

1. How severe is the unemployment crisis in India? Examine. What measures would you suggest to address the problem of unemployment in India? Discuss.

Introduction

India had an unemployment rate of 7.16% according to data released by the Centre for Monitoring Indian Economy (CMIE). (Data released in January, 2020)

Body

Severity of unemployment in India:

- **Impact of COVID-19 Pandemic:** Sub-optimal demand in a weak economic environment is aiding the employment crisis
- **Adverse Impact on Growth:** India's gross domestic product (GDP) contracted by a historic 23.9% in June 2020 quarter according to official data, which has led to job losses and increasing unemployment
- **Increasing unemployment year by year:** Unemployment number has doubled since 2016 — from 79.7 lakh to 1.5 crore being unemployed in the past three years.
- **Core Sectors Impacted:** The construction sector contracted by 50%, manufacturing by 39.3%, and trade, hotel and transport segment fell by 47%.
- **Youth Potential going waste:** The most amount of unemployment is seen in the age group 24-29 years — 32.59 per cent.
- **High Unemployment in Urban areas:** Urban unemployment crept up to 9.83% in August 2020 whereas rural unemployment rate was 7.65%, according to monthly unemployment data released by CMIE
- **Highest in last four decades:** The assessment by the National Sample Survey Office conducted between July 2017-June 2018, showed the unemployment rate stood at 6.1 percent, the highest since 1972-73.
- **Under employment:** India also has lesser jobs for those who are more educated — 14.6 per cent of the graduates in our country who are actively looking for jobs are unemployed

Measures to address the problem of unemployment in India:

- **Encourage Self-employment:** Easy access to loans, target small-business, start-ups or female entrepreneurs.
- **MSME Sector:** It is this sector which is labour intensive and decentralised in nature according to local strengths. Governments needs to identify MSME clusters and equip them with better capabilities like Finance, electricity, Infrastructure, marketing etc
- **Education, Health and Employment Generation:** the expansion of education and health care not only promotes accumulation of human capital and thereby contributes to growth of output, it will also generate a good deal of employment opportunities.
- **Skilling and re-skilling:** Fourth Industrial Revolution will make 75 million jobs obsolete by the year 2022 but will also create 133 million new jobs — a net gain of 58 million. Thus, in order to sustain in the industry, it is crucial for employees to reskill or upskill to stay industry-relevant.

- **Financial literacy:** Introduce money early on and give them goals and responsibilities for managing their finances
- **Digital divide:** Disparity of resources affects developing countries the most, which is a result of the availability of limited resources and the backwardness of certain communities.

Note: You can mention other measures as well like Sector specific packages for labour intensive sectors like leather & textile industry, reduction in repo rates by RBI to increase Credit growth, agricultural reforms, International agreements for labour migration, promoting innovation etc

Conclusion

Everyone —big corporate houses, entrepreneurs, employees and authorities—will have to show a strong commitment. Then it will have a positive impact on job creation and revival of the economy

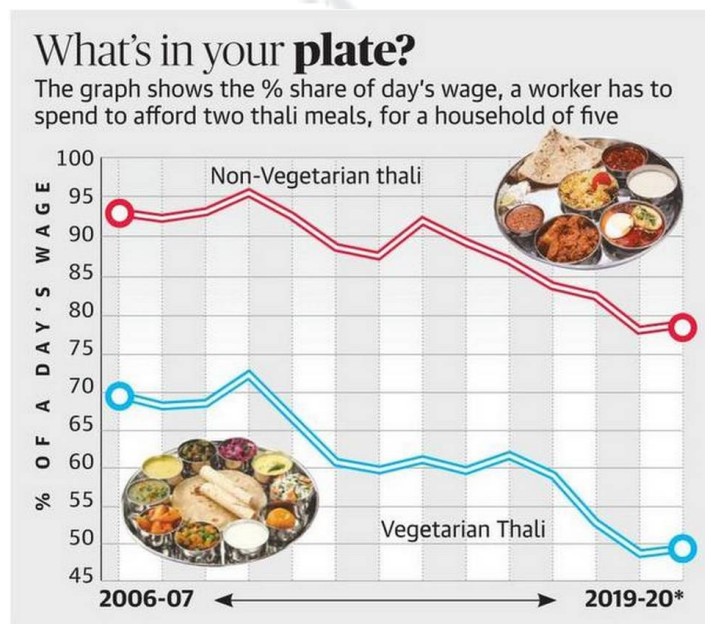
2. What is ‘Thalinomics’? What are the major findings of this year’s Economic Survey with respect to food affordability? Discuss.

Introduction

“Thalinomics: The economics of a plate of food in India” – an attempt to quantify what a common person pays for a Thali across India.

Thalinomics captures the **economics of a plate of food in India.**

The survey analysed data from the Consumer Price Index for industrial workers for about 80 centres in 25 states/ Union Territories from April 2006 to October 2019 to arrive at the cost of a thali as part of ‘Thalinomics



SOURCE: SURVEY CALCULATIONS
 NOTE: *: CALCULATIONS FOR 2019-20 BASED ON PRICES FOR THE PERIOD APRIL-OCTOBER, 2019

Body

Major findings from economic survey:

- **Savings:** A vegetarian household saved Rs 10,887 on an average per year, assuming five individuals had two thalis a day, while households eating nonvegetarian thalis saved Rs 11,878 a year
- **Improved Affordability:** The affordability of a vegetarian thali improved by 29% between 2006-07 and 2019-20 and that of a non-vegetarian thali by 18% over the 13-year period.
- **Across the board gains:** Both across India and the four regions – North, South, East and West – we find that the absolute prices of a vegetarian thali have decreased since 2015-16 though it increased during 2019. This is owing to the sharp downward trend in the prices of vegetables and dal in contrast to the previous trend of increasing prices
- **Southern region with highest gains:** The highest gain in any year was in the Southern region for a vegetarian Thali in 2018-19 of around 12 per cent of annual earnings of a worker.
- **Cheapest thali in Jharkhand:** Jharkhand topped the list of states with the most affordable thalis in both categories in April-October 2019. Two vegetarian thalis for a household of five in Jharkhand required about 25% of a worker's daily wage.
- **Prices of cereals and vegetables:** The prices of Cereals have been mentioned to be declining at a steady rate; the inflation has accelerated in all other components except vegetables.

Initiatives for Enhancing Productivity of Agriculture and Efficiency of Agricultural

Markets:

- Pradhan Mantri Annadata Aay SanrakshAn Abhiyan (PMAASHA)
- Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) - Per Drop More Crop
- Pradhan Mantri Fasal Bima Yojana (PMFBY)
- Soil Health Card
- e-National Agricultural Market (e-NAM)
- National Food Security Mission (NFSM)
- National Food Security Act (NFSA)

Conclusion

- Food is not just an end in itself but also an essential ingredient in the growth of human capital and therefore important for national wealth creation. 'Zero Hunger' has been agreed upon by nations of the world as a Sustainable Development Goal (SDG).
- This goal (SDG 2) is directly related to other SDGs such as Goal 1 (No poverty), Goal 4 (Quality Education), Goal 5 (Gender equality), Goal 12 (Responsible

consumption and production), Goal 13 (Climate Action) and Goal 15 (Life on Land).

3. What is an expansionary budget? When does an economy normally need an expansionary budget? Explain. How would you assess this year's budget on the yardstick of 'reviving demand in the economy'? Critically comment.

Introduction

Expansionary budget is when the government expands the money supply in the economy using budgetary tools to either increase spending or cut taxes—both of which provide consumers and businesses with more money to spend.

Expansionary fiscal policy includes tax cuts, transfer payments, rebates and increased government spending on projects such as infrastructure improvements.

Expansionary Policy is **based on the ideas of Keynesian economics**, particularly the idea that the main cause of recessions is a deficiency in aggregate demand.

Body

Need of expansionary budget:

- **Boosts Aggregate Demand:** Expansionary policy seeks to stimulate an economy by boosting demand by putting more money into the hands of Consumers and firms.
- **Popular tool for managing low-growth periods:** Higher liquidity and disposable income, and increased employment can pull us out of the economic slowdown problem.
- **Business Friendly:** Reduction and reform of direct individual and corporate taxes, and indirect taxes.
- **Counter-Cyclical Measure:** To counterbalance the natural depression in spending and economic activity that takes place during a recession

Challenges with Expansionary Budget

- **Burden on Future Generation:** An expansionary fiscal policy leads to higher budget deficits as the money supply is usually increased through increased borrowing.
- **Loaded with Uncertainty:** Gauging when to engage in expansionary policy, how much to do, and when to stop requires sophisticated analysis and involves substantial uncertainties.
- **Can lead to Inflation:** Expanding too much i.e. putting more money into economy can cause side effects such as high inflation or an overheated economy.
- **Needs time to become effective:** There is also a time lag between when a policy move is made and when it works its way through the economy.
- **Possibility of Misuse:** Like any government policy, an expansionary policy is potentially vulnerable to information and incentive problems. Problems such

as rent-seeking and principal-agent problems easily crop up whenever large sums of public money is being pumped into the system

2020-21 Budget

- Currently for individuals under the age of 60 years, there is zero tax up to an annual income of Rs 2.5 lakh.
- Base corporate tax for existing companies has been reduced to 22 per cent from 30 per cent, and to 15 per cent from 25 per cent for new manufacturing firms.

Assessment:

- Tax collections in the current fiscal may fall short of targets by as much as Rs 2 lakh crore.
- Income and corporate tax collections are likely to miss FY2020 targets by as much as Rs 1.5 lakh crore while indirect taxes may fall short by about Rs 50,000 crore on drop in the Goods and Services Tax (GST) in a sluggish economy.
- The exchequer was shaved off Rs 1.45 lakh crore as the government slashed corporate tax rates up to 10 percentage points, the biggest reduction in 28 years

Conclusion

With economic slowdown resulting in slippages in direct and indirect tax collections the next financial year is expected to pose challenges on the fiscal front. Expansionary fiscal policy is having short and long term implications. Structural reforms are need of the hour.

4. For debt sustainability, the rate of growth of debt must not be faster than the rate of growth of the economy. Do you agree? Substantiate your assessment?

Introduction:

Indian Economy is suffering from one of its worst phases with sharp fall in demand. India Rating's FY21 GDP growth forecast of negative 11.8 per cent will be the lowest GDP growth in the Indian history. India's ever rising debt has rubbed salt to the wound.

The whole idea of Deficit on Current account is due to high expenditure which is balanced by loans. This results in heavy debts and interest paid on these debts create current account deficit.

Body:

With slowdown in GDP growth rate, India's debt dynamics are now at the risk of being unsustainable.

- **Intergenerational Equity disturbed:** While debt grows at a rate higher than the growth rate of the economy, then interest payments increases. This further reduces the future government's (next generation) ability to borrow

funds.

- **India's debt to GDP ratio** was 69% in the year 2019-2020. A higher debt growth rate further increases this ratio which is not a sound macroeconomic management. This proves the necessity to narrow down Debt or increase GDP.
- **Fiscal Prudence Lost:** Non adherence to Fiscal Responsibility and Budget Management Act has made things worse. At least after N.K. Singh committee has relaxed Fiscal deficit norms, commitment to fiscal prudence needs to be stronger.
- **Unrealistic Tax Targets:** High growth rate is also important as it is the basis for tax projections. When the nominal growth rate is over-estimated, as it was last year, tax officials are given unrealistic targets which can result in witch hunting thus driving away foreign investment
- **Sovereign Ratings:** Increasing debt rate indicates that economy is not managed properly which leads to downgrading of government securities by rating agencies. This deters foreign investment flowing into the country.
- **Economic Collapse:** If the debt rate increased without being stabilised then the value of currency falls rapidly which precipitates the economic collapse leading to social & political unrest (Ex: European Union's Greece Crisis in 2012)

Nevertheless, during extreme situations when the economy is under recession then debt has to grow at a rate faster than GDP growth rate as a part of Expansionary policy to revive economy. However, such measure should be limited to short term and discontinued over medium term else, the above challenges will be faced by the Nation

Conclusion:

Thus, government needs to take certain steps to cease and reduce its debts. Such as setting up of a fiscal council, which would be an independent body that would examine the government's revenue, expenditure and borrowing and make estimates of its borrowings. Also setting up of a deeper bond market that hits the government hard if it falters on its commitments to debt sustainability.

5. India suffers from the problem of overproduction of cereals. Do you agree? What can be done to make the spread of farm produce more diverse and nutritious? Suggest.

Introduction:

Green Revolution in post-independence was started and rightly achieved food self-sufficiency. Humongous increase in production of rice and wheat especially in the region of Punjab, Haryana and Western U.P solved the problem of farm income as well as food crisis.

Body:

But it came with its own side effects in socio economic and environmental domain

such as:

- Diversity of production was stopped and focus was laid on quantity of production rather than quality. This led to depletion of soil nutrition without replenishment.
- Lack of diversity led to a new problem of **hidden hunger** also known as malnourishment.
- Its focussed approach led to **regional imbalances** in the economy where western and more fertile eastern India remain backward
- Depletion of ground water table due to water intensive farming in rainfed region has posed a long term problem of **water stress**.

It is therefore important to diversify the farm produce which can be done as following:

- Allied activities need to be introduced in agriculture such as cattle rearing, poultry farming for protein supplements.
- Farming itself should be diversified through inter cropping, relay farming or mixed cropping to replenish soil nutrients.
- Zero Budget Natural Farming is one of the principal solutions to persisting problems in agriculture. The problems that it can tackle include overuse of fertilizer, pesticide, depletion of water table, etc.
- Food fortification can increase the nutrition content of farm produce, e.g Golden Rice has increased content of iron as well zinc, etc.

Conclusion

M.S Swaminathan committee has recommended crop diversification to achieve remunerative income for farmers. Government has also come up with food fortification in collaboration with Russia. Other Lab extension services shall also help India to tackle the dual problem of malnourishment as well as mono cropping of cereals.

6. What are the conventional means of infrastructure financing? What measures have been taken in recent years to expand and innovate in the area of infrastructure financing? Discuss.

Introduction:

Infrastructure financing in India has been a nightmare for both the public and private players in the field. One of the principal reasons for its non-performance is very long gestation period after which profits are incurred. Also rising Non-Performing Assets have left little room for private companies to take greater risk which in turn has led to failure of Public Private Partnership model.

Body:

Government has taken several steps in this area such as:

- Various investment models such as Build Operate Transfer or Design Build Operate Transfer have been offered which has not been able to pull private sector in this arena due to **disproportionate risk sharing** with Private sector

- Special Economic Zone were created as a separate production and export unit which have become underutilized and hotbeds of corruption.
- Public Sector banks have played a key role in financing infrastructure projects which has caused an asset liability mismatch.

These often led to stalling of projects. But recently government has taken several steps such as following have worked:

- Creation of **National Infrastructure Investment Fund** for commercially viable greenfield, brownfield or stalled infrastructure projects.
- **Infrastructure Debt Fund** which as investment vehicle for channelizing investment in infrastructure investments. They are sponsored by commercial banks and NBFCs in India.
- **Development Finance Institutions** to boost economic growth and increase long term finances for infrastructure projects.
- **Hybrid Annuity Model** was launched in which initial 40% of the investment shall be taken up by government and rest 60% shall be returned by govt to private sector in fixed annual instalments. This ensures proportionate risk sharing between private as well as public sector.
- **Vijay Kelkar committee** was formed that gave comprehensive reform agenda for improving PPP structure. The committee recommended sector specific regulators, National PPP Policy

Conclusion:

According to Economic Survey, India must spend \$200 Billion annually in infrastructure sector. To achieve the target of \$10 trillion economy size by 2032, a robust and resilient infrastructure system is required, supported by adequate private investments. As the country has only been able to put \$100 to 110 billion annually into infrastructure development, this huge investment gaps of about \$90 billion in the space needs funding through “innovative approaches” from private sector.

7. How is the global outbreak of the Coronavirus affecting the economy in general and livestock sector in particular? Examine. How can the trends be reversed? Suggest.

Introduction:

Since first being recorded late 2019 in China, the Covid-19 coronavirus has spread around the world, and been declared a pandemic by the World Health Organization. By early spring, Europe had become the worst-affected region, with Italy and Spain particularly hard hit. India recorded its first patient on 31st January 2020 and has the second highest case load in the world

Body

The disease is easily transmitted from human to human and thus to stop its spread, it's vital to control movement of people. Such measure has crippled the economy and has brought it to a standstill. IMF projection for global GDP has dropped down to 1.6 % in 2020. Its effect is witnessed across various sectors including:

1. **Tertiary sector** - This is one of the worst affected sectors especially tourism that is considered to be the cause of the spread. In case of India, contribution of services sector to GDP is maximum at approximately 60% which has been almost brought to a standstill.
2. **Secondary sector** - such as heavy industries have also come to a halt. Manufacturing slump would have long term consequences resulting in huge demand supply gap. Various rating agency have projected IIP growth to be less than 4%.
3. **Trade** - The virus has resulted in “disaster diplomacy” affecting most nations that are highly dependent on China such as India. This has resulted in lack of availability of electronic items, organic fertilizers and most importantly active pharmaceutical ingredients (which forms the basis of most medicines in India).
4. **Primary sector** especially agriculture and allied has been hit hard with slump in global demand. India is one of the largest exporter of wheat, rice along with fisheries and shrimps. Global trade halt has brought the primary sector in danger.
5. **Livestock sector** that is considered as an asset in farm as they bring supplementary income has been interrupted with falling demand especially for poultry sector.
 - a. Poultry sector has faced unprecedented decline. Fake news linking the spread of Covid-19 to chickens have cost the Indian poultry market over ₹1.6 billion a day. Culturally, Indian society has blamed broiler chicken for spread of any zoonotic disease even chickungunya.
 - b. Dairy sector has been hampered by hindrance in supply chain as transport has been curbed. Also, perishability of milk is very high resulting in quicker loss of milk or milk products.
 - c. Feed sector has also become victim to fake news. Poultry and livestock sector have lowered the demand for fodder and feed. As many poultry owners have started to produce their own feed, they have stopped sourcing raw materials like soybean, corn from the market, impacting the farmers too.

Conclusion:

- Amongst the short term measures, adoption of TTT (trace, test and treat) could be helpful in stopping the spread to a great extent. Also, government has announced economic stimulus package amounting to 20 Lakh Crore rupees.
- Long term measures demand increase in investment in health sector, a meagre 1.15% would be of no use. Also, very importantly, India should now include the impact of international tourism on health sector.
- India needs to scale up health test at rural areas so as to avoid the disease being spread in India’s hinterland region where Health infrastructure is weak

8. What is the Kisan Rail proposed in the latest annual budget? How will it be developed and deployed? What advantages would accrue to the farmers of the country by the Kisan Rail?

Introduction:

The Kisan Rail is being launched by the Government of India to set up national cold supply chain in the country. The Centre is planning to transport fish, milk and meat under the scheme. The scheme is to be implemented under Public-Private Partnership. It is in line with the target of Doubling Farmer income by 2022.

Body:

Government has formed a committee under Ministry of Agriculture along with representatives of Indian Railways to work on the modalities of the scheme. The scheme was already being implemented by Container Corporation of India (CONCOR) as a Corporate Social Responsibility in Nasik, Maharashtra. Some of the benefits linked to the scheme include:

- It would significantly reduce losses especially for horticultural products which are of higher economic value.
- This would also increase farmer income thereby help in realising the dream of Doubling Farmer income thereby reduce poverty
- Higher income would give flexibility to farmer to increase investment in fields which would in turn **increase yield**.
- Also, increased nutrition through food diversification would help in tackling hidden hunger and malnourishment.

Conclusion

Kisan rail scheme has been designed to capitalise the untapped potential of allied sector. This is expected to solve multiple problems of supply chain with respect to farmers giving them higher returns. Yet there are certain challenges associated to the scheme such as fund allocated to the scheme is not clear. The plan of implementation has not been clarified such as nodal authority, fund sharing between centre and states, etc. Government needs to remove some confusion for its better implementation

9. What is deepfake? What technology does it use? Explain. Why is it a cause of serious concern? Examine.

Introduction:

Deep fake is a technological invention that began with Apps that can produce image of a person after or before few years. This has been modified using the technology of Artificial Intelligence to inculcate fake audios and spread fake news.

The came to limelight after harassment news of journalist Rana Ayyub were published. Deepfake technology was used to superimpose her image on a pornographic site compromising her integrity.

Body:

It is much more dangerous than fake news itself. Since it is used to combine and superimpose existing images and videos onto source images or videos using a machine learning technique known as generative adversarial network.

- It is a cause of serious concern as it is extremely difficult to identify the whether it is fake or real. As it minutely mimics lip movement even up to the extent of blink of eye.
- It compromises individual's identity and reputation. For example the case of Rana Ayyub.
- Misrepresentation of information especially leaders can cause havoc not only inside the country but also outside. This can disturb national integrity or international security.
- Cybercrime can be one of the direct consequence such as phishing or identity theft that becomes much easier with the use of the technology.

Conclusion:

- It reinforces the Liar's Dividend principle that suggests that in addition to fuelling the flames of falsehoods, faking is actually legitimized through this. With increase in technological interference in daily life, it has become mandatory for the government to regulate such acts with strict criminal punishments.

10. What is zero budget natural farming? What are its advantages and limitations? Can it be adopted as a viable farm practice in India? Critically comment.

Introduction

Zero Budget Natural Farming is a method of farming where the cost of growing and harvesting plants is zero. This means that farmers need not purchase fertilizers and pesticides in order to ensure the healthy growth of crops.

Body

Component of ZBNF:

- Bijamrita (Seed Treatment using local cow dung and cow urine)
- Jiwamrita (applying inoculation made of local cow dung and cow urine)
- without any fertilizers and pesticides)
- Mulching (activities to ensure favourable microclimate in the soil)
- Waaphasa (soil aeration).

Advantages of ZBNF:

- It reduces farmers' investment.
- It also protects the soil from degradation- uses biological pesticides instead of chemical-based fertilizers.
- It also reduces dependence on purchased inputs as it encourages use of own seeds and locally available natural fertilizers.
- It is viable in all climatic conditions- requires only 10 per cent water and 10 per cent electricity.

- Instead of commercially produced chemical inputs, the ZBNF promotes the application of jeevamrutha — a mixture of fresh desi cow dung and aged desi cow urine, jaggery, pulse flour, water and soil — on farmland. This is a fermented microbial culture that adds nutrients to the soil, and acts as a catalytic agent to promote the activity of microorganisms and earthworms in the soil.
- Promotes soil aeration, minimal watering, intercropping, bunds and topsoil mulching and discourages intensive irrigation and deep ploughing

Limitations of ZBNF:

- Fewer yields compared to usual farm practicing.
- Need some access to irrigation and owned at least one cow of their own.
- Large-scale training camps need to be organised to educate farmers in the method.
- Multi-location studies are needed to scientifically validate the long-term impact and viability of the model before it can be scaled up and promoted country-wide

Viable in India:

- **Less cost:** According to National Sample Survey Office (NSSO) data, almost 70% of agricultural households spend more than they earn and more than half of all farmers are in debt.
- **To get rid off debt:** In States such as Andhra Pradesh and Telangana, levels of indebtedness are around 90%, where each household bears an average debt of ₹1 lakh.

Challenges:

- **Not suitable for all places:** Difficult to use ZBNF in all soil types and climatic conditions.
- **Cow is must for ZBNF:** need of an Indian breed cow, whose numbers are declining at a fast pace.
- **Fewer funds by government:** Paramparagat Krishi Vikas Yojana, which was meant to promote organic farming and soil health, has been allocated Rs 325 crore only.

Conclusion

Government of India has been promoting organic farming in the country through the dedicated schemes of Paramparagat Krishi Vikas Yojana (PKVY) since 2015-16 and also through Rashtriya Krishi Vikas Yojana (RKVY).

11. What is the genome mapping project? What are the intended benefits of this project? Discuss.**Introduction**

A genome is an organism's complete set of DNA, including all its genes. It contains all the information needed to build and maintain that organism. By sequencing

the genome, researchers can discover the functions of genes and identify which of them are critical for life.

The essence of all genome mapping is to place a collection of molecular markers onto their respective positions on the genome.

Body

Benefits:

- **To build “reference genome”:** To fully understand the type and nature of diseases and traits that comprise the diverse Indian population.
- **Huge data base:** Derive greater knowledge from information and serve the purpose of enabling better treatment outcomes.
- **Precision Healthcare:** GIP will help in the development of personalised medicine, anticipating diseases and modulating treatment according to the genome of patients.
- **Cancer Treatment:** Identification of mutations linked to different forms of cancer. The design of medication and more accurate prediction of their effects can be foreseen.
- **Common diseases:** Identifying gene and genetic variations for common diseases and thus improve general healthcare.
- **Sustainable agriculture:** Better understanding of genetic basis of plants related to yield, susceptibility to pests etc. This can reduce dependence on chemicals.
- **Deeper Understanding of Ecology:** Traversing from the world’s tallest mountain range to warm seas through multiple bio-zones, this project could provide much information on the interplay of species and genetic groups within them
- **Bioarchaeology, Anthropology, Evolution, and Human Migration:** Study evolution through germline mutations in lineages.
- **DNA Forensics (Identification):** Identify potential suspects whose DNA may match evidence left at crime scenes
- **Agriculture, Livestock Breeding, and Bioprocessing:** Understanding plant and animal genomes will allow us to create stronger, more disease-resistant plants and animals — reducing the costs of agriculture and providing consumers with more nutritious, pesticide-free foods

Associated Challenges

- **Fear of Scientific Racism:** Scientific studies of genes and classifying them could reinforce racial/caste stereotypes and allow for politics and history to acquire a racial twist.
- **Data & Storage:** After collection of the sample, the anonymity of the data and questions of its possible use and misuse would need to be addressed.
- **Political Misuse:** In India a lot of politics is now on the lines of who are “indigenous” people and who are not. A Genome India Project could add a genetic dimension to the cauldron

- **Medical Ethics:** In a project that aims only to create a database of genetic information poses a risk of doctors privately performing gene modification.
- **Selective breeding or Eugenics** has always been controversial for long, as recently a Shenzhen-based scientist, created the world's first gene-edited babies, has been sentenced to three years in prison.

Conclusion

India launched its first human genome mapping project, a move that will help researchers get closer to developing effective therapies for treating diseases such as cancer. In the first phase of the initiative called the Genome India project, the genomic data of 10,000 Indians will be catalogued

12. What are the highlights of the World Air Quality Report, 2019? Should the findings be a cause of concern for India? Critically analyse.

Introduction

World Air Quality Report 2019 was released by the pollution tracker IQAir and Greenpeace. The report is based on information of PM2.5 (fine particulate matter) data as acquired from ground-based air quality monitoring stations with high data availability.

Body

Highlights of World Air Quality Report, 2019:

- South Asia, Southeast Asia, and the Western Asia carry the highest burden of fine particulate matter (PM2.5) pollution overall.
- Bangladesh emerges as the most polluted country for PM2.5 exposure. Pakistan, Mongolia, Afghanistan and India follow behind respectively, deviating from one another by less than 10%.
- According to the World Health Organization, air pollution causes an estimated 7 million premature deaths a year globally, mainly as a result of increased mortality from cardiovascular diseases, cancers and respiratory infections.
- According to it, around 90% of the global population is breathing unsafe air.

Major findings related to India:

- Six cities from India are in the top ten. (Ghaziabad, Delhi, Noida, Gurgaon, Greater Noida, Bandhwari)
- 21 of the 30 most polluted cities in the world are located in India with Ghaziabad in the National Capital Region ranked the world's most polluted. (PM 2.5 concentration measurement of 110.2 in 2019)
- In November, air quality index (AQI) level exceeded 800 in certain parts of New Delhi, which was more than three times the "hazardous" level.
- National air pollution in India has decreased by 20% from 2018 to 2019, with 98% of cities experiencing of varying levels of improvement.
- No Indian cities included in this report met the WHO target for annual pollution exposure (10ug/m³) during 2019.

Conclusion

India launched a National Clean Air Programme (NCAP) in 2019 that commits to reducing air pollution in 102 most polluted cities by a maximum of 30% by 2024. India additionally joined the UN's Climate & Clean Air Coalition (CCAC) as the 65th member to collaborate with global leaders on air pollution solutions

13. Why is the bird population dwindling in India? What will be its adverse ecological impacts?

Introduction:

Over three-fourths of the 146 bird species whose populations were tracked over the last five years declined in numbers, according to The State of India's Birds 2020 report. More than 1500 birdwatchers uploaded their data to eBird, an online repository of bird sightings. These data were collated with supporting information such as taxonomic grouping, habitat, endemism and diet, to create a detailed picture of each species

Body

Some species such as common sparrow has shown stable population in rural and urban areas whereas other such as. The long-term trend shows that more than half of bird species have declined in past 25 years. The short-term trend shows that nearly 80 per cent of the species have declined in the past five years. Some of the prominent reasons for such decline include:

- **Habitat destruction** has been the principle reason for dwindling population of birds. Water birds suffer from lack of habitat for loss of wetlands whereas tree living birds have lost habitat for deforestation.
- **Pesticide and medicine overuse** has killed many birds, the most popular being vultures who have been brought to critically endangered or extinct status due to the use of Diclofenac, a painkiller. Pesticides such as Carbamate and Carbofuran are known to kill approx. 2-3 million million birds annually.
- **Tall glass buildings** often creates confusion to birds who assume them to be continuation of sky. Approximately 1 million migratory birds have been killed due to glass skyscrapers.
- Urban heat island has increased the temperature of the overall urban spaces. This has led to disappearance of a number of common bird species such as koel, cuckoo.
- **Hunting** is one of the prominent causes for decline of exotic birds such as Amur Falcon in Pangti village near Doyang reservoir in Nagaland.
- **Extreme weather events** such as cyclone Fani has resulted in 81% decline in population of sandbar-nesting birds along a 40-km stretch from Baideshwar to Kakhadi along the Mahanadi river.

Some of the visible consequences of dwindling bird population include:

- Vultures are known to **remove animal carcasses**, thus known to be behaving like first level decomposers. Reduction in their number will impact the food chain.
- Birds also act as **bio indicators**, indicating health of an ecosystem. e.g Great Indian Bustard are bio indicators of grassland ecosystem. Reduction in their number means distorted indication of the ecosystem
- Birds also act as **natural pest control measures**. They directly feed on plant eating pests thereby maintaining the healthy balance of ecosystem. Decrease in such bird population reduces the productivity of crop thus increasing the dependence on chemicals
- Birds are very **good pollinators**, popular amongst them include the names of humming bird, honeyeaters, etc. Reduction in their number will impact the natural growth of plant species in the ecosystem

Conclusion:

Although there are few good news such as critically endangered species of birds such as Forest Owlet have been reported from more places. One cannot undermine the fact that birds in India are significant not only in ecological terms but also in cultural view, as many societies in India pray some or the other form of birds. Efforts should be taken to find out hotspot of decline and area specific action should be taken rather than one size fits all approach.

14. What were the factors that led to the disappearance of the Asiatic cheetah from India? Discuss. What are your views on the recent Supreme Court ruling on Asiatic cheetah? Critically comment.**Introduction**

Asiatic Cheetah are grassland habitat animal that were extinct from India soon after its independence by around 1950s. Their last population were seen in central Madhya Pradesh and present day Chhattisgarh. IUCN has declared the species to be extinct in wild. This has made India to lack 1 of one the Big 4 that includes Bengal Tiger, Indian leopard, Asiatic lion and Asiatic Cheetah.

Body:

The primary cause for their extinction in India, according to UNCCD has been declared as desertification. Yet there are other major cause associated to its disappearance such as:

- Coursing- Cheetahs could be tamed easily thus it was used for a sport called coursing. As a fastest animal, they could run fast, capture prey and thereby help in hunting of animals.
- Captive breeding was impossible for Asiatic Cheetah which made its conservation efforts not very productive.
- But their inability to breed while in captivity meant that wild cheetahs needed to be constantly trapped from their natural habitats, especially cubs, to keep the sport alive over centuries.

Recently Supreme court has allowed re-introduction of African cheetahs from Namibia into the Indian habitat on an experimental basis. The decision came after 7 years, with a fear that it would be difficult for them to adapt to the new climate. Also that they would come in conflict with parallel programme of lion re introduction in the area.

Re-introduction would come up with its pros such as:

- The most important benefit would be, conservation of grassland ecosystem as it is an umbrella species.
- India would be able to restore its, species genetic diversity with the presence of the big four. This in turn would promote eco-tourism in India
- The environmental benefits would also add up, as the forest food chain would get another predator.
- India is also home to the world's largest free-roaming populations of livestock. Bringing back the cheetah will focus attention on pastoralism, and in doing so, help restore India's natural heritage.

Conclusion:

Yet, the risk associated in their re-introduction is also very serious. Change in their climate would be the greatest setback. Also, they would meet competition for food from the rest predators of forest life, given the lack of biodiversity. Also, Asiatic lions are also at risk themselves even though they also are counted under umbrella species. It is thus, imperative to make favourable habitat for them before introducing the species to the alien land.

15. What if a global epidemic like the Coronavirus affects India? What are the existing measures and mechanisms in place to mitigate such potential disasters? Critically examine.

Introduction:

Coronavirus is a deadly viral disease that originated in China and belongs to the family of SARS and MERS. The patient shows the symptoms of pneumonia in which cough gets stuck in lungs and the patient finds difficulty in breathing. The disease can easily spread from human to human through sputum or even if the patient touches his nose or mouth and then touches an object, the object become carrier of the disease.

Body:

From china, the disease has travelled to various countries. India reported its first case from Kerala on 31st January. This bring the question regarding preparedness of health facility towards any pandemic as this. Some of the mechanism that are in place include:

At health facility level

- Sanitation have been prioritized at every level. Intensive awareness campaign is being carried out to control the spread.

- National Institute of Virology labs are fully equipped to test the virus and that all State and district health authorities have been alerted.
- Hospitals are equipped with ventilator facility and oxygen cylinders. Also, several institutions are donating spaces for the upkeep of patients such as Indian Railways, ICAR, etc.

At government level

- International flights have been suspended temporarily and tourists are undergoing a thorough checkup.
- A 24*7 helpline has been setup for public enquiry. The call center will monitor the list of caller along with the area from which they are calling. Integrated Disease Surveillance Programme (IDSP) officer would carry out clinical enquiry.
- Regular contact tracing is being carried out to minimise transmission from corona positive patients.

Conclusion:

- The population density of India is a primary concern that increases the chance of increased infection. So far no vaccination has been developed as virus has the ability to undergo mutation which makes its genetic structure flexible. Until, the vaccines are developed, precaution is the only key to safety. However, the long term measure could be to increase the hospital facility and increase in number of beds. Sanitation should be brought to priority and public expenditure to health should be increased from a mere 1.5% to at least the target of 2.5%.

16. With the help of suitable examples, examine the role that technology can play in counterinsurgency and counterterrorism measures.

Introduction

The challenges for India's internal security are left wing extremism, insurgencies in the Northeast India, cross border terrorism and militancy in Jammu and Kashmir, global and national trends in terrorism, management of India's international borders and security of its coasts.

Body

Examples:

- **Ethnic clashes in Assam in 2012:** offensive clips and hate messages that triggered panic and mass exodus of north east Indians from large parts of India that created larger chaos.
- **Muzaffarnagar riots in 2013:** morphed video on YouTube was used to fan communal riots in Muzaffarnagar in Uttar Pradesh and led to mass panic
- **Misuse of social media in 2014:** the arrest of a Bangalore based executive, Mehdi Masoor Biswas, accused of being the man behind terror group Islamic State's (ISIS) most influential Twitter handle in India, @ShamiWitness

brought to surface the extent of the threat posed by the misuse of social media at home.

- **Burhan Wani case in 2015:** Became the new face of Kashmiri militancy by adopting the overt war of ideas and used social media to campaign for his cause.
- **Left Wing Extremism:** Maoists do not only disrupt stability, but also engage in illegitimate trade like weapon and ammunition trafficking which affects the economy.

Technology to counter insurgency and terrorism:

- **Social media labs:** through social media labs the root cause of the message/ audio-video can be traced.
- **Space Technology for Border Management:** (i) Island development and security (ii) Border Surveillance (iii) Communication and Navigation (iv) GIS and Operations Planning System (v) Border Infrastructure Monitoring.
- **BOLD-QIT** (Border Electronically Dominated Quick response team Interception Technique) under CIBMS (Comprehensive Integrated Border Management System): It consists of five types of sensors- radar, electro optics, unattended ground sensors, OFC based sensors and mini aerostat.
- **CyberDome project:** It is a technological research and development centre of Kerala Police Department, conceived as a cyber centre of excellence in cyber security, as well as technology augmentation for effective policing. The Cyberdome will act as an online police patrol. Through its Anti-Cyber Terror Cell and a cybersecurity training unit, its officers will generate intelligence on various cyber threats in near real time and track fugitives online by monitoring their online activities, including social networking sites.
- **Military Satellites:** (IRNSS)-based GPS will provide navigation facilities for operational parties in high altitude, remote and difficult borders, and Maoist affected areas. Example: GSAT 7, Microsat-R, Cartosat 1 and 2 series, Risat-1 and Risat 2
- **e-Surveillance Projects:** National Intelligence Grid (NATGRID), Central Monitoring System (CMS), Internet Spy System Network and Traffic Analysis System (NETRA) of India, National Critical Information Infrastructure Protection Centre (NCIPC) of India, National Cyber Coordination Centre (NCCC) of India, Tri Service Cyber Command for Armed Forces of India, Cyber Attacks Crisis Management Plan Of India.

Conclusion

No intelligence organisation can remain static in the face of growing technological complexity, geopolitical uncertainty, the changing nature of terrorism, and increasing media intrusion. To deal with internal-security threats, the first responders are police. Police must be well trained along with updated technologies.

17. How can social media platforms be made to play a more positive and constructive role for India's internal security? Suggest.

Introduction

According to market research firm techARC, India had 502.2 million smart phone users as of December 2019, which means over 77 per cent of Indians are now accessing wireless broadband through smart phones.

Body

Examples:

- To inform and engage with citizens to build secure communities which share information. Example: Government initiatives and schemes
- India has witnessed the potential of the social media in co-ordinating large scale protests across the country with the 'India Against Corruption' movement led by Anna Hazare in 2011.
- In Delhi gang rape incident in 2013 where a large number of protestors mobilised themselves with the help of social media.
- A propaganda video released by ISIS shows alleged Indian Jihadists fighting in Syria and calling for more Indian recruits to join the cause. The threat has really come to bear upon India and has proved that social media has become a potent tool for radicalisation by terror groups.

Constructive role of social media for India's internal security:

- **Rumour detection:** Ensure presence to combat misuse of social platforms to spread malicious rumours which may trigger problems for internal security and law and order, and prepare standard operating procedures for times of emergency. Example: Mob lynching
- **Track problems:** Posts which are liked, commented and shared can be tracked on all social networking websites.
- **Other reasons:** traffic management, issue advisories, and to understand public opinions, crime investigation, intelligence, and public relation/reputation management
- **To prevent cyber crimes:** To use data available freely on social media platforms to gauge the mood of citizens on issues, predict patterns and possible flash points of disturbances, and prevent and react to cyber-crimes.
- **Social media labs:** Social Media labs have identified the offensive video and established its manipulation, thereby helping officials correct the spread of rumours and plant an effective counter offensive in terms of an information campaign

Challenges:

- **Multiplicity of fake profiles:** person sitting in any corner of world can access the social media and can fake profile.
- **Huge spread in less time:** Social media's capacity to spread information at extremely high volumes and velocities needs to be tapped.
- **Negative effect:** harassment, bullying, fraud, cyber-crimes are common in social media platforms.
- **Complicated networks:** multiple stakeholders, regulation, framework of the internet are difficult to trace.

Conclusion

Social Media, with all its benefits and the potential for more, is definitely a boon to our world, however misuse or irresponsible usage can have negative effects on an Internal security

18. What are the prevalent threat perceptions with respect to India's cyber security? Discuss. What are the measures in place to address the challenges? Examine.

Introduction

There are 730 million internet users in India. Storage Density doubles every 12 months and Bandwidth is doubling every 12 months. These are having huge implications in cyber world.

Body

Prevalent perception on cyber security:

- Online banking frauds
- ATM skimmers
- Cheating in online purchasing
- Cyber bullying and harassment
- Phishing attacks account for more than 80% of reported security incidents
- Fake advertisement and online frauds

Cyber threats:

- **IoT-Based Attacks:** The IoT attack surface is the sum total of all potential security vulnerabilities in IoT devices and associated software and infrastructure in a given network, be it local or the entire Internet
- **Ransomware:** Ransomware attacks generally involve the attacker infecting a victim's systems with a piece of malware that encrypts all of their data. The victim is then presented with an ultimatum—either pay the ransom or lose their data forever.
- **AI-Enhanced Cyber threats:** AI fuzzing (AIF) and machine learning (ML) poisoning are all set to be the next big cybersecurity threats.
- **Machine Learning Poisoning:** Machine learning models typically use data that is crowd-sourced or taken from social media. They also exploit user-generated information such as satisfaction ratings, purchasing histories, or web traffic.
- **Deepfake:** 'Deepfake' is a fake video or audio recording that cybercriminals use for illicit purposes. For instance, amateurs and criminals have created deepfakes by swapping people's faces in videos or altering its audio track.
- **Internal Attacks:** The inside access that employees have make them capable of inflicting great harm if they choose to abuse their access privileges for personal gain. Or, they may accidentally allow their user accounts to be compromised by attackers, or unknowingly download dangerous malware onto their workstations.

- **DDoS Attacks:** Distributed denial of service (DDoS) attacks remain a significant cyber threat to many organizations. These attacks are designed to overwhelm a victim's network resources so they cannot process legitimate traffic on their network

Measures to control cyber threats:

- Establishment of National Critical Information Infrastructure Protection Centre (NCIIPC) for protection of critical information infrastructure in the country.
- Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre) has been launched for providing detection of malicious programmes and free tools to remove such programmes.
- Issue of guidelines for Chief Information Security Officers (CISOs) regarding their key roles and responsibilities for securing applications / infrastructure and compliance.
- Conducting regular training programmes for network / system administrators and Chief Information Security Officers (CISOs) of Government and critical sector organisations regarding securing the IT infrastructure and mitigating cyber attacks.
- Cyber Surakshit Bharat program was in association with the National e-Governance Division (NeGD)

Conclusion

Cyber security is not the responsibility of only government it is the responsibility of each individual to secure their data. India should contemplate being a part of the Budapest convention- Convention on Cybercrime- international treaty addressing the issue of internet and cyber crimes. Additionally, it could endorse and also facilitate private entities to endorse the recent Paris Call for Trust and Security in Cyberspace which is involved in developing common principles for securing cyberspace

19. Describe the different levels of nexus and types of links between organised crime cartels and terrorist organisations. Why is the nexus a serious internal security challenge? Examine.

Introduction

Organized crime can be transnational, national, or local groupings of highly centralized enterprises run by criminals to engage in illegal activity, most commonly for profit. Some of the organised crimes are drug trafficking, arms trafficking, human trafficking, illegal gambling counterfeiting and money laundering, cyber crime, pornography etc.

Body

Different levels of nexus types of links between organised crime cartels and terrorist Organisations:

- **Geographical:** Turkey is a bridge country for illegal immigrations, human smuggling, drug and arms trafficking. Turkey is not a heroin producer

country. Afghanistan, Pakistan and Iran are the main producers of opium in Asia. According to experts, approximately 80% of produced drugs in “Golden Crescent” pass through Turkey to Europe.

- **Ethnic:** Kurdish people live on the borders of Iran, Iraq, Syria and Turkey. Kurdish people, who speak the same language, same ethnic background but also share the same ideologies with the PKK (The Kurdistan Workers’ Party), has been a significant facilitating factor for them to play an active role in organized crimes.
- **Religious:** The Islamic Movement of Uzbekistan (IMU) has close relationship with Afghan and Central Asian criminal groups to ensure the safe shipment of heroin.
- **Commercial terrorism:** Terrorism financing is the provision of funds or providing financial support to individual terrorists or non-state actors. Money laundering, hawala system, counterfeiting of currency is also included.
- **Criminal activities for operational motivation:** Both of them have different aims, but also the state, law and public order are the common enemies of them. In this regard, organized crime (OC) groups use terrorist’s tactics to ensure instability to their goals. Example: In Italy Sicilian Mafia carried out a series of car bomb attacks in Italian mainland near historic sites such as the Uffizi Galleries in Florence and the church of St. John Lateran in Rome; plans were laid to blow up the Leaning Tower of Pisa.
- **International link:** Dawood Company has established relations to numerous terrorist groups including Al Qaeda and Lashkar-e-Taiba (LeT). After 1993, ordinary organized crime group was change to terrorist group. He also accused of bomb attack in Mumbai in 1993.
- **Travel support and protection:** To reach their targets easily by counterfeiting travel passport, different department bureaucrats are involved.
- **Narco terrorism:** Terrorist groups, or associated individuals, participate directly or indirectly in the cultivation, manufacture, transportation, or distribution of controlled substances and the monies derived from these activities.
- **Cyber terrorism:** The communication revolution through the Internet. Publication of terrorist ideologies and ideas propaganda- raising funds, recruiting, geotargetting, planning and discussion
- **Terrorist groups:** separatist terrorist groups (ETA, IRA, PKK), revolutionary terrorists (Red Brigades, RAF, FARC), religious terrorist groups (Holly Warriors, Jihad, Boko Haram, ISIS) and transnational terrorist groups (Al-Qaida).

Challenges to internal security:

- **Places in India that are prone to terrorism:** Jammu and Kashmir, Punjab, north eastern states, red corridor areas.
- **Lone wolf attack:** They may be influenced or motivated by the ideology and beliefs of an external group and may act in support of such a group

- **They built links with other terrorist groups:** Including the People's War Group (PWG), the Communist Party of India -Maoist and the communist groups based in neighbouring Nepal.
- **Naxalism:** Huge influence on naxalism to spread the malicious ideas and they are easily biased.
- **Parallel government:** Funding, taking money from people by extortion, smuggling small arms, homemade explosives and landmines.
- **Narcoterrorism:** Terrorism in Punjab has also been aided by drug money and smuggling of drugs from Afghanistan through Pakistan.
- **Money Laundering:** Money laundering is at the centre of all terrorist activity, because it is the common denominator of all other acts.
- **Fake currency:** Currency counterfeiting in different places leading to instability in the economy

Conclusion

Check on online information, curbing terror financing, strengthening institutional framework, coordinated approaches at national and regional levels, capacity building are need of the hour

20. What are the deficiencies in India's institutional framework designed to tackle internal security challenges. While identifying at least three such deficiencies, suggest ways that can address these deficiencies.

Introduction

Cross border trafficking, ethnic groups opting for secessionist movements, separatists' movement, insurgency in Kashmir, illegal migration, organised crime are few examples that are posing problems to internal security.

Body

Challenges of institutional framework in India to tackle internal security:

- **Constitutional provisions:** Intelligence bureau is considered the nodal counter terror agency and works closely with the state police and the central paramilitary forces on counterterrorism intelligence. However, it cannot fully execute this function because it has no legal authority to investigate an offence, arrest anyone or prosecute them in court. The Research & Analysis Wing (RAW), India's premier external intelligence agency, operates under the cabinet secretariat and, thus, reports to the prime minister. Rivalries between the IB and the RAW often hamper overall intelligence.
- Intelligence sharing between the centre and states happens through the state offices of the IB and the Subsidiary Multi-Agency Centres (SMAC) – personnel shortages have hindered their efficacy. Intelligence sharing depends on the goodwill of the states: if a state is unwilling to cooperate with the central government, it cannot be forced to do so.
- **Legislative provisions:** The major legislation to deal with terrorism in India is the UAPA. India's experiments with TADA, POTA and UAPA have failed to

deliver the desired results. There have been allegations that these anti-terror laws are designed to shield or harass a particular community.

- **Tussle between ministries:** The turf war between the intelligence agencies operating under different government ministries contributed to the difficulty in establishing National Counter Terrorism Centre (NCTC).
- **Criminal justice system:** Poorly trained and understaffed police force and insufficient modern equipment at their disposal
- **Police infrastructure:** Acute shortage in their ranks, police personnel are required to work long hours, without a break, and rarely get to take their weekly off, leaving them stressed and frustrated. This has a huge bearing on their professional responsibilities, including counterterrorism duties

Suggestions

- Police are first responders they need to have modern equipment and training.
- The curriculum at police academies should also be constantly updated.
- The government must consider setting up a separate ministry or special importance in the given ministry due to increased importance.
- National Counter Terrorism Centre (NCTC) must be established and fully operationalised
- Robust policy in judicial system, forensics, cyber law, constitutional amendments are required.
- Intelligence, military, and police organisations together contribute to counterterrorism efforts- coordination of all three is must.

Conclusion

Intelligence, physical security, coordination amongst agencies, investigation and crisis management are considered the most important components of internal security. If the intelligence apparatus fails to provide early warning of the issue the physical-security machinery should be able to prevent insurgency.