TLP PLUS - 2019

TEST - 18 SYNOPSIS

GS - 3

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1. What purpose does merger of banks serve? Does it offer credible solutions to India's slowing economy? Critically comment.

Introduction:

Union Finance minister has recently announced to merger of PSB's due to increasing pressure on banking sector and mounting NPA's. The merger has been both welcomed and criticism from several quarters.

Body:

Purpose of bank mergers:

- Cost benefits: economies of scale, efficiency, cost of funding, risk diversification.
- Revenue benefits: economies and scope for large deals.
- Economic conditions: to create stability during up and downswings in business cycles.
- Other motives: valuation, managerial benefits, pre-empting possible takeovers, etc.

The merger has its own issues and offering credible solutions seems to be challenge:

- Handling of human resources & cultural differences – There is a cost to managing complexity that management tends to overlook in weighing the benefits of merger.
  a. Which general manager reports to which general manager, how portfolios will be assigned to executive directors and so on.
  b. Branch rationalisation without shedding any staff is quite a task.
  c. Further, the multiple posts that exist in the three banks will have to be reconciled as there can be only one head of risk, treasury, credit, HR, etc.
- Customer retention.
- Technology integration – putting all the three banks in the same platform; Systems and processes could be different and would have to be harmonised.
- Ensuring accountability.
- Rationalisation of physical infrastructure which is also linked with the headcount and existing hierarchy. All bank mergers will lead to multiplicity of branches and ATMs that will have to be reviewed. There would be redundancies of the same in the combined entity. When the policy is to retain the headcount, accommodating them in a smaller set of branches will not be possible.

Merits of merger:

- **NPA reduction:** Gross NPAs for the system as a whole fell from an average 43 per cent in 2013 to 24.1 per cent in 2018 with similar decline seen in nationalised banks (42 to 24 per cent) and in private banks (26 to 18 per cent) after mergers of select banks. Example: About choice of targets, Andhra and Corporation reduced NPAs by ₹9,972 crore in FY18 on a combined NPA portfolio of ₹34,714 crore, whereas Union Bank with whom these two were merged could reduce ₹3,476 crore on a total bad loan portfolio of ₹33,712 crore.
- **Basel norms:** It helps banks to implement basel norms with respect to capital ratios.
- **Helpful to economy:** As per studies conducted until now most of the mergers done in the past, have proved to be an overall success for the weaker banks although there are no concrete parameters to verify this observation. Hence going by the track record merger and acquisition in Indian banking have been fruitful for the Indian Economy.
- **Large funding needs and grow to Global scale:** According to the Government this decision of making large entities will make the Indian banks capable of meeting the higher funding needs of the economy and will help in acquiring the global scale.
- **Efficiency and service delivery:** Public sector banks now can improve on service delivery and increase efficiency. Also the need for recapitalization of banks will come down in near future.

Conclusion:

Mergers are a short terms solution, The long-term solution outlined by Raghuram Rajan, former RBI Governor, mentioned in his note to the estimates committee of Parliament: 'Improve governance of public sector banks and distance them from the government' and 'delegate appointments entirely to an entity like the Banks Board Bureau', should be taken up for discussion.

2. "Government bailouts are a moral hazard". What do you understand by this statement? Moreover, do you agree with this statement? Substantiate your response.

Introduction:

A Government bailout is the act of a providing money and resources also known as a capital injection to a failing company by the government to help prevent the consequences of that business's potential downfall which may include bankruptcy and default on its financial obligations.

Body:

Governments across the world have time and again bailed out companies and business several time which has been criticized as a moral hazard in free economy. For instance, Indian government has bailed out Air India during its worst phases.

Bailing out cannot be justified and it is a moral hazard because:

- Taxpayers funding: Taxpayers could be paying for this for generations to come if the government fails to make any return on these assets. And they will pay for it through higher taxes or higher inflation – both of which are likely to prolong the global consumer downturn.
- Loss of sovereignty: Government could raise the money for bailout through international markets or foreign government which will set the terms and gradually Government will become a instrument of private players and foreign governments.
- False hope: The bailout fund may help avert a collapse of business but it could reinforce perceptions the government will step in to keep firms from failing every time and affect the efficiency and productivity in longer run.
- Fraud: This could create a system where credit agencies, auditors can be brought to hide the real numbers until a crisis hits and government needs to step in.
- Erode privacy: With government stepping in, the business will have to give up all details of its handling of funds and business details which can be utilized by competitors and MNC's for their own benefits in future.
- Profits are private and loss in public: Profits earned by business are enjoyed by them but losses incurred are settled using tax payers money which is morally and ethically wrong and cannot be justified at any cost.

But bailing out also has its share of advantages:

- It will restore liquidity: The crisis has been a crisis of liquidity. Business collapse because of non-availability of funds to meet their working capital. Any loans they have got, have been expensive. The deal should help improved liquidity not just for business, but economy,
- Benefits to economy: After bail out the employment is restored which will decrease the government's responsibility and increase taxes, also money in hands of employees will future increase demand in economy.
- Economic collapse: For example, Bear Stearns, Lehman Brothers, Fannie Mae, Freddie Mac, Merrill Lynch, AIG – behemoths of financial world collapsed during financial crisis of 2008. There are only so many giants that can fall. The bail out stopped them from any more from toppling, by stripping the "toxic assets" from their balance sheets. This saved, potentially, tens of thousands of jobs, not just in the US but across the world.
- Profit for government: The bailout costs sounds enormous, equating each rupees spent for on every taxpayer. But, in theory, the government could make a profit from the deal if the economy improves, and the toxic assets end up being worth more than they are now.

Conclusion:

Every business has its up and down phase. Mistakes do happen, unless allowed to make mistakes a business cannot grow. All the great inventions/discoveries today in scientific and business world are because of dare to experiment and fail.

3. Why is it important to promote household savings in a middle income country like India? What positive spillovers does saving habit have in the economy? Analyse.

Introduction:

Household saving is the main domestic source of funds to finance capital investments, a major impetus for long-term economic growth. The net household saving rate represents the total amount of net saving as a percentage of net household disposable income.

Body:

Importance of promoting household savings and its positive spill over effect in developing and middle income country like India:

- Healthy savings facilitates consumption smoothing, which is particularly important in developing countries where incomes are often at subsistence levels and falls in consumption could have disastrous consequences.
- High savings also allows the self-employed to accumulate funds for making investments in their businesses or covering shortfalls in operating cash flow.
- Saving empowers poor individuals by shifting the saver's perception of his or her situation from "a day to-day struggle to survive to a longer-term view based on planning with a growing cushion of savings."
- Household savings will curb excessive demand for credit from financial institutions in the economy and contain inflation.
- High levels of national savings increase the amount of domestic resources available for investment and decrease the need to resort to foreign borrowing in order to cover domestic investment and consumption demand.
- Also High household saving will help the government reduce its dependence on external borrowing as the various saving instruments of citizens can fund Government projects.
- Less government borrowing helps prevent crowding out effect and clears space for corporate borrowing which gives boost to economic activity.
- Countries with low internal savings rates must borrow from abroad, which results in a debt service burden but currently this is not possible for developing countries like India because of the huge debt overhang.
- In developing nations, households tend to be large and poor, they have a different demographic structure, more of them are likely to be engaged in

Agriculture and their income prospects are much uncertain and hence healthy savings rate is crucial requirement in a developing economy to grow and sustain.

- In light of these, this clearly underlines the importance of savings mobilisation to sustain economic growth with domestic financial resources.

Positive spillover of Household savings:

- Reducing Current Account Deficit which stood at 2.1% in India.
- The key to a sustainable rise in economic growth is the revival of investment by reviving savings.
- An economic model driven by a virtuous cycle of savings, investment and exports helps in sustaining high growth rate in India.
- Investment, especially private investment which creates capacity, increases labour productivity, introduces new technology, allows creative destruction, and generates jobs.
- Capital investment fosters job creation, as capital goods production, research & development, and supply chains also generate jobs.
- Precautionary savings helps entrepreneurs to take the risk of idiosyncratic business failure that leads to the loss of the invested capital.
- The lesson from that golden growth phase is that stepping up private and public investment is an inescapable prerequisite for high growth. This in turn is financed by both domestic and foreign savings, although the dependence on the latter should not be excessive. That's because foreign inflows impact currency and financial stability, and are not as reliable as domestic savings.

Conclusion:

The saving rate should be optimal and should be utilized for investment activity. Majority of Indian savings are in the form of gold which brings in no value addition either to government or economy but has ill effects where gold import bills are increased leading to trade deficits.

4. Without the involvement of the private sector and simultaneous financial reforms, the target of spending 100 lakh crore on infrastructure in the next five years will be a distant dream. Do you agree? Critically analyse.

Introduction:

The Global Infrastructure Outlook reflects that rising income levels and economic prosperity are likely to further drive demand for infrastructure investment in India over the next 25 years. Also, the target of Rs 100 trillion investment in the infrastructure sector by 2024 requires huge reforms in the sector.

Body:

Infrastructure sector is a key driver for the Indian economy. The sector is highly responsible for propelling India's overall development and enjoys intense focus from Government for initiating policies that would ensure time-bound creation of world class infrastructure in the country. Infrastructure sector includes power, bridges, dams, roads and urban infrastructure development. In 2018, India ranked 44th out of 167 countries in World Bank's Logistics Performance Index (LPI) 2018.

The importance of private sector:

The Economic Survey, presented a day before the budget, had said the country has been able to put in only $100-110 billion (Rs 6.8-7.5 lakh crore) annually into infrastructure when it needs to pump in $200 billion (Rs 13.6 lakh crore). That means the private sector, which contributes one third of the investment into the core sector in India, needs to be cajoled a lot to ensure a flood of money comes in.

- Private Investment: Government alone cannot meet the target because of fiscal consolidation so encouraging private investment is the must
- National highways remain the only bright spot, where policy actions and the hybrid annuity model (HAM) have revived projects.
- Toll-operate-transfer (TOT) auction is a great example of asset monetization and crowding-in of private capital.
- A spike in public spending has offset some of the fall in private investments
- Private sector participation in infrastructure delivery helps deliver tangible benefits.
- The private sector has also delivered efficiently—both on project execution as well as operations.
- Private participation enhances public accountability.
- Public private partnership (PPPs) bring back trust in public utilities that execute them, improve service delivery and bridge resource gaps.
- Reviving the stalling private sector investments is crucial to accelerate the infrastructure build-up that India needs, aspires for, and deserves.

Financial reform

- India will face a $526 billion infrastructure investment gap by 2040 as there are 1,263 projects in progress across sectors such as power, road, railways, shipping and telecom, according to the latest Economic Survey.
- The Survey said the gap needs to be filled by private investments and the National Infrastructure Investment Bank (NIIB), along with support from global institutions such as the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank.
- A lot of the policy action has been focused on the trifecta of recognition, resolution and recapitalization.

- The new regulatory architecture built around the Insolvency and Bankruptcy Code shifts the balance of power from borrowers to creditors—and will hopefully change the credit culture in the country.
- The problem becomes especially acute in the case of large industrial projects as well as infrastructure projects. The task of funding them cannot be left to commercial banks alone.
- India needs specialist financial agencies to do some of the heavy lifting as well as an active corporate bond market.
- One possible option is to let commercial banks focus on loans to small and medium enterprises, while larger projects are funded by specialist banks and the corporate bond market.
- The government has proposed to set up a development financial institution (DFI) to solve the infrastructure financing needs of the country.
- It will boost economic growth which would increase capital flows and energise capital markets.
- Debt flow towards infrastructure projects would be improved.
- The RBI had also specified in 2017 that specialised banks could cater to the wholesale and long-term financing needs of the growing economy and possibly fill the gap in long-term financing.

Problem of PPP

- PPP projects have been stuck in issues such as disputes in existing contracts, non-availability of capital and regulatory hurdles related to the acquisition of land.
- Indian government has a poor record in regulating PPPs in practice.
- Metro projects become sites of crony capitalism and a means for accumulating land by private companies.
- Across the world PPPs are facing problems, performance of PPPs has been very mixed according to study conducted by various research bodies.
- It is also argued that PPP is mere a ‘’language game” by governments who find it difficult to push privatization, or when politically it is difficult to contracting out.
- Loans for infrastructure projects are believed to comprise a large share of the non-performing asset portfolio of public sector banks in India.
- In many sectors, PPP projects have turned into conduits of crony capitalism.
- Many PPP projects in infrastructure sector are run by “politically connected firms” which have used political connections to win contracts.
- PPP firms use every opportunity for renegotiating contracts by citing reasons like lower revenue or rise in costs which becomes a norm in India.
- Frequent renegotiations also resulted into drain of larger share of public resources.
- These firms create a moral hazard by their opportunistic behavior.

Conclusion:

The finance ministry said a task force under the chairmanship of Secretary (DEA) has been constituted to draw up a "national infrastructure pipeline" from 2019-20 to 2024-25. The national infrastructure pipeline project would include greenfield and brownfield projects costing above Rs 100 crore each.

5. India has had three consecutive years of bumper onion crop production. How does it affect the farmers? What policy measures can be taken to address the challenges arising out of this trend?

Introduction:

India is set for a third consecutive year of bumper onion crop production in 2018-19, according to the Union Ministry of Agriculture's third advance estimates. The production of onion last fiscal is projected to be around 23.48 million tonnes (MT), 0.95 per cent higher than the previous fiscal, said the estimates released.

Body:

Effect on farmers:

- Price crash: In 2016-17, onion production soared to around 23 MT. Subsequently, onion prices in the wholesale market fell 41 per cent from Rs 21 per kg to Rs 12. The following year, production climbed to 23.26 MT and prices plummeted further.
- The traders and nation on the whole might benefit from bumper crops but for the farmers, there will be loss because they will be compelled to sell their whole produce at throwaway price which will make them debt ridden further.
- They are, therefore, unable to repay loans they have taken, both from institutional sources and private moneylenders.
- And without doing so, they will not be eligible for fresh credit for the Rabi [winter] crop. This is one of the reasons why they have been demanding a loan waiver.
- Bumper crops don't always bring good money to the farmers and even consumers do not get benefit of this. They have to pay a higher price for the produce in general because of the involvement of middlemen and traders.
- There needs to be decentralized storages, cold storage chain and there should be food processing at the village gate level to reduce wastage of food in long term specifically for perishable items like fruits and vegetables.

Policy measures that can be taken to address the challenges:

- Post-harvest infrastructure has to be adequately created. A proper policy framework has to be there to ensure a better coordination between efforts of Central as well as State Governments as agriculture is a state subject. Export import policies have to be in place.

- Milk model can be executed for perishable items in agriculture. SAFL has set an example. Sustainable Agro-commercial Finance Ltd. (SAFL) is the first private sector NBFC in India providing agri-loans with a wide and diverse range of financing options for almost every need of agricultural activity.
- While encouraging the private sector to take the lead, the state can do some stocking under a 'Price Stabilisation Fund – PSF'.
- Promoting exports in case of a bumper crop and encouraging imports in case of deficits should be primary to any trade policy.
- This has to be done well in advance — as soon as one comes to know the advance estimates of production.
- Processing - Encourage the setting up of onion dehydrating units and promote demand for dehydrated onions can be considered.
- Dehydrated onions are being exported to Japan, Europe, Russia, US and some African countries.
- Ministry of Food Processing and state governments should encourage entrepreneurs to setting up onion processing units.
- While a subsidy of up to 35% with a cap of Rs 5 crore is currently being provided, the budget of the scheme is just Rs 95 crore.
- This needs to go up manifold if we are serious about encouraging food processing and stabilising prices.
- Promotion of cluster based development of agri commodities and regions in partnership with Ministry of Agriculture, Commerce and allied ministries;
- 100% income tax deduction from profit derived from activities such as post-harvest value addition to agriculture to FPOs having annual turnover of Rs. 100 crore;
- Setting up of state of art testing facilities in all the 42 Mega Food Parks to encourage export of agri-commodities realizing their full potential.

Conclusion:

Problem of Indian agriculture is not scarcity. It is the management of the good years in agriculture for future adversaries. There is an urgent need to address the fundamental problems of crop and regional bias of MSP policy, government procurement and access to institutional credit. Merely increasing MSP will not benefit most farmers in the country.

6. For the sugar manufacturers in India, examine the current status, challenges on the export front and future prospects arising out of a global shift toward cane-based ethanol.

Introduction:

Sugar industry is an important agro-based industry that impacts rural livelihood of about 50 million sugarcane farmers and around 5 lakh workers directly employed in sugar mills. India is the second largest producer of sugar in the world after Brazil and is also the largest consumer. Indian sugar industry's annual output is worth approximately Rs.80, 000 crores. There are 735 installed sugar factories in the country as on 31.01.2018, with sufficient crushing capacity to produce around 340 lakh MT of sugar.

Body:

Dynamics of sugar Industry: How it functions

- Farmers grow sugarcane and sell it to the sugar mills. Farmers want the sugar cane price to increase even when the sugar price fall.
- Sugar mills have to buy the sugarcane from farmers at a fixed rate called FRP which is decided by the government.
- Since the price of sugar cane does not reflect the market price of sugar there is a price mismatch and the mill owners are not able to pay the farmers when the market price of sugar is low, and thus arrears get accumulated.
- The government provides incentives to these mill owners so that they could clear the arrears.

Current status on the export front:

- In view of huge carryover stock and estimation of excess production of sugar in the sugar season 2018-19 (October-September) and in order to improve the liquidity of the sugar mills to facilitate them for clearance of cane price arrears of farmers, the Central Government has fixed export targets by allocating mill-wise Minimum Indicative Export Quotas (MIEQ) of 50 LMT of sugar for export in sugar season 2018-19.
- However, it has been observed that the sugar mills are not undertaking export of sugar at a desired pace. Only about 2.46 LMT of sugar has been exported and contracts of only about 6 LMT (including 2.46 LMT of actual export) in the 1st quarter of the season.

Government Initiative

- Fair and remunerative price (FRP): The FRP is the minimum price that sugar mills have to pay to sugarcane farmers for procurement of sugarcane. It is determined on basis of recommendations of Commission for Agricultural Costs and Prices (CACP) and after consultation with State Governments and other stakeholders.
- State Advised Price: Although the Central government decides the FRP the state governments can also set a State Advised price which a sugar mill has to pay to the farmers.

Current challenges on the export front:

- Uncertain Production Output: Sugarcane has to compete with several other food and cash crops like cotton, oil seeds, rice, etc. This affects the supply of sugarcane to the mills and the production of sugar also varies from year to year causing fluctuations in prices leading to losses in times of excess production due to low prices.

- Low Yield of Sugarcane: India yield per hectare is extremely low as compared to some of the major sugarcane producing countries of the world. For example, India's yield is only 64.5 tonnes/hectare as compared to 90 tonnes in Java and 121 tonnes in Hawaii.
- Short crushing season: Sugar production is a seasonal industry with a short crushing season varying normally from 4 to 7 months in a year. It causes financial loss and seasonal employment for workers and lack of full utilization of sugar mills.
- Low Sugar recovery rate: The average rate of recovery of sugar from sugarcane in India is less than ten per cent which is quite low as compared to other major sugar producing countries.
- High Production cost: High cost of sugarcane, inefficient technology, uneconomic process of production and heavy excise duty result in high cost of manufacturing. Most of the sugar mills in India are of small size with a capacity of 1,000 to 1,500 tonnes per day thus fail to take advantage of economies of scale.
- Government policy and control: Government has been controlling sugar prices through various policy interventions like export duty, imposition of stock limit on sugar mills, change in meteorology rule etc., to balance supply demand mismatch. But these controls have resulted in unremunerative sugar prices, increasing arrears for sugar mills and dues to be paid to sugarcane farmers.
- India is again facing with the problem of overflowing sugar stocks. The industry's production estimate for 2018-19 is 35.5 MMT, up from 32.3 MMT in 2017-18, against an annual consumption of about 26 MMT.

Future prospects arising out of a global shift toward cane-based ethanol:

Ethanol is a biofuel extracted from sugarcane and is blended in petrol in different proportions, depending on the volume produced by the country. In December 2009, the government announced its National Policy on Biofuels, which called for blending petrol with 5 per cent ethanol. In 2015, the target was raised to 10 per cent. But this was never achieved.

- Government has also proposed the Ethanol Blending Program
- A major scheme worth more than Rs.4400 crore for increasing the ethanol capacity in the country for diversion of sugarcane for production of ethanol in surplus sugar season.
- The Government will bear the interest subvention cost for this scheme.

Best Practices: India can learn from Brazil:

- Brazil being the largest producer of sugarcane began deriving ethanol from sugar cane in 1970s under National Alcohol Program.

- The government offered subsidy to the ethanol producers and also enforced high ethanol blending mandate which is 27% nationwide currently.
- The programme also initiated the availability of E100 (96% pure ethanol and 4% water) or hydrous ethanol at the retail level.
- But the E100 can only be used in flex-fuel vehicles (FFVs). Therefore, there was tax incentive for consumers in order to purchase FFVs.
- However, since 2000 the Brazilian ethanol market has been restructured with the government playing minimal role, leaving the determination of ethanol price to the market forces.
- Majority of the sugar mills in Brazil are capable of producing both sugar and ethanol.
- The sugar processing facilities in Brazil are considered as biorefinery, which along with sugar can produce bioethanol and electricity from bagasse.
- These plants are flexible to either produce more sugar or more ethanol depending on the price premium of one over another.
- If India replicates the Brazilian model then domestic sugar cane-producing farmers will see renewable-energy feedstock market as an alternative to the traditional sugar market.
- Sugar mills with ethanol production capacity could switch between sugar and ethanol and remain profitable even if there were to be a fall in the price of one of the commodities. This could further stabilize India's sugar market as it did for Brazil.

Way Forward:

- Rangarajan Committee stated that the sugar industry has the potential to double its turnover in 5 years. The government should implement the recommendation of Rangarajan committee at the earliest.
- The government should make the trade policy more transparent so that uncertainties in sugar market are avoided.
- The government should also create a larger buffer so that excess sugar can be stored safely.
- The government should focus more on Ethanol blending program and try to harness its full potential.
- The government should learn from the best practices of countries like Brazil which have achieved substantial success in improving their sugar industry
- Government should also popularize innovative methods like Sustainable Sugarcane Initiative (SSI) which uses less seeds, less water and optimum utilization of fertilizers and land for sugarcane production.
- Sugar cane production is an important pillar in achieving the government's aim of doubling the farmer's income by 2022 and the government should take all the necessary steps to achieve it.

7. What are high temperature superconductors? How are they different from normal conductors? What are their potential applications? Discuss.

Introduction

High-temperature superconductors (abbreviated high-Tc or HTS) are materials that behave as superconductors at unusually high temperatures. The first high-Tc superconductor was discovered in 1986 by IBM researchers Georg Bednorz and K. Alex Müller, who were awarded the 1987 Nobel Prize in Physics "for their important break-through in the discovery of superconductivity in ceramic materials".

Body

Differences between high temperature superconductors and normal conductors are:

- High Tc Superconductors (HTS) have high temperature coefficient (Tc) (>100 K) while conductors have low Tc (<20 K).
- In HTS super conduction is due to hole states whereas in conductors, conduction is due to Cooper pairs.
- HTS are explained by RVB Theory while Conductors are explained by BCS theory.
- HTS are very useful for commercial and engineering purposes while conductors are not that useful due to its low maintenance temperature.
- HTS are called as P type superconductor while conductors are called as N type superconductor.

Applications of High Temperature Superconductors are:

- The production of sensitive magnetometers based on SQUIDs (superconducting quantum interference devices).
- Fast digital circuits (including those based on Josephson junctions and rapid single flux quantum technology),
- Powerful superconducting electromagnets used in maglev trains, magnetic resonance imaging (MRI) and nuclear magnetic resonance (NMR) machines, magnetic confinement fusion reactors (e.g. tokamaks), and the beam-steering and focusing magnets used in particle accelerators
- Low-loss power cables.
- RF and microwave filters (e.g., for mobile phone base stations, as well as military ultra-sensitive/selective receivers).
- Fast fault current limiters.

- High sensitivity particle detectors, including the transition edge sensor, the superconducting bolometer, the superconducting tunnel junction detector, the kinetic inductance detector, and the superconducting nanowire single-photon detector.
- Railgun and coilgun magnets.
- Electric motors and generators.

HTS require only liquid nitrogen, not liquid helium, to cool to superconducting temperatures. However, the problem with HTS technology is that the currently known high temperature superconductors are brittle ceramics which are expensive to manufacture and not easily formed into wires or other useful shapes. Therefore, the applications for HTS have been where it has some other intrinsic advantage, e.g. in

- low thermal loss current leads for LTS devices (low thermal conductivity),
- RF and microwave filters (low resistance to RF), and
- increasingly in specialist scientific magnets, particularly where size and electricity consumption are critical (while HTS wire is much more expensive than LTS in these applications, this can be offset by the relative cost and convenience of cooling); the ability to ramp field is desired (the higher and wider range of HTS's operating temperature means faster changes in field can be managed); or cryogen free operation is desired (LTS generally requires liquid helium that is becoming more scarce and expensive).

Conclusion

The commercial applications so far for high temperature superconductors (HTS) have been limited but it carries huge potential.

8. Would you consider Chandrayaan II a failure? Critically comment.

Introduction:

Chandrayaan II is the second lunar exploration mission developed by the Indian Space Research Organisation, after Chandrayaan-I. It consists of a lunar orbiter, the Vikram lander, and the Pragyan lunar rover, all of which were developed in India

Body:

It's not a Failure:

While the powered landing of Vikram and exploration of the moon's surface for 14 Earth days by Pragyan rover were one of the main objectives of Chandrayaan II, it is wrong to think that the mission itself has failed, cause:

- Successful initiation of operational service of GSLV MK III

- Precise placement into orbit saved fuel, giving orbiter prolonged life around moon.
- Orbiter earlier predicted to have one year life span could now go on for 7.5 years.
- Orbiter carries 7 of 13 major payloads of the mission.
- Camera, spectrometers can offer insights into origin and evolution of moon.
- Will generate 3D terrain map, study mineral distribution.
- Data generated by such missions yield results for long time.
- Vikram, the Lander, got extremely close (i.e 2.1 kms) to realizing soft landing, providing many lessons.

It's a failure:

- The distance of moon from earth is 38400 km, but at a height of 2.1 km above the lunar surface anomalies began to occur.
- The lander and the rover failed to soft land on the surface of the moon.
- The exact reason of the anomaly is still to be discovered.

Conclusion

Lunar missions have a chequered history. For instance, the USA did land a manned mission on Moon 50 years back, in 1969, but its first few attempts ended in failure. It's the same story for erstwhile USSR. A look at Moon missions down the decades only shows that India's inability to soft-land Vikram on the lunar South Pole is a minor setback, and the lessons learned from this mission might well pave the way for a smooth landing for ISRO's next foray. A failed attempt is a failure and a loss only if we learn nothing from it.

9. The decision to appoint a Chief of Defence Staff (CDS) is one of the biggest defence reforms. What will the benefits of this decision? Analyse.

Introduction:

The CDS is a high military office that oversees and coordinates the working of the three Services, and offers seamless tri-service views and single-point advice to the Executive (in India's case, to the Prime Minister) on long-term defence planning and management, including manpower, equipment and strategy, and above all, "jointsmanship" in operations.

Body:

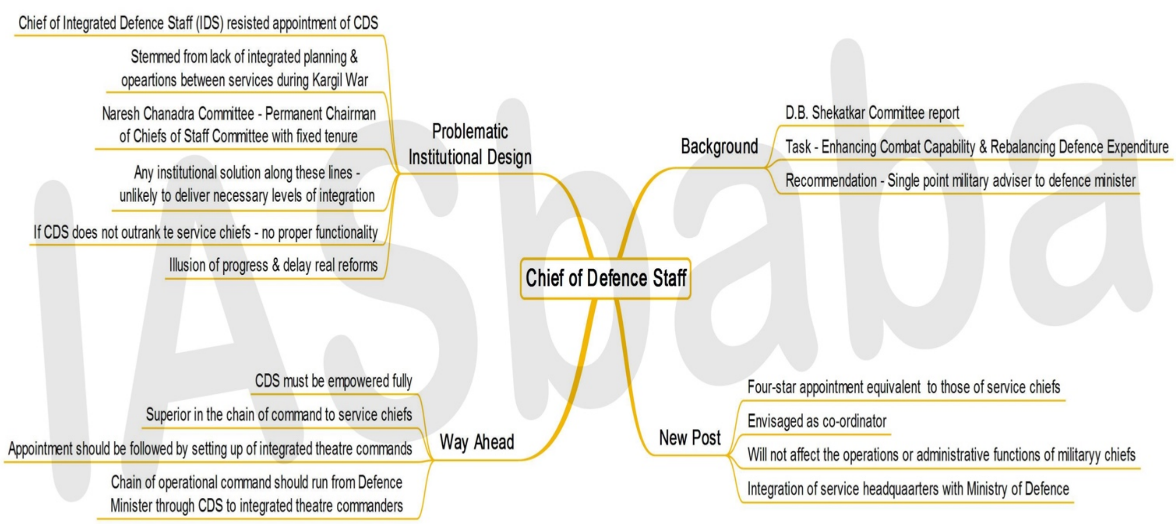
The decision to appoint CDS was announced by Prime minister in his independence day address to the nation, which can be considered as one of the biggest defence reforms of Independent India.

Structure of CDS:

- The three service chiefs are expected to retain the operational role, but they would be answerable to the CDS, who is most likely to have direct control over the tri-services strategic, space, cyber and special forces commands.
- He is also expected to spearhead military diplomacy. In a nutshell, he would be responsible for overall defence preparedness and function as the single-point military advisor to the government.

It is going to benefit the defence force in huge way:

- CDS is a post that will act as the single-point advisor to the Government of India.
- CDS will be in a position to advise on matters related to all the three services — Army, Navy and Air Force — thus making India's armed forces integrated.
- CDS will be a 'first among equals', a fourth four-star officer who will be senior to the three other service chiefs
- The post is aimed at ensuring better coordination between the three services.
- The intention is to "reconcile possible differences" in service-specific opinions to enable the government to arrive at considered military decisions.
- The institution of a CDS will also foster inter-services jointness in terms of budgeting, equipment purchases, training, joint doctrines and planning of military operations- necessary for strategizing a robust and cost-efficient national defence policy.



Challenges involved:

- For CDS to be able to discharge all, or even some of, these functions, several structural and functional changes will have to be made. To begin with, he will need an organisational set up.
- The functions to be carried out by the CDS will need to be specified unambiguously. It will be a challenge to strike the right balance between empowering the CDS sufficiently enough to discharge the functions assigned to him and overloading him with an unmanageable charter.
- The modality of their transfer will need to be worked out to prevent disruption in work.
- The question whether the manpower handling such functions in the MoD should also be transferred will need careful consideration.
- The CDS would require to interact not only with MoD but also with several other ministries, including External Affairs and Finance, and also with functionaries like the Cabinet Secretary, Defence Secretary, and the National Security Advisor.It would be desirable to lay down protocols and standard operating procedures for such interactions to ensure smooth functioning of the new dispensation under a non-obtrusive system of checks and balances, and to pre-empt contretemps over status, authority and responsibility of various functionaries and organisations.
- Since one of the most important functions of the CDS would be to build up the capability of the armed forces, the existing capital procurement system will need to be re-engineered.
- CDS would undoubtedly require financial powers for carrying out whatever other functions are assigned to him.
- The CDS is likely to face severe constraints in resource allocation as the need for funds projected by the armed forces has routinely been far higher than the budgetary allocations.
- Also there could be the biggest challenge for the CDS in form of allocation to specific service, as he will have to withstand the pressure from the specific Service Chiefs, as operational commanders, for higher allocation to meet their service-specific requirement.

Conclusion:

The CDS cannot be a panacea for all problems faced by the defence establishment. However, an effective implementation of the blueprint of the plan by the panel will help Indian defence system to undergo much needed and long-waited reform.

10. Singapore passed the Protection from Online Falsehood and Manipulation Act (POFMA) 2019 on 8 May 2019. Do you think, a similar law is needed in India as well? Critically assess.

Introduction:

The Protection from Online Falsehoods and Manipulation Act ("POFMA") was passed by Parliament on 8 May 2019 after a vigorous debate in Parliament.

Background

Internet-enabled messaging platforms and social media platforms have allowed news and information to be disseminated with unprecedented speed. These platforms have also facilitated the dissemination of deliberate online falsehoods, colloquially known as "fake news", which represent a critical threat to the integrity of the society and our democracy. POFMA was enacted with the objective of safeguarding Singapore against this threat.

Body:

A similar law is needed in India as well

Yes:

- Misinformation and disinformation spread in media is becoming a serious social challenge. It is leading to the poisonous atmosphere on the web and causing riots and lynchings on the road.
- In the age of the internet (WhatsApp, Facebook, Twitter,) it is a serious problem as rumours, morphed images, click-baits, motivated stories, unverified information, planted stories for various interests spread easily among 35 crore internet users in India.
- There have been many instances of online rumours leading to killings of innocent people. In some cases, ministers have deleted tweets after realizing the fake news which they shared earlier.
- In the recent Karnataka Assembly elections (2018) fake news about rival parties and candidates flooded the media.
- Fake News Damages: Popular Examples from India:
- Muzzafarnagar riots of 2013: fake video fuelled communal passions.
- UNESCO has declared 'Jana Gana Mana' best national anthem in the world (WhatsApp).

No, as the Act has been criticized on various grounds:

- While there is no universally accepted definition of fake news, the Ethical Journalism Network defines it as "information that is likely to be perceived as news, which has been deliberately fabricated and is disseminated with the intention to deceive others into believing falsehoods or doubting verifiable facts".
- Singapore's law has been at the receiving end of heavy criticism from civil rights organisations for being detrimental to free speech and press freedom.
- Under the new law Singapore's government will determine what factual news is and what is not.

- If there is content about public institutions the government says is false, it can issue corrections that must be published, though it is yet unclear the exact process of how that would happen.
- The punishment includes a prison sentence up to 10 years as well as a fine of a million Singaporean dollars. The apprehension of activists is that these laws will become a way for governments to curb freedom of speech and dissent.
- In fact, such laws could easily morph into a muzzling mechanism against any form of dissent, as has been the case in the use of archaic sedition laws in India as a means to silence dissent and meaningful criticism.
- "Several sections [4(f), 7(1)(b)(vi), 8(3)(f), 9(3)(f)] say that a person must not do anything in or outside Singapore, according to the law, to 'diminish public confidence' in a state body," "What does 'diminish public confidence' mean? A minister can have a lot of latitude to determine whether a statement diminishes public confidence or not."
- For example the high profile escape of alleged terrorist Mas Selamat, who escaped from a Singapore prison in 2008 by climbing out of a window. Under the law, that he broke out may be a fact, but could reporting that it was because of inadequate security measures, thereby eroding confidence in a public institution, be in violation of the law?

- The way the law is worded suggests the government can exempt anybody from this act that they want. The fear is that if power is abused, the law leaves open the possibility that a government official would not be brought to account for potentially spreading falsehoods.

Further, India already has Laws and Regulation to curb Fake news:

- Press Council of India, a regulatory body, can warn, admonish or censure the newspaper, the news agency, the editor or the journalist or disapprove the conduct of the editor or the journalist if it finds that a newspaper or a news agency has violated journalistic ethics.
- News Broadcasters Association (NBA) represents the private television news and current affairs broadcasters. The self-regulatory body probes complaints against electronic media.
- Indian Broadcast Foundation (IBF) also looks into the complaints against contents aired by channels.
- Broadcasting Content Complaint Council (BCCC) admits complaints against TV broadcasters for objectionable TV content and fake news.
- Indian Penal Code (IPC) has certain sections which could curb fake news: Sections 153 (wantonly giving provocation with intent to cause riot) and 295 (injuring or defiling place of worship with intent to insult the religion of any class) can be invoked to guard against fake news.
- Section 66 in The Information Technology Act, 2000: If any person, dishonestly or fraudulently, does any act referred to in section 43 (damage to computer, computer system), he shall be punishable with imprisonment for a

term which may extend to three years or with fine which may extend to five lakh rupees or with both.
- Civil or Criminal Case for Defamation is another resort against fake news for individuals and groups hurt by the fake news. IPC Section 499 (defamation) and 500 (whoever defames another shall be punished with simple imprisonment for a term which may extend to two years, or with fine, or with both) provide for a defamation suit.

Conclusion:

The answer lies not in endangering free speech and press freedom, but for governments to consistently invest in increasing voter awareness, voter literacy, a robust fact-checking environment and critical thinking among the masses, as has been successfully done in Finland and closer to home in Kannur in Kerala, which have created the necessary infrastructure to ensure these outcomes through educational curriculum.

11. The MSMEs will play a key role in realising the target of becoming a 3 trillion-dollar economy. Comment. What measures can be taken to strengthen the engine of economic growth i.e. the MSMEs? Suggest.

Introduction:

Micro- Small and Medium Enterprises (MSMEs) are small sized entities, defined in terms of their size of investment made in plant and machineries if they are operating in the manufacturing sector and investment in equipment for service sector companies.

Body:

MSME's will play a key role in releasing the target of 3 trillion-dollar economy:

- Present contribution of the sector to overall economy: The share of MSME Gross Value Added (GVA) in total GVA during 2016-17 was 31.8% and Exports' contribution which currently stands at 50%.
- Employment generation: The small and medium enterprises account for 11.10 crores jobs, becoming the 2nd largest employment provider. SMEs are thought to have lower capital-output and capital-labour ratios than large-scale industries, and therefore, better serve growth and employment objectives.
- Helps in inclusive growth: the larger population in India is involved in the economy in a big way through the SMEs. It focuses on empowering people to break the cycle of poverty and deprivation, on people's skills and agency.
- Cheap Labor and minimum overhead: While in the large-scale organizations, one of the main challenge is to retain the human resource through an effective human resource management professional manager. But, when it

comes to MSME, the requirement of labor is less and it does not need a highly skilled laborer. Therefore, the indirect expenses incurred by the owner is also low.

- Simple Management Structure for Enterprises: MSME can start with limited resources within the control of the owner. From this decision making gets easy and efficient. On the contrary, a large corporation requires a specialist for every departmental functioning as it has a complex organizational structure. Whereas a small enterprise does not need to hire an external specialist for its management. The owner can manage himself. Hence, it could run single-handedly.
- Checks rural-urban migration: In the village, a person may at least live a dignified life, but when he becomes a slum dweller in the city, what he is put through is quite terrible. Not only do MSMEs generate the highest employment per capita investment, they also go a long way in checking rural-urban migration by providing people living in isolated areas with a sustainable source of employment.
- Increases export potential and promote sustainable growth: The share of MSME related Products in total export from India during 2018-19 is 48.10%. A major portion of the exports from SMEs are handcrafted and eco-friendly and thus help in sustainable growth.
- Strong backward linkages: They act as ancillary industries for Large Scale Industries providing them with raw materials, vital components and backward linkages. For ex: large scale cycle manufacturers of Ludhiana rely heavily on the MSMEs of Malerkotla which produce cycle parts.

Despite the enormous potential, there are several factors that hinder the growth of this sector, like access to finances, access to markets, technology up gradation, ease of doing business, under-utilization of capacity and unorganized nature of employment.

Measures taken by government to address the issues of MSME's:

- Policy support: MSMED Act 2006 and subsequent amendment in 2018, National Apprenticeship Promotion Scheme, Revamped SFURTI (Scheme of Fund for Regeneration of Traditional Industries), ASPIRE (A Scheme for Promotion of Innovation, Rural Industries and Entrepreneurship), MSME Outreach programme in 2018 etc. Prime Minister's Employment Generation Programme (PMEGP) alone generated employment of 5.87lakhs (number of persons) in micro enterprises during the years 2018-19 only.
- Infrastructure strengthening: MSME Samadhaan, Udyami Mitra Portal, MSME Sambhandh, Zero Defect-Zero Effect scheme, Cluster Development Programme, National Manufacturing Competitiveness programme (NMCP) etc.
- Credit and financial strengthening: Through Technology Development and Acquisition Fund (TADF), Trade Related Entrepreneurship Assistance and

Development Fund (TREAD), Mudra Loan scheme, Trade receivables discounting system (TReDS) etc.
- Definition of MSMEs: Classifying MSMEs from current investment in plant and machinery criteria to annual turnover criteria, compliant with the formally introduced GST regime.

Conclusion:

MSME is the backbone of the Indian economy. This sector has proven the instrumental in the growth of the nation. In coming times, it is poised for rapid growth and integration with major global value chains. Timely policy intervention and due support will definitely result in rendering the Indian MSMEs globally competitive.

12. Domestic consumption has long propped up India's economy, so its decline is cause for alarm. Comment. What has caused this decline? What measures can be taken to address it? Discuss.

Introduction:

India is poised to become the third-largest consumer market behind only the US and China; and consumer spending in India is expected to grow from USD 1.5 trillion at present to nearly USD 6 trillion by 2030, a World Economic Forum report titled 'Future of Consumption in Fast-Growth Consumer Market – India' stated.

Body:

Decline in consumption:

- The growth of the Indian economy had been predominated by consumption inclusive of both -- Private Final Consumption Expenditure (PFCE) as well as the Government Final Consumption Expenditure (GFCE). Over the last five years, the total consumption expenditure by Indian households had accelerated with an average growth rate of 7.8 per cent compared to an average of 6.1 per cent in 2011-14. But the recent sharp fall in PFCE in the June quarter to 3.1 per cent compared to 7.2 per cent in the March quarter has significantly contributed to the recent slowdown (GDP growth rate for April-June quarter 2019-20 was 5 per cent).
- The GDP growth rate of the economy has slipped to 5 per cent in the first quarter of FY20, the lowest in over six years. This is an indication of tougher times ahead. Be it the recent collapse of the automobile sector or the rising number of non-performing assets (NPAs) or failing manufacturing sector; all have a hand in this deceleration of growth rate including sluggish consumer demand.

Decline in consumption- a cause for alarm:

- The recent sharp fall in PFCE in the June quarter to 3.1 per cent compared to 7.2 per cent in the March quarter has significantly contributed to the recent slowdown.
- Any fall in consumption expenditure, as and when it would happen, would escalate the crisis even more.
- If consumption spending falls, then output and employment levels also fall since consumption expenditure directly impacts the other two.
- As a consequence, the economy would stagnate, and prices deflate.
- Lower prices, if unable to recover the costs, would halt the operations of any firm and would initiate the layoff process.
- This, in turn, reduces earnings further. Hence this vicious cycle keeps on repeating itself until the economy slips into a deeper state of shock.
- If India have to become $5 trillion economy by 2024, from $2.7 trillion now, India needs its economy to expand at a 9%-10% pace for a sustained period of time. With growth slowing for the past five straight quarters, and no sign of a respite, that's a setback for efforts to fix the extreme income gap.

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Causes of decline:

- Private consumption, which contributes nearly 55-60 per cent, to India's GDP has been slowing down. While the reduced income growth of households has reduced urban consumption,
- drought/near-drought conditions in three of the past five years coupled with collapse of food prices has taken a heavy toll on rural consumption,
- The current slide in GDP growth - for four consecutive quarters -- is interspersed with a series of policy decisions. Two mega policy decisions -- demonetisation in November 2016 and the rollout of the goods and services tax (GST) in July 2017 -- disrupted the Indian economy. the twin disruptions struck a big blow to the informal sectors that employ the maximum number of the workforce.
- The jobless rate jumped to a 45-year high of 6.1% in 2018 and anecdotal evidence suggests that there's more pain to come as the struggling auto sector -- which makes up almost half of India's manufacturing sector - continues to cut jobs. The slide in consumer spending and plunge in auto sales mean overall manufacturing, which contributes about a fifth to the economy, is barely growing, and businesses are curbing investment.

Measures to be taken:

- Government revised GST for the automobile sector, opened up FDI in contract manufacturing sector and even announced the recapitalization of the banking sector. Together with these, it should also focus on optimum

utilization of funds granted by RBI and direct them to boost investment in the economy both infrastructural and research investment.
- Further, structural shifts over the long run can be achieved through tapping into the health and education sectors that long for quality improvements.
- Further rate cuts, increase in fiscal spending, deviation from fiscal deficit target, and boost in consumption sentiment. On its part, the RBI has cut the repo rate by 110 basis points so far in CY19 to 5.4 per cent – its lowest level since 2010.
- There are structural issues in land, labour, agricultural marketing and the likes, which also need to be addressed.
- Merger of weak state-run banks with stronger ones, which can spur lending.
- Foreign investment rules were eased and tax breaks given on vehicle purchases.
- The government also got a windfall from the central bank in excess of $24 billion to boost spending, although it hasn't decided yet what to do with the money. Most of these measures though are focused on improving the long-term potential of the economy, rather than providing a short-term boost.

Conclusion

This is the third instance of an economic slowdown for India in the past decade after the ones that began in June 2008 and March 2011. The technical term for the same is growth recession. A recession is defined in economics as three consecutive quarters of contraction in GDP. But since India is a large developing economy, contraction is a rarity. The last instance of negative growth for India was in 1979. A growth recession is more commonplace where the economy continues to grow but at a slower pace than usual for a sustained period, what India has been facing nowadays.

13. What difficulties are being faced by India on the international trade front? Discuss the factors creating these challenges. What measures need to be taken to address them? Discuss.

Introduction:

According to the Economic Survey, the world is facing Hyper globalization repudiation in which western countries have reached its political capacities for globalization. There is a rising tendency of protectionism across the world, especially the developed countries like US, Japan, China, UK and EU.

Body:

Difficulties being faced by India in International trade:

- Reduced export of IT services to the US due to the H1B visa issue.

- Curb on fruit and vegetable exports to Europe due to Sanitary and phytosanitary reasons.
- The dominance of developed nations in international platforms such as WTO and UN.
- An environment of restrictive global trade has an adverse impact on profit growth of Indian companies. Higher import tariffs can have a negative impact on earnings, by increasing the cost of inputs.
- Openness will lead to a drop in sales growth of Indian companies. While trade openness benefits Indian companies, reduction in import tariff hurts them on the demand front because of competition from imports.
- There has been increasing pressure on India to cut tariffs and dilute export incentives.

Factors creating these challenges are:

- Backtracking from trade liberalization is not new. Global Trade Alert (GTA) data reveals a significant reversal in trade liberalization since the global financial crisis of 2008, and especially since 2011.
- In an inward-looking economic policy, protecting domestic industries against the foreign competition through tariffs, subsidies, import quotas, or other restrictions or handicaps placed on the imports of foreign competitors. The objective of trade protectionism is to protect a nation's vital economic interests such as its key industries, commodities, and employment of workers.
- Concerns about global trade hostilities getting prolonged have escalated lately in the context of the recent measures taken by the US. The Donald Trump administration has imposed tariff hikes on steel and aluminium, triggering retaliatory actions by China.

Way forward:

- Increase in tariff rate to improve the performance of selected sectors.
- Use ASEAN and BIMSTEC like regional platforms to negotiate with developed countries.
- Advocate for a more democratic process of WTO.
- With massive trade surpluses in India's favour, it should offer greater market access to the neighbourhood by reducing tariff and non-tariff barriers.
- Before opening up its markets to the outside world, India should go for a controlled manner bilateral free trade arrangements and give Indian industry time and space to compete in markets around the world in the coming years.
- India, with the world's single largest cohort of young workers, should be a major beneficiary of ageing populations in industrialized nations. For India, securing international worker mobility is an important objective since domestic opportunities alone might not fully optimize India's workforce, and remittances from expatriate workers are a major source of much needed foreign exchange.

- With increasing protectionist trends and appetite for overarching trade deals getting lower, traditional trade negotiations might need to be replaced with specific bilateral solutions; which will be product and country-specific.

14. Why has India emerged as a key player in solar power? Examine. What challenges are the domestic manufacturers of solar cells facing? How has the government responded to this challenge? Discuss.

Introduction:

The International Solar Alliance (ISA) became first international intergovernmental organization headquartered in India on 6th December, 2017. ISA is part of India's vision to provide clean and affordable energy to all. So far 71 countries have signed the Framework Agreement of the ISA. Out of these, 48 countries have ratified the same

Body:

Keeping in view our commitment to a healthy planet and our Nationally Determined Contributions as per the Paris Accord on Climate Change, India made a pledge that by 2030, 40% of installed power generation capacity shall be based on clean sources, it was determined that 175 GW of renewable energy capacity will be installed by 2022. This includes 100 GW from solar, 60 GW from wind, 10 GW from bio-power and 5 GW from small hydro power.

India emerged as a key player in solar power, reasons:

- The Government has revised the target of Grid Connected Solar Power Projects from 20,000 MW by the year 2021-22 to 100,000 MW by the year 2021-22 under the National Solar Mission.
- The country currently has the fifth highest solar installed capacity in the world with total installed capacity of 24.33 GW as on October, 2018 against a target of 100 GW by 2022. Further, 22.8 GW capacity is under implementation or have been tendered out.
- The tariff for grid-connected solar power projects is determined through competitive bidding process involving reverse e-auction. This has helped in bringing down the tariff significantly. The solar tariff has come down from around Rs 18/kWh in 2010 to Rs. 2.44/kWh in 2018 due to various factors like economies of scale, assured availability of land and power evacuation systems etc.
- Solar Parks are being set up in the country. 47 solar parks of aggregate capacity 26,694 MW has been approved in 21 States up to November, 2018.Over 1,00,000 lakh acres of land identified for various solar parks out of which over 75,000 acres have been acquired.
- The Ministry of New and Renewable Energy is also taking up projects for new emerging technologies such as floating solar power.

Challenges faced by the domestic manufacturers of solar cells:

- The issues relate to India's conflicting desires to procure cheap solar equipment, on the one hand, and to encourage a domestic manufacturing base through imposition of import duties, on the other. The latter means slower capacity additions and higher tariffs in the short-run.
- India imports 90% of its solar cell and module requirements from China, Malaysia and Taiwan.
- Moreover, measures like safeguard duty work only when there is a large existing domestic manufacturing base
- Domestic manufacturers believe the safeguard duty will be offset by the fall in prices of Chinese solar panels owing to the phasing out of subsidies for solar installations by the government in Beijing. With demand in China evaporating, Chinese solar panels may be cheaper by up to a third by the end of the year. A global solar panel price have fallen 84% since 2010 and is forecast to decline another 52% by 2025.
- Delay in new manufacturing policy implementation
- India and the US clashed in their trade dispute over solar cells and solar modules at WTO.
- Lack of stable, flexible financing, incentives, and tax exemption benefits to domestic manufacturing industry.
- Lack of demand for domestic solar modules.
- Lack of awareness of solar technologies

Government response to this challenge:

- Creating an ecosystem for domestic manufacturing of solar cells is priority of the government and it have issued expression of interest for setting up solar PV manufacturing capacities linked with assured off take of 20GW. This stimulus is expected to kick start domestic manufacturing in solar energy space.
- Government is offering capital subsidies to manufacturing plants in Special Economic Zone (SEZs) and outside SEZs, and bringing quotas to increase demand for domestic manufacturers.
- The Ministry of New and Renewable Energy supports R&D on various aspects of solar photovoltaic technology including development of poly silicon and other materials, development of device fabrication processes and improvements in crystalline silicon solar cell/module technology, development of thin film solar cell technology (based on amorphous silicon films, cadmium telluride films and copper indium diselenide thin films, organic, dye sensitized and carbon nano tubes).
- MNRE is also supporting development of photovoltaic systems and components used in manufacture of such systems. The Ministry has identified thrust areas for R&D support in solar photovoltaic technology during the 11th plan.
- Development of Solar Parks and Ultra Mega Solar Power Projects.

- Scheme for setting up 1000 MW of Grid-Connected Solar PV Power Projects by the Central Public Sector Undertakings (CPSUs) and the Government of India organisations with Viability Gap Funding(VGF).

- Scheme for setting up 300 MW of Grid-Connected Solar PV Power Projects by Defence Establishments and Para Military Forces with VGF.

Conclusion:

The KUSUM (KisanUrja Suraksha evamUtthaanMahabhiyan) Scheme and SRISTI (Sustainable Rooftop Implementation for Solar Transfiguration of India) – new scheme for solar rooftop being formulated by the Government of India in this regard.

15. How does high consumption of meat and dairy produce fuel global warming? Can a vegan lifestyle address this problem? Critically examine.

Introduction:

Global Warming refers to the sustained increase in the average temperature of the earth's atmosphere. Global warming is heating up of the globe when the accumulation of greenhouse gases in the atmosphere disturbs the heat budget (balance between incoming and outgoing heat) of the earth, which otherwise remains balanced. Since heat remains trapped within the earth s atmosphere, temperatures begin to rise.

Body:

High consumption of meat and dairy produce fuel global warming:

- Cows and other ruminant animals (like goats and sheep) emit methane, a potent greenhouse gas, as they digest grasses and plants. This process is called "enteric fermentation,"
- Rising beef production requires increasing quantities of land. New pastureland is often created by cutting down trees, which releases carbon dioxide stored in forests.
- A 2013 study by the U.N. Food and Agriculture Organization (FAO) estimated that total annual emissions from animal agriculture (production emissions plus land-use change) were about 14.5 percent of all human emissions, of which beef contributed 41 percent.
- Ruminant animals have lower growth and reproduction rates than pigs and poultry, so they require a higher amount of feed per unit of meat produced. Animal feed requires land to grow, which has a carbon cost associated with it.
- Beef is a bigger problem than other sources of meat.
- Producing beef requires significantly more resources (e.g. land, fertilizer, and water) than other sources of meat.

Is a vegan lifestyle solution?

Yes:

- Switching to a plant-based diet can help fight climate change, according to a major report by the UN's Intergovernmental Panel on Climate Change (IPCC), which says the West's high consumption of meat and dairy is fuelling global warming.
- Eating vegetables produces lower greenhouse gas emissions yet. For example, potatoes, rice, and broccoli produce approximately 3–5 times lower emissions than an equivalent mass of poultry and pork (Environmental Working Group 2011). The reason is simple – it's more efficient to grow a crop and eat it than to grow a crop, feed it to an animal as it builds up muscle mass, then eat the animal.
- A new report, published in the British medical journal The Lancet, claims to do just that. It recommends a largely plant-based diet, with small, occasional allowances for meat, dairy, and sugar.
- Even small increases in the consumption of red meat or dairy foods would make this goal difficult or impossible to achieve
- But dietary and technological change [on farms] are the two essential things, and hopefully they can be complemented by reduction in food loss and waste.
- Cutting meat and dairy products from your diet could reduce an individual's carbon footprint from food by two-thirds, according to the Oxford study, published in the journal Science

No:

- In developed countries where the 'veganism will solve the problem' argument is most frequently made, animal agriculture is responsible for an even smaller share of the global warming problem than fossil fuels. For example, in the USA, fossil fuels are responsible for over 10 times more human-caused greenhouse gas emissions than animal agriculture.
- While livestock has an impact, the report makes it sound as if it was the leading source of the impacts. By far the use of fossil fuels are the leading source of carbon emissions,
- The critical issues which need to be addressed are encroachment into wetlands, deforestation, eutrophication of lakes and water bodies resulting in dead zones etc. rather than going vegan completely.
- Agriculture is directly responsible for 14 per cent of total greenhouse gas emissions.
- Agriculture's GHG emissions do not come from cattle alone. Various methods of irrigation, tillage and soil management lead to the production of N2O, and the use of manure contributes to both CH4 and N2O emissions. Clearing space for agriculture (e.g., deforestation) is also a contributor to carbon emissions and land degradation.

Conclusion:

The researchers found a global shift to a "flexitarian" diet was needed to keep climate change even under 2C, let alone 1.5C. This flexitarian diet means the average world citizen needs to eat 75% less beef, 90% less pork and half the number of eggs, while tripling consumption of beans and pulses and quadrupling nuts and seeds. Further, balanced approach needs to be taken to achieve SDG- 13 (Climate action).

16. What are the objectives of India's National Policy on Biofuels? Discuss. Also, examine the prospects and challenges of biofuels in India.

Introduction:

Bio fuels are liquid or gaseous fuels primarily produced from biomass, and can be used to replace or can be used in addition to diesel, petrol or other fossil fuels for transport, stationary, portable and other applications.

Body:

Objectives of National Biofuels policy:

- **The Policy categorizes biofuels as "Basic Biofuels" viz.**
    a. First Generation (1G) bioethanol & biodiesel– made from sugar + starch + oil + animal fats + food crops like corn, sugarcane, sugar beet, wheat and sorghum (made from feedstocks that can also be consumed as human food).
    b. "Advanced Biofuels" – Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels – made from non-food crops + agricultural waste + wood chips (not normally used for human consumption).
    c. Third Generation (3G) biofuels, bio-CNG etc. to enable extension of appropriate financial and fiscal incentives under each category – made from algae + other biomass sources.
- Raw materials: The Policy expands the scope of raw material for ethanol production by allowing use of Sugarcane Juice, Sugar containing materials like Sugar Beet, Sweet Sorghum, Starch containing materials like Corn, Cassava, Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production.
- Appropriate Pricing: Farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Taking this into account, the Policy allows use of surplus food grains for production of ethanol for blending with petrol with the approval of National Biofuel Coordination Committee.

- Funding Scheme: With a thrust on Advanced Biofuels, the Policy indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in addition to additional tax incentives, higher purchase price as compared to 1G biofuels.
- Supply Chain Mechanism: The Policy encourages setting up of supply chain mechanisms for biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.
- Roles and responsibilities of all the concerned Ministries/Departments with respect to biofuels has been captured in the Policy document to synergise efforts.

Prospects of Biofuels:

Crops used to make bio fuels are generally high in sugar (such as sugarcane, sugar beet, and sweet sorghum), starch (such as maize and tapioca) or oils (such as soybean, rapeseed, and coconut, sunflower).

- Reduce Import Dependency: One crore liters of ethanol saves Rs.28 crore of forex at current rates. The ethanol supply year 2017-18 is likely to see a supply of around 150 crore litres of ethanol which will result in savings of over Rs.4000 crore of forex.
- Cleaner Environment: One crore liters of ethanol saves around 20,000 ton of CO2 emissions. For the ethanol supply year 2017-18, there will be lesser emissions of CO2 to the tune of 30 lakh ton. By reducing crop burning & conversion of agricultural residues/wastes to biofuels there will be further reduction in Green House Gas emissions.
- Health benefits: Prolonged reuse of Cooking Oil for preparing food, particularly in deep-frying is a potential health hazard and can lead to many diseases. Used Cooking Oil is a potential feedstock for biodiesel and its use for making biodiesel will prevent diversion of used cooking oil in the food industry.
- MSW Management: It is estimated that, annually 62 MMT of Municipal Solid Waste gets generated in India. There are technologies available which can convert waste/plastic, MSW to drop in fuels. One ton of such waste has the potential to provide around 20% of drop in fuels.
- Infrastructural Investment in Rural Areas: It is estimated that, one 100klpd bio refinery will require around Rs.800 crore capital investment. At present Oil Marketing Companies are in the process of setting up twelve 2G bio refineries with an investment of around Rs.10,000 crore. Further addition of 2G bio refineries across the Country will spur infrastructural investment in the rural areas.
- Employment Generation: One 100klpd 2G bio refinery can contribute 1200 jobs in Plant Operations, Village Level Entrepreneurs and Supply Chain Management.
- Additional Income to Farmers: By adopting 2G technologies, agricultural residues/waste which otherwise are burnt by the farmers can be converted

to ethanol and can fetch a price for these waste if a market is developed for the same. Also, farmers are at a risk of not getting appropriate price for their produce during the surplus production phase. Thus conversion of surplus grains and agricultural biomass can help in price stabilization.

Challenges of biofuels:

- Food prices: Estimates of the role of bio fuels in the hike of food prices during 2008 have been much debated. It is estimated that 30% (International Food Policy Research Institute) to 65% (World Bank) of the increase in food prices can be attributed to the increased production of bio fuels instead of food.
- Tenure and Conflicts: Large scale bio fuel production often competes with other land and water uses. Power imbalances make it difficult for local communities to negotiate sufficient compensation for e.g. lost land, especially if they hold no formally recognized tenure rights. Indigenous communities and women are particularly vulnerable.

Environmental challenges

- Soil and Water: Many bio fuel crops are highly water intensive. Crops like sweet sorghum, tropical sugar beet and jatropha can grow on drier soils, but may require irrigation and fertilisers to become commercially attractive.
- Deforestation, climate change and ecosystem services large scale monoculture bio fuel production often leads to deforestation. Rapidly expanding oil palm plantations in South East Asia, considered one of the largest threats to tropical forests and peat lands, serve as alarming examples. These ecosystems store millions of tons of carbon which is released when they are exploited. Deforestation is in turn a major threat to biodiversity, local communities and indigenous groups dependent on biodiversity.

Conclusion:

Indian government has realised the potential advantages of bio fuel and have taken steps to promote befouls through its recent document National Bio fuel policy. This will help in realising dreams of doubling farmers income along with reducing dependency on fuel imports.

17. What is blockchain technology? What is so revolutionary about it? What can be its applications? Discuss.

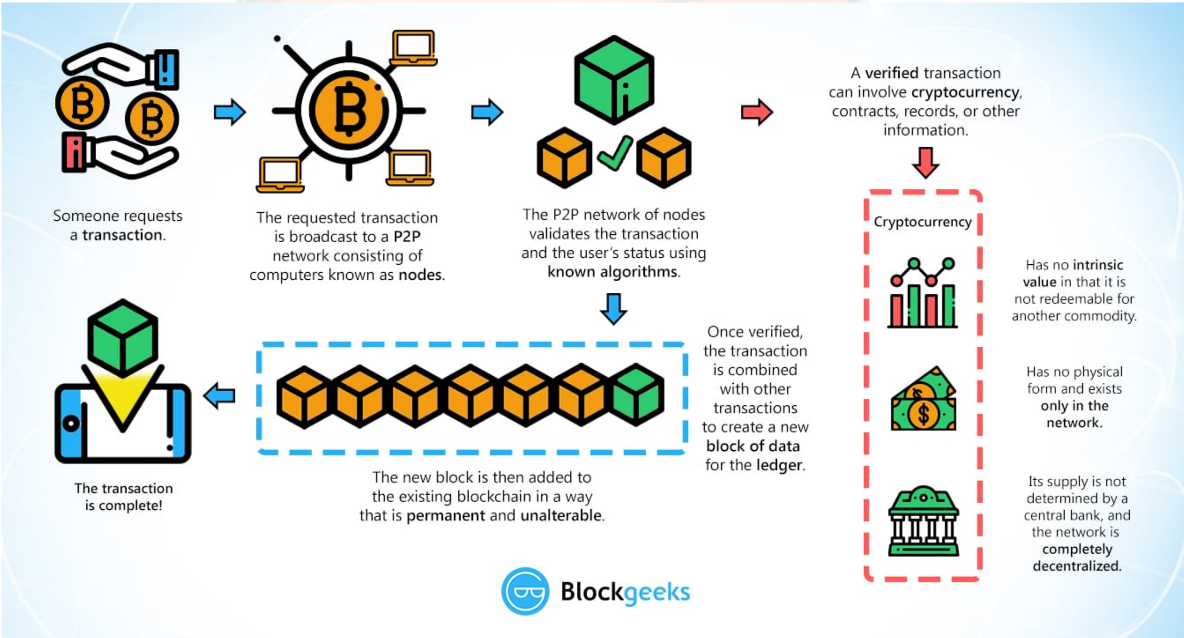
Introduction:

"Blockchain technology" typically refers to the transparent, trustless, publicly accessible ledger that allows us to securely transfer the ownership of units of value using public key encryption and proof of work methods.

Body:

It is considered revolutionary because of several intended and potential benefits it carries for the humanity. For instance, The technology is a solution to bring in transparency especially in financial sector which can track the origin and source of money and prevent many financial frauds.

Even though blockchain was conceived for financial transactions, its characteristics make it an apt solution that can support voting systems. Due to its unique attributes of trust, transparency and immutability, such a system is expected to mitigate issues like vote manipulation in political processes.



Applications of Block chain technology:

- Australia has declared its plan for using blockchain in voting and began projects for prototyping the technology a couple of years ago.
- Malta with a small population of 450,000, is about to embrace blockchain in land registry, voting and other national services.
- Confidentiality: "Blockchain will ensure two things -- non- repudiative and confidentiality. Only those authorised to access details will be able to access details and only when they need to deliver service.
- Telecom industry: Telecom regulator Trai recently issued new draft norms to curb pesky calls and SMSes by using blockchain technology to ensure that telemarketing messages are sent only to those who have subscribed to them, and that too by authorized entities.
- Information exchange: The blockchain is a simple yet ingenious way of passing information from A to B in a fully automated and safe manner

- Financial institutions: In the financial world the applications are more obvious and the revolutionary changes more imminent. Blockchains will change the way stock exchanges work, loans are bundled, and insurances contracted.
- Government corruption and fraud: the immutable, un-alterable nature of the blockchain allowed for government fraud to be detected.

Pro's	Con's
Anything of value can be transferred and saved safely and confidentially - without unlawful alteration	Scammers and other seedy characters can use the anonymity to their advantage to do evil
Transactions are verifiable by a vast, peer-to-peer global network	Hacks and manipulation can still occur
Cryptocurrencies are not able to be "frozen" in the case of economic crisis (such as your money in the bank would be)	The majority of governments, offices, retailers, and everyone who deals with money, do not understand, let alone use / accept cryptocurrencies as valid payment.
There will no longer be the need for intermediaries such as banks, lawyers, government, etc.	Many people are currently employed in institutions that serve as intermediaries… there will certainly be a lot of resistance
Transactions are irreversible.	Transactions are irreversible.
1 Bitcoin is (as of this publication) worth $1252 USD, and has increased in value over time	Behind the scenes, there may be trouble with bitcoin, and there are rumors of it splitting into two separate cryptocurrencies

Conclusion:

Blockchain is not a panacea for all issues facing the system today but is an ideal technology to ensure proof of integrity to the data and reduce incidents of fraud.

18. What is zero budget natural farming? What are its benefits? Is it a viable form of farming in Indian conditions and for catering to India’s food requirements? Critically examine.

Introduction:

The word 'budget' refers to credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming with Nature and without chemicals.

Body:

Zero budget natural farming:

- The technique replaces fertilisers and pesticides with concoctions of cow dung, cow urine, jaggery and pulse flour, and ensure perfect soil conditions for plant growth.
- It does so by keeping the top soil covered with crop residues to increase water retention, coating of seeds with cow dung and urine, concoction made of dung, urine, jaggery and pulse flour to multiply soil microbes, concoction to protect plants from pests etc.

Benefits of ZBNF:

- Natures principles: It applies nature principles that is no chemicals, no inputs in form of industry manufactured fertilizers, Bt/Hybrid seeds etc. Treats soil with natural products like cowdung, cow urine etc.
- Cost effective: Since no application of chemical fertilizers, no tillage required, it reduces cost of production and giving more profits to farmers.
- Soil health: It helps in increasing soil health, by using this techniques, good amount of soil bacteria's and soil microbes can be cultivated.
- Evergreen revolution: It will take India from its current green revolution to evergreen revolution.

It is a viable form of farming for Indian conditions because:

- In ZBNF, yields of various cash and food crops have been found to be significantly higher when compared with chemical farming.
- Input costs are near zero as no fertilizers and pesticides are used.
- Profits in most areas under ZBNF were from higher yield and lower inputs.
- Model ZBNF farms were able to withstand drought and flooding, which are big concerns with regard to climate change.
- The planting of multiple crops and border crops on the same field has provided varied income and nutrient sources.
- As a result of these changes, there is reduced use of water and electricity, improved health of farmers, flourishing of local ecosystems and biodiversity and no toxic chemical residues in the environment.

Conclusion:

However, The Natural Academy of Agricultural Sciences, the country's top body of farm scientists, has criticised zero-budget natural farming, calling it an "unproven" technology that will not bring tangible gain to either farmers or consumers.

19. What vulnerabilities does India's open coastline cause to the internal security ecosystem? What measures have been taken to address those? Discuss.

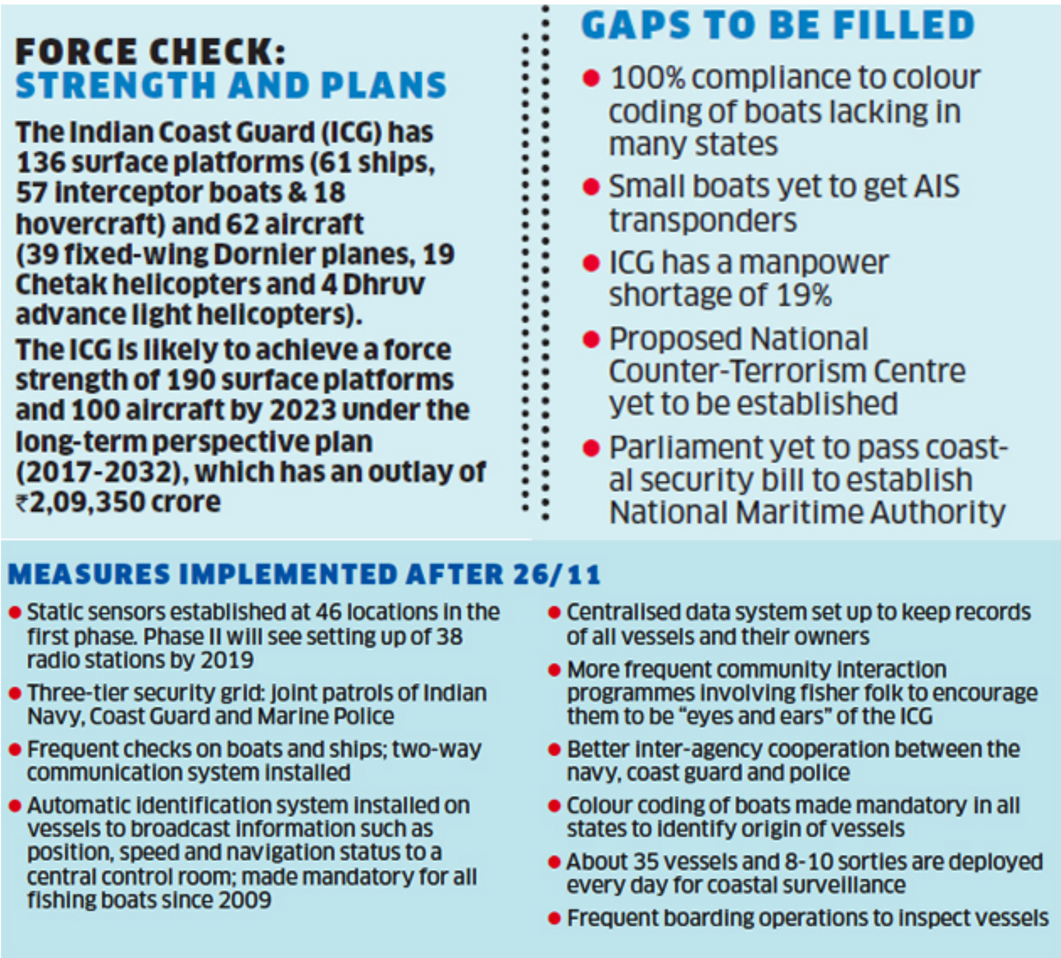
Introduction:

India has 7516.5 km of open coastline which is guarded by Indian coast guard and Indian Navy. But open coastline anytime is a serious threat and they are vulnerable to international security ecosystem.

Body:

Vulnerabilities of India's open coastline to internal security ecosystem:

- Highest vulnerability is from terrorists coming from Pakistan. India already faced a terrorist attack due to open coastline on 26/11.
- Attack on installations: vital installations like atomic power plants, oil platforms, naval/ military/coast guard bases and industrial areas are situated to near coast.
- Economy: Financial capital of India and manufacturing hubs like Chennai, Kolkata all are located near coastline, attack on them is like attack on India's economy.
- Collateral damage: Attack on these is no just an attack on infrastructure but also has serious effect on psychology of people.
- Organized crime: Open coastlines are vulnerable to organized crimes like smuggling of narcotics, arms and ammunitions, human trafficking etc.
- Piracy: Open coastlines are also vulnerable to piracy.
- Illegal migration: the vulnerability of the Indian coast from illegal inflow of migrants and refugees from Bangladesh and Sri Lanka, especially along the Odisha and Tamil Nadu coasts might causes internal disturbances and civil unrest.



FORCE CHECK: STRENGTH AND PLANS

The Indian Coast Guard (ICG) has 136 surface platforms (61 ships, 57 interceptor boats & 18 hovercraft) and 62 aircraft (39 fixed-wing Dornier planes, 19 Chetak helicopters and 4 Dhruv advance light helicopters).

The ICG is likely to achieve a force strength of 190 surface platforms and 100 aircraft by 2023 under the long-term perspective plan (2017-2032), which has an outlay of ₹2,09,350 crore

GAPS TO BE FILLED

- 100% compliance to colour coding of boats lacking in many states
- Small boats yet to get AIS transponders
- ICG has a manpower shortage of 19%
- Proposed National Counter-Terrorism Centre yet to be established
- Parliament yet to pass coastal security bill to establish National Maritime Authority

MEASURES IMPLEMENTED AFTER 26/11

- Static sensors established at 46 locations in the first phase. Phase II will see setting up of 38 radio stations by 2019
- Three-tier security grid: joint patrols of Indian Navy, Coast Guard and Marine Police
- Frequent checks on boats and ships; two-way communication system installed
- Automatic identification system installed on vessels to broadcast information such as position, speed and navigation status to a central control room; made mandatory for all fishing boats since 2009
- Centralised data system set up to keep records of all vessels and their owners
- More frequent community interaction programmes involving fisher folk to encourage them to be "eyes and ears" of the ICG
- Better inter-agency cooperation between the navy, coast guard and police
- Colour coding of boats made mandatory in all states to identify origin of vessels
- About 35 vessels and 8-10 sorties are deployed every day for coastal surveillance
- Frequent boarding operations to inspect vessels

Conclusion:

The Union defence minister has also pointed out time and again that though maritime terror poses a grave threat to India, the country's coastline is now more secure compared to 2008 due to a slew of initiatives taken by the government.

20. Cyber Security breaches have become the new normal with invasive bugs on the rise. In this light, examine the threats that social media platforms and online messaging tools bring into the lives of common citizens.

Introduction:

India was the country with third highest number of cyber-attacks in 2018, according to a report, after Mexico and France. Cyber security continues to be a major issue in India with 76% organizations hit by online attacks in the last year, as compared to 68% incidents across the globe, reveals a new global survey from security firm Sophos.

Body:

Cybercrime is a global problem that's been dominating the news cycle. It poses a threat to individual security and an even bigger threat to large international companies, banks, and governments.

Cyber-attack in India of late:

- Union Bank of India Heist: Through a phishing email sent to an employee, hackers accessed the credentials to execute a fund transfer, swindling Union Bank of India of $171 million, Prompt action helped the bank recover almost the entire money
- Wannacry Ransomware: The global ransomware attack took its toll in India with several thousand computers getting locked down by ransom-seeking hackers. ransomware.
- Data theft at Zomato: The food tech company discovered that data, including names, email IDs and hashed passwords, of 17 million users was stolen by an 'ethical' hacker-who demanded the company must acknowledge its security vulnerabilities-and put up for sale on the Dark Web.
- Petya Ransomware: The ransomware attack made its impact felt across the world, including India, where container handling functions at a terminal operated by the Danish firm AP Moller-Maersk at Mumbai's Jawaharlal Nehru Port Trust got affected.

The threats that social media platforms and online messaging tools bring into the lives of common citizens:

- The sharing of bank details in lure of job or lottery over such platform can lead to financial fraud.
- Mark sheets sharing can trigger cyber-bullying.
- Private information can be the basis for blackmail or other criminal activities.
- Private data out in the open can also spark psychological problems.
- Being the target of focused advertising can be a menace. Companies can use a person's data, such as search history, for instance, to know more about the person, and thereby target him or her with customised ads.

Precautions to be taken while using social media platforms and online messaging tools:

- Use a strong password. The longer it is, the more secure it will be.
- Use a different password for each of social media accounts.
- Set up your security answers. This option is available for most social media sites.
- If you have social media apps on your phone, be sure to password protect your device.

- Be selective with friend requests. If you don't know the person, don't accept their request. It could be a fake account.
- Click links with caution.
- Be careful about what you share. Don't reveal sensitive personal information ie: home address, financial information, phone number. The more you post the easier it is to have your identity stolen.
- Become familiar with the privacy policies of the social media channels you use and customize your privacy settings to control who sees what.
- Protect your computer by installing antivirus software to safeguard. Also ensure that your browser, operating system, and software are kept up to date.
- Remember to log off when you're done.

- When downloading any new app, users get permission-dialogue boxes, requesting for access to media and document libraries, your camera and microphone. Read carefully and take a stance on what permissions you may or may not be granting.
- One shouldn't use social media accounts to link-up with any third-party apps. For example, if you use Facebook to log into an app such as FaceApp, they may be able to gain access to device details, or even behaviour patterns. Any data you voluntarily or involuntarily supply can then be used by the app (maliciously or otherwise) or sold as data.

Things to be taken into consideration:

- Srikrishna Committee recommendations to the government for the data protection bill.
- Supreme Court of India's recognition of privacy as a fundamental right.

Conclusion:

Social media (eg- Facebook) and online messaging tools (eg- Whatsapp) has become irreplaceable in our lives. It has great influence not only on individual citizens, but also on a broader scale on the whole society and its structures. World Economic Forum has termed social media as one of the biggest threat to democracy.