



## CURRENT AFFAIR

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## POLITY

### 1. High on hysterectomies: Losing wombs to medical malpractice

**Four Karnataka hospitals have been suspended for performing the procedure unnecessarily, often on poor young women**

- An unusually large number of hysterectomies performed in Kalaburagi district of Karnataka has led to a State government probe, and an order suspending the licenses of four hospitals.
- During a 30-month period, the four institutions are said to have removed the uterus of women, often without medical justification and allegedly for entirely commercial reasons.

### 2. Gauging the breeze in Manipur

**The 2015 Framework Agreement on the Naga issue is a key concern in these Assembly elections**

- Manipur is to vote in two phases, on March 4 and 8, to elect the 60 members of the Legislative Assembly. The term of the current Legislative Assembly ends on March 18.

#### **Factors that matter**

- There are three major factors that are critical to Manipur's electoral politics.
- The first and perhaps most **important factor is the territorial integrity of the State**. The majority of Manipur's population, especially those in the valley, are worried about the contents of the [Framework Agreement](#) signed between the BJP government at the Centre and the NSCN-(IM) in August 2015.
- BJP has categorically stated that the agreement would not infringe upon the integrity of Manipur and its territorial boundary.
- Many observers are of the view that the creation of seven new districts in December last year was a judicious plan by the Congress government to prevent or oppose the concept of greater or southern Nagaland from materialising.
- The [economic blockade](#) imposed by the UNC since November 1 last year is also seen by many as a move to strengthen the argument for a separate administration for the Nagas of Manipur. The UNC's main demand for ending the blockade is a rollback of the new districts, which the Congress government thus far rejects.
- By [creating new districts](#) such as Kangpokpi and Jiribam, the people here would now oppose any move of being made part of a greater or southern Nagaland. In other words, the Congress government has successfully involved the people of the new districts in protecting the State's territorial integrity.

- The second factor is money power. Since many voters, especially in the hill or rural areas, are in need of financial assistance for their daily necessities, such as food, clothing and educational expenses, these issues will influence how votes are cast.

#### **Influence of armed groups**

- The third factor is the role of armed groups. There are more than two dozen armed groups operating in the State, with varying degrees of influence in certain areas. Though some of them have signed a ceasefire or suspension of operations with the government, there are groups that have ongoing conflicts with both the State and Central forces.
- Though necessary security arrangements have been made for the polls, there is still a possibility that the armed groups could use different forms of intimidatory tactics to influence the vote.

### **3. What exactly is a money bill?**

#### **Or, why we need to reconsider the Aadhaar Act, with all its implications for privacy**

- The Supreme Court will begin hearing final arguments next month on a writ petition challenging the validity of the **Aadhaar (Targeted Delivery of Financial & Other Subsidies, Benefits & Services) Act, 2016** — or the Aadhaar Act as money bill or not.
- A detailed report differing with the government of the time over critical aspects of the bill, **particularly its treatment of concerns over privacy and protection of data security**.
- A money bill is defined by **Article 110 of the Constitution**, as a draft law that contains only provisions that deal with all or any of the matters listed therein.
  - These comprise **a set of seven features**, broadly including items such as the imposition or regulation of a tax; the regulation of the borrowing of money by the Government of India; the withdrawal of money from the Consolidated Fund of India; and so forth.
- In the event a proposed legislation contains other features, ones that are not merely incidental to the items specifically outlined, **such a draft law cannot be classified as a money bill**.
- Article 110 further clarifies that in cases where a dispute arises over whether a bill is a money bill or not, the Lok Sabha Speaker's decision on the issue shall be considered final.

#### **Flawed counterpoint**

- The government's response is that the Speaker's decision to classify a draft legislation as a money bill is immune from judicial review, and that, in any event, the Aadhaar Bill fulfilled all the constitutional requirements of a money bill. A careful examination of these arguments will, however, show us that the government is wrong on both counts.
- To be fair, the assertion that the Speaker's decision is beyond judicial review finds support in the **Supreme Court's judgment in Mohd. Saeed Siddiqui v. State of UP (2014)**. Here, a three-judge bench had ruled, in the context of State legislatures, that a Speaker's decision to classify a draft statute as a money bill, was not judicially reviewable, even if the classification was incorrect. This is because the

error in question, the court ruled, constituted nothing more than a mere procedural irregularity.

- But there are significant problems with this view. Chief among them is the wording of Article 110, which vests no unbridled discretion in the Speaker. The provision requires that a bill conform to the **criteria prescribed in it for it to be classified as a money bill**. Where a bill intends to legislate on matters beyond the features delineated in Article 110, it must be treated as an ordinary draft statute. Any violation of this mandate has to be seen, therefore, as a substantive constitutional error, something which *Siddiqui* fails to do.
- Most notably, it brushes aside the verdict of a Constitution Bench in ***Raja Ram Pal v. Hon'ble Speaker, Lok Sabha (2007)***, where the court had ruled that clauses that attach finality to a determination of an issue do not altogether oust the court's jurisdiction.
- That is, the bench held, there are numerous circumstances where the court can review parliamentary pronouncements. These would include instances where a Speaker's choice is grossly illegal, or disregards basic constitutional mandates, or, worse still, where the Speaker's decision is riddled with perversities, or is arrived at through dishonest intentions.

#### **What Aadhaar Act shows?**

- A simple reading of the Aadhaar Act would show us that its contents go far beyond the features enumerated in Article 110. If anything, it is the provisions in the legislation that pertain to the Consolidated Fund and its use that are incidental to the Act's core purpose — which, quite evidently, is to ensure, among other things, the creation of a framework for maintaining a central database of biometric information collected from citizens.
- Ordinarily, draft legislation is classified as a money bill when it provides for funds to be made available to the executive to carry out specific tasks. In the case of the Aadhaar Act, such provisions are manifestly absent.
- The Speaker's decision to confirm the government's classification is, therefore, an error that is not merely procedural in nature but one that constitutes, in substance, an unmitigated flouting of Article 110.
- The government has argued, with some force, that Indian citizens possess no fundamental right to privacy. This argument, however, is predicated on judgments of the Supreme Court that have little contemporary relevance, and that have, in any event, been overlooked in several subsequent cases where the court has clarified the extent of the liberties that the Constitution guarantees.

#### **Right to privacy**

- The Aadhaar Act permits the creation of a database of not only biometric information but also various other private data, without so much as bothering about safeguards that need to be installed to ensure their security.
- It even has the effect of negating altogether the Rajya Sabha's legislative role, making, in the process, a mockery of our democracy.
- It is imperative, therefore, that the court refers the present controversy to a larger bench, with a view to overruling *Siddiqui*.

#### **4. NOTA and the Indian voter**

### **The perceived cynicism of voters against the political class seems exaggerated**

- Three years, one Lok Sabha election and four rounds of Assembly elections have passed since the introduction of 'None of The Above' (NOTA) option in the Indian electoral system.
- The 2016 Assembly elections also saw some active canvassing for NOTA, which allows voters to express their dissent against all the contestants.

### **The patterns**

- NOTA polling figures are still small. On an average, the maximum NOTA vote share has not crossed 2.02% of the total votes polled in any election cycle.
- NOTA was introduced in India following the 2013 Supreme Court directive in the *People's Union for Civil Liberties v. Union of India* judgment.
- NOTA in India does not provide for a 'right to reject'. The candidate with the maximum votes wins the election irrespective of the number of NOTA votes polled.
- NOTA button saw its debut in the 2013 Assembly elections held in four States — Chhattisgarh, Mizoram, Rajasthan and Madhya Pradesh and the former Union Territory, Delhi.
- In these States and Delhi, NOTA constituted 1.85% of the total votes polled. It increased to 2.02% in the 2015 Assembly elections held in Delhi and Bihar. While Delhi polled a mere 0.40%, Bihar saw 2.49% of NOTA votes, which remains the highest NOTA votes polled so far in any State in Assembly elections.
- In the 2016 Assembly elections held in Assam, West Bengal, Kerala, Puducherry and Tamil Nadu, NOTA vote share dropped again to 1.6%. In the 2014 Lok Sabha polls, NOTA constituted 1.1% of the total votes.

### **Some early pointers**

- A quick analysis of NOTA usage in all elections so far does suggest some interesting early pointers.
- First, reserved constituencies have seen a relatively larger number of NOTA votes, which points to the continued social prejudice against political reservation for SC/STs.
- Second, constituencies affected by left-wing extremism have also recorded higher NOTA performance and here probably it served as an instrument of protest against the State itself.
  - It is important to note that these voters have used the democratic means of NOTA to express their resentment rather than boycotting the polls outright.
- Last, NOTA figures are comparatively higher in those constituencies which have seen a direct contest between the Congress and the Bharatiya Janata Party. One may read into this some indication of the people's disenchantment with two mainstream political parties and yearning for alternatives.

## **5. Amnesty faults sedition law, curbs on NGO**

### **Criticizes curbs on NGOs, attacks on activists, journalists**

- Amnesty International's State of the World's Human Rights Report 2016-17 has expressed concern over a range of human rights violations in India.
- The report, being released worldwide on Wednesday, slammed the use of legislation such as the Foreign Currency (Regulation) Act (FCRA) and the sedition law to silence government critics and crack down on civil society organizations.
- It noted, in particular, the suspension of the FCRA registration of Lawyers Collective, and the government's refusal to renew the FCRA licences of 25 NGOs "without offering valid reasons," which constitute a violation of the **right to freedom of association**.
- In a sub-section on India titled '**Caste-based discrimination and violence**', the report noted that "Dalits and Adivasis continued to face widespread abuses".
- It also highlighted the nationwide protests following the suicide of Dalit student Rohith Vemula, the attack on Dalit men by a cow vigilante group in Una, and the discrimination faced by Dalits in accessing social spaces and public services.
- Noting that crimes against children in India grew by 5% in 2015, the report drew attention to India's amendment to the child labour law, which allows children under 14 to work in "family enterprises", and children between 14 and 18 years to work in occupations not classified as "hazardous."
- It also pointed out that India's draft national education policy released last August "made no mention of human rights education."

## **6. Necessary limit, price control for cardiac stents**

### **Price control for cardiac stents is inevitable to promote access to treatments**

- Capping the prices of medical stents, which are used to treat coronary artery disease, by the **National Pharmaceutical Pricing Authority (NPPA)** is an extreme regulatory measure necessitated by the market failure that afflicts the overall delivery of health care in India.
- Rising costs have led to impoverishment of families and litigation demanding regulation.
- Given the overall dominance of private, commercial, for-profit health institutions, and the asymmetry confronting citizens, correctives to bring about a balance are inevitable.
- Nearly two-thirds of the **high out-of-pocket expenditure** on health incurred by Indians went towards drugs; even the meagre research data available showed that there was **irrational use of medical technologies**, including **cardiac stents and knee implants**.
- Regulated prices can, therefore, be expected to make stents more accessible to patients who really need them, helping them avoid using up the weak insurance cover available, while also reducing the incentive for unethical hospitals to use them needlessly.
- It is worth recalling that there are over 60 million diagnosed diabetics in the country, and the average age at which the first heart attack strikes Indians is 50, a decade earlier than people in developed nations. At appropriate prices, and with a health system that pools the cost among all citizens, it would be possible to provide access to stents and other treatments for all.
- In the case of cardiac stents, this argument does not hold water since stakeholder consultations held by the NPPA in January revealed that there are 'huge unethical markups' in the supply chain.



- It would serve the cause of medical innovation if costing is transparent, and a system of risk pooling is introduced to help patients get expensive treatment without high out-of-pocket spending.
- It was estimated five years ago by the Planning Commission's expert group on universal health coverage that raising spending on public procurement of medicines to 0.5% of GDP (from 0.1%) would provide all essential medicines to everyone. What is necessary, then, is for a two-pronged approach to improve access to medicines and technology.
- The Centre should monitor expenditures jointly in partnership with the community, use regulation where needed, and raise public spending on health. Several developing countries have moved ahead on this path.
- Well-considered price control is a positive step, but more needs to be done. The latest measure provides an opportunity to expand the availability of stents, and by extension angioplasty procedures, in the public health system.
- District hospitals should offer cardiac treatments uniformly. This should be a priority programme to be completed in not more than five years.

## **ECONOMICS**

### **1. Set timeline on NPAs**

#### **Says surgical restructuring required to boost balance sheet**

- For resolution of stressed assets, there is suggestion of a **private Asset Management Company (PAMC)**, which would be suitable for sectors where the **stress is such that assets are likely to have economic value in the short-run**, with moderate levels of debt forgiveness.
- Some of the sectors seeing heavy stress are metals, telecom, and textiles.
- In terms of timeline, the banking sector will be asked to resolve and restructure, say its 50 largest stressed exposures in these sectors, by December 31, 2017.
- The rest can follow a similar plan in six months thereafter
- Possibly a **sixth of public sector banks' gross advances are stressed**, and a significant majority of these are in fact non-performing assets (NPAs)
- For banks in the worst shape, the share of assets under stress has approached or exceeded 20%.

#### **NAMC model**

- The other model suggested is that of a **National Asset Management Company (NAMC)**, which would be necessary for sectors where the problem is not just one of excess capacity but possibly also of economically unviable assets in the short- to medium-term.

#### **'Need to create bad bank quickly'**

- Reserve Bank of India to set up an institution similar to a "bad bank," saying urgency was needed to address troubled loans.
- Delaying a clean-up would further reduce private-sector investment

- Banks had record stressed loans of \$133 billion, or 12.34% of their total loans, as of September.

## **2. 'Legally vetted' pact on services tabled at WTO**

- India has submitted to the World Trade Organisation (WTO) a legally vetted proposal on a global services pact, that among other things, aims to ease norms for movement of skilled workers across borders for short-term work.
- The proposal for a **Trade Facilitation in Services (TFS) Agreement** will be taken up by an expert committee at the WTO headquarters in Geneva during March 14-17, following which it will be put up for discussion among all the WTO members.
- **The proposed pact also aims to ensure portability of social security contributions, a single window mechanism for foreign investment approvals and cross-border insurance coverage to boost medical tourism.**
- The TFS proposal is on the lines of the Trade Facilitation Agreement (TFA) in Goods.
- The proposed TFS pact is also about 'facilitation' – that is "making market access 'effective' and commercially meaningful and not about 'new' (or greater) market access."
- Meanwhile, the TFA in Goods — adopted by the WTO Members in 2014 — entered into force
- According to the WTO Director General Roberto Azevêdo, the TFA in Goods aims to streamline, simplify and standardise customs procedures. By doing so, it will help to cut trade costs around the world, he said in a statement.

### **TFA in goods**

- By 2030 the (TFA in Goods) Agreement could add 2.7% points per year to world trade growth and more than half a percentage point per year to world GDP growth.
- It will lead to effective functioning of ports and reduce transaction costs. Logistics will improve, goods will move faster. Besides, since all the ports will be connected electronically, we will have export and import data on a real time basis.

## **3. Plan to allow larger firms to shut shop sans govt. nod**

- The Labour Ministry has proposed that factories with up to 500 workers be allowed to lay off workers or shut shop without seeking government permission, in a bid to give firms flexibility in hiring and firing employees.
- At present, factories with up to 100 workers are allowed to go in for retrenchment, lay-off or closure without seeking government permission, as per the Industrial Disputes Act, 1947.

### **Single code stalled**

- In May 2015, the Labour Ministry had proposed integrating three labour laws — the Trade Unions Act, the Industrial Disputes Act and the Industrial Employment (Standing Orders) Act — into a single code for industrial relations.

- It had then also proposed allowing factories with up to 300 workers to retrench workers or close down without seeking official sanction.
- The Labour Ministry may back its latest proposal to increase the **threshold limit for applicability of chapter V-B of the Industrial Disputes Act**, citing hard data from Sixth Economic Census report released last year.
- The data shows that around **99% of a total of 4.53 crore non-agricultural establishments employed less than 100 workers in 2013-14** and were allowed to retrench workers or close shut shop without government permission.
  - Most of the establishments in India needn't take government permission to retrench workers or close their set up. So, the amendments will only impact a very small proportion of the total establishments in the country.
- It is incontestable that the law on prior permission has a chilling effect on new investors,
- The Rajasthan government increased the threshold limit under the I-D Act in 2014 but there has been no change in the business development scenario in the State in last three years as per our assessment

#### **4. Wind tariffs at a low of Rs. 3.46 per unit**

- Wind power tariffs closed at ₹3.46 per kWh in India's first-ever auction for wind energy projects
- The bid was called by government-owned Solar Energy Corporation of India for 1 GW of wind capacity.
- Such low tariffs in wind energy come on the back of historically low solar tariffs achieved in a recent auction of a total capacity of 750 MW.

#### **5. Getting the basics wrong**

**Unlike the 'Economic Survey' proposal, the idea behind a universal basic income is one of redistribution**

- The [Economic Survey 2016-17](#) proposed introducing a universal basic income in India, and has devoted an entire chapter to this new idea.
- A universal and unconditional income transfer to all citizens

#### **The experiment in Europe**

- The main features of universal basic income are that it is provided by the state to all citizens on an individual basis, without a means test and without a work requirement.
- An example of universal basic income is the Finnish proposal to provide unemployed citizens between the ages of 25 and 58 a monthly income of €560. In the experiment currently under way, the monthly income is being provided to 2,000 randomly selected unemployed persons irrespective of other income and whether that falls below a certain minimum (that is, the "means test") and

irrespective of whether they are seeking work, in job-related training, or even find part-time employment (that is, the “work requirement”).

- In other words, universal basic income, as proposed and discussed in Europe, is a substitute for means-tested income benefits, with certain work requirements (such as undergoing job training).
- **Existing guaranteed incomes schemes** are usually targeted or means-tested, that is, dependent on level of income and only available to those below a threshold level of income. It is often linked to employment status.
- The core of the concept of basic income is the “absence of the means test and the absence of the work test”, that is, it separates the income benefit from eligibility based on current levels of income and from employment status.
- The most commonly discussed alternative to universal basic income **is a negative income tax**. This is a scheme in which, for individuals below a certain income threshold, not only is the income of a household not taxed, but the household receives a tax credit that is the difference between the basic income or guaranteed income and tax liability.
- Universal basic income may be cheaper to operate than a negative income tax. The negative income tax, of course, assumes a country where all citizens file tax returns.

#### **Distortions in Indian proposal**

- *Economic Survey* wants universal basic income not to supplement, but to replace, all existing anti-poverty and social welfare programmes.
- It is thus technically and ethically wrong to compare the costs and benefits of universal basic income with those from a range of subsidies relating to food and nutrition (public distribution, school meals, Integrated Child Development Services), education, and sanitation, as is done in the *Economic Survey*.
- The second wrong is thus the argument that the universal basic income should replace **all current in-kind and cash transfers**.
- The third wrong, and one that goes against the core philosophy of universal basic income, is the *Economic Survey*’s assertion that “universal basic income is not framed as a transfer payment from the rich to the poor.”
- If a basic income is added to existing tax-benefit schemes, “the comparatively rich would need to pay both for their own basic income and for much of the basic income of the comparatively poor.”
- The literature discusses different ways that funds for the universal basic income could be raised, such as through progressive taxation or a specific earmarked tax, or even a consumption tax. The bottom line, whichever way, is that the rich have to pay for this universal provision.
- In terms of the level of basic income, the higher it is, the “higher the average rate of income tax, and, therefore the greater the redistribution from the comparatively rich to the comparatively poor (Parijs, 2005).” While the basic income is given to all, the manner in which the basic income is funded has to ensure that society transfers resources from the rich to the poor.

- The philosophy behind universal basic income is clearly one of redistribution. It is not one of taking existing benefits, whether in the form of in-kind (such as food subsidies) or in cash transfers (such as maternity benefit), and dividing it up among all individuals as cash.

## **INTERNATIONAL RELATIONS**

### **1. India, Israel to jointly develop missile for Army**

**H17,000 - crore deal approved by Cabinet Committee on Security ahead of Modi's likely visit to Tel Aviv in June**

- India has approved a deal to jointly develop a medium range surface-to-air missile (MR-SAM) system for the Army in a ₹17,000-crore deal.
- This is the latest in a series of other variants of SAM systems for the Navy and the Air Force being jointly developed with Israeli help under deals estimated at billions of dollars.
- The deal is for 200 missiles for five regiments, each getting 40 units. The missile has a range of 50-70 km.
- The system will be based on the older Barak system of Israel, which is in use in India. The systems will be manufactured in India and would have an 80% indigenous content.
- The two countries are also in an advanced stage of negotiations for the purchase of two more long-range Phalcon Airborne Warning And Control System (AWACS). The CCS had approved the deal for additional AWACS last year that is expected to cost ₹7,500 crore.

#### **Russian partnership**

- India now operates three Phalcon AWACS with Israeli radars mounted on Russian IL-76 transport aircraft, under a \$1-billion tripartite deal with Russia, signed in 2003.
- Officials said they were hopeful of a deal on for additional long-range drones.

### **2. INDIA-CHINA**

**India-China cooperation on Afghanistan could help bring bilateral ties out of the 2016 freeze**

- In Afghanistan, where both **China and India see potential for investment** and share concerns over the rise of radicalism and terrorism, there are many avenues for cooperation.
- The fact that Beijing initiated the special talks by inviting Indian officials who deal with Afghanistan and proposed a **"joint development project"** encourages the conclusion that China is unwilling to have its options cramped by Pakistan's reservations about India's role in Afghanistan.
- There was broad agreement on trade and economic ties, with Chinese officials reportedly praising India's measures to **welcome investment** and **facilitate visas** for closer business ties.

- On the issues that dominated the India-China narrative in 2016, particularly India's bid for Nuclear Suppliers Group membership and to have Masood Azhar designated a global terrorist at the UN, there was little movement
- New Delhi must prepare for the larger challenge this year that will inevitably come from **China's Belt and Road Initiative (B&RI, or One Belt, One Road)**. Through the mega infrastructure and trade project, China has plans in place to reach out to each one of India's land and maritime neighbours, most of whom have signed up for it.
- In May, a conference hosted by President Xi Jinping will bring all of India's neighbourhood to Beijing, with the exception of India.
- India has decided to not join the B&RI and will not attend even as an observer as the **\$51-billion China Pakistan Economic Corridor**, now an integral part of the B&RI initiative, runs through areas of Pakistan-occupied Kashmir.
- His threat of abandoning the **"One China" policy**, and backing down on it after talks with Mr. Xi, should indicate the dangers of depending on a consistent U.S. policy on other issues in the region for India as well.
- To that end, the strategic dialogue was divided into five different "sub-groups" — Afghanistan, nuclear issues, United Nations including the 1267 designation committee, bilateral issues, and consular and visa matters, or people-to-people ties
- On Afghanistan, it is learnt that the Chinese government, which proposed a separate discussion, had expressed its "admiration" for India's work on developmental projects, including the Salma Dam in Herat.

### **3. INDIA-BANGLADESH**

- India's [decision](#) to allow its border roads in Mizoram and Tripura to be used by Bangladeshi forces as they construct border outposts in the inhospitable terrain of the Chittagong Hill Tracts shows just how far the two countries have come to bridging their trust deficit.
- Prime Minister Sheikh Hasina will visit India in early April, it will be her first bilateral trip to India since 2010, when the MoU for the [Land Boundary Agreement](#) was originally signed.
- There is speculation about a defence partnership agreement, movement on the Teesta water-sharing agreement, the Ganga water barrage project, and other energy and connectivity projects.
- However, **both New Delhi and Dhaka** would be aware of the possible bumps in the road ahead. Some of these involve the Centre and the affected Indian States. For instance, water-sharing is a highly emotive subject, and movement on Teesta water-sharing has been held up largely because of West Bengal's reservations.
- To address them, the Central government needs to reach out to Chief Minister Mamata Banerjee. Similarly Bihar Chief Minister Nitish Kumar has raked up the Farakka Barrage project.
- For Ms. Hasina, the political worries are greater. She faces an election in 2018, and with the opposition accusing her of being soft on India, she cannot be seen to be returning home empty-handed on the water question.

- Also, while the border issue has been resolved, border firing has not ceased, an issue Ms. Hasina's rivals use to target her.
- Meanwhile, she faces the task of addressing India's mistrust over Chinese investment in Bangladesh, with \$38 billion pledged in infrastructure cooperation and joint ventures during President Xi Jinping's visit last year.

#### **4. Act East policy promoting ties with Asia-Pacific region'**

- India's "Act East" policy aimed at reviving age-old ties with the Cambodia, Laos, Myanmar and Vietnam (CLMV) nations has strengthened trade and investment in the Asia-Pacific region and encouraged manufacturers to create value chains with these countries.
- India and the CLMV countries could deepen each other's manufacturing capabilities, learn from each other's experiences and create a stronger regional platform for trade and commerce.
- India's trade with the *CLMV nations* has grown ten times from 1.5 billion U.S. dollars to more than 10 billion U.S. dollars during the last 10 years.
- If the Indian manufacturers set up businesses in countries such as Myanmar, they would get benefit under the **generalised system of preferences (GSP) for export** to the U.S. and European Union.

#### **Less duty for exports**

- The **GSP gives the benefit of zero or less duty for exports** from least developed countries to the U.S. and E.U.
- CLMV countries were actively invited as partner in "Make in India" programme, while affirming that India would participate in the **Asia - Pacific region's manufacturing growth** and **develop a strong India - CLMV vertical** within the ASEAN market.
- Land and sea connectivity with the South-East Asian nations was being enhanced to boost trade, with the work having started on projects such as Kaladan Multi-Modal Transit Transport connecting Kolkata with Sittwe seaport in Myanmar.
- A proposal to create a ₹500-crore project development fund to increase economic presence in Cambodia, Laos, Myanmar and Vietnam, which can act as gateways for market access to China and E.U.
- **An increased regional connectivity, reduction in transaction cost of trade and skill development** were imperative if the **India - CLMV trade and tourism** were to reach their potential.

#### **5. The IS challenge**

**What India should and shouldn't do to stop the group from striking roots among its young**

- The [arrest of two suspected Islamic State associates](#) on Sunday from Gujarat once again raises the question whether the terrorist group is finding support in India.
- The IS thrives on support from foreign jihadists, largely the young.

- It used two tactics — urging sympathisers either to travel to Iraq or Syria, its strongholds, and join the war, or carry out terror attacks in their own countries after declaring allegiance to the 'Caliph', Abu Bakr al-Baghdadi.
- India has remained largely insulated from this trend. The number of Indians to have joined the ranks of the IS is very small. The number of Indians who have joined the IS was 23, compared to 760 from the U.K. and 150 from the U.S.
- Given the syncretic nature of Indian Islam, it is extremely difficult for groups such as the IS to become popular among Muslims, as it did in parts of Iraq and Syria.
- But lone- wolf attacks, inspired by the IS world view and tactics, could pose security risks.
- The IS is not recruiting people through local communities as in the case of other terror organisations or, as in Pakistan and Afghanistan, through madrasas. The IS's medium is the Internet. It reaches out through online propaganda.
- The outreach to South Asia should worry India. Better coordination between the state and Muslim religious leaders in countering radicalisation and having in place specific de-radicalisation programmes, as western governments do.

#### **6. INDIA-US WTO Dispute Settlement Mechanism**

**The WTO dispute that India lost over solar power and the one that it has now filed against the U.S. are similar. It is best for both countries to find an amicable solution**

- India and the U.S. have been filing a number of disputes against each other, challenging the other's domestic content requirement in the renewable energy sector.
- The last was in September 2016 when India requested consultations with the U.S. under the **dispute settlement system** regarding alleged domestic content requirements and subsidies provided by eight U.S. states.
- India alleges that some US states have been granting subsidies to local manufacturers in the renewable energy industry along with the requirement that the products be made domestically.

#### **The WTO ruling**

- JNNSM required that 20 gigawatt (GW) of solar power should be generated from domestically produced modules or solar cells.
- The WTO found that the mandatory domestic content requirement under JNNSM violated the **National Treatment provision of Article III:4** of the WTO agreement.
- The Indian government has significantly reduced the domestic content requirement after the initiation of proceedings at the WTO. At the beginning of the mission, the domestic content requirement in the auctioned contracts was as much as 50% of the total output generating capacity. This value dropped significantly through the auctions and is currently down to 5%. The U.S. is still unsatisfied with the measures undertaken by the government.



- After the WTO ruling was delivered, India asked the U.S. not to implement it. Under WTO law, the complainant can give 15 months to the defendant to implement the ruling. If 15 months were provided, India would be able to complete the JNNISM without having to painstakingly restructure the entire mission. After the 15-month period, the ruling would be applicable.
- The Indian government then announced that it had decided to file many cases against the U.S. because eight of the latter's states had domestic content requirements in the renewable energy sector. Few imagined that India would pursue the dispute and ask the WTO to establish a panel.
- The decision to not pursue the formation of a WTO dispute resolution panel came after Indian officials met the transition team of U.S. President Donald Trump and were assured that a settlement would be reached. It was decided that the cases would not be pursued further and that the Trump administration would seriously consider the settlement once in office.
- The request for the establishment of a panel came on January 24, 2017. The reasons stated by India include that the eight U.S. states were giving **"performance-based incentives"** for generating renewable energy.
- These incentives were contingent on the fact that domestically produced goods were being used and were given to offset the investment cost. India claims that this violates Article III: 4 because the measures provide less favourable treatment to imported products than domestically produced goods.

## **SOCIAL ISSUES**

### **1. Why India needs the rubella vaccine?**

#### **Why is the measles-rubella vaccine being administered to children?**

- Buoyed by the elimination of polio six years ago and maternal and neonatal tetanus and yaws in 2016, India has set an ambitious target of eliminating measles and controlling congenital rubella syndrome (CRS), caused by the rubella virus, by 2020.
- While two doses of measles vaccine given at 9-12 months and 16-24 months have already been part of the national immunisation programme, it is the first time that the rubella vaccine has been included in the programme.
- Single dose of rubella vaccine gives more than 95% long-lasting immunity
- Measles is highly infectious and is one of the major childhood killer diseases. Of the 1,34,000 measles deaths globally in 2015, an estimated 47,000 occurred in India. T
- The introduction of the second dose of the measles vaccine and an increase in vaccine coverage have led to a sharp decline in deaths in India — from an estimated 1,00,000 deaths in 2010 to 47,000 in 2015.
- Unlike measles, rubella is a mild viral infection that mainly occurs in children. But a woman infected with the rubella virus during the early stage of pregnancy has a 90% chance of transmitting it to the foetus.

- The virus can cause hearing impairments, eye and heart defects and brain damage in newborns, and even spontaneous abortion and foetal deaths

## **2. Problems with Ageing: Old age**

### **We may be a young nation, but we need to gear up to meet the needs of the elderly**

- While India's celebrated demographic dividend has for decades underpinned its rapid economic progress, a countervailing force may offset some of the gains from having a relatively young population: rapid ageing at the top end of the scale.
- This is a cause of deep concern for policymakers as India already has the world's second largest population of the elderly, defined as those above 60 years of age.
- As this 104-million-strong cohort continues to expand at an accelerating pace, it will generate enormous socio-economic pressures as the demand for healthcare services and tailored accommodation spikes to historically unprecedented levels. It is projected that approximately 20% of Indians will be elderly by 2050, marking a dramatic jump from the current 8%.
- While more mature economies have created multiple models for elder care, such as universal or widely accessible health insurance, networks of nursing homes, and palliative care specialisations, it is hard to find such systemic developments in India.
- Experts also caution that as the proportional size of the elderly population expands, there is likely to be a shift in the disease patterns from communicable to non-communicable, which itself calls for re-gearing the health-care system toward "preventive, promotive, curative and rehabilitative aspects of health".
- The ground realities faced by the elderly include abandonment by their families, destitution and homelessness, inability to access quality health care, low levels of institutional support, and the loneliness and depression associated with separation from their families.
- On the one hand, the traditional arrangements for the elderly in an Indian family revolve around care provided by their children.
- According to the National Sample Survey Organisation's 2004 survey, nearly 3% of persons aged above 60 lived alone. The number of elderly living with their spouses was only 9.3%, and those living with their children accounted for 35.6%.

### **Govt. interventions**

- Among these the Central Government has since 1992 been implementing its **Integrated Programme for Older Persons**, which aims to provide senior citizens with basic amenities such as shelter, food, medical care and entertainment opportunities.
- Perhaps the most relevant policy for the poorer sections amongst the elderly is the Ministry of Rural Development's **Indira Gandhi Old Age Pension Scheme**.
  - This ensures for below poverty line households, a monthly pension of Rs.200 is given for each person in the age group of 60-79 years and Rs. 500 for those above 80 years and above.

- Paradoxically, women sometimes end up worse off because in many of the patriarchal-patrilineal families especially in rural areas, the responsibility for care and nurture falls to the women of the family, which in turn has cast women both as victims and perpetrators of abandonment.
- As long as women's leisure-less labour freed men of any such responsibility towards aged members of the household, men's workplaces and the government establishment could afford to plod on in the same patriarchal modes.

### **3. More radars to beef up coastal surveillance**

- To strengthen surveillance of over 7,500-km coastline of the country, the Defence Ministry gave the go-ahead to expand the coastal radar surveillance network.
- The decision was taken by the Defence Acquisition Council (DAC), chaired by Defence Minister Manohar Parrikar.

#### **Vessel management**

- One official said Phase II involves setting up **38 additional radars and four mobile surveillance stations** as well as two vessel traffic management systems (VTMS) in Kutch and Khambhat in Gujarat
- In the aftermath of the 2008 Mumbai attacks in which terrorists used a fishing boat to enter the city, the government decided to set up a chain of static sensors to fill gaps in coastal surveillance and keep track of boats entering Indian territorial waters.
- Under Phase I, a chain of 46 coastal **surveillance radar and electro-optic sensors** were set up, including 36 in the mainland, six in the Lakshadweep islands and four in the Andaman & Nicobar Islands.
- India is also **setting up similar radar stations in friendly Indian Ocean littoral nations**, which are integrated into India's own radar network.
- The information received from the **various stations and sensors is collated at the Information Management and Analysis Centre (IMAC)** located outside the national capital and manned by the Navy for real-time maritime domain awareness.

#### **Aircraft engine repair**

- The DAC also gave approval for the setting up of a **shore-based intermediate engine repair facility for the Navy's MiG-29K fighter aircraft** at the Naval aircraft yard in Goa.

### **4. U.K. mulls easing entry norms for Commonwealth citizens**

#### **Lawmakers to debate new proposal on border control**

- British Members of Parliament are set to debate on Tuesday proposals to make it easier for Commonwealth citizens to arrive at the U.K border.
- The proposals, which include dedicated Commonwealth border control gates and the expansion of a scheme that enables frequent business travellers to register and use speedy entry lanes to include the nationals of some Commonwealth countries,

were originally set out by a group of Conservative MPs earlier this month, as part of efforts to improve relations with the Commonwealth in preparation for Brexit.

- The proposals mark a new strategy for tackling concerns about Britain's visa regime.
- The government has repeatedly made it clear that it intends to keep immigration control as a top priority, and will not relax its visa requirements from outside the E.U.
- Mr. Berry believes the reforms being proposed would help make travel less onerous between Commonwealth countries.

## **MISC**

### **1. India building a supercomputer juggernaut**

- India will unveil its most powerful supercomputer. If its processors operate at the full capacity of 10 petaflops (1 followed by 15 zeroes of floating point operations per second), a clock speed a million times faster than the fastest consumer laptops, it could earn a place among the world's top 10 fastest supercomputers.
- Though India has built or hosted supercomputers since the 1990s, it held a 'top 10' spot only once, in 2007, the EKA built by the Computational Research Laboratories, which is part of the Tata group.
- The as-yet-unnamed machine will be jointly hosted at the **Indian Institute of Tropical Meteorology, Pune** and the **National Centre for Medium Range Weather Forecasting** at Noida in Uttar Pradesh.
- For the first time, colleges and other research institutions can log in and harness its power to address problems, ranging from weather modelling to understanding how proteins fold.
- Most of the machine's computing power will help in monsoon forecasting, using a dynamical model.
- The processing speed of supercomputers is only one of the factors that determine its worth, with power usage and arrangement of processors, being other key metrics that determine the worth of a system.
- Top500, the global authority tracking the fastest 500 computers, said in its latest report that China and the U.S. were "pacing each other for supercomputing supremacy."

### **2. Copper axes point to an ancient culture story**

**Archaeologists excited, as discovery may shine light on a 4,000-year-old Ganga-Yamuna culture**

- Six copper axes and some pieces of pottery discovered in Sakatpur of Saharanpur district, Western Uttar Pradesh pointing to a separate culture that straddled the Ganga and Yamuna, coinciding with the Indus Valley Civilization
- The Archaeological Survey of India is excavating the site at Rampur Maniharan, hoping to discover more artefacts.

**In fertile plains**

- The **copper axes and pottery sherds** found last week may be related to the Ochre Coloured Pottery (OCP) culture in the doab (plains) of the two rivers in the late Harappan period, around 2000 BC.
- **OCP marked the last stage of the North Indian Bronze Age** and was succeeded by the Iron Age black and red ware culture and the painted grey ware culture.
- The people who used ochre pottery and their culture are specific to the doab region. The first remnants of OCP culture were found in Hastinapur, in Meerut district, in 1951 and later in Atranjikhhera in Etah district.

### **3. How tiny natural ponds can speed up global warming**

- Tiny natural ponds pose an overlooked danger for speeding up global warming, according to a study published in the journal *Nature Climate Change*.
- Such ponds — a metre across — gradually lose the capacity to soak up one kind of greenhouse gas and give off even more of another.
- After seven years at higher-than-ambient temperatures, the ability of the ponds to absorb carbon dioxide was reduced by almost half, while methane release nearly doubled
- With soil, by contrast, warming initially stimulates CO<sub>2</sub> output but then causes it to taper off.
- The new findings matter because small ponds play an outsized role in the planet's carbon cycle — the balance between input and output of greenhouse gases.

#### **Amplification effect**

- While covering only a tiny fraction of Earth's surface area, they are **responsible for about 40% of methane emissions from inland waters**
- Methane is about 28 times more effective in trapping the sun's radiation in our atmosphere than carbon dioxide
- "Our findings show that warming can fundamentally alter the carbon balance of small ponds over a number years," Mr. Yvon-Durocher said. "This could ultimately accelerate climate change."
- Scientists working on the next major UN scientific report on climate change, scheduled for 2020, should take note, he added.
- "Up to now, the Intergovernmental Panel on Climate Change [IPCC] models do not take into account the amplification effects of warming on these aquatic ecosystems."
- The main source of man-made carbon pollution is the burning of fossil fuels, accounting for more than 70% of global greenhouse gas emissions. The rest comes from deforestation, the livestock industry, and agriculture.

- In the experiments, scientists warmed artificial ponds four degrees Celsius (7.2 degrees Fahrenheit), corresponding to the projected increase in global average temperatures by 2100 in temperate zones under a “moderate” climate change scenario.

## Crossing the limits

A total of 94 cities in 22 States have violated the National Ambient Air Quality Standards, according to the Central Pollution Control Board



- Five cities — Delhi; Badlapur, Pune and Ulhasnagar in Maharashtra and Kolkata — violated both the PM10 and NO<sub>2</sub> permissible levels
- The rest violated only the allowed PM10 limit
- None of the cities crossed the prescribed SO<sub>2</sub> limit
- 680 stations spread over 300 cities in 29 States and 6 UTs are monitoring pollution levels in India

### 4. There's poison in the air

#### One-third of Indian cities breach limits, show govt. data

- Nearly a third of Indian cities have breached annual pollution limits mandated by the Central Pollution Control Board (CPCB) between 2011 and 2015
- The numbers — the latest available and updated in blocks of 4 years — sourced from 680 pollution-monitoring stations spread over 300 cities across the country, measure levels of particulate matter (PM 10), nitrogen dioxide (NO<sub>2</sub>), and sulphur dioxide (SO<sub>2</sub>).
- “The CPCB can only give guidelines on controlling air pollution, it is up to the States to implement them
- Agency only calculated average figures because there was tremendous variation within a year among cities, mostly on account of rainfall.
- The numbers come on the back of international research reports attributing about a million deaths in India to air pollution.
- The Environment Ministry has said these mortality figures were “extrapolations without due scientific validation” but hasn’t countered with numbers of its own.
- Key directives by the Centre to the States to control particulate matter pollution include promoting public transport, improving fuel quality and fuel efficiency standards and banning burning of leaves, biomass and municipal solid waste.

### 5. Roche can't hang on to breast cancer drug: HC

#### Court says it finds company's stand difficult to digest

- The Delhi High Court on Wednesday told Swiss pharma major Roche that it “cannot hang on to” breast cancer drug Trastuzumab, innovated by it, for the rest of its life after having enjoyed the fruits of its patent.
- Other pharma firms such as Biocon, Mylan and Reliance Life Sciences want marketing and sale of generic drugs biosimilar to the Swiss company's Trastuzumab.
- Roche argued that Biocon, Mylan and Reliance cannot term their medicine merely **Trastuzumab** and ought to call it **Biocon's Trastuzumab** or **Mylan's Trastuzumab** as these companies have not followed the entire protocol of tests and studies, as was done by it.
- The **advantage of biosimilarity** was that it was an abbreviated process and companies like Biocon and Mylan need not go through the entire “rigmarole” as was

done by Roche. It also said that it was finding Roche's stand "difficult to digest" as it has already gained from its patent.

- During arguments, Roche also alleged that Biocon and Mylan were using package inserts which contained data of tests and studies carried out by it and not their own. It said Reliance was not doing so and Biocon and Mylan should follow the example.
- Biocon and Mylan said their package inserts contained their test data also and added that they were entitled to show data of Roche also.
- They also claimed that their inserts were approved by the Drugs Controller General of India (DCGI). Package inserts are the slips of paper inside each box of the medicine containing details of the drug.

## **6. Seven Earth like exoplanets found**

### **Low temperatures make possible the presence of liquid water on their surface**

- Seven planets, with mass similar to the Earth and orbiting around a dwarf star the size of Jupiter, just 39 light years from the Sun, have been spotted by scientists.
- The planets' temperatures are low enough to make possible the presence of liquid water on their surface.
- In May last, the scientists found three planets passing in front of star TRAPPIST-1. On further monitoring of the star from the ground and space, they found four more exoplanets orbiting it.

### **In habitable zone of star**

- The scientists have been able to make precise mass measurement of six of the seven planets. Though this is preliminary, they do indicate that the planets are terrestrial with liquid water.
- The seven planets are suitable for detailed atmospheric study
- They are first trying to rule out the presence of large hydrogen envelope to make sure that the planets are indeed Earthlike.
- This will be followed by a detailed study of climate and chemical composition to try and find out if there is life on these planets. If there is life on these planets we will know it in a decade.

### **Orbital periods**

- The four newly discovered planets orbit around the star every 4.04 days, 6.06 days, 8.1 days and 12.3 days respectively; the orbital period of two of the three planets discovered last year are 1.51 days and 2.42 days respectively.
- Five planets have sizes similar to that of the Earth, while the remaining two are intermediate in size — between the Mars and the Earth.
- Based on the mass estimates, the six inner planets may have a rocky composition. The sixth planet has low density, suggesting a volatile rich composition. The volatile content could be either ice layer and/or atmosphere.

### **Life elsewhere**

- This is by far the largest collection of Earth-like planets in the habitable 'Goldilocks' zone of a star — neither too close nor too far from a star, which raises the possibility of liquid water being present on the surface.

- Less than a year after scientists announced the discovery of three planets orbiting the dwarf star, the team found four more through intense searches using several ground-based telescopes, including a 20-day continuous monitoring using the U.S. National Aeronautics and Space Administration's Spitzer Space Telescope.
- Since the dwarf star is much cooler than the Sun, the dimming of light each time a planet passes or transits before the star could be easily recorded from Earth unlike in cases when planets transit a Sun-like bright star.
- Since the initial discovery of three planets was made using the **Chile-based Transiting Planets and Planetesimals Small Telescope**, the exoplanet system is called **TRAPPIST-1**. Unlike in the case of our solar system, the **planets have apparently formed far away from the star** and gradually migrated towards it; they share a similar formation history with the Galilean moons, which migrated towards Jupiter after formation.
- Another major difference in comparison with the solar system is the tight packing of the seven planets around the star. The closest planet in the TRAPPIST-1 system takes just 1.5 days to complete an orbit and the farthest one takes 20 days; the orbital period of the planets is also similar to the Galilean moons.
- The composition of the atmosphere can be identified by measuring the wavelength characteristics of light. Since the TRAPPIST-1 system is close by and the star is cool enough, it would be easier to decipher the various critical features of the planets.

#### **7. Centre doubles solar park capacity to 40,000 MW**

- The Cabinet has approved the doubling of solar park capacity to 40,000 MW, which will entail an additional 50 solar parks to be set up at a cost to the government of ₹8,100 crore,
- The Centre is also considering smaller parks in Himalayan and other hilly states where contiguous land is difficult to acquire.
- The **solar parks and ultra mega solar power projects** will be set up by 2019-20
- The state governments **will first nominate the solar power park developer (SPPD)** and will also identify the land for the proposed solar park.
- The proposal will then be sent to the Ministry of New and Renewable Energy for approval, following which the SPPD will be sanctioned a grant of up to ₹25 lakh.
- Following this, the government will provide central funding assistance of ₹20 lakh per megawatt or 30% of the project cost, whichever is lower.

#### **Nepal hydro project**

- The Cabinet has given its ex-post facto approval for the existing implementing agency, already incorporated in the name of SJVN Arun-3 Power Development Company (SAPDC) registered in Nepal as a 100% subsidiary of SJVN Limited for the implementation of the project
- The project, located on the Arun River, is expected to provide any surplus power not used by Nepal to India.



## **8. Record Olive Ridley nesting baffles wildlife experts**

- A record-breaking mass nesting by 3.8 lakh endangered olive ridley turtles (*Lepidochelys olivacea*) took place at the Rushikulya rookery coast in Ganjam district of Odisha in February 2017. Interestingly, no mass nesting had taken place at the site a year ago.
- It was then suspected that several environmental factors, including chemical factors like salinity of the beach and the sea near the coast, may have prompted these marine reptiles to give the coast a miss in 2016.

### **Mass nesting**

- According to experts, most mass nesting sites of olive ridley turtles in the world are located near river mouths, where salinity is low. However, a lot still needs to be explored with regard to the influence of the salinity factor as not much is known about the relation between mass nesting by these endangered turtles and coastline salinity.
- This behaviour, however, has prompted experts to study turtle sensing superpowers.
- Explaining what may have prompted the mass nesting, a sandbar emerged at the mouth of Rushikulya River near Purunabandha this year. This, he added, prevented fresh water from the river from entering the sea directly.
- So the fresh water started flowing northward. This must've decreased the salinity of sea water near the coast towards north of the river mouth.
- Usually mass nesting takes place between Gokharkuda and new Podampeta, where the effect of fresh river water diverted by the sandbar may be high.
- Low salinity also means more small fish and insects, which are food for the turtles near the coast during mating and mass nesting seasons. The corrosive effect of salinity on eggshells cannot be ignored either.
- Olive ridley turtles bury their eggs on the beach. These eggs incubate with the help of sand heat for 45 to 50 days.
- It's possible the olive ridleys took the salinity factor into account while nesting at Rushikulya rookery coast this year, but what remains unanswered is how they sensed it.

## **9. Fluorosis contamination in Nuapada, ODISHA**

### **Over 50,000 villagers in Odisha district consume fluoride-laced groundwater**

- A large population in Odisha's Nuapada district suffering from crippled backbones on account of consumption of high fluoride-laced water
- Adults mostly suffer from **skeletal fluorosis that deforms bones and causes acute pain**. Most cannot straighten their backs and get exhausted very easily.

- Children below 15 years of age suffer from mottling of teeth or dental fluorosis. A few hundreds have even died of the disease.
- Apart from causing health hazards, fluorosis adversely affects the economic productivity of the area, leading to hunger and malnutrition.
- There is a social impact, too. People from the non-contaminated zones do not wish to establish any marital relationship with people in the contaminated pockets.

## **10. Choke on it**

### **Air quality continues to deteriorate, but there is no pressure on the government to take action**

- Facts of the case: A report from *The Lancet*, published on Sunday, estimated that two lives in India are lost every minute due to ambient air pollution.
- The first response from the Environment Minister was that the government would come out with its own study to understand the effects of air pollution on human health.

### **Valuing cars over lungs**

- Acute respiratory infections (ARIs), which have a direct link to pollution, have been rising significantly. The National Health Profile 2015 reported a 30% increase in ARIs since 2010.
- According to private doctors and paediatricians, the rise in the number of respiratory ailments, skin and eye infections — all of which can directly be linked to air pollution — in the last three months is well over 50%. The elderly and children are especially vulnerable to this. Yet, much like the government, people too have decided to err on the side of denial.
- In **January 2016**, when the Delhi government **decided to run the odd-even experiment** and restrict the number of cars in the city, it was met with much outrage by a citizenry that seemed to value its automobiles more than its lungs.
- In October and November 2016, even when a dense brown air was blowing from the burning fields of Punjab, a vast majority of the city's population had no qualms about bursting firecrackers and adding more toxins to the air.
- This baffling lack of personal awareness about the real impact of air pollution is part of the reason why there is no pressure on the government to take action.

## **11. Universities to compete with IITs, IIMs in rankings**

### **NIRF rankings are drawn up on the basis of five parameters**

- Central and State universities will have to compete with institutions like Indian Institutes of Technology and Indian Institutes of Management in this year's official rankings of higher education institutions, which will be released early in April.
- The National Institutional Ranking Framework (NIRF) was put in place by the Ministry of Human Resource Development last year, but the first NIRF ranked engineering colleges, business schools and universities in three separate categories.
- This year, there will have a common list of all institutions across disciplines and fields. The IITs, IIMs and our universities will be ranked in a common list

- The NIRF rankings are done on the basis of five parameters against which institutions are rated: teaching and learning resources; research and professional practice; graduation outcome; outreach and inclusivity, and perception.

#### **Pay packages**

- Asked whether a common ranking of institutions would not be like comparing what were intrinsically different kinds of institutions — as, for instance, placements from the IIMs were likely to be better than universities offering humanities' courses — however, the comparisons would be done in such a way as to account for the differences.
- We are not just looking at pay packages but also at different kinds of job placements with different salary levels.
- Last year, IIT Madras had topped the list of engineering colleges and IIM Bengaluru had edged out IIM Ahmedabad to top among business schools.

### **12. NIO begins fingerprinting tar balls to track oil spills**

#### **The technique will help fix responsibility**

- Environmental forensic analysts are chasing tar balls in sea coasts to trace the source of marine oil spills.
- The slicky job of forensic experts working in the environment sector came to focus last month following the leakage of huge quantities of crude oil into the sea off Ennore coast near Chennai.
- Samples collected from the Ennore spill will be fingerprinted at the National Institute of Oceanography (NIO), Goa, shortly.
- Tracking the source of oil pollution through fingerprinting is significant as it could identify the polluters and thus fix responsibility.
- It will help in evaluating the spills and devising methods for averting them.

#### **Source determination**

- Crude oil explored from each well has specific characteristics. A comparison of the characteristics of oil spills or tar balls with the crude oil will reveal the location from which the oil originated. After identifying the characteristics of the oil spill or tar balls, it would be easy to track them back to the source
- The facility at NIO, which was set up recently with the support of the DST, has been extensively used to analyse the source of tar balls deposited on the west coast of India
- The samples collected from the coast or water is subject to a series of chemical analyses to determine its characteristics for comparison with crude.
- The analysis can generate huge data bank on fingerprint results, which ultimately will be useful towards mitigation of oil pollution.
- The Institute has been collecting and fingerprinting the tar ball samples from the west coast since 2010. Besides the scientific identification of the source of oil

pollution, the fingerprinting would reveal the **residence time of the oil residues/tar balls in water and the deposit of the balls on the coast.**

### **13. Pleating membranes into compact forms**

#### **The technique of folding could be used for making nanoscale capacitors**

- A team of researchers, which includes faculty from TIFR Centre for Interdisciplinary Sciences, Hyderabad, has proposed a **novel method to fold micron-sized sheet like objects to spontaneously crumple into a compact space.**
- There are many possible applications, for example folding soft membranes for use in nanoscale capacitors.
- They suggest using a special type of force field to catapult the soft object from a flat to a pleated compact form by inducing a “first-order phase transition” – the sort of transition that we see when water freezes.

#### **Miura Ori pleats**

- We are familiar with the way folding paper methodically can be used to make beautiful origami shapes. While such objects are fun to make, they are also extremely efficient and compact.
- A definite type of **fold, or pleat, called the Miura Ori tessellation is a way of making “flat foldable” forms – forms that pop-up** when released.
- Such a folding technique can be immensely useful –some examples include compact packing of a sail or a foldable solar panel that can be used in a spaceship.
- In biology, we encounter many systems where chemical reactions require a large surface area, but it needs to be compactly folded into a small volume – like a mitochondria.
- In other cases, a folded shape has to expand from a compressed two-dimensional form into three dimensions, as when a leaf unfolds.
- In this context, it becomes useful to know how to make a soft membrane fold into a compact shape at small sizes ranging from the micrometres to nanometers. At that size Brownian motion, caused by the thermal fluctuations in the medium, usually play a highly disruptive role. “Imagine that you need to produce origami structures from sheets at very tiny length scales and for soft objects and in the presence of Brownian motion caused by thermal fluctuations. Normal manufacturing techniques will be very difficult under those circumstances. In such cases, it is useful if, somehow, the sheet folds all by itself, spontaneously, into a specified structure,” says Surajit Sengupta, Professor and Dean, TCIS, Hyderabad, and one of the team members, in an email.
- The team proposes a way in which applying an external field will cause an elastic membrane to spontaneously fold itself into pleats. The resulting structure could be of different types and is determined by the magnitude of the field and the external strain.
- The field acts by setting up “cameras” and “laser traps” whose positions may be adjusted by a feedback mechanism to give a bias to the fluctuations of atoms. More precisely, this biases the so-called non-affine fluctuations – basically, those

fluctuations of the component atoms that are not simply rotations and uniform stretches about their mean positions. This is used to calculate the forces to be applied locally to enact the phase transition into a pleated structure.

#### **Stable models**

- With current technology it is possible to create various structures, but it is not always possible to ensure that they are stable. “This theoretical work suggests how one such stable arrangement, made the way they describe, could have a ‘pleated structure’. This work is a nice example of how computer simulations can guide the design of materials with special properties,” says Gautam Menon of Institute of Mathematical Sciences, Chennai, who is not involved in this research.

#### **14. Pests eat away 35% of total crop yield, says ICAR scientist**

##### **‘Such large-scale crop loss has adverse effect on biosafety’**

- About 30-35% of the annual crop yield in India gets wasted because of pests, Indian Council of Agricultural Research.
- He said that among such pests, nematodes (microscopic worms many of which are parasites) had recently emerged as a major threat to crops in the country and they caused loss of 60 million tonnes of crops annually.
- Large-scale crop-loss was having an adverse effect on the agricultural biosafety which was “paramount to food security.”
- “Nematodes, consisting of roundworms, threadworms and eelworms, are causing loss of crops to the tune of almost 60 million tonnes or 10-12 % of crop production every year
- The farmers are still not fully aware about these potential crop-destroyers
- Citing the instance of a particular kind of nematode which affected plants such as potatoes and tomatoes, the Potato Cyst Nematode was first discovered in the Nilgiris and had now spread to various parts of the country.

#### **15. The CRISPR story**

##### **What is CRISPR-Cas9?**

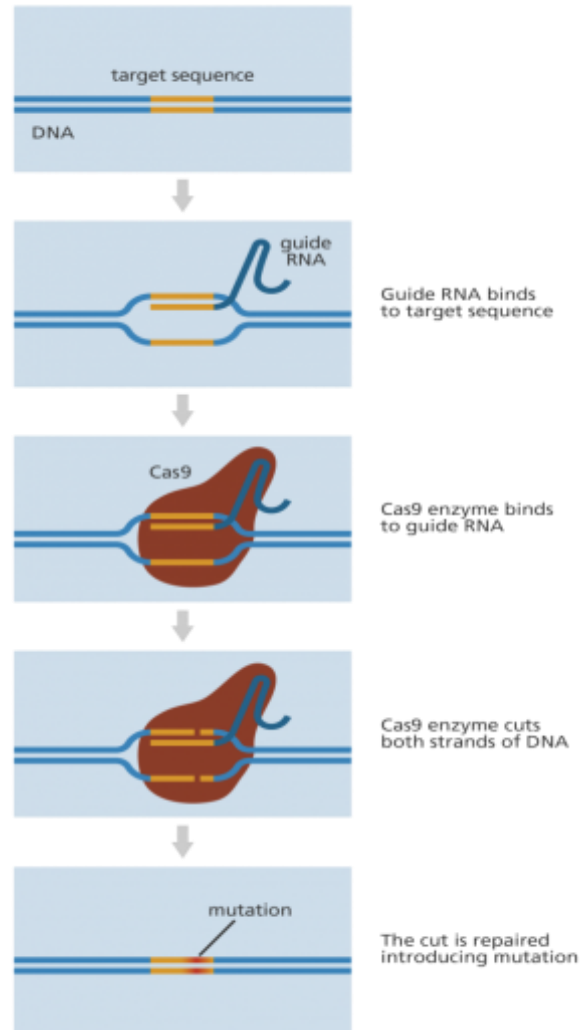
*CRISPR-Cas9 is a genome editing tool that is creating a buzz in the science world. It is faster, cheaper and more accurate than previous techniques of editing DNA and has a wide range of potential applications.*

##### **What is CRISPR-Cas9?**

- CRISPR-Cas9 is a unique technology that enables geneticists and medical researchers to edit parts of the [genome](#) by removing, adding or altering sections of the [DNA](#) sequence.
- It is currently the simplest, most versatile and precise method of genetic manipulation and is therefore causing a buzz in the science world.

### How does it work?

- The CRISPR-Cas9 system consists of two key molecules that introduce a change ([mutation?](#)) into the DNA. These are:
  - an [enzyme?](#) called Cas9. This acts as a pair of 'molecular scissors' that can cut the two strands of DNA at a specific location in the genome so that bits of DNA can then be added or removed.
  - a piece of [RNA?](#) called guide RNA (gRNA). This consists of a small piece of pre-designed RNA sequence (about 20 bases long) located within a longer RNA scaffold. The scaffold part binds to DNA and the pre-designed sequence 'guides' Cas9 to the right part of the genome. This makes sure that the Cas9 enzyme cuts at the right point in the genome.
- The guide RNA is designed to find and bind to a specific sequence in the DNA. The guide RNA has RNA [bases?](#) that are [complementary?](#) to those of the target DNA sequence in the genome. This means that, at least in theory, the guide RNA will only bind to the target sequence and no other regions of the genome.
- The Cas9 follows the guide RNA to the same location in the DNA sequence and makes a cut across both strands of the DNA.
- At this stage the [cell?](#) recognises that the DNA is damaged and tries to repair it.
- Scientists can use the DNA repair machinery to introduce changes to one or more [genes?](#) in the genome of a cell of interest.



*Diagram showing how the CRISPR-Cas9 editing tool works. Image credit: Genome Research Limited.*

### How was it developed?

- Some [bacteria?](#) have a similar, built-in, gene editing system to the CRISPR-Cas9 system that they use to respond to invading [pathogens?](#) like [viruses?](#) much like an immune system.
- Using CRISPR the bacteria snip out parts of the virus DNA and keep a bit of it behind to help them recognise and defend against the virus next time it attacks.

- Scientists adapted this system so that it could be used in other cells from animals, including mice and humans.

#### **What other techniques are there for altering genes?**

- Over the years scientists have learned about [genetics](#) and gene function by studying the effects of changes in DNA.
- If you can create a change in a gene, either in a cell line or a whole organism, it is possible to then study the effect of that change to understand what the function of that gene is.
- For a long time geneticists used chemicals or radiation to cause mutations. However, they had no way of controlling where in the genome the mutation would occur.
- For several years scientists have been using 'gene targeting' to introduce changes in specific places in the genome, by removing or adding either whole genes or single bases.
- Traditional gene targeting has been very valuable for studying genes and genetics, however it takes a long time to create a mutation and is fairly expensive.
- Several 'gene editing' technologies have recently been developed to improve gene targeting methods, including CRISPR-Cas systems, transcription activator-like effect or nucleases (TALENs) and zinc-finger nucleases (ZFNs).
- The CRISPR-Cas9 system currently stands out as the fastest, cheapest and most reliable system for 'editing' genes.

#### **What are the applications and implications?**

- CRISPR-Cas9 has a lot of potential as a tool for treating a range of medical conditions that have a genetic component, including [cancer](#), hepatitis B or even high cholesterol.
- Many of the proposed applications involve editing the genomes of [somatic](#) (non-reproductive) cells but there has been a lot of interest in and debate about the potential to edit [germline](#) (reproductive) cells.
- Because any changes made in germline cells will be passed on from generation to generation it has important ethical implications.
- Carrying out gene editing in germline cells is currently illegal in the UK and most other countries.
- By contrast, the use of CRISPR-Cas9 and other gene editing technologies in somatic cells is uncontroversial. Indeed they have already been used to treat human disease on a small number of exceptional and/or life-threatening cases.

#### **What's the future of CRISPR-Cas9?**

- It is likely to be many years before CRISPR-Cas9 is used routinely in humans.
- Much research is still focusing on its use in animal models or isolated human cells, with the aim to eventually use the technology to routinely treat diseases in humans.

- There is a lot of work focusing on eliminating 'off-target' effects, where the CRISPR-Cas9 system cuts at a different gene to the one that was intended to be edited.

#### **Better targeting of CRISPR-Cas9**

- In most cases the guide RNA consists of a specific sequence of 20 bases. These are complementary to the target sequence in the gene to be edited. However, not all 20 bases need to match for the guide RNA to be able to bind.
- The problem with this is that a sequence with, for example, 19 of the 20 complementary bases may exist somewhere completely different in the genome. This means there is potential for the guide RNA to bind there instead of or as well as at the target sequence.
- The Cas9 enzyme will then cut at the wrong site and end up introducing a mutation in the wrong location. While this mutation may not matter at all to the individual, it could affect a crucial gene or another important part of the genome.
- Scientists are keen to find a way to ensure that the CRISPR-Cas9 binds and cuts accurately. Two ways this may be achieved are through:
  - The design of better, more specific guide RNAs using our knowledge of the DNA sequence of the genome and the 'off-target' behaviour of different versions of the Cas9-gRNA complex.
  - The use of a Cas9 enzyme that will only cut a single strand of the target DNA rather than the double strand. This means that two Cas9 enzymes and two guide RNAs have to be in the same place for the cut to be made. This reduces the probability of the cut being made in the wrong place.

