporting country, proving that the requirements established by the importing country are being met.
- This will make it easier for India to receive regular imports of biological genetic material, fish, pork meat and their products.
- Note: Biological genetic material is used for breeding and improving animal productivity.
- It has been reported that Brazil will provide India bull semen genetic material to improve the productivity of Indian cattle. India through the National Dairy Development Board received its first batch of 40,000 doses of bull semen from Brazil.

Status of animal husbandry and dairy in India

1. India is home to the world's largest livestock population. It is the top producer of buffalo meat and the largest global milk producer, with almost all its milk consumed domestically.
2. In 2022-23, milk production was stagnant, partly due to an outbreak of lumpy skin disease.
3. About half of its milk output comes from indigenous and non-descript buffaloes, with another 20% from similar types of cows.
4. The 2023 Household Consumption Expenditure Survey reveals that daily per capita milk consumption is approximately 330 ml.

3. India allows FIIs to Invest in Green Bonds

- Recently, the Reserve Bank of India (RBI) has allowed investments in the country's Sovereign Green Bonds (SGrBs) by Foreign Institutional Investors (FIIs).
- This decision will expand the available capital for the country's ambitious objectives, as committed by Prime Minister Narendra Modi at the 2021 COP26 in Glasgow.

About Foreign Institutional Investors (FIIS)

1. Foreign institutional investors (FIIs) are those institutional investors who invest in assets belonging to a different country other than that where these organizations are based.
2. Investors such as pension funds, mutual funds, insurance companies, banks, and other significant financial institutions from abroad are included in Foreign Institutional Investors (FIIs).
3. FIIs are crucial to a country's financial markets as they enhance liquidity, boost trading volumes, and affect stock prices.
4. These investors deploy their capital into various financial instruments like stocks, bonds, and derivatives, driven by their strategic investment plans and views on market conditions.
5. The capital influx from FIIs can positively or negatively impact the local economy, influenced by factors including market dynamics, governmental policies, and worldwide economic conditions.
6. FIIs in India are governed by the Securities and Exchange Board of India (SEBI), and the Reserve Bank of India (RBI). They also set the investment limits for them.
7. SEBI has over 1450 foreign institutional investors registered with it.

GREEN BONDS

1. Green bonds are bonds issued by any sovereign entity, inter-governmental groups or alliances and corporates with the aim that the proceeds of the bonds are utilised for projects classified as environmentally sustainable.
2. The framework for the sovereign green bond was issued by the government on November 9, 2022.
3. Green bonds are specifically designed to fund environmentally friendly initiatives. The projects they finance can include renewable energy, energy efficiency, clean transportation, sustainable agriculture, and more.
4. Green Bonds provide investors with an opportunity to support environmentally sound practices, impacting the strategic decisions of the entities issuing the bonds.
5. They offer a way to mitigate risks associated with climate change and aim to achieve returns that are comparable to, if not better than, traditional investments.

4. Lake Kariba

Due to the latest El Nino drought, water levels at Lake Kariba in Zimbabwe have dropped dramatically.

1. It is the world's largest man-made lake and reservoir by volume.
2. It lies approximately 1,300 kilometres upstream from the Indian Ocean, along the border between Zambia and Zimbabwe.
3. The Kariba dam is a double curvature concrete arch dam in the Kariba gorge of the Zambezi river basin between Zambia and Zimbabwe.
4. The wall spans the Kariba Gorge, forming a boundary between Zambia and Zimbabwe.
5. The dam generates substantial electricity for both Zambia and Zimbabwe and bolsters a robust commercial fishing industry.
6. Lake Kariba and its shores host a diverse array of bird species, such as fish eagles and cormorants, often seen hunting along the shoreline.
7. The lake also draws elephants and other big game for hydration, creating spectacular scenes of these animals at the water's edge and bathing in the shallows.

5. Radiation Therapy

- Lady Hardinge Medical College in Delhi has inaugurated its Radiation Therapy facility, providing treatment to cancer patients using Brachytherapy equipment.
- About Radiation therapy (Radiotherapy):
- It is a cancer treatment that kills cancer cells by exposing them to ionizing radiations like X-rays, gamma rays, high-energy electrons, or heavy particles. There are two main types: External (Teletherapy), which uses a linear accelerator to send radiation from a distance to target cells, and Internal (Brachytherapy), where the radiation source is placed inside the body.

This treatment is highly effective for various cancers, including brain, breast, head, neck, and cervical cancers, while minimizing damage to healthy tissues. However, it can lead to side effects like fatigue, nausea, hair loss, and loss of appetite.

ANSWER WRITING

Q. Analyze the current state of research and development (R&D) funding in India, highlighting the challenges faced and the potential impact of recent government initiatives.

The realm of Research and Development (R&D) is crucial for fostering innovation, propelling economic growth, and tackling societal challenges. In India, despite the recognized importance of R&D for national development, the sector encounters significant challenges, primarily in funding and strategic focus.

Current State of R&D Funding in India

Overview of R&D

- R&D in India is aimed at innovation and the development of new products or services.
- It is vital for achieving high market participation, creating innovative products, enhancing brand visibility, and fostering public-private partnerships.
- The Indian government has introduced various tax incentives to stimulate R&D investments.

Funding Dynamics

- India's gross expenditure on R&D has significantly increased, tripling from 2008 to 2018, predominantly driven by the government sector.
- The R&D landscape spans basic research, applied research, and development research, with notable investments in sectors like healthcare, automotive, software and IT, and semiconductors. Despite these advancements, India's R&D spending as a percentage of GDP is comparatively lower than that of other BRICS nations.

Challenges in R&D Funding

Financial Constraints

- One of the main hurdles is the inadequate level of funding, especially when benchmarked against developed nations.
- In 2017-18, India allocated 0.7% of its GDP to R&D, trailing behind other BRICS countries.
- Furthermore, the private sector's contribution to research investment is markedly lower in India than in countries like China and the US.

Need for Private Sector Engagement

- The involvement of the private sector in R&D activities is crucial but currently falls short of expectations.
- Enhancing this engagement is essential for driving innovation and addressing the funding gap effectively.

Government Initiatives and Impact

Policy Reforms and Incentives

- The Indian government has undertaken several initiatives, including tax reliefs and incentives, to promote R&D investments from both public and private sectors.
- Emphasis has been placed on basic research and ambitious projects, with a focus on facilitating rather than directly funding research.
- Strengthening intellectual property rights and improving infrastructure are also part of these initiatives.

Strategic Focus and Evaluation

- There is a move towards specifying research outcomes rather than approaches in applied research funding, to avoid crowding out of technologies and to allow market forces to determine the most effective solutions.
- This approach encourages the commercialization of technologies, ensuring better outcomes for research funding.

India's R&D sector, despite its potential, faces numerous challenges, primarily in funding and private sector participation. Recent government initiatives aimed at creating a more conducive environment for research and innovation are commendable. However, a multifaceted approach involving sustained investment, strategic focus, and a conducive policy framework is imperative for these efforts to be fruitful. Enhancing R&D funding and its strategic utilization is pivotal for India to harness its innovation potential and secure a competitive position in the global R&D landscape.

MCQs

- Which of the following statements about radiation therapy is correct?
 - Radiation therapy uses radioactive substances to treat diseases.
 - Radiation therapy is only used for treating cancer.
 - Radiation therapy can be used alone or in combination with other treatments like surgery and chemotherapy.**
 - Radiation therapy is a surgical procedure to remove tumors.
- Which one of the following best describes the characteristic of 'torrential rains'?
 - Consistent rainfall throughout the day
 - Gradual increase in rainfall intensity over time
 - Sudden and significant accumulation of precipitation**
 - Periods of rain alternating with dry spells.
- Consider the following statements:
 - All terrestrial animals use tools to hunt for food or drink water.
 - Some fish species use tools to catch their prey.

3. Some species of sea urchins serve as agents of reef erosion by excavating deep burrows within the reef structure.
How many of the statements given above are correct?
- Only one
 - Only two**
 - All three
 - None
4. Which one of the following is the primary factor that leads to 'coral bleaching' by disrupting the symbiotic relationship between corals and their algae, ultimately causing the expulsion of algae and bleaching of coral reefs?
- Overfishing of coral reefs
 - Pollution from industrial runoff
 - Increased sea surface temperatures**
 - Acidification of ocean waters
5. Consider the following statements:
- In India, persons with disabilities account for 5-8% of the population.
 - Rules under the Rights of Persons with Disabilities Act (RPWDA), 2016 require that all Information and Communications Technology (ICT) goods and services to be accessible in accordance with the Bureau of Indian Standards (BIS).
 - The Consumer Protection Act (CPA), 2019 lacks any dedicated rights for consumers with disabilities.
- Which of the statements given above are correct?
- 1 and 2 only
 - 2 and 3 only
 - 1 and 3 only
 - 1, 2 and 3**
6. Consider the following statements:
- In India, the Electronic Voting Machine (EVM) was first introduced on a trial basis in Kerala.
 - Electronic Voting Machines (EVMs) are used in elections in Germany.
 - The issue of invalid votes, common with paper ballots, has been eradicated by EVMs, streamlining the counting process.
- How many of the statements given above are correct?
- Only one
 - Only two**
 - All three
 - None
7. In the context of Imported Inflation, which of the following statement(s) is/are correct?
- Imported inflation is caused by excessive government spending on domestic infrastructure projects, leading to higher demand for imported goods.
 - A decline in the value of a country's currency is also a factor behind imported inflation.
- Select the correct answer using the codes given below:
- 1 only
 - 2 only**
 - Both 1 and 2
 - Neither 1 nor 2
8. Consider the following statements:
- Sovereign Green Bonds (SGrBs) are government debts specifically aimed at funding projects that facilitate transition to a low carbon economy.
 - Foreign Institutional Investors (FIIs) are eligible to invest in India's Sovereign Green Bonds (SGrBs).
 - SGrBs offer higher interest rates compared to conventional G-Secs.
 - Greenium is the term used to describe the process of converting traditional bonds into green bonds.
- Which of the statements given above are correct?
- 1 and 3 only
 - 2, 3 and 4 only
 - 1 and 2 only**
 - 1, 2 and 4 only
9. The term "monsoon shock" refers to:
- A sudden drop in temperature during the monsoon season
 - Unexpected variations in monsoon rainfall causing adverse impacts**
 - Increased humidity levels during the monsoon season
 - Strong winds accompanying monsoon rains.
10. Which statement accurately describes India's Antarctic research station, Bharati?
- Bharati was established in 1981.
 - Bharati is India's third Antarctic research station.**
 - Bharati primarily focuses on marine biology research.
 - All of the above statements are correct.