



Civil's IAS
Empowering Nation

Weekly Current Affairs Compilations

A holistic magazine for UPSC Prelims, Mains and Interview

Volume 13

10th – 17th Oct 2019

AHMEDABAD

204, Ratna Business Square, Opp HK College, Ashram Road, Ahmedabad - 380009

Landline: **079-484 33599**

Mobile: **73037 33599**

Mail: info@civilsias.com

NEW DELHI

9/13, Near Bikaner Sweets, Bada Bazar Road, Old Rajinder Nagar, New Delhi - 110060

Landline: **011-405 33599**

Mobile: **93197 33599**

Mail: info@civilsias.com

Courses conducted by CIVIL'S IAS

1. GS FOUNDATION [PRELIMS cum MAINS]

- a. LECTURE - 14 hours/week: 10 hours (Static Subjects) + 4 hours (Current Affairs)
- b. All NCERTs / Reference Books / Materials will be provided from academy free of cost.
- c. Weekly MCQs and ANSWER WRITING Tests
- d. 24 x 7 Library facilities
- e. Weekly Performance Report of students.
- f. Revision Lecture before prelims and Mains exam
- g. Personal mentorship to students

2. CURRENT AFFAIRS Module [PRELIMS cum MAINS]

- a. Current Affairs lecture - 4 hours / week
- b. Weekly Current Affairs compilations and Monthly Yojana Magazine will be provided from academy free of cost.
- c. MCQs and ANSWER WRITING Tests
- d. 24 x 7 Library facilities
- e. Revision Lecture before exam

3. DAILY ANSWER WRITING (online /offline)

- a. Weekly: 16 Questions + 1 Essay
- b. Model Answers
- c. Evaluation by faculty
- d. One to one interaction with students

4. NCERT based TEST SERIES

- a. MCQs and Answer Writing tests based on NCERT 6 - 12th Standards

5. PRELIMS 2020 TEST SERIES

6. MAINS 2020 TEST SERIES (online /offline)

7. MOCK INTERVIEW

- a. Interview and one to one Feedback session with experienced panels.
- b. Recorded CDs of the same will be provided to students

8. GS MAINS - MARKS ENHANCEMENT SERIES [MES]

- a. Coverage of General Studies 1,2,3,4 and ESSAY topics to boost students marks in Mains examination.

9. OPTIONAL

- a. Geography
- b. Gujarati Literature

INDEX

EDITORIALS / NEWS

1. LIVESTOCK CENSUS
2. DATA MANAGEMENT
3. INDIA - US
4. NUTRITION
5. INDIA - CHINA
6. ECONOMY
7. MOB LYNCHING
8. ELECTRICITY
9. NOBEL PRIZE – ECONOMY
10. TURKEY – SYRIA
11. NOBEL PRIZE – MEDICINE
12. NOBEL PRIZE – LITERATURE
13. NOBEL PRIZE – PHYSICS
14. NOBEL PRIZE – CHEMISTRY
15. GLOBAL HUNGER INDEX
16. MICROBIAL FUEL CELLS
17. LAND ACQUISITION ACT
18. RCEP
19. MAHABALIPURAM
20. COALITION FOR DISASTER RESILIENT INFRASTRUCTURE
21. GLOBAL COMPETITIVENESS INDEX

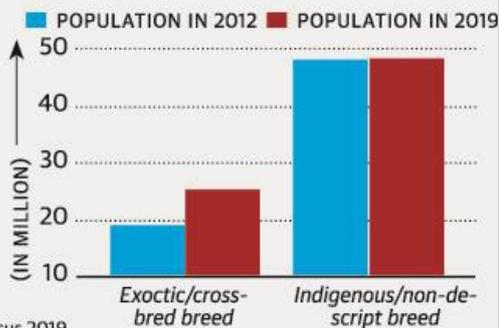
1. LIVESTOCK CENSUS

Cattle diary 2019

The population of crossbred cattle and those of foreign-origin has increased substantially compared to the previous Census in 2012 while that of indigenous cattle has grown by the minutest of margins

Source: Livestock Census 2019

Graph shows the change in cattle population of different breeds



Total Livestock population is 535.78 million, increase of 4.6%*

Total Bovine population (Cattle, Buffalo, Mithun and Yak) is 302.79 Million in 2019, an increase of about 1%*



Total Number of Cattle Increase of 0.8%*



Female Cattle Population Increase of 18%*

Exotic/Crossbred and Indigenous/Non-descript Cattle population is 50.42 million and 142.11 million respectively

*Over the previous census(2012)

Indigenous breeds record marginal rise Foreign cattle grew 32%, says Census

The Centre's drive to increase indigenous breeds of cattle seems to have had little impact among cows kept for dairy purposes, according to data from the 20th Livestock Census. There are 4.85 crore desi (native) milch cows in the country, less than 1% higher than the 4.81 crore population in the last census in 2012.

On the other hand, the milch population of exotic and crossbred cattle — including varieties such as Jersey or Holsteins which have much higher milk yields — saw a whopping growth of 32% over the last seven years, growing from 1.9 crore to 2.5 crore animals.

Milch cattle are cows kept for the purpose of milk production. Among this category, therefore, foreign breeds now have a population that is more than half the population of desi breeds.

The Rashtriya Gokul Mission, launched by government in 2014, aimed to promote indigenous desi breeds.

However, the total population of such cattle — male and female together, milk-producing or not — actually dropped 6% to 14.2 crore animals, while exotic and crossbred cattle saw an overall growth of almost 27% to 5 crore animals.

2. DATA MANAGEMENT

Taking national data seriously

India must not trade away its national data rights at the Regional Comprehensive Economic Partnership negotiations

In a digital economy, data is the central resource. The Prime Minister recently compared data to property at the advent of the industrial era. Data is being considered as a nation's new wealth. How data will be employed fruitfully, and its value captured, will decide a nation's rank in the emerging new global geo-economic and geo-political hierarchies. The global digital or artificial intelligence (AI) economy is currently a two-horse race between the U.S. and China. It is feared that all other countries, including the European Union (EU) and major developing countries such as India, will have to become fully digitally dependent on one of these two digital superpowers. This will considerably compromise their economic and political independence, something referred to as digital colonization.

The shift to digital power, and its concentration, is very evident. Seven of the top eight companies by market cap globally today are data-based corporations. A decade back, this list was dominated by industrial and oil giants. Almost all top digital corporations in the world are U.S. or Chinese.

Importance of data sharing

All credible efforts to escape such a dismal situation, like in the French and the U.K.'s AI strategies, numerous EU documents, and India's NITI Aayog's AI strategy, focus on one central issue — more data-sharing within the country, and better access to data for domestic businesses. But how is this to be actually achieved when a few global digital corporations such as Google, Facebook, Amazon and Uber, continually vacuum out India's and Indians' data, and then by default treat it as their private property, including freely sending it abroad? French AI strategy calls for an aggressive data policy, and control on data outflows. NITI Aayog's AI strategy has sought mandated sharing of data for social purposes.

Appropriate data policies must ensure that the required data is actually available to Indian digital businesses. After all, most of this data in the first place is collected from Indian communities, artefacts and natural phenomenon, and is about them. Global corporations like to consider data as a freely shareable open resource till the data is out there, with the people, communities, outside 'things', etc. But the moment they collect the data, it seems to become their de facto private property and they refuse to share it, even for important public interest purposes.

This lawless logjam can only be broken by asserting a community's legal right over data that is derived from, and is about, the community concerned, or about 'things' that belong to it. This is the concept of community data inscribed in India's draft e-commerce policy.

Community data

To understand data's value, and why a community should own data about itself, it helps to see data as the basis of detailed and deep intelligence about a community. We are careful in parting with personal data because it provides deep intelligence about us which can be used to manipulate us. Similarly, data about a group of people, even if anonymized, provides very wide and granular intelligence about that group or community. The very basis of a digital economy is to employ such data-based intelligence to reorganize and coordinate different sectors — think Uber in the transport sector and Amazon in consumer goods. But this data-based community intelligence can equally be used to manipulate or cause harm to the community, if in the hands of an untrusted or exploitative party. Such data-based harm could be economic

— beginning with unfair sharing of the gains of digital efficiency, but also social, political security-related and military.

It is for this reason that communities, including a national community, should effectively control and regulate intelligence about them. This requires effective community control over its data that produces such intelligence. A complex and gradual process of classification of various kinds of data, and developing governance frameworks around them, is required.

A great amount of data would indeed be fully private to the corporation concerned. Public agencies and regulators may not be too bothered about how such private data is used, where it is moved to, etc. But a big part of data that comes into play in a digital economy is community data, which has to be treated carefully. In less important areas or sectors it may need no or very little regulation, but in other important areas, the community data concerned may require close regulation. This could be about accessing such data for social purposes, ensuring that important public interest is met in various uses of data, and to make data available to domestic businesses, to stimulate competition and for India's digital industrialisation.

All this requires India to preserve its data policy space. We have not even begun dealing with the very complex data policy issues, including data classification, data ownership rights, data sharing, data trusts, and so on. This is a task that India should urgently embark upon, in full earnest. There is no time to lose as global advantages and vulnerabilities in terms of a digital economy are fast being entrenched. This is very similar to how the Industrial Revolution triggered fundamental changes and new global power configurations in the 19th century.

Preserving data policy space

News reports indicate that at the Regional Comprehensive Economic Partnership trade negotiations, being held with Association of Southeast Asian Nations, China, South Korea, Japan, Australia and New Zealand, India may accept free data flow clauses with some public policy exceptions.

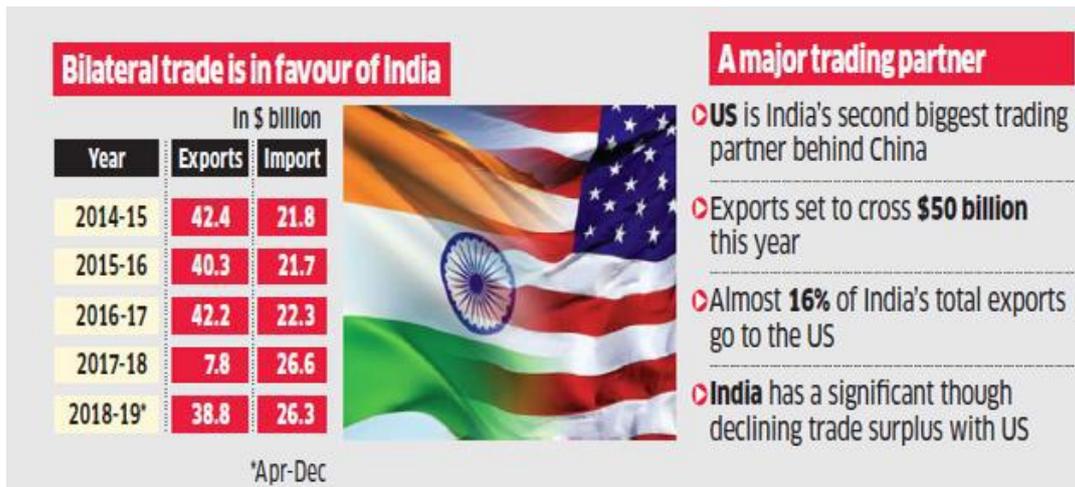
The history of trade agreements clearly show that such public policy exceptions almost never work, especially for developing countries. It needs to be understood that suitable data controls and policies are not to be exceptions but the mainstream of a digital economy and society.

In signing on a free flow of data regime, however cleverly worded, India will largely end up ceding most of its data policy space, and data sovereignty. And with it, it will give up any chances for effectively using Indian data for India's development, and for digital industrialisation to become a top digital power. It will effectively be laying the path for permanent digital dependency, with India's data flowing freely to data intelligence centres in the U.S., and now some in China. From these global centres, a few global "intelligence corporations" will digitally, and intelligent-ally, control and run the entire world.

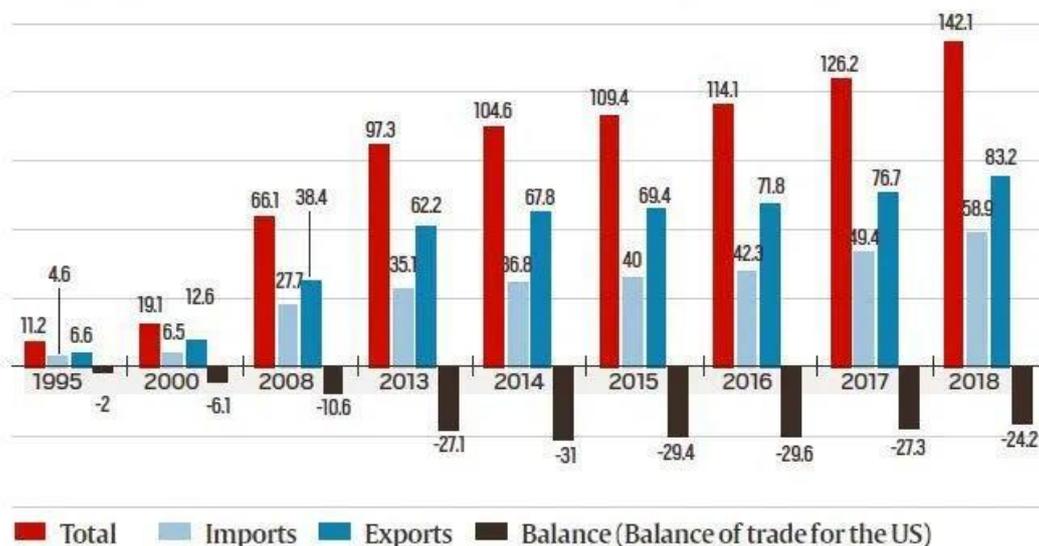
With countries yet hardly clear about appropriate data policies, and the data-related requirements for digital industrialisation, it is not clear what the hurry is to sign global free flow of data agreements. The digital economy seems to be growing and flourishing very well even without such regimes.

Disengaging from signing binding agreements on uninhibited data flows across borders does not mean that a country would simply localise all data. Some kinds of data may indeed need to be localised, while others should freely flow globally. It just means that a country retains complete data policy space, and the means to shape its digital industrialisation, and thus its digital future. Our understanding in these areas is just now beginning to take shape. It will be extremely unwise to foreclose our options even before we discover and decide the right data and digital policies and path for India.

3. INDIA - US



INDIA'S GOODS & SERVICES TRADE WITH US (IN BILLION DOLLARS)



Source: United States Trade Representative (USTR) data

The operative word must be bilateralism

Using their convergence of perception on many issues, India and the U.S. can work closely in reshaping the global order

Global politics is changing at a fast pace. Thus a setting where there was a chariot of peace, joint co-operation, multilateralism and liberalism whose strings were controlled by institutions such as the United Nations, the World Trade Organisation (WTO) and the International Court of Justice has now become one of warhorses pulling in different directions to embrace unilateralism, protectionism and isolationism. The global order is now dipping into a vortex of disruptions largely caused by the United States, China and Brexit. India also stands at the crossroads in terms of its foreign policy approach. It has a crucial decision to make in terms of the journey ahead whether to: continue with its time-tested stable policy of non-alignment and strategic autonomy; join the bandwagon of unilateralism and be a permanent treaty ally of one of the superpowers, and, finally, embark upon a calculated trip with the objective of expansion in terms of forging new relations and exploring fresh territories by adopting a strategy of "multi-alignment and transactional autonomy".

The answers are complex. But one domain of foreign policy which requires a serious relook is the India-U.S. relationship because the backstage reality of a no-trade deal, and continuing U.S.-Pakistan bonhomie, among other irritants, have taken the wind out of the sails of the friendship between the leaders of the two nations as seen at the recent "Howdy Modi" event in Houston. Cross-currents in the India-U.S. relationship cannot be ruled out.

Contextualising ties

India-U.S. ties have shades of the good, the bad and the ugly. The good is linked to historic terms, a key example being the India-U.S. civil nuclear deal, the ongoing defence cooperation of the past decade worth billions of dollars and the signing of three “foundational defence agreements”, i.e. the Communications Compatibility and Security Agreement, the Logistics Exchange Memorandum of Agreement and the Basic Exchange and Cooperation Agreement for Geo-spatial Cooperation. The bad is current trade challenges, the U.S.’s hyphenation of India with China in its trade war and its call for the removal of the “developing country” tag assigned by the WTO. And the ugly is when during the 1971 war, the U.S. sent its fleet towards India to assist Pakistan.

The good outweighs the bad and the ugly but a sense of the current mood at Capitol Hill that preceded the high-profile visit to Houston in September seems loaded with scepticism as far as India’s multilateral outreach is concerned, especially in connection with the procurement of defence material from Russia and some unreal expectations such as India having military boots on the ground in Afghanistan. In this context, before taking any decision on the future trajectory of India-U.S. dynamics, the Indian establishment must remain mindful of the unpredictability and inherent contradictions in U.S. foreign policy and, at the same time, capitalise on U.S. “isolationism and retrenchment” by maintaining its time-tested policy of “non-alignment and strategic autonomy”.

Points of concern

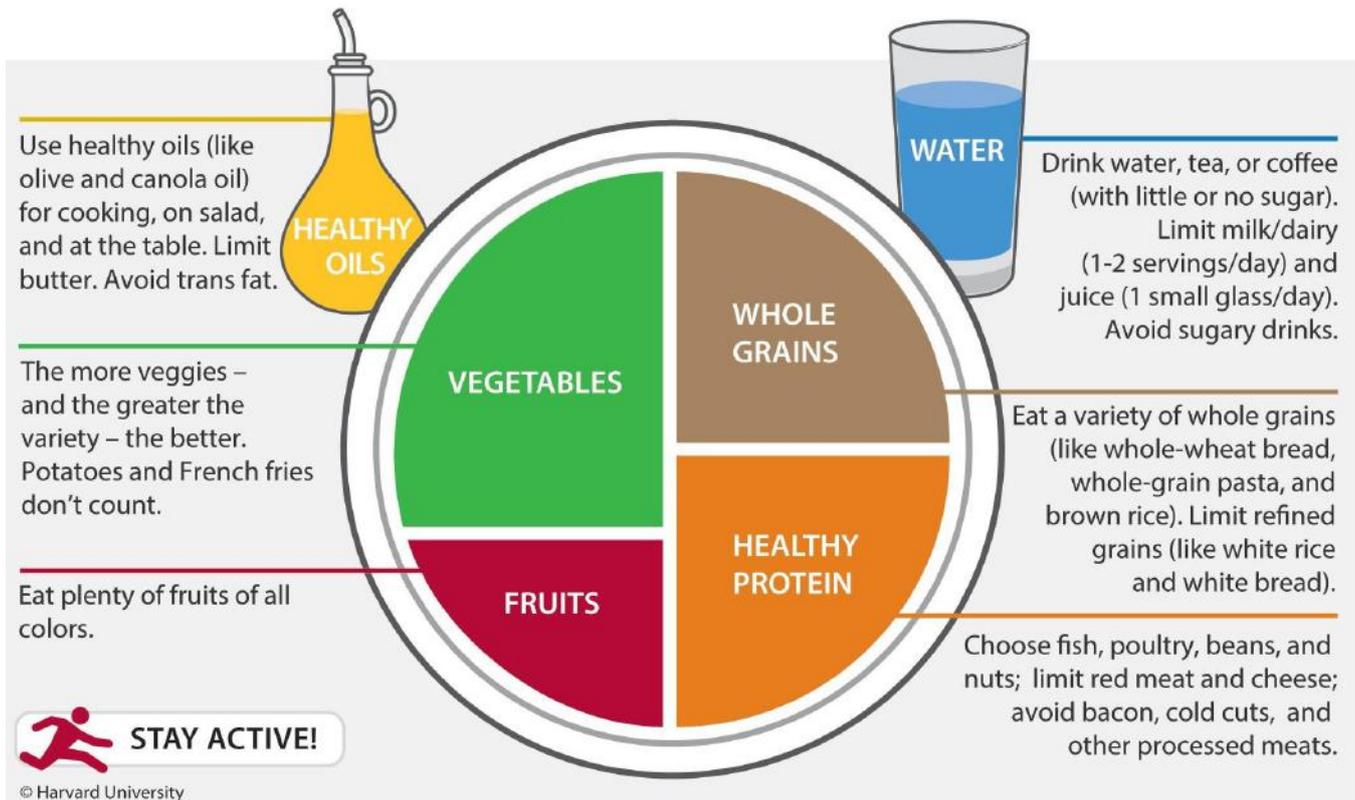
The contradictions in the U.S.’s outlook are many. First, the recent and abrupt abandonment by the Trump administration of the Kurds who assisted the Americans in fighting the Islamic State both in terms of resources and manpower should serve as a warning sign to India in terms of its Afghanistan strategy. The current Indian dispensation must prepare for the eventuality of a sudden withdrawal of U.S. forces from Afghanistan which could lead to a complete takeover by the Taliban, with potential repercussions on India’s northern front. Second, with respect to Pakistan, there is confused signalling from the official “advisers” of the White House, often creating a fog of uncertainty over stated policy. For example, Jim Mattis, former U.S. Secretary of Defence has openly lambasted Pakistan (in his latest book) even as Mr. Trump who was till very recently calling Pakistan a “friend who he does not need” is now projecting Pakistan Prime Minister Imran Khan as his “friend in need” (on account of America’s Afghan ‘ejection plan’) without realising Pakistan’s bond with terrorism. Third, the U.S. campaigned for Iran’s nuclear deal in 2015, then withdrew itself from the accord in 2018 and has now adopted a blanket sanction policy qua any nation dealing in oil transactions with Iran. With such a track record what is the guarantee that the U.S., which now expects India to forego its age-old friendship with Russia, will not start transactions with them later, leaving India out in the cold?

Despite these contradictions and challenges, a number of opportunities in the new world order await India. The Prime Minister must ensure that India-U.S. bilateralism survives the axe of unilateralism without sacrificing India’s “sweet spot” and tag of being “everyone’s friend”. Mr. Trump needs to realise that India at this juncture cannot afford to get derailed from the tracks of globalisation, regional alliances, trade opportunities and, at the same time, be convinced that India will never take sides hurting U.S. interests in real strategic and economic bilateral terms. When the U.S. withdrew from the Intermediate-Range Nuclear Forces Treaty signed with Russia in 1987, the comment by U.S. Defence Secretary Mark Esper that the “U.S. is looking to deploy more missiles in Asia” has led to chatter about the start of another arms race. However, India cannot afford to get dragged into this and must focus on multi-alignment both with the U.S. and Russia especially in terms of getting a waiver under the Countering America’s Adversaries Through Sanctions Act in purchasing the S-400 missile system from Russia.

Potential in trade

On the trade front, India, instead of China, can be an effective supplier rather than being an outsourcing hub. With respect to the Indo-Pacific, the U.S. views it as a platform to contain China hegemony. India, on the other hand, sees it as an opportunity for economic expansion, with the U.S. being an equal partner. China’s cautious pragmatism along with assertiveness needs to be factored into the decision-making process of both New Delhi and Washington. What India and the U.S. could do is to forge a broad-based and productive political partnership. After all, mutual interdependence of countries is based on formal prerogatives of sovereign states. The convergence of perception between India and the U.S. on global and regional issues of common interest provides enormous opportunities for both countries to work closely in reshaping the global political order. The friendship has the potential to grow stronger by the day without sacrificing India’s global positioning at the altar of unilateralism.

4. NUTRITION



Agents of change

There is evidence of the overall benefits that accrue from investing in women's education

If the evidence is clear and present, then not acting on it would be a chilling demonstration of inability and inefficiency, and the lack of will to bring about change. There should be no doubt that educating a woman serves a larger ameliorative purpose. The recently released Health Ministry survey that showed a direct correlation between the nutritional status of children and their mothers' education is a further stroke for the case of women's education. The Comprehensive National Nutrition Survey, which studied 1.2 lakh children between 2016-18, measured diet diversity, meal frequency and minimum acceptable diet as the three core indicators of nutritional deficiency among infants and young children. It demonstrated that with higher levels of schooling for a mother, her children received better diets. On two counts, meal diversity and minimum acceptable diet, and in terms of bolstering food with micro nutrients, the children of mothers with better education did well. The data is revelatory: Only 11.4% of children of mothers with no schooling received adequately diverse meals, while 31.8% whose mothers finished Class XII received diverse meals. While 9.6% of children whose mothers had finished schooling got minimum acceptable diets, only 3.9% of children whose mothers had zero schooling got such a diet.

Development economists have long studied the role that education of girls plays in enabling them to emerge as agents of change. Empirical work in recent years, Nobel laureate Amartya Sen reasons, has clearly shown how the relative aspect and regard for women's well being is strongly influenced by women's literacy and educated participation in decisions within and outside the family. In the late 1990s, Tamil Nadu along with the Danish International Development Agency, launched a mass rural literacy project in Dharmapuri, then considered backward, riding largely on local leaders, most of them women. Evaluation showed overall salubrious effects on the community within a short while. Implemented largely through the employ of the local arts, one measure of success, as recorded then, was an increased outpatient attendance in primary health centres. There is a body of compelling evidence for the government to focus on improving female literacy. In Census 2011, the female literacy rate was 65.46%, much lower than for males, at 82.14%. States such as Kerala with a high literacy rate (male and female) also sit at the top of the table on development indicators. As former American First Lady Michelle Obama said, "Because we know that when girls are educated, their countries become stronger and more prosperous." No other task can assume greater urgency for a nation striving to improve its performance on all fronts.

5. INDIA - CHINA

Restoring maritime commons

India and China must aspire to ensure that Asia's seas are not arenas of contestation

The bonds of commerce and cosmopolitanism that had illuminated the First Asian Millennium were on ample display at the second informal summit between Prime Minister Narendra Modi and Chinese President Xi Jinping in Mamallapuram.

At a time when China and India's dash towards westernisation has left a residue of aggressive nationhood and mutual antagonism, Mamallapuram was a reminder of the syncretic values that had furnished a principle of order and self-restraint in an earlier age of Asia's international relations. At a time when protectionism and xenophobic populism threaten to topple the edifice of the rules-bound international economic order, Mamallapuram was a reminder of an era when theological advances in Buddhist worship had catalysed triangular trading networks in pearls, precious stones and silks.

At a time when the threat of interdiction along Asia's strategic maritime passageways is becoming a currency of geopolitical contestation and control, Mamallapuram was a reminder of an earlier golden age of sail when Asia's seas were a common heritage of mankind. Each sovereign entertained a vested interest in preserving the freedom of Asia's waterways and none sought to dominate. Beginning with the Capture of Malacca by the Portuguese in 1511, that norm died a slow death at the hands of state-controlled violence introduced into Asia's seas by Westerners.

In this Asian Century, India and China must aspire to once again restore Asia's seas to their former purpose as win-win economic passageways rather than zero-sum arenas of contestation. To this end, Mr. Modi and Mr. Xi should periodically issue strategic guidance to their respective foreign offices and navies.

Similar interests

For the most part, both New Delhi and Beijing share fundamentally similar interests in Asia's maritime commons, yet each would rather pursue these interests and frame strategies separately. Both share an interest in keeping their overlapping sea lines of communication open to free navigation, yet both seek to exercise leverage via the veiled threat of interdiction over the choke points through which these sea lanes pass. Both retain an interest in securing sea-borne access to ensure the economic viability of their landlocked, underdeveloped regions, yet both would prefer to design connectivity initiatives that run at odds with their counterparts'. Since 2014, both navies have begun to bump-up more frequently in the proximity of each other's naval bastions, yet neither has dialled-up a conversation to reassure its counterpart of its intentions.

Steps forward

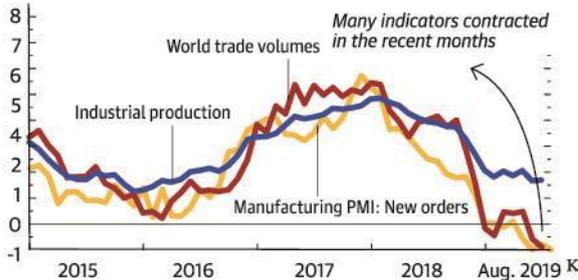
As a first step, India and China must commit to respecting each other's 'core' interests — reasonably defined — in their respective backyards. Conversely, both countries must respect each other's maritime engagements with third parties so long as these engagements do not trample on their counterparts' interests. Infrastructure investment must not be weaponised under any circumstance. Next, both India and China bear an obligation to keep their surface and sub-surface fleets at some distance from their counterparts' naval bastions so as not to degrade the integrity of their second-strike deterrence capability. To the extent that India and China seek to exercise leverage over Asia's maritime choke points, both countries would be better-off exploring a broader bargain that resists the temptation to challenge each other's growing authority west and east of Sumatra, respectively. In the longer term, India, China and their Asian partners should aim to develop soft laws that fortify the ongoing development and conservationist orientation of global sea law, and to the relative disfavour of military and other non-peaceful uses of the sea. The lessons learnt by India and China in stabilising their disputed land boundary offer useful pointers to chart a framework to regulate their interactions at sea. Let this journey of a thousand miles commence with a single step at the next informal summit.

6. ECONOMY

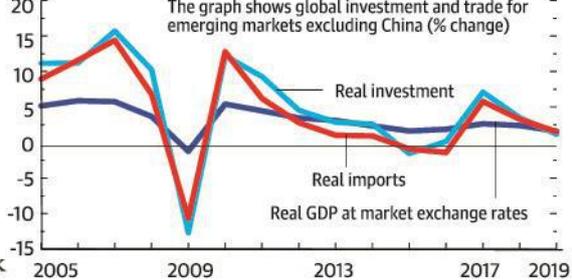
Gloomy outlook

In the World Economic Outlook released on Tuesday, the IMF downgraded global growth to 3% for 2019, the lowest since 2008-09 and a 0.3 percentage point downgrade from April 2019. In a few major economies, including India, growth in 2019 is sharply lower than in 2018, but is expected to recover in 2020. Excerpts from the latest report

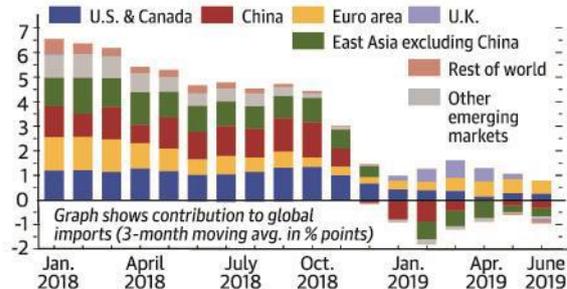
Bad business | Over the year, a common feature across the world has been a slowdown in industrial output. The graph depicts y-o-y% change across economic indicators



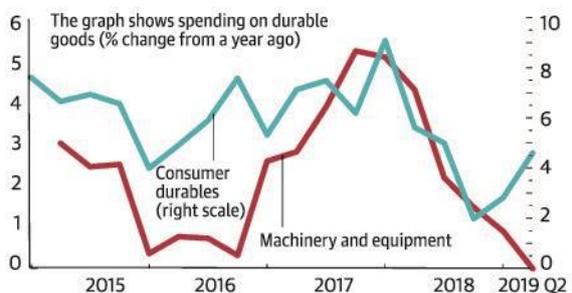
Investments decline | Downturns in global trade are related to reduced investment spending. Global investment did slow down in line with reduced imports



Trade woes | Production slowdown led to a standstill in trade. In the first half of '19, global trade volume was just 1% above its value a year ago, the slowest pace for a 6-month period since 2012



Auto slump impacts | Another contributor to the slowdown in global trade has been the slump in car sales, which is reflected in a slowdown in the purchase of consumer durables



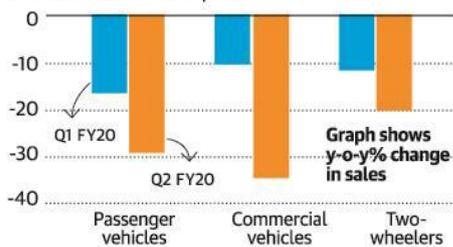
Source: IMF

Still in slump mode

The double-digit negative growth in automobile sales in August and September 2019 resulted in new lows for the sector, which was already reeling under policy shocks. Due to the demand slump several non-production days have been announced in recent months, which have affected factory output and workers' pay. By **Sumant Sen** and **Vignesh Radhakrishnan**

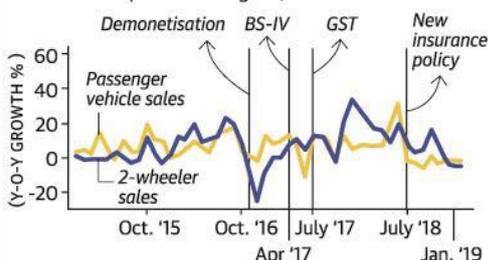
1. Going downhill

Automobile sales, which had already declined in the first quarter of 2019-20, further slumped in Q2 due to the worst-ever monthly drop recorded in August and a continued decline in September



2. Policy shocks

While not as pronounced as in 2019-20, the previous three years recorded many short-term slumps in automobile sales mostly due to policy changes: demonetisation, BS-IV implementation & a new insurance announcement*. The much-debated GST's immediate impact was marginal, however



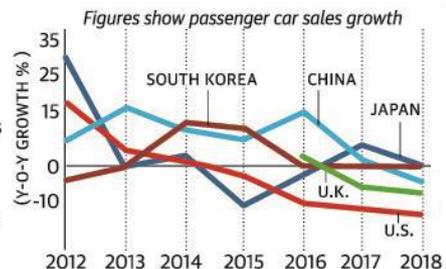
3. Shutters down

Due to the demand slowdown, major auto manufacturers and their ancillaries have been declaring non-production days over the last three months. Such days continue this month too

Company	Plant locations	Non-production days	Months
Ashok Leyland	Various facilities	upto 25	July to Oct.
Mahindra and Mahindra	Various facilities	upto 17	Q2 FY20
Bosch Ltd.	Nashik, Maharashtra	at least 8	Aug. and Sept.
Daimler India Commercial Vehicle	Oragadam, T.N.	at least 6	Sept. and Oct.
Bosch Ltd.	Gangaikondan, T.N.	at least 5	August
Hero MotoCorp	Various facilities	at least 4	August
Bosch Ltd.	Bidadi, Karnataka	at least 4	July and Aug.
Tata Motors	Pune, Maharashtra	at least 3	August
Pricol	Coimbatore	at least 3	October
Sundaram-Clayton Limited	Padi, T.N.	at least 2	August

4. India not alone

Such a slowdown was also observed across major economies. Stricter emission norms in China and Europe, mandatory sale of electric vehicles in Europe, and U.S.-China trade tensions were a few contributors



*Mandatory years of third party insurance for new automobile registrations | Source: SIAM, RBI Monetary Policy Report and Mint Street Memo series

7. MOB LYNCHING

Lynching, the scourge of new India

The word lynching is of foreign origin. But this does not mean that mob killings are alien to India

In the years since Narendra Modi was elected in 2014, ugly mob hate has spilled onto the streets, trains and people's homes. Fevered throngs surround, brutally assault and sometimes kill unarmed men, mostly Muslim. The crowds allege that the men had slaughtered cows, or were thieves; but sometimes their only crime — as when a child was stabbed to death on a crowded train near Delhi — is that they are visibly Muslim.

Living in denial

We describe these mob killings as lynching. The initial response of the ruling establishment to criticism of this frightening rising graph of lynching during the Modi regime was one of denial. Both the leadership of the Bharatiya Janata Party (BJP) and its ideological mentor, the Rashtriya Swayamsevak Sangh (RSS), claimed that these were simple failures of law and order, ordinary crimes which had ensued under every regime. Vested interests opposed to the leadership of Mr. Modi and the BJP imposed on these statistically insignificant, random and spontaneous crimes a pattern and called these an epidemic of lynching.

However, this defence began to crumble as horrific lynch attacks continued to rock many parts of the country. The second rationalisation, which echoed in television studios each time stories of lynching briefly stirred our public conscience, was that these attacks occurred because Muslims continue to traffic and slaughter cows, callous to the sentiments of their Hindu neighbours. Hindus, according to this vindication, are understandably provoked. Not normally given to violence, they sometimes cross a line, which is regrettable but natural. Such violence will end only if Muslims and Christians learn to respect the sentiments of the majority Hindu community, and abjure from cow slaughter.

Flaws in the argument

There were many obvious flaws in this argument: Hindus, including Dalits and Adivasis, in many parts of India eat beef; Hindu farmers give up their aged cattle for culling because it is no longer economically viable for them to feed unproductive cattle; Muslim dairy farmers are no less devoted to their cattle than Hindus; in the majority of lynch attacks (such as of Pehlu Khan) the animals are transported for dairying, and not for slaughter; and nothing explains the sudden outbreak of lynching in many corners of the country under the present ruling dispensation (98% of cow-related lynching since 2010 occurred after 2014).

In his annual Dussehra address, RSS chief Mohan Bhagwat felt compelled to provide more compelling explanations; therefore he spoke expansively about lynching. Because of the enormous influence which the RSS wields on BJP governments, the words of the RSS head must be held to close scrutiny.

He made five main points. The first is that lynching is a foreign Biblical practice, alien to Indian traditions. The second is that Indians are culturally non-violent. The third is that the RSS has no role in these lynch attacks, and tries to prevent these. The fourth is that many ordinary crimes are wrongly portrayed as lynching. And last that the law should be strengthened, if necessary, to ensure those guilty of these crimes are punished. Let me consider each of these in turn.

There indeed is no word for lynching in most Indian languages (except in Bengali — ganadholai — possibly because Kolkata for many years witnessed lynching of pick-pockets). But Mr. Bhagwat's claim that lynching is a practice created by religions whose 'sacred book is written outside India' conforms to the customary RSS bigotry against Christian and Muslim religions, demonising their beliefs. The example he picks from the Bible in fact is one which seeks to teach love and compassion, not hate. Jesus tells a crowd bent on stoning an adulterous woman — 'He that is without sin among you, let him first cast a stone at her.'

Word origins

The word lynching in fact originated in the United States in the mid-18th century. Historians believe that the term was first used by planter Charles Lynch to describe extra-judicial authority assumed by private individuals like him. It came to be applied over time to extra-judicial killings by crowds, most commonly of African-Americans in the late 19th century.

Although the word lynching is of foreign origin, this does not mean that mob killings are alien to India. Single women have frequently been lynched through the centuries, branded as witches. Dalits have been lynched with enormous cruelty for millennia. Jhajjar, Khairlanji and Una are just three recent sites of ghastly lynching of Dalits. In recent years, Dalits have been lynched for growing a moustache, riding a horse, or building a two-storey home.

Mr. Bhagwat's claim that Indians are culturally non-violent and their culture promotes peaceful coexistence also does not stand up to historical or contemporary scrutiny. The example he offers, that disputes over water were settled amicably by adversaries through dialogue is a cruel joke, because many of the most gruesome lynch attacks on Dalits have occurred when they have simply sought a share of water, even today. It was to draw water from a public lake that B.R. Ambedkar had to wage a powerful public agitation.

Right's connection

But perhaps the most brazen untruth is Mr. Bhagwat's contention that the RSS has nothing to do with lynch attacks, and contrarily prevent them. In more than 31 journeys to lynching sites with the Karwan e Mohabbat, I have found no lynching which is spontaneous, nor any in which anyone, least of all RSS members, have tried to prevent the lynching. The vigilantes make no secret of their adherence to hard-line violent Hindutva beliefs; and victims of lynching are most often Muslims who are sometimes forced to recite 'Jai Shri Ram'. In a strict technical sense, their membership of the RSS cannot be proved, as there is no public record of the formal adherents of the RSS. Just as Nathuram Godse may not have been a formal member of the RSS at the time he assassinated Mahatma Gandhi; but this cannot obscure the reality that Godse and the vigilantes were driven by Hindu supremacist ideologies of the RSS.

Mr. Bhagwat's fourth claim that many lynchings are ordinary crimes are an older rationalisation, deliberately obscuring the character of lynching as hate crimes that target people because of their identity. It cannot be a coincidence that 86% of people killed in cow-related attacks are Muslim.

The final avowal by Mr. Bhagwat of the need for tougher laws to bring lynch mobs to justice carries little credibility, because the majority of these attacks occur in BJP-ruled States, and existing laws are more than sufficient to secure justice against the attackers. Instead, almost without exception, police administrations in all these States exert to protect the killers, and criminalise the victims.

Mr. Bhagwat, in these ways, relies on many old RSS tropes — demonising 'foreign religions' for advocating violence; characterising Indian culture as intrinsically peaceable; and releasing the RSS from responsibility in instigating, organising and valorising this violence; and State governments from failures to prevent lynching and ensuring justice.

It is hardly surprising lynching survivors can draw no solace, security or healing from his declarations. His words are arid in compassion, displaying neither acknowledgement nor remorse. There seems no early end therefore to the long dark night of hate and fear that has been unleashed by lynching, the scourge of new India.

8. ELECTRICITY

Powering India

The major growth drivers have been renewable energy sources such as solar and wind power, and private sector investment



Table 1: Power plants: average capacity and average cost

Plant Type	Average capacity (MW)	Average Cost / MW (₹ crore)
Thermal	741	7.50
Solar	39	9.38
Wind	44	7.06
Hydel	112	12.01

Table 2: Comparison of public and private capacity costs (1997 - 2017)

Plant Type	Average cost (₹ crore/ MW)		Average Capacity (MW)	
	Public	Private	Public	Private
Thermal	7.9	6.8	721	748
Solar	8.1	11.4	82	37
Wind	7.7	6.8	36	46
Hydel	12.2	8.0	223	29

Table 3: Reducing costs of power capacity (1997 - 2017)

Plant Type	Average cost / MW (₹ crore)		Average plant capacity		Percentage fall in costs	Percentage change in capacity
	Before 2013	After 2013	Before 2013	After 2013		
Thermal	8.3	6.6	561.0	676.0	-21%	20%
Solar	11.3	8.4	30.0	51.0	-25%	70%
Wind	7.4	6.6	42.0	44.0	-11%	5%
Hydel	14.5	7.7	141.0	279.0	-47%	98%

(Note: All costs are calculated for 2017 values)

A cost-effective way to power generation

Creating generation assets with the lowest unit cost is linked to optimizing plant capacities and using private investment

India has been aggressively expanding its power generation capacity. Today's installed capacity of 358 GW is about four times of what it was in 1997-98, which shows a doubling of capacity in each of the past two decades — or about 75 MW per day. By India's historical standards, these are astonishing numbers indeed. In recent years, the major growth drivers have been renewable energy sources such as solar and wind power, and investment from the private sector. The private sector accounts for almost half the installed generation capacity. For the last three years, growth in generation from renewables has been close to 25%. India aims to have a renewables capacity of 175 GW by 2022 and 500 GW by 2030. Solar and wind power plants would account for much of the targeted capacity from renewables. How can this be achieved?

Project size and cost

Today, thermal generation capacity accounts for about two-thirds the installed generation capacity in the country. This shows that though there is increasing awareness about the environmental impact of fossil fuels, the reliance on thermal plants is unlikely to end any time soon. (Table 1 underlines the two major advantages that thermal power plants enjoy relative to solar and wind power plants). Thermal plant capacities are large and therefore targeted capacity additions can be achieved by constructing fewer such plants. On average, it would take 18 solar or wind projects to generate the same quantity of power as one thermal plant. For the same reason, switching from fossil fuel to renewables will remain challenging as the administrative overheads that would have to be incurred in setting up the multiple projects could significantly add to the cost.

Not surprisingly, infrastructure projects have an inverse relationship between size and unit cost, indicating economies of scale. As the capacity of power plants increases, the average cost of power per MW reduces. The average cost per MW for a thermal plant is about 25% lower than that of a solar plant. In order to surmount the cost advantages that large thermal plants enjoy today, we must focus on developing larger solar and wind power plants that can also exploit similar economies of scale.

Project ownership

The next point is that of ownership. Over the last two decades, 63% of the total planned generation capacity has come from the private sector. Private investment has been even more pronounced in renewables, accounting for almost 90% of investment in wind and solar projects. So has private investment helped?

Table 2 has the answer. Private sector plants have an average cost per MW that is 12-34% lower for all categories except solar. Lower capacity cost has a direct impact on electricity tariffs. Electricity tariffs broadly consist of two components: fixed capacity costs and operation and maintenance costs, which include fuel expenses. In general, capacity costs account for more than 90% of the levelised cost of electricity, irrespective of the fuel type. If we are able to create additional capacity at lower cost, then it will play a big role in keeping electricity tariffs low. Private investment in the power sector has not only helped in augmenting capacity but has also helped in lowering cost.

Marginal capacity costs

Even as total capacity in generation has been growing, the cost of installing additional capacity has fallen (Table 3). The reasons for the decline could be as follows: First, advances in technology have resulted in the construction of larger power plants. Compared to the 15-year period before 2013, power plants installed in the past six years have on average been significantly bigger, even twice as large in the case of hydel power. The economies of scale in power generation appear to have been dramatic. The second point could be the increasing share of private sector investment. The share of private sector in capacity creation has been 70% in the last decade as compared to 46% in the decade before that. And, as indicated previously, private sector capacity has lower costs.

Falling marginal costs suggest that retiring some existing high-cost capacity plants with newer plants could be explored.

With economic growth, the demand for power in India is only going to increase further. To put things in perspective, China added generation capacity that was equal to a third of India's total installed capacity in 2018. As India continues to ramp up capacity, it is imperative to create generation assets with the lowest unit cost by optimising plant capacities and encouraging private sector investment. Declining marginal cost for capacity provides opportunities for replacing existing capacity with newer capacity that are more efficient. However, the challenge of replacing fossil fuel-fired plants with renewables prevails.

9. NOBEL PRIZE - ECONOMY

Uplifting the underprivileged

The experiment-based approach of the laureates involved dividing an issue into smaller and more manageable questions

- They have shown that smaller and more precise questions are often best answered through carefully designed experiments among the people who are most affected

- In the mid-1990s, Dr. Kremer and his colleagues demonstrated how powerful

this approach can be when they used field experiments to test a range of interventions that could improve school results in western Kenya

- Dr. Banerjee and Dr. Duflo, often with Dr. Kremer, have performed similar studies on other issues and in other countries



Abhijit Banerjee
He was born in Mumbai in 1961 and completed his Ph.D. from Harvard University in 1988



Esther Duflo
She was born in Paris in 1972 and finished her Ph.D. from Massachusetts Institute of Technology in 1999



Michael Kremer
He was born in 1964 and received his Ph.D. from Harvard University in 1992, where he teaches currently

Impact on policy

- Research surrounding remedial tutoring provided arguments for large-scale support programmes that have now reached more than five million children in India

- Their studies showed that

deworming provides clear health benefits for schoolchildren but also that parents are very price-sensitive. This led the WHO to recommend that medicine should be distributed for free to the over 800 million schoolchildren

living in areas where over 20% of them have a specific type of parasitic worm infection

- Their studies paved the way for heavy subsidies for preventive healthcare that have been introduced in many countries

Source: Nobelprize.org

10.TURKEY - SYRIA

Kurds under attack

Turkey on Wednesday launched a long-planned military operation in northeast Syria, targeting the Kurdish militia group, People's Protection Units (YPG)

Why is Turkey attacking Kurds?

- Turkey sees the YPG, the Syrian Kurdish militia, as an offshoot of the PKK, the Kurdish militia on the Turkish side, and therefore as a threat to the Turkish state

- It wants to create a buffer between the YPG-guarded Syrian Kurdistan and the Turkish border

- Turkey also plans to resettle some of the 3 million Syrian refugees it hosts in this buffer zone

What's the U.S. stand?

The YPG was the U.S.'s ally in the war on the Islamic State. But it was Donald Trump's decision to pull back U.S. troops from Syria that allowed Turkey to launch the invasion

▲ Camps for displaced people

■ Camps holding families of IS suspects

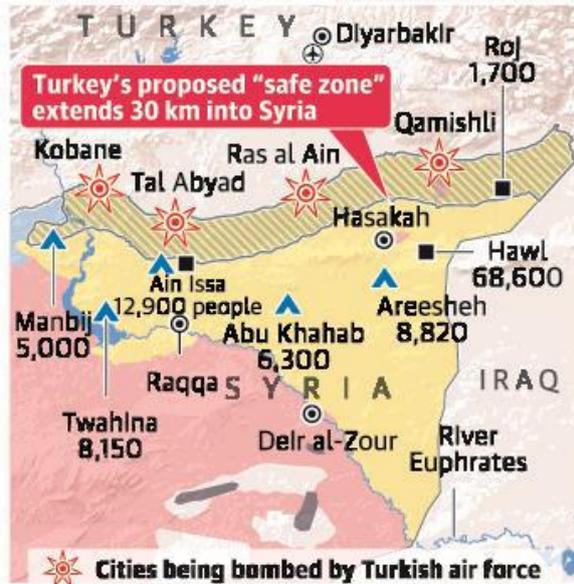
Areas of control (as of Oct. 9, 2019)

■ Turkish-backed opposition

■ Kurdish forces

■ Syrian government forces

■ So-called Islamic State



Civilians fleeing Turkish bombardment on Syria's northeastern town of Ras al-Ain, along the Turkish border, on Wednesday. ■ AP

Source: Graphic News

A Turkish misadventure

Turkey's military intervention in Syria can have wide-ranging consequences beyond the war zone

While Turkey has been active in the eight-year-old civil war in Syria, its recent military incursion significantly ups the ante on the conflict. Its egregiously named 'Operation Peace Spring' aims to create a "safe zone" that is 480 km wide and up to 35 km deep inside Syria. Ankara says it intends to relocate some of the 3.6 million Syrian refugees living in Turkey in this "safe zone".

A legacy that still reverberates

The Istanbul-based Ottoman Khilafat ruled most of West Asia, including Syria, till the end of World War I. The Ottoman Empire and Khilafat were both abolished by the nationalist revolution spearheaded by Kemal Ataturk, and replaced with a unitarian, secular republic with a Turkish national identity. However, its legacy still reverberates, as seen in President Recep Tayyip Erdogan's efforts to revive ties with the Muslim world and in his constant emphasis of Turkey's Islamic roots. About 20 million Kurds, a quarter of Turkey's population, live in the underdeveloped south-east. By subsuming Kurdish sub-national identity, Turkish nationalism resulted in politico-economic discontent among Kurds. It fuelled a Kurdish insurgency led by the Kurdistan Workers' Party (PKK), which Ankara calls a terrorist organisation. A smaller number of Kurds live in Iran, Iraq and Syria. Although most Kurds have conformed to their respective nationalities, aspiration for a unified homeland, Kurdistan, remains.

Kurdish communities in Iraq and Syria have leveraged the political upheaval triggered by the Arab Spring. Iraqi Kurds have created the Kurdish Regional Government, a proto-state with tentative ties with Baghdad. Syrian Kurds have cobbled together a militia called People's Protection Units (YPG), trained and equipped by the U.S. and its allies. YPG has become the backbone of the Syrian Democratic Forces (SDF), which played a frontal role in decimating the Islamic State (IS) in Syria. Turkey has been increasingly alarmed at the growing Kurdish power in Syria and Iraq and has been fretting about the impact of this on its own Kurdish insurgency. It perceives YPG as a terrorist outfit nominally allied to the PKK. Ankara has used its Syrian Islamist proxies to contain the YPG and also intervened militarily on its own.

Turkey draws a red line at Kurds being militarily active on both sides of the Syria-Turkey border. An unstated objective of the current operation is to thwart that possibility by carving out a border strip under Turkish military control. Ironically, this first-ever Turk-Kurd military confrontation may harden mutual antipathy and foster Kurdish unity. The other objective of settling the Syrian refugees in the "safe zone" also seems unrealistic. Syrian refugees largely mirror their homeland's ethnic diversity and many among them are economic migrants. Thus only a few would be willing to relocate to a largely arid, Kurdish-dominated "safe zone". Moreover, the current hostilities have begun creating more refugees, mostly Kurds, living in the war zone. Lastly, Turkish attack and U.S. betrayal have prompted the SDF to join hands with Assad. Thus the military action runs the risk of creating the very conditions it was intended to prevent.

Bolstering popularity

Mr. Erdogan may have domestic reasons for muscle flexing. His party lost the June mayoral election in Istanbul. He has often alleged coup plots by the military and Islamists. His Islamism contradicts Kemalist secular traditions. He may hope that a successful military campaign could bolster his popularity among Turks who are increasingly wary of Syrian refugees.

Turkey has the second largest armed forces in NATO, and the SDF is unlikely to match them in a frontal confrontation. Flat and arid terrain also favours the Turkish military. However, the battle-hardened Kurdish militia may not be a walkover in a subsequent asymmetric warfare, turning the Turkish foray into a costly mistake. Further, the SDF holds thousands of IS prisoners who may flee, taking advantage of the conflict, and unleash their abhorrent brand of terror.

The Turkish military intervention can have wide-ranging consequences beyond the war zone. It would complicate the endgame in Syria. In a rare sign of unity, the Arab League has already condemned it. It could spillover into Europe where a significant number of Kurds and Turks live. In the past century, the Kurdish quest for an elusive Kurdistan has led to their betrayal by a number of regional and foreign powers, of which the U.S. is only the latest. This sudden abandonment of the SDF by the U.S. would further diminish American credibility in this region. While diplomatic flux may intensify, most observers expect the hostilities to continue in the foreseeable future. Thus, the unfolding developments may, yet again, underline the Kurdish adage "Kurds have no friends except the mountains".

MAIN KURDISH AREAS IN MIDDLE EAST



Who are the Kurds, and why is Turkey attacking them in northern Syria? What role did Kurdish fighters play in the complex war in Syria, and what are the ramifications of US troops' withdrawal from the conflict?

On Sunday, Kurdish forces who had until recently been America's allies against both the Islamic State and President Bashar al-Assad of Syria, announced an agreement with the Damascus regime, which is backed by Moscow and Tehran, the United States' two great rivals in the region. This happened after President Donald Trump abruptly pulled US forces out of Syria, leaving Turkey's President Recep Tayyip Erdogan to simply cross the border into Syria, pummel Kurdish positions, and take over Kurdish-held territory. The developments mark a remarkable turn in the long-running conflict in Syria. Trump's action, seemingly an effort to end America's overseas wars ahead of his 2020 re-election bid, greatly helps Turkey, Assad, Russia and Iran — and possibly, the battered but still-potent Islamic State. With the US out of the picture, the Kremlin is now seen to be the major player in negotiations between the Kurds, Assad, and Erdogan.

Why is Turkey attacking the Syrian Kurds? Who are the Kurds to begin with, and why are they crucial to this complex war? An old culture, stateless people

The Kurds are the world's largest stateless ethnic group. There are an estimated 25 million to 35 million of them — numbers that are broadly comparable to those of Assam, Jharkhand, Kerala, and Telangana, as well as of Canada and Australia. They live in the highlands of southern and eastern Turkey, northern Iraq, the northeastern Syria, northwestern Iran, and parts of south Armenia, and are a minority in each of these countries. Small communities live in Georgia, Kazakhstan, Lebanon, and eastern Iran as well.

Main Kurdish areas in Middle East.

Kurdish nationalists claim a history going back 2,500 years, but they became identifiable as a distinct community only in the 7th century, when most tribes in the area adopted Islam. The majority among the Kurdish people today are Sunni Muslim, but there are adherents of other faiths too, including Sufism and other mystical practices.

They speak a language that is related to Persian and Pashto, although local dialects differ. Kurmanji, which most Kurds in Turkey speak, uses the Latin script; the other widely spoken Kurdish dialect, Sorani, is written in the Arabic script. Kurds have long had a reputation for being fearless fighters, and they have served as mercenaries in many armies over the centuries. The mediaeval warrior Saladin, founder of the

Ayyubid dynasty that replaced the Fatimids in Egypt and ruled over large parts of the Middle East in the 12th and 13th centuries, was of Kurdish ethnicity.

Quest for an elusive homeland

Their numbers, and distinct cultural and ethnic identity notwithstanding, the Kurdish people have never had their independent national homeland. At the Versailles peace conference after World War I, the Kurdish Ottoman diplomat Mehmet Sherif Pasha proposed borders of a new Kurdistan that covered parts of modern Turkey, Iraq, and Iran; however, the Treaty of Sèvres (1920), which partitioned the old Ottoman dominions, marked out a much smaller territory, entirely in what is now Turkey. Turkey negotiated with the Allied powers and, in 1923, the Treaty of Lausanne overtook Sèvres and ended the idea of a self-governing Kurdistan.

Over the decades that followed, the Kurds made repeated attempts at establishing a de facto Kurdistan with defined national borders — and in the process attracted massive Turkish repression, including bans on the Kurdish language, names, songs, and dress. In Saddam Hussein's Iraq, Chemical Ali attacked them with chemical weapons, and in Iran, their uprisings of the 1980s and 1990s were crushed.

In 1978, the Marxist revolutionary Abdullah Öcalan formed the Kurdistan Workers' Party (Partiya Karkerên Kurdistanê or PKK in Kurdish) with the aim of setting up an independent Kurdistan. PKK guerrillas fought the Turkish army from 1984 until Öcalan's capture in 1999, during which some 40,000 Kurdish civilians were killed. Sporadic terrorist attacks continued until 2013, when the PKK declared a ceasefire. This collapsed when Turkey joined the war against the Islamic State in 2015 and started to bomb PKK targets in Iraq.

As the Islamic State swept across Syria and Iraq, the only fighters who were able to resist the onslaught were the Syrian Kurdish militias, the most powerful of which was the People's Protection Units, known by its Kurdish initials, YPG. The Kurds, who lived mostly along Syria's border with Turkey, had begun an armed defence of their areas after the civil war started in 2011-12. In 2014, as the US joined the war against Da'esh, it found in the YPG a helpful regional ally. From the US perspective, the Kurds also served as a military counterpoint against the Iranians and Russians, and provided some leverage in a future deal to end the war.

Once the Kurds, backed by the Americans, had forced Daesh out of northern Syria, they took over the re-captured land along the Syria-Turkey border, home mainly to ethnic Kurds, Arabs, and some other groups. The YPG has close links with the PKK, and for Erdogan's regime, this seemed like a serious security threat. For the US, the problem was of balancing decades-old hostilities and suspicion between its two allies — Turkey was part of NATO and an ally against Assad; the Kurds had just helped defeat the Islamic State at the cost of losing over 11,000 fighters.

On the nudging of the Obama administration, the Syrian Kurdish militia sought to cover its links with the Turkish guerrillas, changed its name to Syrian Democratic Forces (SDF), and started to enlist larger numbers of non-Kurdish fighters. By 2016, the Americans were guessing that some 40% of SDF fighters belonged to non-Kurd ethnicities. The US also worked to keep the peace on the Turkish border, carrying out patrols both on its own, and jointly with the Turkish army.

But earlier this month, Trump decided to withdraw forces from Syria — an idea he had had in 2018 as well, but had been thwarted. He informed Erdogan on October 6, and within three days, on October 9, Turkey and its Syrian Arab allies launched an assault on Kurdish-held territory in Syria. Americans troops are now on the way out, and even though Trump has issued dramatic warnings to Erdogan, the Turkish attacks on the Kurds continue.

11. NOBEL PRIZE - MEDICINE

THE NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2019

Illustrations: Niklas Elmehed



How oxygen levels affect cell metabolism

Will the discoveries that won the Nobel Prize for Medicine help in the fight against anaemia and cancer?

The story so far: This year, the Nobel Prize for Physiology or Medicine was awarded to three scientists, William G. Kaelin Jr. from Howard Hughes Medical Institute, Maryland, U.S., Sir Peter J. Ratcliffe from Francis Crick Institute, London, and Gregg L. Semenza from the Johns Hopkins Institute for Cell Engineering for their discovery of how cells sense and adapt to oxygen availability. The three scientists have uncovered the genetic mechanisms that allow cells to respond to varying levels of oxygen.

Why is it important?

Oxygen is used by all cells to convert food to useful energy. While oxygen is essential for the survival of cells, excess or too little oxygen can lead to adverse health consequences.

Oxygen supply temporarily reduces in muscles during intense exercise and under such conditions the cells adapt their metabolism to low oxygen levels. Proper growth of the foetus and placenta depends on the ability of the cells to sense oxygen.

Drugs have already been developed to treat anaemia by making the body produce increased number of red blood cells. Similarly, drugs to increase oxygen availability in people with heart disease and lung cancer are being tested. Many diseases can be treated by increasing the function of a particular pathway of the oxygen-sensing machinery. At the same time, inhibiting or blocking the pathway will have implications in treating cancer, heart attack, stroke and pulmonary hypertension. Cancers are known to hijack the oxygen-regulation machinery to stimulate blood vessel formation and also re-programme the metabolism in order to adapt to low oxygen conditions. The reprogramming of metabolism gives cancer cells the plasticity to shift from a state where they have limited potential to cause cancer to a state when they have greater

potential for long-term growth. Efforts are under way to develop drugs that can block the oxygen-sensing machinery of cancer cells to kill them.

What do we already know?

The rate at which we respire depends on the amount of oxygen being carried in the blood. Specialised cells present next to large blood vessels in the neck sense the blood oxygen level and alert the brain to increase the rate of respiration when the oxygen level in the blood goes down. This discovery won a Nobel Prize in 1938.

At the beginning of the last century, scientists knew that specialised cells present in the kidneys make and release a hormone called erythropoietin. When oxygen level is low, as in high altitudes, more of this hormone is produced and released, leading to increased production of red blood cells in the bone marrow — helping the body adapt to high altitudes. Besides increasing red blood cells, the body also grows new blood vessels to increase blood supply.

What are the main contributions of 2019's winners?

Both Prof. Semenza and Sir Ratcliffe independently studied how the erythropoietin gene is regulated by varying oxygen levels. Both researchers found that the oxygen-sensing mechanism is not restricted to kidneys where the erythropoietin is produced but by diverse cells in tissues other than the kidney. Prof. Semenza identified a pair of genes that express two proteins. When the oxygen level is low, one of the proteins (HIF-1alpha) turns on certain genes, including the erythropoietin gene, to increase the production of erythropoietin. The hormone, in turn, increases the oxygen availability by boosting the production of red blood cells.

Prof. Kaelin Jr., who was studying an inherited syndrome called von Hippel-Lindau's disease (VHL disease) found that people had increased risk of cancer when they inherited VHL mutations. He found the VHL gene seemed to be involved in how cells respond to oxygen.

The function of the HIF-1alpha protein, which turns on the genes to produce more erythropoietin, is blocked and is rapidly degraded when the oxygen level is normal but remains intact when oxygen level is low. Sir Ratcliffe found that VHL interacts with the HIF-1alpha protein and degrades it when the oxygen level is normal. This ensures that excess red blood cells are not produced when the oxygen level is normal. In 2001, Prof. Kaelin Jr. and Sir Ratcliffe both elucidated more details on the mechanism of degradation of HIF-1alpha protein by VHL when the oxygen level is normal but not when the oxygen level is low.

Why do athletes use erythropoietin? What are the risks?

Athletes have been found to use erythropoietin, synthetic oxygen carriers and blood transfusions for blood doping. Each of the three substances or methods is banned by the World Anti-Doping Agency (WADA). While the use of erythropoietin in people who are anaemic due to chronic kidney disease helps in increasing the oxygen level in the blood, the use of the hormone by normal, healthy people can lead to serious health risks. In the case of healthy people who have a normal red blood cell count, the use of external erythropoietin is highly likely to make the blood thick (increase viscosity) leading to an increased risk of heart disease, stroke, and cerebral or pulmonary embolism (clot that blocks the flow of blood).

12. NOBEL PRIZE - LITERATURE

Stories out of thin air

Austrian novelist and playwright Peter Handke won the 2019 Nobel Prize for Literature while Polish writer Olga Tokarczuk was selected for the prize for 2018



PETER HANDKE Many forms

- Handke has established himself as **one of the most influential writers** in Europe after the Second World War
- His bibliography includes **novels, essays, note books, dramatic works and screenplays**

- The peculiar art of Handke is extraordinary **attention to landscapes and the material presence** of the world. At the same time it shows an unending quest for existential meaning

- His work is characterised by a **strong adventurous spirit** but

An erring protagonist: In *Die Obstdiebin* the erring young heroine is unaware of the strange fortune she is expecting

also by a nostalgic inclination

- A few of his works include *Die Obstdiebin oder Einfache Fahrt ins Landesinnere* (novel), *Über die Dörfer* (drama) and *Das Gewicht der Welt* (note book)



OLGA TOKARCZUK

Many genres

- Tokarczuk, a Polish writer, is the **15th woman** to have won the award out of 116 literature laureates since 1901

- She constructs her novels in a **tension between opposites**; nature versus culture, reason versus madness, male versus female, home versus alienation

- Her writings are also inspired by maps and a perspective from above, which



Magnum opus: Her best work is considered to be the historical novel, *The Books of Jacob*

tends to make her **microcosmos a mirror of macrocosmos**

- Her first book, *Podróż ludzi Księgi* (*The Journey of the Book-People*), which released in 1993, is set in 17th century France and Spain, where the characters are in search of a mysterious book in the Pyrenees

Scandal to controversy

Why is the choice of the 2019 Nobel Prize for Literature seen as divisive? What is the criticism against the Swedish Academy?

The story so far: On Thursday, Austrian writer Peter Handke bagged the 2019 Nobel Prize for Literature, and Polish author Olga Tokarczuk was named the winner for 2018. Last year, the Swedish Academy, which awards the annual Nobel Prize for Literature, called off the ceremony after a sex scandal. The Swedish body called for reforms in the secretive organisation and said it wanted to move on from the scandal. But apart from the 'Eurocentric' choice for 2018 and 2019, picking Handke, who has played down Serb atrocities against Bosnian Muslims in the Balkan war, have left many writers and critics fuming.

Why was the prize shelved last year?

The 233-year-old Swedish Academy was forced to cancel the 2018 prize when rape accusations emerged against the husband of an Academy member. The Academy has made changes to improve transparency. But the Nobel Foundation, which funds the \$914,000 prize, said the organisation (its members are elected for life and statutes can be changed only with the approval of Sweden's king) needed to do more. Lars

Heikensten, executive director of the Nobel Foundation, told Reuters that the Academy should review the lifetime membership and test out ideas on limited terms of office.

Why is another dispute brewing?

While announcing the 2019 prize, the Academy said it was awarding it to Handke “for an influential work that with linguistic ingenuity has explored the periphery and the specificity of human experience.” According to critics, Handke’s choice is controversial because of his Serbia-as-victim stance in the Balkan war and for attending the funeral of former Serbian President Slobodan Milošević. Under Milosevic’s regime, thousands of ethnic Albanians were killed and at least a million had to flee. The Serbian president was indicted for war crimes in 1999 but died in 2006 before a ruling was reached. At the funeral, Handke said: “I don’t know the truth. But I look. I listen. I feel. I remember. This is why I am here today, close to Yugoslavia, close to Serbia, close to Slobodan Milosevic,” Balkan Transitional Justice, a platform that looks at justice issues for the former Yugoslav countries, posted on its website. On Twitter, Kosovo’s Ambassador to Washington, Vlora Citaku, reacted strongly: “Have we become so numb to racism, so emotionally desensitized to violence, so comfortable with appeasement that we can overlook one’s subscription & service to the twisted agenda of a genocidal maniac?” The 76-year-old novelist, essayist, playwright’s works include Short Letter, Long Farewell, The Goalie’s Anxiety at the Penalty Kick, A Sorrow Beyond Dreams, Till Day You Do Part or A Question of Light and Slow Homecoming. He co-scripted Wim Wenders’ critically acclaimed 1987 film “Wings of Desire”. Writer Hari Kunzru, who has taught the Austrian’s works, told The Guardian: “Handke is a troubling choice for a Nobel committee that is trying to put the prize on track after recent scandals. He is a fine writer, who combines great insight with shocking ethical blindness,” adding, “More than ever we need public intellectuals who are able to make a robust defence of human rights in the face of the indifference and cynicism of our political leaders. Handke is not such a person.”

What about Olga Tokarczuk?

The 57-year-old Polish writer, one of the 15 women to win the Nobel Prize since 1901, bagged the 2018 Man Booker International Prize for translated fiction with her ambitious novel on border-crossing, Flights. In the opening pages, the narrator looks back at the first trip across the fields as a child and coming across a river which looked enormous: “Standing there on the embankment...I realised that — in spite of all the risks involved — a thing in motion will always be better than a thing at rest; that change will always be a nobler thing than permanence...” Tokarczuk is driven by the attempt to contain a multitude of often contradictory perspectives into one whole, says the Nobel citation, and she has “a narrative imagination that with encyclopedic passion represents the crossing of boundaries as a form of life.” A trained psychologist, Tokarczuk made her debut as a fiction writer in 1993 with The Journey of the Book People, where the characters set off in search of a mysterious book in the Pyrenees. Tokarczuk has courted controversy too. In 2015, her historical novel The Books of Jacob, which tells the story of a Jewish-born religious leader who leads fellow Jews to forced conversions to Catholicism in the 18th century, won her Poland’s highest book prize. But statements she made soon after — that Poland had “committed horrendous acts as colonizers, as a national majority that suppressed the minority...” — angered nationalists. Tokarczuk was branded a “targowiczanie” or traitor in Polish, and she had to be under protection of bodyguards for a while because of death threats.

How did the Nobel Laureates react?

With Polish elections due this Sunday, Tokarczuk told a press conference at Bielefeld in Germany that she wanted Poles to “vote in a right way for democracy”. Handke, who lives at Chaville outside Paris, admitted to reporters that he was surprised. “I was astonished, yes. It was very courageous by the Swedish Academy, this kind of decision.” He had told The New York Times in 2006 he no longer cared [for the top literary prize] because he thought it was “finished” for him after his “expressions about Yugoslavia.”

13. NOBEL PRIZE - PHYSICS

The unknown & an exoplanet

Canadian-American cosmologist James Peebles and Swiss scientists Michel Mayor and Didier Queloz won the 2019 Nobel Prize for Physics for revealing the wonder of the evolution of the universe and discovering exoplanets



James Peebles

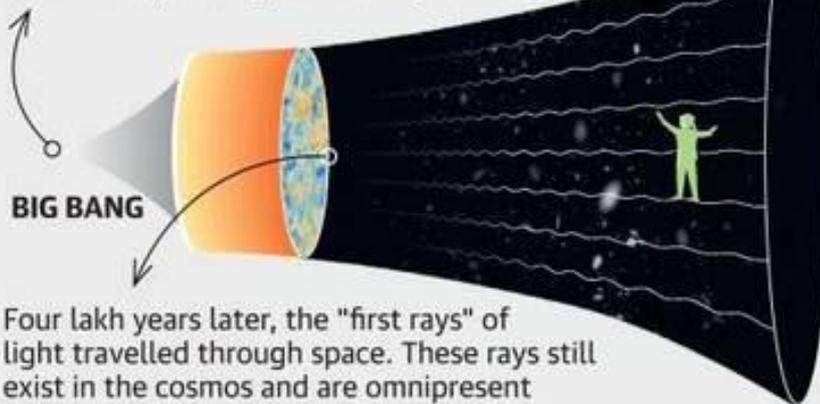


Michel Mayor



Didier Queloz

The universe was in a hot and dense state, and 14 billion years ago there was a "big bang" and then it started expanding and cooling down



Four lakh years later, the "first rays" of light travelled through space. These rays still exist in the cosmos and are omnipresent

■ **Peebles** interpreted the "first rays" and showed that in the universe just 5% is known matter. The rest is unknown dark matter & dark energy. His insights turned cosmology from speculation to science sparking further research

■ The dark matter is the force which holds together galaxies which otherwise may get torn apart. The dark energy helps the universe's increasingly rapid and constant expansion. Thus, one pulls and the other pushes

■ **Mayor and Queloz** discovered "51 Pegasi b" – first-ever find of an exoplanet orbiting a solar-type star

■ Surprisingly, the planet was as big as Jupiter (1,300 times Earth's volume) but was very close to its star (takes just 4 days to orbit)

■ Big planets were thought to be created far from their stars. How did "51 Pegasi b" get so close? This question led to theories that described how large gas balls formed at the edges of their solar systems, then spiralled inward

Unravelling the secrets of the universe

How the Physics Nobel winners answered some of the age-old questions

The story so far: On Tuesday, October 8, the royal Swedish Academy of Sciences announced that the Nobel Prize in Physics would go to three people: One half of it would be shared by Michel Mayor and Didier Queloz of the University of Geneva, for discovering for the first time a planet outside our solar system orbiting a Sun-like star; the other half would go to James Peebles, Princeton University, for his contribution to physical cosmology.

What are exoplanets? Since when have people been looking for them?

The word planet is a general term that describes any celestial body that moves around a star. Well, there are also "rogue" planets that do not orbit stars. An exoplanet is a planet outside our solar system.

What were Indian astronomers doing?

The very first, significant "false alarm" came from no place other than Chennai, then known as Madras. Captain William Stephen Jacob who was the director of the Madras Observatory (The East India Observatory at Madras) from 1849 to 1858, made this "finding" in 1855.

He was studying the binary star (a pair of stars that orbit each other) named 70 Ophiuchi and noticed a slight difference in the orbital motions of the pair. He attributed this to the presence of a planet orbiting them. He published this result in the Monthly Notices of the Royal Astronomical Society.

His findings were corroborated by astronomer Thomas Jefferson Jackson See who even deduced that the planet would take 36 years to orbit the stars. Sadly, however, both of their calculations were later shown to have mistakes. This story is narrated in the book *Worlds Beyond Our Own*, by Prof. Sujana Sengupta, of the Indian Institute of Astrophysics, Bengaluru.

What kind of a planet is 51 Pegasi b? Is it habitable?

The constellation Pegasus has a star 51 Pegasi which is some 50 light years away from earth. On October 6, 1995, the prize-winning duo discovered a planet orbiting it. It was named 51 Pegasi b, as per astronomical conventions. It is a gas giant, about half the size of Jupiter. It orbits its star in just four days. It is unlikely that we can survive that.

How many such exoplanets have been discovered? Who maintains a list of exoplanets?

According to the NASA exoplanet archive, as of October 10, 2019, there are 4,073 confirmed exoplanets.

Why did James Peebles get the Prize?

In the beginning was the Big Bang, about 13.8 billion years ago. No one knows much about the earliest states of the universe, but theories hold that it was a compact, hot and opaque particle soup. About 400,000 years after the Big Bang, the universe expanded and cooled to a few thousand degrees Celsius. This caused it to become transparent, allowing light to pass through it. This ancient afterglow of the Big Bang, the remnants of which still can be observed, is known as the cosmic microwave background (CMB). The universe continued to expand and cool and its present temperature is close to 2 kelvin. That is, approximately minus 273 degrees Celsius.

Peebles realised that measuring the CMB's temperature could provide information about how much matter had been created in the Big Bang. He also saw that the release of this light played a role in how matter could form clumps creating what we now see as galaxies. This was a major breakthrough. This discovery by Peebles heralded a new era of cosmology. Many questions — how old is the universe? What is its fate? How much matter and energy does it contain? These could be answered by studying the variation of the CMB. The news release of the Nobel academy describes these variations as wavelets on the sea surface — small from a distance but significant when close.

What is Peebles' role in understanding dark matter? For that matter, what is 'dark' matter?

By measuring the speeds of rotating galaxies, scientists were able to see that a lot of mass needed to be there that would hold the galaxies together with the strength of their gravitational attraction. Before Peebles intervened, the missing mass was attributed to neutrinos. Peebles instead said this is due to a hitherto unknown type of "dark" matter particles. However, while they could "see" a portion of this mass, a large part of it could not be seen. Hence the mass missing from view was named "dark" matter. It is to be understood that in this case "seeing" is not being used in the sense that the matter in question is very far away and hence cannot be seen. It means that even though this matter is all around us, close as well as far away, we only feel it through its gravity, but we cannot see it through other interactions.

14. NOBEL PRIZE - CHEMISTRY

More power to batteries

M. Stanley Whittingham, John B. Goodenough and Akira Yoshino have been selected for the 2019 Chemistry Nobel for their roles in the development of the Li-ion battery



M. Stanley Whittingham

- In the 1970s, he used titanium disulphide as cathode and lithium, which is highly reactive, as anode. When put together, it generated two volts of electricity



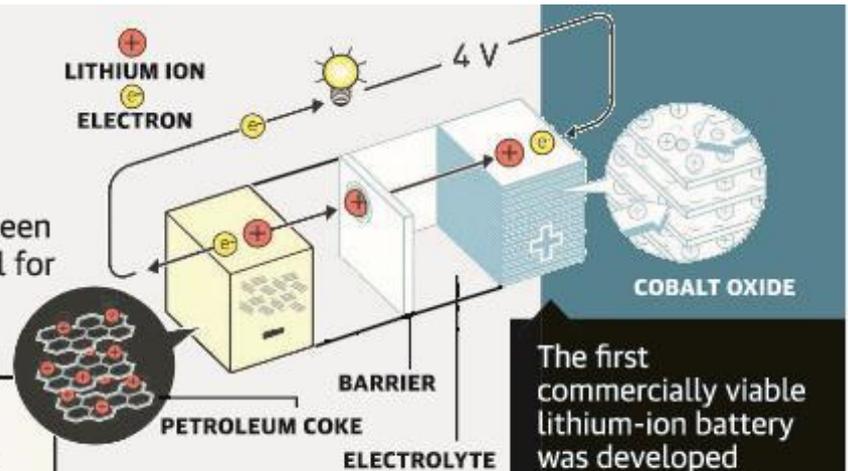
John B. Goodenough

- In the 1980s, he replaced titanium disulphide with cobalt oxide as the cathode. The battery's potential doubled because of oxide in the cathode but the use of reactive lithium remained a concern



Akira Yoshino

- He replaced lithium with petroleum coke, which drew the Li-ions towards it. Once the battery was operational, the ions and electrons flowed towards the cobalt oxide cathode



The first commercially viable lithium-ion battery was developed by Akira Yoshino in 1991

How does a battery work?

Electricity is the flow of electrons from one atom to another. In a battery, electrons flow from the negative electrode - the anode - to the positive one - the cathode, producing electricity

Towards a rechargeable world

How the Li-ion battery, which won for its developers the Chemistry Nobel, set off a technology revolution

The story so far: The 2019 Nobel Prize for Chemistry was awarded to John B. Goodenough, M. Stanley Whittingham and Akira Yoshino for working towards the development of practical lithium-ion batteries. These batteries are the edifice of the wireless technology revolution that made possible portable compact disc players, digital wrist watches, laptops and the mobile phones of today. It is also seen as important to a fossil-free future of electric cars that governments envisage to address climate change. Stanley Whittingham, a chemist at the University of Binghamton, State University New York, was at oil giant Exxon when he contributed to the development of the lithium-ion battery. Goodenough, who served in the United States Army in World War II before studying material science and engineering, became, at 97, the oldest Nobel Laureate. Yoshino, a professor at Meijo University, Japan was at the Asahi Kasei Corporation, one of the biggest chemical and material-sciences companies in Japan.

Why are lithium-ion batteries important?

By the 1960s petrol-driven cars had proliferated around the world. However, realisation dawned that the burning of this fossil fuel was harmful to the environment and, along with coal, responsible for the smog enveloping major cities. Also, fossil fuel was limited and research was launched to develop alternate fuel sources. Since the early 19th century, chemical batteries have been around. They consist of two electrodes between which electrons flow and generate a current. The challenge of such batteries is to choose appropriate electrodes and electrolyte, which mediates the current, and generate sufficient current safely at room temperature without occupying too much space.

Lead acid batteries — still used in cars to start engines and power headlights and power windows — are too bulky to practically function as car engines. Exxon, which was worried about depleting oil stocks, commissioned top researchers to find alternatives to fossil fuels.

One of them, Whittingham, studied solid materials whose atoms had spaces between them. Fitting positively charged ions in them — a process called intercalation — changed their properties and Whittingham found that potassium ions when intercalated in titanium made for an extremely energy-dense material. Lithium is also a light element and useful as an electrode, he found. In a battery, electrons should flow from the negative electrode — the anode — to the positive one — the cathode. Therefore, the anode should contain a material that easily gives up its electrons and lithium releases electrons willingly. This made for an ideal battery.

Was Whittingham's battery a success?

Exxon was impressed with the product and decided to go ahead with commercially manufacturing the battery. However, subsequent tests revealed problems. As the new lithium battery was repeatedly charged, thin slivers of lithium grew from the lithium electrode. When they reached the other electrode, or the cathode, the battery short-circuited which could lead to an explosion. To make the battery safer, aluminum was added to the metallic lithium electrode and the electrolyte between the electrodes was changed. The batteries thus made were small and the next step was to make them big enough to be used in cars. However, the price of oil nose-dived in the early 1980s and Exxon needed to make cutbacks and development work was discontinued.

What were the contributions of Goodenough and Yoshino?

Goodenough had moved to Oxford University as a professor of inorganic chemistry and he set to work on improving Whittingham's battery. He eventually found that the cathode could have a higher potential if it was built using a metal oxide instead of a metal sulphide. The challenge for Goodenough and his colleagues was to find a metal oxide that produced a high voltage when it intercalated lithium ions, but which did not collapse when the ions were removed. Eventually they chanced upon a battery with lithium cobalt oxide in the cathode, which was almost twice as powerful as Whittingham's battery.

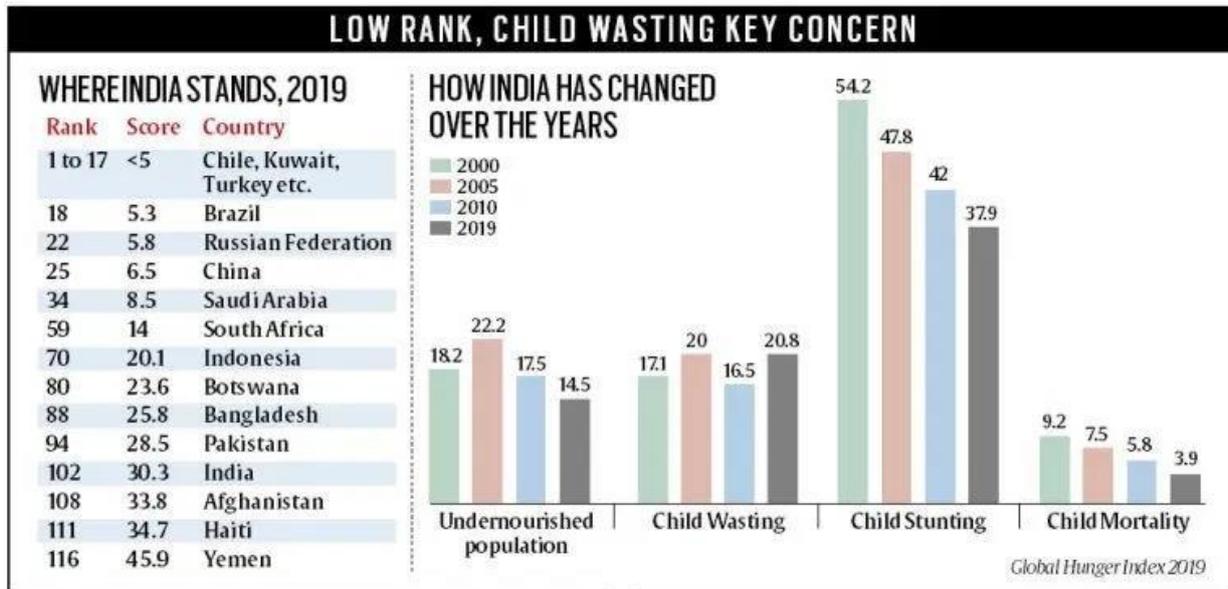
Goodenough's major insight was that batteries did not have to be manufactured in their charged state, as had been done previously. Instead, they could be charged afterwards.

In 1980, a new energy-dense cathode material was available which, despite its low weight, resulted in powerful, high-capacity batteries. This, however, did not lead to an automobile revolution but triggered a wireless-electronics revolution.

This was when Yoshino came into the picture. Consumer electronics companies in Japan were looking for light, rechargeable batteries that could power video cameras, cordless telephones and computers. Yoshino, who was working at Asahi Kasei Corporation, used Goodenough's lithium-cobalt design as a working template and tried various carbon-based materials as the anode.

Researchers had previously shown that lithium ions could be intercalated in the molecular layers in graphite, but the graphite was broken down by the battery's electrolyte. Yoshino used petroleum coke, a by-product of the oil industry, and when he charged the petroleum coke with electrons, the lithium ions were drawn into the material. When he turned on the battery, the electrons and lithium ions flowed towards the cobalt oxide in the cathode. Though the voltage generated in Yoshino's battery was similar to Goodenough's battery at 4 volts, it was a stable battery — it had a long life and could be charged several times before its performance deteriorated. Moreover, the battery designed eschewed pure lithium which is extremely volatile and explodes on contact with air and water. The lithium cobalt design was safe and could be manufactured in a variety of sizes and conditions. There have been subsequent improvements to this design too and that's what made it amenable to smart phones and other electronic devices that require rechargeable batteries.

15.GLOBAL HUNGER INDEX



Why India trails in Global Hunger Index

In Global Hunger Index report, India has the highest percentage of children who suffer from acute undernutrition. On other parameters, where India has improved, the pace has been relatively slow.

The GHI slots countries on a scale ranging from “low” hunger to “moderate”, “serious”, “alarming”, and “extremely alarming”. India is one of the 47 countries that have “serious” levels of hunger.

The latest Global Hunger Index (GHI) has ranked India a lowly 102 among the 117 countries it has mapped. In 2018, India was pegged at 103 but last year 119 countries were mapped. So while the rank is one better this year, in reality, India is not better off in comparison to the other countries. The GHI slots countries on a scale ranging from “low” hunger to “moderate”, “serious”, “alarming”, and “extremely alarming”. India is one of the 47 countries that have “serious” levels of hunger.

On the whole, the 2019 GHI report has found that the number of hungry people has risen from 785 million in 2015 to 822 million. It further states that “multiple countries have higher hunger levels now than in 2010, and approximately 45 countries are set to fail to achieve ‘low’ levels of hunger by 2030”.

What is the Global Hunger Index?

The GHI has been brought out almost every year by Welthungerhilfe (lately in partnerships with Concern Worldwide) since 2000; this year’s report is the 14th one. A low score gets a country a higher ranking and implies a better performance.

The reason for mapping hunger is to ensure that the world achieves “Zero Hunger by 2030” — one of the Sustainable Development Goals laid out by the United Nations. It is for this reason that GHI scores are not calculated for certain high-income countries.

While in common parlance hunger is understood in terms of food deprivation, in a formal sense it is calculated by mapping the level of calorie intake.

But the GHI does not limit itself to this narrow definition of hunger. Instead, it tracks the performance of different countries on four key parameters because, taken together, these parameters capture multiple dimensions — such a deficiency of micronutrients — of hunger, thus providing a far more comprehensive measure of hunger.

How does GHI measure hunger?

For each country in the list, the GHI looks at four indicators:

- * Undernourishment (which reflects inadequate food availability): calculated by the share of the population that is undernourished (that is, whose caloric intake is insufficient);

- * Child Wasting (which reflects acute undernutrition): calculated by the share of children under the age of five who are wasted (that is, those who have low weight for their height);
- * Child Stunting (which reflects chronic undernutrition): calculated by the share of children under the age of five who are stunted (that is, those who have low height for their age);
- * Child Mortality (which reflects both inadequate nutrition and unhealthy environment): calculated by the mortality rate of children under the age of five (in part, a reflection of the fatal mix of inadequate nutrition).

Each country's data are standardised on a 100-point scale and a final score is calculated after giving 33.33% weight each to components 1 and 4, and giving 16.66% weight each to components 2 and 3.

Countries scoring less than or equal to 9.9 are slotted in the "low" category of hunger, while those scoring between 20 and 34.9 are in the "serious" category and those scoring above 50 are in the "extremely alarming" category.

What is India's score relative to those of the others?

Among the BRICS grouping, India is ranked the worst, with China at 25 and a score of just 6.5. Within South Asia, too, India is behind every other country. Sri Lanka, Nepal, Bangladesh and Pakistan (in that order) are all ahead of India.

Some of the other countries ahead of India are Saudi Arabia (rank 34), Venezuela (rank 65, even as its score has doubled from just over 8 to over 16, because of the socio-economic and political crisis), Lesotho (rank 79), Burkina Faso (rank 88), and North Korea (rank 92).

In stark contrast to India, which has the world's largest democracy and one of the biggest economies, most of the countries below India on the GHI — Afghanistan, Haiti or Yemen etc — are either poorly governed or war-torn or ravaged by natural calamities.

Why is India ranked so low on GHI?

With an overall score of 30.3, India finds itself sandwiched between Niger (score 30.2, rank 101) and Sierra Leone (score 30.4, rank 103). In 2000, India's score was 38.8 and its hunger level was in the "alarming" category. Since then, India has steadily improved on most counts to reduce its score and is now slotted in the "serious" category.

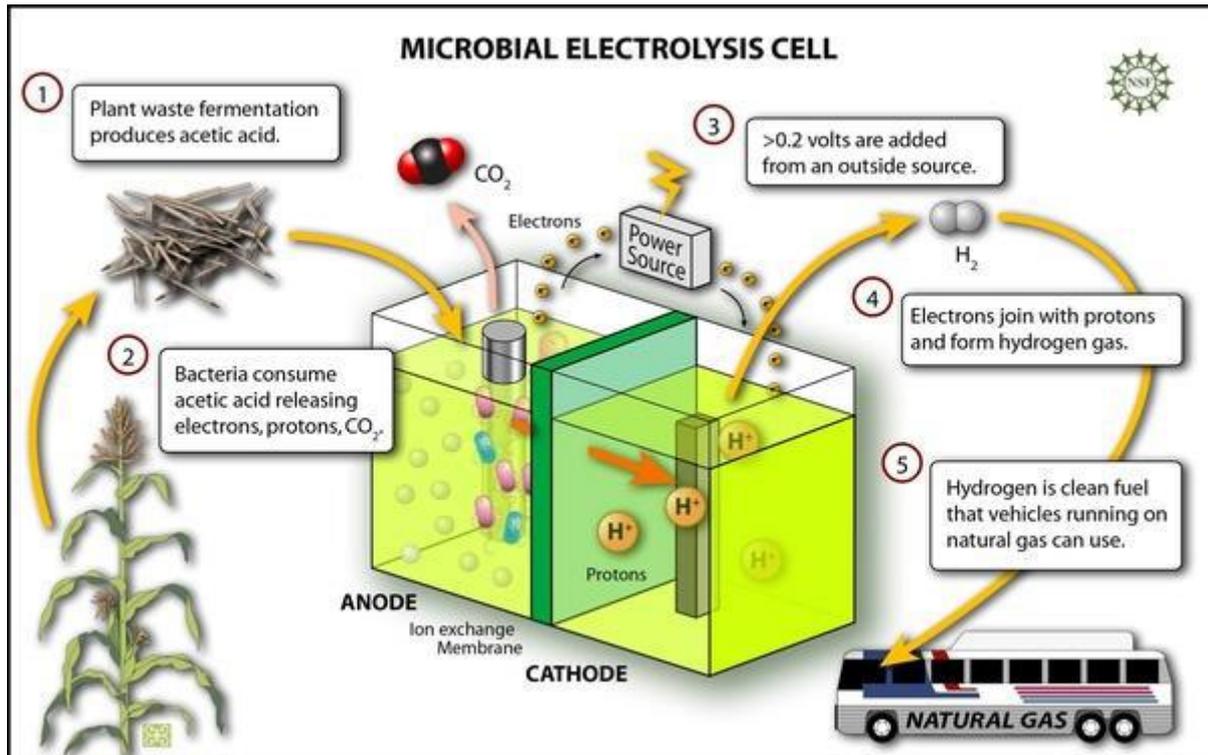
But the pace of India's improvement has been relatively slow. Nothing illustrates this better than the trajectory of Niger and Sierra Leone, which in 2000 had scores of 52.1 and 53.6, respectively, and found themselves in the "extremely alarming" category of hunger — and were much worse off than India. So, even though India has improved its score, many others have done more and that explains why despite achieving relatively fast economic growth since 2000, India has not been able to make commensurate strides in reducing hunger.

What are the reasons for which India's improvements have been slow?

For one, notwithstanding the broader improvements, there is one category — Child Wasting, that is, children with low weight for their height — where India has worsened. In other words, the percentage of children under the age of 5 years suffering from wasting has gone up from 16.5 in 2010 to 20.8 now. Wasting is indicative of acute undernutrition and India is the worst among all countries on this parameter. "India's child wasting rate is extremely high at 20.8 percent — the highest wasting rate of any country in this report for which data or estimates were available. Its child stunting rate, 37.9 percent, is also categorized as very high in terms of its public health significance... In India, just 9.6 percent of all children between 6 and 23 months of age are fed a minimum acceptable diet," states the report.

"In 2014 the prime minister instituted the 'Clean India' campaign to end open defecation and ensure that all households had latrines. Even with new latrine construction, however, population's health and consequently children's growth and development as their ability to absorb nutrients is compromised," it said.

16.MICROBIAL FUEL CELLS



Microbial fuel cells are devices that use bacteria as the catalysts to oxidise organic and inorganic matter and generate current.

At the London Zoo, a fern has started taking its own selfies, the Zoological Society of London (ZSL) announced on Tuesday. ZSL scientists had laid the groundwork for the feat earlier this year, with the ultimate aim of using plants to power camera traps and sensors in the wild. This they achieved by installing microbial fuel cells in Pete, a maidenhair fern.

Microbial fuel cells are devices that use bacteria as the catalysts to oxidise organic and inorganic matter and generate current. A research paper from the Massachusetts Institute of Technology earlier this year explained that electrons produced by the bacteria are transferred to the negative terminal and flow to the positive terminal.

In a statement on the ZSL website, Conservation Technology Specialist Al Davies explained: "Plants naturally deposit biomatter as they grow, which in turn feeds the natural bacteria present in the soil, creating energy that can be harnessed by fuel cells and used to power a wide range of vital conservation tools remotely, including sensors, monitoring platforms and camera traps."

Among conventional power sources, batteries must be replaced while solar panels rely on a source of sunlight. On the other hand, plants can survive in the shade, naturally moving into position to maximise the potential of absorbing sunlight.

The ground-breaking solution was enabled by ultra low-powered technology created by US AI company Xnor.ai. It works around the clock on any device while consuming such low energy that it can be powered by a small plant.

Pete's delicate leaves and shiny stalks are clearly visible in the images. "Pete has surpassed our expectations and is currently taking a photo every 20 seconds – he's been working so well we've even accidentally photobombed him a few times!" Davies said.

17.LAND ACQUISITION ACT

The scheduled hearing will decide the legality of several cases of land acquisition that took place across the country before 2009. The matter also raises significant questions on judicial discipline, and how judgments of the court are applied while deciding subsequent cases on similar issues.

The issue involves Section 24(2) of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, which replaced the colonial 1894 land acquisition law. (File) On Tuesday, a five-judge Constitution Bench of the Supreme Court will begin hearing a case to clarify the interpretation of the law on land acquisition, specifically the provision related to compensation awarded to land owners. Two three-judge Bench rulings delivered by the apex court in 2014 and 2018 on the same issue differed in their interpretations, prompting the court to refer the matter to a larger Bench.

The scheduled hearing will decide the legality of several cases of land acquisition that took place across the country before 2009. The matter also raises significant questions on judicial discipline, and how judgments of the court are applied while deciding subsequent cases on similar issues.

What is the provision of the law in question?

The issue involves Section 24(2) of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, which replaced the colonial 1894 land acquisition law.

The provision says that in cases where acquisition proceedings were initiated under the 1894 law and compensation had been determined, the proceedings would lapse if the state did not take possession of the land for five years, and also had not paid compensation to the landowner.

Once the proceedings lapse under the old law, the acquisition process would be initiated again under the new law, allowing the owner to get a higher compensation.

The term “paid” needed interpretation — and since it placed the responsibility on the government, cases were filed before courts soon after the law was implemented.

What did the two conflicting judgments say?

In 2014, in the first such case involving the interpretation of the new law, a three-judge Bench comprising Justices R M Lodha, Madan Lokur and Kurian Joseph in *Pune Municipal Authority v Harakchand Misirimal Solanki* said that the state depositing the compensation in its own treasury cannot be equated with the landowners being “paid”.

In exceptional circumstances, where the landowner refuses the compensation, the sum can be deposited with the court, but a deposit in its own treasury would not suffice.

This ruling was followed as precedent by High Courts in several cases, and was affirmed by the apex court itself in 2016.

However, in February 2018, a three-judge Bench comprising Justices Arun Mishra, Adarsh Goel and Mohan Shantanagoudar while dealing with a similar issue, ruled in *Indore Developmental Authority v Shailendra* that in cases where the landowner had refused compensation, depositing it with the treasury was sufficient, and the state was not obligated to deposit it with the court.

The court also said that the only consequence of not depositing the compensation with the court “at the most in appropriate cases may be of a higher rate of interest on compensation”, and not lapse of acquisition.

In doing so, the court also invalidated the settled law on the issue — the 2014 judgment by another three-judge Bench on the same issue — and declared it “per incuriam”.

The two senior judges formed the majority in the 2018 verdict; Justice Shantanagoudar dissented.

Why was a referral to a larger Bench made?

Days after the 2018 verdict was pronounced, another three-judge Bench comprising Justices Lokur, Joseph (both of whom were part of the 2014 verdict that was invalidated), and Deepak Gupta noticed the inconsistency and stayed all cases relating to this provision of the land acquisition Act in High Courts across the country until the question of law was settled.

It also asked “other Benches of the Supreme Court” to not take up the issue until it was decided by a larger Bench.

Justice Joseph in oral observations made in the court strongly criticised the 2018 ruling, and said that the verdict had deviated from “virgin principles” of the institution in declaring a verdict of equal Bench strength as per incuriam.

Subsequently, separate Benches headed by Justices Goel and Mishra referred the case to then Chief Justice of India Dipak Misra requesting him to set up a larger Bench.

What is the problem with an ruling being invalidated?

The controversy stemmed from not only the fact that the 2014 ruling was declared per incuriam, but also because it was done so by a Bench of equal strength. In common law, a judicial system that is followed in India, a judgment of the court is used as the basis or precedent for determining future cases.

A ruling of the Supreme Court is binding on all High Courts, and a ruling of the Supreme Court by Benches of larger or equal strength is binding on other Benches of the court.

A three-judge Bench cannot hold a decision by another three-judge Bench to be per incuriam, but can only ask for consideration by a larger Bench if it disagrees with the precedent.

Similarly, a Bench cannot ask other Benches to not follow a judgment.

Since the Supreme Court sits in Benches of two or three (unlike in the US where all justices of the Supreme Court sit together for hearing every case), the practice of following precedent ensures consistency and certainty in law. Hence, larger Bench rulings are preferred to make sure that the law laid down by the court is predictable as far as possible.

And what does it mean for a case to be declared per incuriam?

‘Incuria’ is Latin for “carelessness”, and when a judgment is declared per incuriam, it means that the case was wrongly decided, mostly because the judges were ill-informed about the applicable law. A judgment can also be declared per incuriam if it has materially deviated from earlier precedents.

A judgment that is per incuriam has no legal force or validity and does not have to be counted as a precedent.

Justice Shantanagoudar in his dissent agreed with the interpretation of the law with Justices Mishra and Goel who wrote the majority opinion, but declined to declare the 2014 ruling per incuriam. He said that the ruling had considered all aspects of the law, but since it was the first decision on the provision, had taken a different view.

18.RCEP

Negotiations on the details of the RCEP have been on since 2013, and all participating countries aim to finalise and sign the deal by November.

The purpose of RCEP is to create an “integrated market” spanning 16 countries. (AP Photo: Ted S. Warren)
Commerce Minister Piyush Goyal is in Bangkok for the eighth Regional Comprehensive Economic Partnership (RCEP) ministerial meeting, which will continue until October 12. The meeting, which is likely to be the last one at this level, is expected to work out the unresolved issues in the negotiations on the mega trade deal that is to be concluded later this year.

What is the RCEP?

The Regional Comprehensive Economic Partnership (RCEP) is a trade deal that is currently under negotiation among 16 countries — the 10 member countries of the Association of Southeast Asian Nations (ASEAN), and the six countries with which the ASEAN bloc has free trade agreements (FTA).

The ASEAN, which includes Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam, has FTAs with India, Australia, China, South Korea, Japan and New Zealand.

Negotiations on the details of the RCEP have been on since 2013, and all participating countries aim to finalise and sign the deal by November.

What does the RCEP propose?

The purpose of RCEP is to create an “integrated market” spanning all 16 countries, making it easier for products and services of each of these countries to be available across this region.

ASEAN says the deal will provide “a framework aimed at lowering trade barriers and securing improved market access for goods and services for businesses in the region”.

The negotiations are focussed on areas like trade in goods and services, investment, economic and technical cooperation, intellectual property, competition, dispute settlement, e-commerce, and small and medium enterprises.

Why is the RCEP important?

It is billed as the “largest” regional trading agreement ever — these countries account for almost half of the world’s population, contribute over a quarter of world exports, and make up around 30% of global Gross Domestic Product (the value of all goods and services produced in a year).

How have the talks progressed?

Of the 25 chapters in the deal, 21 have been finalised. Chapters on investment, e-commerce, rules of origin, and trade remedies are yet to be settled, and ministerial guidance is being sought at the ongoing meeting in Bangkok.

How does India stand to gain?

Sections of Indian industry feel that being part of RCEP would allow the country to tap into a huge market, if the domestic industry becomes competitive. Pharmaceuticals and cotton yarn are confident of gains, and the services industry too, may have new opportunities.

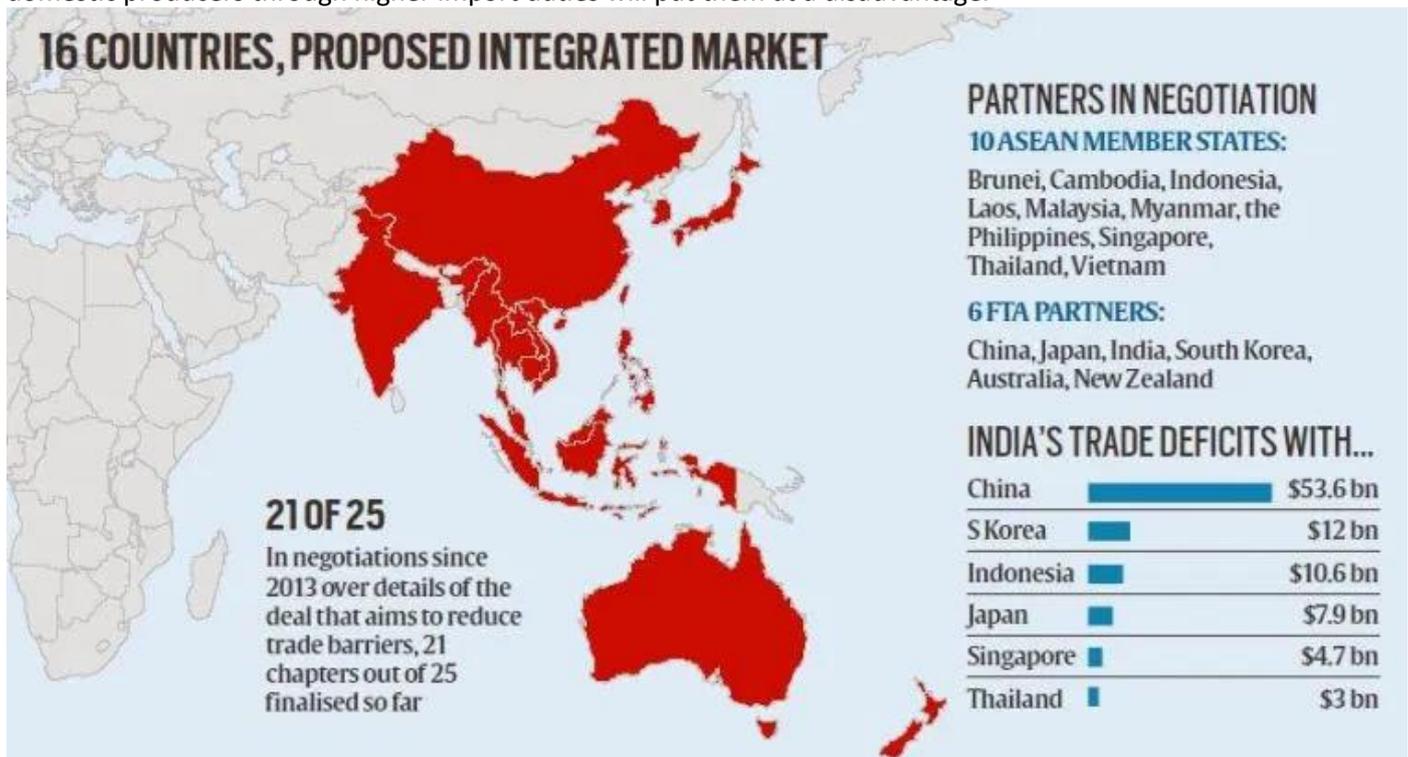
And what are the concerns?

Several industries feel India needs to be mindful of the amount of access it gives to its market. There is fear that some domestic sectors may be hit by cheaper alternatives from other RCEP countries. Apprehensions have been expressed that cheaper Chinese products would “flood” India.

Critics are also not confident that India would be able to take advantage of the deal, given its poor track record of extracting benefits from the FTAs with these countries. India’s trade gap with these countries may widen if it signs the RCEP deal, they say. (See figures with map above)

Industries like dairy and steel have demanded protection. The textile industry, which has already raised concerns about growing competition from neighbouring countries with cheaper and more efficient processes, fears the deal would impact it negatively.

There are some differences within industries. The bigger players in steel, for example, are apprehensive of the potential impact on their businesses; however, makers of finished goods have argued that limiting steel supply to domestic producers through higher import duties will put them at a disadvantage.



Why dairy is RCEP sticking point

It is the industry that is lobbying the hardest to keep its products out of the free trade agreement currently under negotiation among 16 countries to India's east and north. Why is this so?

Milk, in the Indian context, is also a 'superior' food with income elasticity of demand greater than one.

What makes milk and milk products such a big deal for India?

Milk is the country's largest "crop". In 2018-19, the estimated production of milk, at 187.75 million tonnes (mt), was more than that of paddy (174.63 mt) or wheat (102.19 mt). The value of milk output (Rs 5,63,250 crore at an average farm-gate rate of Rs 30/kg) far exceeded paddy's (Rs 3,05,602 crore at a minimum support price of Rs 1,750/quintal) and wheat's (Rs 1,88,030 crore at Rs 1,840/quintal). Milk is, moreover, a source of liquidity for farmers, as it is sold daily and generates cash to take care of routine household expenses, unlike other crops that are marketed only once or twice a year.

But milk matters equally to consumers in India, because it meets the animal protein/fat requirements of a significant portion of the population that is vegetarian.

Milk, in the Indian context, is also a 'superior' food with income elasticity of demand greater than one. This means that as incomes rise, the demand for milk goes up even more. The moment families experience some upward mobility, they are likely to put desi ghee (butter fat) rather than vanaspati (vegetable fat) on their rotis.

16 countries, proposed integrated market

So, where does the RCEP come in?

Global dairy trade takes place not in milk, but in the solids that derive from it — mainly milk powder, butter/butter oil, and cheese. India isn't a major player in the world market. Till the eighties, it used to import up to 50,000-60,000 tonnes of skim milk powder and 10,000-15,000 tonnes of butter oil annually, largely channelised through the National Dairy Development Board.

Over the past couple of decades, with sustained production increases, the country has become self-sufficient, or even marginally surplus. This is evidenced by its dairy product exports surpassing imports in most years (table 1), although their values are insignificant relative to both domestic output and global trade. Further, as can be seen from table 2, one reason for India's imports being low is the high tariffs, especially on milk powder (60%) and fats (40%).

Dairy industries, RCEP, Dairy industries RCEP, Regional Comprehensive Economic Partnership, what is RCEP, Dairy industry opposes RCEP, express explained, indian express Dairy industries, RCEP, Dairy industries RCEP, Regional Comprehensive Economic Partnership, what is RCEP, Dairy industry opposes

If dairy products are covered under an RCEP deal, India may have to allow members of the bloc greater access to its market, whether through phased duty reductions or more liberal tariff rate quotas (TRQs). There is an already existing TRQ for milk powder, which enables import of up to 10,000 tonnes per year at 15% customs duty, and quantities beyond that at the regular rate of 60%. The Indian dairy industry is resisting any enhanced TRQs or other import concessions, even if extended only to RCEP countries, as opposed to the US or European Union.

Which are the major global dairy players within the RCEP group?

Only New Zealand and Australia. The two countries together exported 19,37,000 tonnes of milk powder, 5,18,000 tonnes of butter/fat and 4,94,000 tonnes of cheese in 2018, accounting for 44.5%, 58.3% and 24.8% of the world trade respectively in these commodities. New Zealand, in particular, hardly has a domestic market for dairy products. In 2018, 93.4% of its milk powder, 94.5% of its butter, and 83.6% of its cheese production was exported. India's milk powder and butter/ghee shipments, by contrast, have barely touched 1,30,000 tonnes and 50,000 tonnes even in their best ever years of 2013-14 and 2018-19 respectively. But the country is the world's biggest market for milk and milk products — which will only grow with rising incomes and high elasticity of demand. Access to this market will obviously benefit the predominantly export-oriented dairy industry of New Zealand and Australia.

What are the specific dairy segments that overseas suppliers would target?

India's imports primarily comprise whey products and cheese, which have limited consumer markets in the country. For all the hype, the domestic market for cheese is just Rs 1,400-1,500 crore, of which Rs 900-1,000 crore goes for industrial use (basically pizza-making), and only the balance is sold in consumer packs. There may not be too many takers for foreign ice cream or yogurt brands either.

What New Zealand and Australia would really be eying is the Indian market for commodities, viz. milk powder and fat. That is where the volumes are — which Malaysia and Indonesia successfully exploited in palm oil, as did Argentina and Brazil in soyabean oil and Ukraine in sunflower oil.

RCEP could perhaps end up doing to dairy what the free trade agreement with the Association of Southeast Asian Nations (ASEAN) did in palm oil, fear many in the industry in India.

TABLE 1: INDIA'S DAIRY PRODUCTS TRADE (IN Rs CRORE)

	Exports	Imports
2010-11	1216.76	847.83
2011-12	647.79	1219.41
2012-13	2324.68	184.25
2013-14	4407.78	232.68
2014-15	2169.03	375.01
2015-16	1677.46	371.58
2016-17	1701.18	254.84
2017-18	1954.63	312.59
2018-19	3375.73	254.12
2018-19*	957.15	108.90
2019-20*	921.43	114.43

*April-August

Source: Department of Commerce

TABLE 2: INDIA'S DAIRY IMPORTS DUTY STRUCTURE

	Duty %	Imports (Rs cr)
Milk powder	60	8.55
Butter/fat	40	14.27
UHT milk*	30	12.69
Yogurt**	30	6.56
Cheese	30	70.85
Whey	30	85.57
Ice cream	30	24.8

*Includes cream; **Includes butter milk.

Source: Ministry of Finance and Department of Commerce

19.MAHABALIPURAM

S Swaminathan, author of Mamallapuram, a book on the architectural and sculptural achievements of the Pallavas, said Mamallapuram was the original name, even though the town is also called Mahabalipuram.

The venue of Prime Minister Narendra Modi's meeting with China's President Xi Jinping over Friday and Saturday has been referred to, interchangeably, Mamallapuram and Mahabalipuram. It is 56 km to the south of Chennai on the coast. The Ministry of External Affairs' media advisory mentions 'Mahabalipuram', and officials have been using that name in informal communication.

Today's seaside resort was once a bustling port that derived its name from Mamallan or 'Great Wrestler' — one of the names of Narasimhavarman I, the Pallava monarch who ruled from 630 AD to 668 AD, and who commissioned much of the architecture Mamallapuram is famous for.

BIRTH OF 'MAHABALIPURAM'

S Swaminathan, author of Mamallapuram, a book on the architectural and sculptural achievements of the Pallavas, said Mamallapuram was the original name, even though the town is also called Mahabalipuram. "The name Mahabalipuram emerged much later, some time in the Vijayanagara period (14th-17th centuries). But there is nothing to directly connect the Asura King Mahabali with Mamallapuram," he said.

The only, indirect link, he added, is the legend of Trivikrama carved in stone at Mamallapuram's famous Varaha Mandapam (Varaha Cave Temple). "Mahabali was killed by Trivikrama, the giant form of Vamana, the fifth avatar of Vishnu. Maybe that is the only connection that Mahabali has with Mamallapuram. But this Trivikrama panel too is just one of the many compositions there," he said.

After Independence, the prevalent Dravidian politics of Tamil Nadu made sure that Mamallapuram's original name was retained. 'Mamallapuram' was notified in a government gazette in 1957, and that name was reiterated when the ancient port town was declared a village panchayat in 1964. "Instead of the association with a mythological king (Mahabali), the governments here made sure that the original name in the memory of a Tamil king was restored," Swaminathan laughed.

The name Mamallapuram derives from Mamallan, or "great warrior", a title by which the Pallava King Narasimhavarman I (630-668 AD) was known.

While Narasimhavarman I is credited with excavating the stone caves of Mamallapuram, it was Mahendravarman I, Narasimhavarman's father who ruled from 600 AD to 630 AD, who was the pioneer of Pallava rock-cut architecture. The successors of Narasimhavarman I, especially his grandson Parameswaravarman I (670-695 AD) and his great grandson Narasimhavarman II (700-728 AD), continued to build in Mamallapuram. Narasimhavarman II, also known as Rajasimha Pallava, built the magnificent Shore Temple among others in Mamallapuram, as well as grand temples at several other places, including the famous Kailasanathar Temple at Kancheepuram.

The Descent of the Ganga/Arjuna's Penance in Mahabalipuram.

Mahabalipuram, or Mamallapuram, 56 km south of Chennai on the Tamil Nadu coast, where Prime Minister Narendra Modi will meet China's President Xi Jinping on October 11 & 12 in an informal Wuhan-style summit, had ancient links with Buddhism and China through the maritime outreach of the Pallava dynasty.

The setting speaks to several contemporary themes in India-China relations — and of contacts, both continuous and changing, across space and time. While the powerful symbolism of Mahabalipuram will

likely not succeed in influencing China's hard-nosed assertion over J&K and other issues with India, the remarkable historical significance of the venue bears underlining.

When the Pallavas ruled

The name Mamallapuram derives from Mamallan, or "great warrior", a title by which the Pallava King Narasimhavarman I (630-668 AD) was known. It was during his reign that Hiuen Tsang, the Chinese Buddhist monk-traveller, visited the Pallava capital at Kanchipuram.

Narasimhavarman II (c.700-728 AD), also known as Rajasimhan, built on the work of earlier Pallava kings to consolidate maritime mercantile links with southeast Asia.

Most interestingly, as historian Tansen Sen recorded in his 2003 work *Buddhism, Diplomacy and Trade: The Realignment of Sino-Indian Relations, 600-1400*, Narasimhavarman II sent a mission to the Tang court in 720 with a request that would seem unusual in the context of India-China relations today.

The emissaries of the Pallava king sought the permission of Emperor Xuangzong to fight back Arab and Tibetan intrusions in South Asia. And, "Pleased with the Indian king's offer to form a coalition against the Arabs and Tibetans, the Chinese emperor bestowed the title of 'huaide jun' (the Army that Cherishes Virtue) to Narayansimha II's troops", Sen wrote. The offer of help by the Pallava ruler, Sen noted, may have had more to do with furthering trade and for the prestige of association with the Chinese emperor, rather than any real prospect of helping him to fight off enemies in the faraway north.

The Descent of the Ganga/Arjuna's Penance, a rock carving commissioned by Narasimhavarman I, with its depiction of the Bhagirathi flowing from the Himalayas, may serve as a reminder of the geography of India-China relations, and their shared resources.

Tamil-Chinese links continued after the Pallavas, flourishing under the Cholas as the Coromandel coast became the entrepot between China and the Middle East. The links extended to a wider area beyond Mahabalipuram, through a layered history that has left a rich tapestry of society, culture, art and architecture, which is diverse and complex, and reaches up to modern times.

If he looks south from the platform of the 7th century Shore Temple, President Xi might be able to spot a key symbol of 20th century — the white domes of the Madras Atomic Power Station at Kalpakkam, 15 km down the coastline. MAPS, built in the 1980s, is India's first indigenously constructed power station.

India's secularism and diversity would not be on the agenda of the two leaders — however, their meeting ground is in a part of the country where this ethos is a lived reality. Hindu- and Muslim-majority villages alternate along that coast, each community having lived next to the other for centuries.

By the time Islam arrived on south India's east coast in the 9th century, Muslims had already started trading with China by maritime routes, Sen wrote. The trading missions that the Cholas sent to the Song court included Muslims. A trader named Abu Qasim was second-in-command of a mission sent in 1015; the next mission, in 1033, included one Abu Adil. "It is possible that both Abu Qasim and Abu Adil were members of the Tamil-speaking Muslim community on the Coromandel coast known as Ilappai," Sen wrote. Today, the ancient port of Marakanam is a fishing village, known for its Muslim boatmakers.

Continuing connections

In later centuries, the Coromandel coast retained its importance for trade between China and the west. In the 17th and 18th centuries, it was a staging post for the Dutch, French and British for control of the seas between South Asia and Southeast Asia, as the Europeans fought to protect their trade routes with China and other countries in the region.

The ancient port city of Pondicherry, 80 km south of Mahabalipuram, was a French colony famous for its Chinese exports known as “Coromandel goods”, including crepe de chine. Today the Union Territory, with its French legacy, Tamil residents, Bengali and international devotees of Sri Aurobindo, is among the most diverse and cosmopolitan of cities in South India.

After establishing their writ on the Coromandel Coast, the British expanded eastward and established control over the Straits of Malacca, essentially to protect their trade routes to China and the rest of the region.

Going back 1,300 years, the story of Mahabalipuram’s China connection

Among the colonial outposts on this coast is Sathurangapattinam, or Sadras, right next to Kalpakkam, where the Dutch East India Company built a fort, their second one on the east coast after establishing a capital at Pulicat, north of Chennai.

Sadras became a huge centre for the Dutch-controlled manufacture of cotton and muslin. The Dutch presence in the region grew rapidly after they established themselves in Java in 1603. They traded within Asia, buying textiles, metal, and porcelain, importing and exporting between India, China and Japan, to keep the spice trade going.

20.COALITION FOR DISASTER RESILIENT INFRASTRUCTURE

At climate summit in New York, PM Modi pushed the global Coalition for Disaster Resilient Infrastructure. As world observes International Day for Disaster Reduction, a look at the initiative India has taken

While speaking at the UN Secretary General's Climate Action Summit in New York on September 23, Prime Minister Narendra Modi had announced the launch of the Coalition for Disaster Resilient Infrastructure (CDRI) and invited all countries to join it. Ahead of International Day for Disaster Reduction on Sunday, a look at what CDRI is.

What it proposes to do

Envisaged as an international knowledge platform where countries can collaborate to make their existing and new infrastructure strong enough to withstand natural disasters, CDRI is the fruition of at least three years of discussions that India has had with more than 40 countries on this subject.

In simple terms, CDRI is an attempt to bring countries together to share and learn from the experiences of one another to protect their key infrastructure — highways, railways, power stations, communication lines, water channels, even housing — against disasters.

Need to protect infrastructure

Many countries, including India, have over the years developed robust disaster management practices that have helped in sharply reducing human casualties in a disaster. However, the economic costs of a disaster remain huge, mainly due to the damage caused to big infrastructure.

According to a recent estimate by the World Bank, Cyclone Fani, which hit Odisha in May this year, caused damage to the tune of \$4 billion. The losses in the Kerala floods last year could be in excess of \$4.4 billion, according to a post-disaster needs assessment report by the state government. In the US, there were 10 climate change disasters this year in which losses exceeded \$1 billion.

Much of the developing world is still building its basic infrastructure. Many developed countries are also in the process of replacing old infrastructure that have completed their lifetimes. Future infrastructure needs to take into account the heightened risks arising out of the increased frequency and intensity of extreme weather events and other adverse impacts of climate change. Even existing infrastructure would need to be retrofitted to make them more resilient. Disaster-proofing a project would involve changes in design, and use of newer technologies. These involve additional costs which, however, are only a fraction of the losses that a disaster can bring.

“We have pretty good evidence to show that wherever we have made investments in making infrastructure more resilient, over a period of time that investment has basically paid for itself,” said Kamal Kishore, member of National Disaster Management Authority. The NDMA is operating as the interim secretariat of CDRI as of now.

An international forum

Disaster preparedness and infrastructure creation are largely national endeavours. However, modern infrastructure is also a web of networked systems, not always confined to national boundaries. There are increasing numbers of trans-national and trans-continental highways and railways; transmission lines carry electricity across countries; assets on a river are shared. Damage to any one node can have cascading impacts on the entire network, resulting in loss of livelihoods and disruption in economic activity in places far away from the site of a disaster.

To make entire networks resilient is the main thought behind the Indian initiative of CDRI. The platform is not meant to plan or execute infrastructure projects. Nor is it an agency that will finance infrastructure projects in member countries. Instead, CDRI will seek to identify and promote best practices, provide access to capacity building, and work towards standardisation of designs, processes and regulations relating to infrastructure creation and management. It would also attempt to identify and estimate the risks to, and from, large infrastructure in the event of different kinds of disasters in member countries.

CDRI hopes to have as its members not just countries, but organisations like UN bodies, financial institutions, and other groups working on disaster management. It seeks to help member countries integrate disaster management policies in all their activities, set up institutions and regulatory provisions to ensure creation of resilient infrastructure, and identify and use affordable finance and technology.

CDRI and Belt Road Initiative

CDRI has sometimes been seen as India's response to the Belt Road Initiative, China's ongoing multi-billion-dollar programme to recreate the ancient Silk Route trading links. China is building massive new land and maritime infrastructure in several countries. India and some other nations view this as an attempt by China to use its economic and military heft to usurp strategic assets in other countries.

Though the comparisons are not surprising given the competing strategic interests of the two neighbours, the magnitude and purpose of the two initiatives are starkly different. Unlike BRI, CDRI is not an attempt by India to create or fund infrastructure projects in other countries. Having said that, international initiatives like these are not without any strategic or diplomatic objective.

CDRI and Solar Alliance

A more relevant comparison of CDRI can, however, be made with the International Solar Alliance (ISA) that India launched at the climate meeting in Paris in 2015. ISA, which has evolved into a treaty-based organisation with more than 50 countries already signed up, aims at a collective effort to promote the deployment of solar energy across the world. Its objective is to mobilise more than \$1 trillion into solar power by 2030, and to deploy over 1,000 GW of solar generation capacity in member countries by that time. India hosts ISA, with its headquarters in Gurgaon.

The CDRI secretariat too would be based in New Delhi. While it is not envisioned to take the shape of a treaty-based organisation, CDRI can be seen as complementing ISA's efforts. ISA is about climate change mitigation — deployment of more solar energy would bring down the reliance on fossil fuels, thereby reducing greenhouse gas emissions. CDRI, on the other hand, is about adapting to climate change, a need that is inevitable.

With these two initiatives, India is seeking to obtain a leadership role, globally, in matters related to climate change.

Kishore of NDMA stressed, however, that CDRI is more than just a climate change initiative. "It does not matter whether the infrastructure is risk from climate-induced disasters or those taking place due to geophysical reasons, like earthquakes, volcanoes, landslides or tsunamis. The infrastructure needs to be strengthened to cope with all these," he said.

21.GLOBAL COMPETITIVENESS INDEX

'India slips to 68th place on global competitiveness index'

India has fallen 10 places to the 68th rank on the Global Competitiveness Index, released by the World Economic Forum (WEF), largely on account of improvement witnessed by several other economies

WHAT IS THIS INDEX?

The Global Competitiveness Index, which was launched in 1979, maps the competitiveness landscape of 141 economies through 103 indicators organised into 12 pillars

SOUTH ASIAN NATIONS' RANKING:

84 Sri Lanka

105 Bangladesh

108 Nepal

110 Pakistan

China is ranked 28th (the highest ranked among the BRICS)

THE TOPPERS



INDIA'S SHORTCOMINGS

■ India's financial sector is relatively deep and stable, but the high delinquency rate continues to weaken its banking system

■ Limited ICT adoption, poor health conditions and low

healthy life expectancy

■ Product market efficiency undermined by lack of trade openness

■ Labour market characterised by a lack of worker rights' protections, underdeveloped active labour market policies

■ Low ratio of female workers to male workers of 0.26; India is ranked at 128th place

■ Low rank, i.e. 118th, in terms of meritocracy and incentivisation

BRIGHT SPOTS

■ India well ahead of most emerging economies and on par with several advanced economies in terms of innovation

■ In terms of the market size, India is ranked third, while it has got the same rank for renewable energy regulation

The slippage this year is not just because India's score fell, albeit marginally, but also because several other close competitors surged ahead

The slippage this year, however, is not just because India's score in the Global Competitiveness Index fell, albeit marginally, but also because several other close competitors surged ahead. (File)

The latest edition of the Global Competitiveness Report, which was first launched in 1979, ranks India at 68th position among 141 countries – that's 10 ranks below its 2018 position in the same index. The slippage this year, however, is not just because India's score in the Global Competitiveness Index fell, albeit marginally, but also because several other close competitors surged ahead.

What is GCI?

This is the fourth version of the global competitiveness index – hence referred to as GCI 4.0 – and it was introduced in 2018. The 141 countries mapped by this year's GCI account for 99 per cent of the world's GDP.

The basic notion behind the GCI is to map the factors that determine the Total Factor Productivity (TFP) in a country. The TFP is essentially the efficiency with which different factors of production such as land, labour and capital are put to use to create the final product. It is believed that it is the TFP in an economy that determines the long-term economic growth of a country.

So what factors does GCI map?

According to the report, the GCI 4.0 is "the product of an aggregation of 103 individual indicators, derived from a combination of data from international organizations as well as from the World Economic Forum's Executive Opinion Survey".

The GCI 4.0 tracks data and/or responses on 12 factors divided into 4 broad categories. The first category is the "Enabling Environment" and this includes factors such as the state of infrastructure, institutions, the

macroeconomic stability of the country and its ability to adopt new technology. The second category is “Human Capital” and includes health and level of skills in the economy. The third is the state of “Markets” such as those for labour, product, financial and the overall market size. The last category is “Innovation Ecosystem” which includes business dynamism and innovation capability.

Why did India fall in the Global Competitiveness Index?

Each of these 12 factors will further include sub-factors. For example, within “Institutions” under the “Enabling Environment” category, the GCI tracks the performance on detailed factors such as the performance of the public sector, the level of transparency and corruption, the state of corporate governance, the incidence of terrorism etc.

Overall, there are a total of 103 individual factors that GCI 4.0 maps to arrive at the final result.

How are countries ranked?

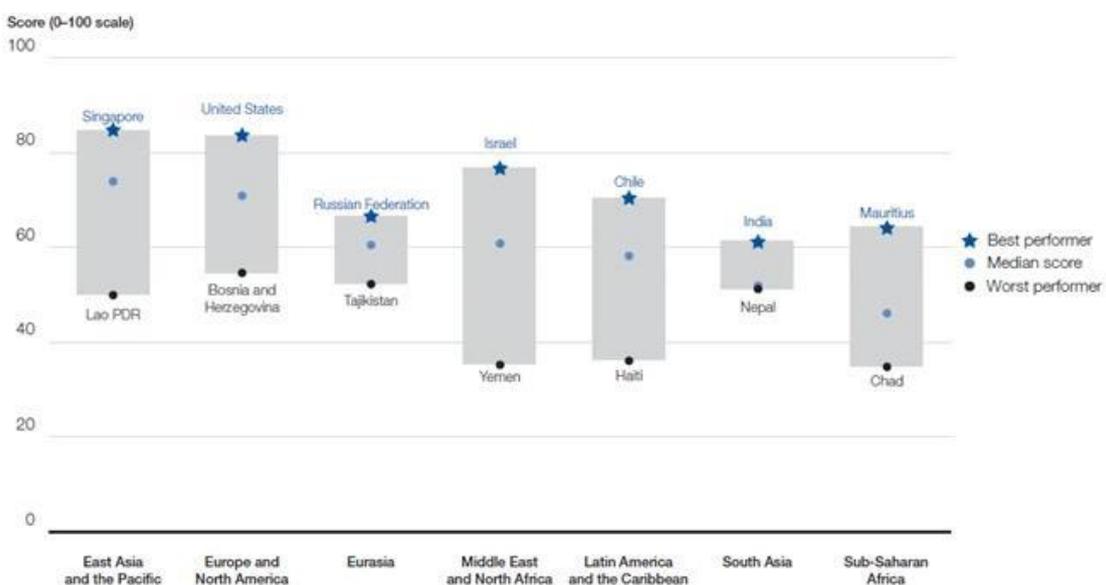
According to the report, “a country’s performance on the overall GCI results as well as each of its components is reported as a ‘progress score’ on a 0-to-100 scale, where 100 represents the ‘frontier’, an ideal state where an issue ceases to be a constraint to productivity growth”. For example, the average GCI score across the 141 economies that were studied this year was 60.7. This means that the ‘distance to the frontier’ stands at almost 40 points.

How did India fare?

India’s 2019 overall score (61.4) fell by merely 0.7 when compared to its 2018 score. But this slippage was enough for it to slide down 10 ranks in the list. The report states: “In South Asia, India, in 68th position, loses ground in the rankings despite a relatively stable score, mostly due to faster improvements of several countries previously ranked lower”. Some of the countries that were close to India and made rapid progress were Colombia (which had a score of 62.7, up 1.1 points from last year, and now ranked 57th), Azerbaijan (62.7, +2.7, 58th), South Africa (62.4, +1.7, 60th) and Turkey (62.1, +0.5, 61st).

India trails China (28th, 73.9) by 40 places and 14 points. But within South Asia (see chart), it is the best performer and is followed by Sri Lanka (the most improved country in the region at 84th), Bangladesh (105th), Nepal (108th) and Pakistan (110th).

Figure 1: Competitiveness gap within regions
Best, median and worst GCI 4.0 2019 scores, by region



Source: World Economic Forum analysis.