GS SCORE

TEST - 8

AGRICULTURE AND ENVIRONMENT

Time Allowed: 3 hrs. *Max. Marks: 250*

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110

Instructions to Candidate

- There are 20 questions.
- All questions are compulsory
- The number of marks carried by a question is indicated against it.
- Answer the questions in NOT MORE THAN 200 words each. Contents of the answer is more important than its length.
- Answers must be written within the space provided.
- Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

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Date 18-9-2017

Signature _____

1. *Invigilator Signature* _____

2. *Invigilator Signature* _____

Roll No._____

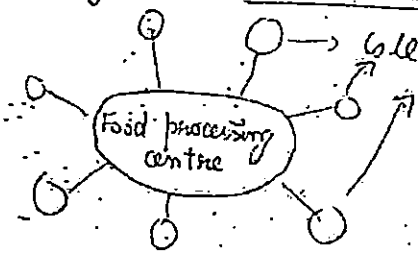
GS SCORE
GS MAINS TEST SERIES 2017

Q1. Despite the fact that, Food Processing sector is recognized as sunrise sector and paid ample attention in recent years, the recent statistics suggest that many of Mega food parks, which were announced in the scheme have either not been established or they are on the verge of shutdown. Analyze the factors behind this trend; also suggest what should be done to reverse the trend? (12.5 Marks)

Ans-

Only 5-6% of the agriculture produce in India is processed. Because of this value addition in agriculture produce, farm incomes and employment in rural areas remains low.

To reverse this trend, the Government had introduced the Mega Food Park scheme which would ~~enhance~~ work through a Hub and Spoke model



But the Mega food Park scheme has had to face a number of challenges

- Land acquisition: is a problem as acquiring land is a long and tedious process and ends into numerous legal battles
- Infrastructure is lacking: such as ware houses & silos to store agricultural produce and collection centres have not come up at village & block level.
- Backward & forward linkages missing - due to which procurement from farmers & further sale to industries doesn't happen
- Distress sale of agri produce by farmers - due to low

No incentive to promoters

Not much linked to Hub of value chain

Remarks

prices of products, indebted ness etc.

- Investment is lacking : in the food park scheme by the private companies.
- Lack of political will : to pursue the scheme vigorously.

⇒ To reverse this trend, a number of steps can be taken -

- State investment in infrastructure : should be enhanced by building roads as in PM Gram Sadak Yojana, construction of silos & cocoa houses.
- Encourage co-operatives in villages : which can encourage farmers to collectivise farm produce and act as collection centres.
- Encourage private investment : Through provision of cheap credit. Government has already allowed 100% FDI in agro processing sector.
- Encourage farmers to sell to food parks : eg Through negotiable cocoa house receipts against which farmers can get loans - Govt. has taken this step already.
- Encourage entrepreneurs to set up small food processing centres in villages eg Through startup India scheme.

Food processing section can enhance farm incomes, provide employment & ensure the government's vision of doubling farm incomes by 2022.

Remarks

Q2. Recent Farmers' agitations and suicide once gain highlight the discrepancies in inclusive development. In this reference, analyze the factors behind famer's suicide with a reference to NCRB report. What steps are needed to break the vicious cycle? (12.5 Marks)

Ans-

Large number of farmer suicides have rocked India with Maharashtra alone witnessing nearly 3000 suicides in 2015 & 2016. Relatively prosperous states like Punjab too aren't spared with numerous deaths witnessed.

NCRB (National Crime records bureau) noticed the following trends about farmer suicides -

- Marginal (less than 1 hectare) & small (1-2 ha) farmers — contributed less than about 75% to farmer suicide.
- Medium farmers (2-4 ha) & semi large (4-10 ha) farmers witnessed more than 20% suicides.
- Large (more than 10 ha) witnessed 5% suicides.

Causes of farmer suicides -

- Indebtedness is the major cause among farmer suicides. This is further caused due to -
  - Crop failure due to pest attacks (eg white fly attack in Punjab cotton belt of 2015) and droughts (eg Vidarbha in 2016) or excessive / untimely rain & hail
  - Price realization is low as in case of potato growers of UP and chilli growers (Karnataka), onion growers etc because of
    a) Fall in prices due to over production

NCRB suicides increased by 41.7% from 2015 suicides to 2016

Remarks

b) MSP (Minimum support price) is not given except on wheat & rice.

Govt

family related issues

- Uneconomic holdings : 80% of Indian farmers are small & marginal.
- Fragmentation of land : over the generations.
- Inability to repay bank loans : embarrassment caused due to bank taking away property causes suicide.
- Increase in input costs : eg GM seeds by Monsanto are very expensive & have to be bought every year.
- Wrong selection of crops : eg Soyabean in Vidarbha

⇒ Steps to reverse this trend

- Educate farmers about right crops : for any particular area. Soil Health Card scheme will help by telling farmers their soil can support which crops.
- Agriculture insurance : needs to be widespread so farmers can withstand crop failure. eg PM Fasal Bima Yojana is being spread rapidly
- Encourage co-operatives in villages : To enable
  - cheap loans to farmers.
  - educate farmers about latest farming techniques
- Provide alternative livelihoods eg Dairy, fisheries, beekeeping, encourage startups.

Farm income can be doubled and farm suicides abolished if only they are educated about latest techniques, given price support & appropriate crops

Remarks

Q3. Micro irrigation can be way out for rainfed agriculture and small land holding in India. In this reference, discuss the advantages associated with micro irrigation, initiatives taken by government and challenges associated with it. (12.5 Marks)

Ans-

Micro irrigation is defined as a set of targetted irrigation techniques using sprinklers, drip irrigation & root irrigation. It avoids flooding of fields with water as is otherwise done.

⇒ Advantages of micro irrigation

- Reduces water use : as water is provided drop by drop : to only root area or by sprinklers
- Conserves water table : reduced water use means reduced extraction of underground water.
- Reduces cost of operations : as electricity cost of pumping water or canal usage ~~charge~~ is reduced. reduce
- Increases yield : As the roots get appropriate water amount directly and ~~only~~ can be used in drought conditions. salinity forest
- Drought proof agriculture : since only a small amount of water is needed which can be stored in tanks. Offers flexibility in practice
- Reduces soil erosion : as flood irrigation takes away top soil with it.
- Reduces salinity : which is common in arid area.

Remarks

which are irrigated with flood irrigation & resulting capillary action.

⇒ Steps taken by government

- Pradhan Mantri Krishi Sinchayee Yojana - under it the component of Per drop more crop focuses on drip irrigation
- Pradhan Mantri Krishi Vikas Yojna - which encourages building of tanks - to be used for micro irrigation.

⇒ Challenges faced

- Farmers are unaware of the benefits of micro-irrigation & believe only flood irrigation can help grow healthy crops.
- Farmers are also unaware of the government scheme & the subsidy offered by it.
- Poor farmers can't afford the equipment
- Small uneconomical holdings are unviable for micro irrigation.

Lack of dedicated team of experts to guide farmers

Micro irrigation is the way forward in a world of climate change & uncertain monsoons. For this farmers need to be educated of its benefits & assisted by NGO's & co-operatives to help get loans at cheap rates.

Remarks for micro irrigation.

Q4. The Vulnerability of farmers is not just due to natural vagaries, but also due to defects of public procurement policy. Analyse what should be done to reform the public procurement system?
(12.5 Marks)

Ans-
Potato farmers of UP dumped their potatoes on highways, chilli farmers of Karnataka publically burnt their chilli crop while onion & pulses farmers took to suicides in 2016. Such farm distress wasn't due to drought or excess rain or pest attacks but due to fall in prices as a result of faulty public procurement.

⇒ Defects in public procurement-

- MSP is not certain : only wheat & rice are procured at MSP whereas other pulse crops, oilseeds, vegetable ~~here no~~ are not procured at MSP
- Fall in prices when overproduction : as MSP is not guaranteed, prices of crops fall when there is overproduction as in case of pulses in 2016-17.
- Procurement by government starts late : as a result of which farmers make distress sale to private middlemen (arhtiyas) as they have to buy seeds for next crop.
- Unfair practises : such as showing more moisture content (in wheat grains) than actual to pay less prices

MSP Arrear & moisture late procu. ... delayed pay

S.K. Panel
delay in opening of procurement plans

Remarks

Exclusion & classification

⇒ Steps to reform public procurement -

- MSP should be guaranteed - especially for pulses, oilseeds & volatile crops such as onion.
- Online marketing - Public agencies can resort to online procurement to make process fast & transparent.
- NAM (National agriculture market) - introduced by the government should be provided in every state & farmers trained & made aware to use it to sell directly to ~~middlemen~~ consumers by passing the middlemen.
- Timely procurement by government - immediately once harvesting begins.
- Unfair practices at APMC's : can be held in check by farmer co-operatives, NGO's & SHG's (self help groups)
- Enable farmers to set up mandis - eg Apni mandis in Chandigarh & other cities to directly sell vegetables & fruits to consumers.

Public procurement should be checked, made fast & transparent while it should be supplemented with e-NAM, apni mandis & other private procurement to protect farmer interest.

Diversification of Agriculture, Grievance redressal mechanism for farmers

Remarks

Q5. Throw light on the structural change in the composition of agriculture in recent years. Point out the areas, where the structural transformation of composition of agriculture is still lacking. (12.5 Marks)

Intro-

Agriculture is the domestication of plants & animals for human use. Agriculture has been evolving & developing ever since it began 10000 years ago.

⇒ India too has witnessed a few structural changes in agriculture in recent years-

- Cash crops - Recently, there has been an increasing emphasis on growing of cash crops eg sugarcane, cotton, jojoba (its oil is used in cosmetics & also for bio-diesel), rubber etc.
- New seeds used - HYV (High yielding variety) of seeds for wheat, cotton, rice, oilseeds & GM (Genetically modified) seeds for cotton & now even mustard (DMH-11 is awaiting open growing) has increased.
- Increase in input costs - due to increased use of fertilizers, pesticides, weedicides, HYV seeds.
- Increasing technological use - eg Tractors, threshers, fertilizers, drip irrigation (PM Krishi Sinchayee Yojana)
- Increasing use of water guzzling crops - eg sugarcane in Maharashtra, rice in Punjab, 3 crops of rice in

Remarks

Recent delta

- Alternative livelihoods : are being taken up eg Dairy farming to meet increasing demand from cities, pisciculture (fish farming), api culture (bee farming).

⇒ Areas where structural transformation is lacking

- Uneconomical & fragmented land holdings — 80% of farmers in India own patches of land. less than 2 hectares in size. Land holdings are also fragmented due to inheritance in families.
- Low assured irrigation — Only 40% of India agriculture is irrigated. This is right to be changed through PM-Krishi Sinchayee Yojana
- High chemical content in food products : due to high fertilizer & pesticide use. Organic farming is being promoted by Paramparagat Krishi Vikas Yojana
- Over emphasis on grains : Grains such as wheat, rice, jowar, bajra are mainly grown. Diversification is needed.
- Low insurance coverage - Despite PM Fasal Bima Yojana it is less than 25%.

Less processing of agri produce - only 8% processed.

Structural changes in agriculture, aided by government intervention & innovation can transform Indian agriculture.

Remarks

Q6. Indian government provides indirect agriculture subsidy in the form of loan waiver to farmers. Critically examine its effectiveness in tackling the agrarian debt crisis. What alternatives can be taken up? (12.5 Marks)

Intro- Recently the Uttar Pradesh government announced a loan waivers for farmers to the tune of ₹ crore. This was done in wake of severe agricultural stress in the state. Eg. Potato prices fell to ₹ 1/kg & potato farmers dumped their produce on highways. Maharashtra followed suit to give loan waiver.

⇒ Benefits of loan waiver -

- Helps ease the debt burden of small & marginal farmers who don't have the capacity to repay especially in wake of low price realization.
- Reduces farmer suicides: as indebtedness was the major cause of suicide.
- Helps farmer invest in next crops - the amount they would otherwise have spent to repay loan.
- Helps farmers escape double debt burden - eg the debt farmers take from money lenders / Sahukaras to repay bank debt.
- Help escape from starvation

⇒ Negative effects of loan waivers

- Reduces credit discipline - even farmers who can pay

Remarks –

back don't pay in hopes of loan waiver eg Debt recovery (40%) by 50% in co-opera

- Reduces lending by bank & middlemen : as they fear farmers wont pay back. eg loans by banks has dipped 30% in Maharashtra.
- Affects state finances as state government has to divert resources to pay for loan waives.
- Increase in taxes by states to pay for loan waiver.
- Or increase in lending by state government which crowds out private companies wanting loans.
- Or decrease in social sector spending by state government
- Deeper maladies of the system are intact - eg
  - Poor procurement
  - Less irrigation coverage
  - Less insurance coverage
  - Obsolete farming methods
  - Less bank credit available

Disrupt credit market

more selection in extending credit by banks

⇒ Steps needed instead

- Increase capacity of farmer to earn instead of giving out doles.
- Assured MSP for crops ; will help in price realization.
- Micro Irrigation, village tanks, rain water harvesting to counter droughts.
- Right selection of crops eg Drought prone crops in Maharashtra

Strengthen rural credit system

Richard Nixon had said "The success of welfare is measured by how many people leave it not how many more are added" We thus need to make farmers self sufficient.

Remarks

5

Q7. What is precision agriculture? How precision agriculture can help in improving the resource use efficiency in agriculture, with special focus to irrigation? (12.5 Marks)

Ans:

Precision agriculture is the application of agricultural inputs (water, fertilizer, pesticides) only where it is needed & in most effective instead of spraying or flooding in the fields.

⇒ Examples of precision agriculture.

- Drip irrigation : water is provided through a system of pipes only near the root of plant where it is needed.
- Fertigation : Dissolving fertilizers along with water for drip irrigation so that, again only the roots receive it.
- Specific application of pesticides - using drone, robots only to the specific plant or part of the plant where it is needed.

⇒ How precision agriculture can help resource use efficiency.

- Reduced resource use - be it water or fertilizers
- Specific application - ensures resources are applied only where they have to be used as it avoids wastage : as in case of flood irrigation or spraying and deal with pesticide

Remarks

- Reduces cost - as it ensures better use of money to pump water or buy fertilizers which are specifically used.
- Enhances soil quality : by preventing soil erosion due to flooding of fields or overuse of fertilizer and thus soil resource is used efficiently.
-

⇒ Steps taken by government

- Use of micro irrigation under (Per drop more crop) Pradhan Mantri Krishi Sinchayee Yojana.
- Use of GPS (Global Positioning system) & GIS (Geographic information system) for spraying of fields.
- Pradhan Mantri Krishi Vikas Yojana provides subsidy to build tanks for micro irrigation.

Precision agriculture is best used by Israel, a water deficit nation to grow crops & vegetables in deserts using technology such as ______
India can learn from such examples to make its own agriculture modern, profitable, efficient & its farmers prosperous.

provide real time data about condition of soil, crop. sensors can measure field moisture, temp. & the weather conditions in that

NA satisfactory answer

Remarks

3

Q8. How pink revolution can supplement farmer's income? Critically analyse, how the developments of recent years coupled with steep inflation in animal feed prices have impacted the development of sector? : (12.5 Marks)

Ans-

Pink revolution is defined as high growth in the animal meat sector. This is usually done through rearing animals such as milch cattle, buffaloes, sheep etc. modernisation and tech. revolution in meat and poultry processing sector.

How pink revolution can supplement farmers income

- First used for milk or draught : Animals reared such as buffaloes, oxen, sheep, goats can be used for milking or a draught force in fields to help with agricultural activities. Milk can be sold for additional income.
- Then can be culled for meat : Aged animals be it goats, sheep or buffaloes can then be sold to slaughter houses for meat & thus farmer earns additional income.
- Can protect farmers against vagaries of monsoon, pests, crop diseases.
- Can also provide additional employment in rural areas eg. through running of slaughter houses, exporters of meat, co-operatives who collect milk from villages.

Remarks

⇒ How development of recent years impacted the sector:

- Unavailability of feed & fodder: Feed & fodder for animals faces a shortage due to -
  - Lands dedicated to growing fodder diverted to food crops
  - Burning of crop stubble which acts as fodder.
- This has lead to animals dying of starvation.
- Poor farmers are unable to buy expensive fodder & thus abandon their animals.
- Drought in Central India, Maharashtra & Less availability of water for animals.
- Cow ~~vig~~ Laws banning eating of beef: Have left old aged cows with farmers unable to sell them.
- Since farmers cant sell old cows, they cant buy younger new ones & thus milk production & meat exporters suffer.
- Cow vigilantes: attack & kill even farmers transporting cows, buffaloes for own use. Fear has let farmers not sell their old cattle because of which they cant buy new ones.

India has the largest bovine population in the world. It can be used to supplement farmers income & help India earn foreign income from exports. But govern-ment needs to ensure security to farmers & fodder availability.

Remarks

6

Q9. Give brief account of Ozone Depleting Substances? What are the recent controversies regarding proposed amendment to the Montreal Protocol to phase down the harmful greenhouse gases? What is India's stand on this issue? (12.5 Marks)

Ans-

Ozone depleting substances are those man-made substances that destroy the ozone layer by reacting with it. Such substances include -

- CFC's (Chloro-fluoro carbons) - containing Chlorine, bromine, iodine etc.
- HCFC's (Hydro-Chloro fluoro carbons).

To tackle the issue of the depleting ozone layer, an international Protocol, the Montreal Protocol was signed under the aegis of the Vienna Convention in 1987.

- The Montreal Protocol outlined a time limit for phasing out of Ozone Depleting substances. eg. CFC's to be phased out from the year 2005.
- As a result, developing countries switched to HFC (Hydro Fluoro carbons) which are not Ozone depleting by are strong GHG's (Green house gases).
- Now to tackle & reduce use of HFC's, Montreal Protocol was amended to include HFC's within its ambit.

⇒ AMENDED MONTREAL PROTOCOL

- Gives timeline for reducing use of HFC's eg India has to stop production by 2028.

Remarks

- Divides world into 3 groups & gives each group separate timelines to reduce use of HFC's.
- Time limits are binding in nature
- Action can be taken for violating these.

⇒ CONTROVERSIES about amended Montreal Protocol.

- Issue of Payments: Developing countries such as India and China demand aid from Western Nations to switch over to cleaner technologies.
- Issue of Technology: Cleaner technology has a lot of issues -
  - It is owned by Developed nations.
  - It is patented and is thus very expensive.
  - Developing nations have limited access to it.
- Some countries question why India has been kept in the 3rd group to which will start the phase out the last.
- Unemployment to rise as HFC manufacturing centres exist in India & China mostly.

⇒ INDIA'S STAND -

- Transfer of technology by developed countries at cheap rates
- Provision of aid to switch over to new technology

Though the amended Montreal Protocol will help in arresting climate change, it needs to be ensured that it doesn't become a burden on developing countries & there is better international co-ordination.

Remarks

Q10. Environmental governance introduced by international bodies aims at improving the quality of human living within the carrying capacity of supporting ecosystems. Elaborate with respect to role played by UN in sustainable development. (12.5 Marks)

Ans:- Environmental governance is basically governing actions of man to see that developmental efforts to increase economic growth and improve quality of life don't hurt the environment. It also deals with steps to be taken to ensure that environment is protected not only against anthropogenic activities but also climate change and improve its quality over time.

United Nations and various conventions and agreements under it are involved in environmental governance -

- UNFCCC (United Nations Framework convention on climate change)
  - Various COP's (Conference of Parties): held under it laid out different steps to deal with, mitigate & prevent climate change.
    eg - COP at Copenhagen set up the Green Climate Fund.
  - Kyoto Protocol, 1997: which restricted emissions of developed countries & put binding limits on reduction of emissions (to be reduced by 6% of 1990 levels by 2005)
  - Paris Climate Pact: held at the COP held at Paris in 2015 to lay out a road map to reduce emissions by all the countries of the world by from 2020.
- UNCCD (United Nations Convention to Combat Desertification)

Puts binding limits on nations to help prevent & reverse

Remarks

deforestation by protecting forests, following sustainable agriculture

- SDG's (Sustainable development goals)

Under the aegis of the UN these cover 17 broad goals to be achieved by the year 2030 & cover diverse topics such as protecting forests, wetlands, biodiversity.

- Convention on Biological diversity

Part of the Rio Earth summit 1992, this sets out guidelines to help protect the flora & fauna of nation's countries through legislation, setting up sanctuaries etc.

⇒ POSITIVES

- Efforts by the UN cover diverse areas such as:
  - Air pollution
  - Water pollution
  - Soil erosion
  - Plant & animal life.
- It promotes the use of renewable energy eg. Under Paris Pact, India has set a target of 175 GW of clean energy by 2021.
- It helps spread awareness of climate change.
- Binding agreements - Some agreements are legally binding
- Economic growth will become sustainable only if it takes care of nature.

⇒ NEGATIVES

- Failure of Kyoto Protocol: as countries follow self interest instead of collective interest
- Paris Pact is said to be weak: as it is not binding.

The UN is doing a spectacular work in sustainable development but its measures should be followed by decisive action

Remarks

(5)

Q11. Recently Uttarakhand high court banned mining activities in the state. In this reference, discuss the various available in Uttarakhand and how mining in this hilly state is impacting the ecology and environment? What should be done to maintain a balance between economic need and environment protection? (12.5 Marks)

Ans:- Mining while essential for economic activities and industrial development also has a number of negative effects on the environment.

In view of this the Uttarakhand High Court banned mining in the state.

⇒ Minerals available in Uttarakhand.

- Sandstone - available in Himalayan region is used for construction
- Limestone - also a sedimentary rock is found in Himalayan states and is also used for construction.
- Graphite
- Mica found in parts of the state.

⇒ How mining affects ecology and environment

- Mass Deforestation : Mining especially open cast mining leads to deforestation in order to extract the ore.
- Pollution of ground water : Mining activities & processing of ores leads to effluents being released which pollute streams and underground water.
- Wastage of water : water is also used for extraction & cleaning of the ores which is extremely wasteful.
- Biodiversity loss : Flora and fauna of the region gets affected as a result of habitat loss due to deforestation

more prone to landslide

Remarks

- Change in micro climate ; as a result of deforestation which may result in increased temperature and decreased rain fall.
- Air pollution : due to suspended particulate matter of the mined ore eg small limestone particles.

⇒ Steps to be taken to maintain a balance

- Avoid open cast mining : and wherever possible underground mining should be done.
- Afforestation : should be practises once the mining operations are complete.
- compensatory afforestation : in some other place to balance out the deforestation done in the mined place.
- Economical use of water : water use should be limited - and effluents should be treated before discharging into streams.
- Follow international best practises : to minimize E.I.A. of the area.

Economic growth must not come at the cost of ecology as then growth would be unsustainable & nature will stop growth in the long run through climate change, - extreme weather events etc. Instead growth must be done within the limits prescribed by nature & in a sustainable & inclusive way so as to benefit all

(5)

Remarks

Q12. The effects of urbanization and climate change are converging in dangerous ways. In this reference, Discuss how cities are contributing to climate change and in turn how they are impacted by it? discuss what should be done to make cities more suitable with special mention of concept of green buildings to reduce impact of climate change. (12.5 Marks)

Ans- Both Urbanization and climate change are the by-products of the Industrial Revolution and rapid industrial development that took place.

Lately the have both come to impact each other as Urbanization leads to & exacerbates climate change while ch climate change in turn affects urban centres.

⇒ How cities contribute to climate change.

- Release of Green house gases in large quantities is being done by cities- eg-
  - Exhaust of vehicles - rich in carbon dioxide (CO_2) & Nitrogen dioxides (NO_x), Particulate matter (PM)
  - Industrial exhausts - rich in CO_2, NO_x, PM & sulphur dioxides.
  - Thermal Plants - burn coal to provide electricity to cities. Delhi alone has 3 Thermal Plants
  - Excessive use of HFC's (Hydrofluoro carbons) in air conditioning.
- Deforestation in cities : absence of trees which use CO_2 & trap PM to clean the air.
- Heat island effect : due to extensive use of glass, cement, tar on roads that trap solar heat.

Remarks

=> How cities impacted by climate change.

- Rise in extreme weather events – such as torrential rains & flooding eg Chennai floods, 2015
- Rise in sea level : threatens existence of coastal cities
- Increasing temperature : affects work efficiency, reduces agricultural yield to feed urban residents, leads to heat waves & deaths

=> Making cities more resilient –

- Afforestation on a large scale : eg Chandigarh has 1 lakh trees.
- Revive water bodies : eg marshes, streams, ponds to deal with heavy rain & floods
- Reduce air pollution :
  - Using clean fuel eg India switched over to BS 4 fuel standard
  - Promote use of buses & metro
  - Composting of water waste & processing of sewage to prevent land fills & fires.
- Paint the roofs white or plants on roofs to reduce temperature
- Green buildings – these buildings that use energy efficient (less electricity, water, heating) & reduce & reuse waste.
  eg Indian government's GRIHA (Green building rating)

Remarks

6

Q13. Elephant-human conflict is one of the most challenging issues in conservation of Heritage animal of India. What are various reasons of Elephant-human conflict? What need to be done in resolving these conflicts? (12.5 Marks)

Ans = Elephants, our heritage animals are increasingly coming into conflict with humans. This can be seen as.

- Elephant raids of agricultural fields has increased
- Elephants coming into villages near the forests.
- Death of elephants on train tracks
- Elephants making humans to death.

⇒ Reasons for increase in elephant human conflict

- Deforestation : of forest areas especially of Chhattisgarh, Odisha, Karnataka & Kerela where large elephant populations are found.
- Fragmentation of forests : due to construction of roads, rails through forests.
- Degradation of forests : decrease in canopy covers where elephants can't find enough fodder
- Climate change & hot summers : leads to drying up of water bodies due to which elephants come out of the forests looking for water.
- Mining : especially in forests of Odisha & Chhattisgarh displaces elephants.
- Practise of agriculture : on the outskirts of forests

changing elephant behaviour ecology

Remarks

- by tribals & peasants attracts elephants due to easy availability of food.

⇒ Steps to resolve the conflict:

- Afforestation and increase in canopy cover & to provide natural home and enough fodder for elephants
- Revive water bodies: such as streams, lakes used by elephants in hot summer season.
- Wildlife corridors: Forested corridors that connect different areas as elephants walk many kilometres a day.
- Wildlife crossings: as bridges over roads & railways as done by Western nations.

eg Recently Odisha government built wildlife & elephant tunnels & to help elephants cross to different forest areas.

But these were criticised due to delays, irregularities, tunnel size was too small for elephants

- Fences on agriculture fields: Ultrasound & laser emitting fences that drive away elephants without harming them.

With increasing urbanization & industrialization, human animal conflict will increase. We need to take pre-emptive measures to ensure animals live in harmony with man.

Remarks

Q14. What are BS IV emission standards? How are they different from BS III? Do you think carbon emissions can be checked by implementing these standards? Critically Comment. (12.5 Marks)

Ans-

Bharat stage emission standards are fuel standards adopted by the government and which have to be followed throughout the nation.

~~Recently~~

- These standards set the limits for =
  - Nitrogen oxides (NO_x)
  - Carbon monoxide (CO)
  - Sulphur dioxide (SO_2)
  - Particulate matter (PM2.5 & 10)

that the fuel will emit on being burnt in a vehicle.

- Recently BS 4 emission standards (which were in use in only 33 cities) were extended to the entire nation.
- Improvement over BS-3
  - BS 4 allows for 50 PPM (Parts per million) of SO_2 whereas BS 3 allowed for 150 PPM.
  - BS 4 reduces NO_x and PM in exhaust to ½ th the BS 3 levels.
  - BS 4 are more stringent for trucks than BS 3

⇒ How they can help check carbon emissions -

- They reduce the CO in exhaust as compared to BS-3
- They reduce unburnt carbon in exhaust

Remarks

- They reduce NO_2 and SO_2 & PM: all of which are green house substances & help accelerate climate change.

⇒ How they can't check carbon emissions

- BS-4 are quite outdated as the developed countries of Europe are following Euro standards-6 (ES-6) equivalent to BS-6
- Increasing number of vehicles on Indian roads will negate the positive effects of using a cleaner fuel. eg Delhi alone has a lakh + vehicles
- Thermal plants standards are very poor in India and they emit more carbon than all the vehicles combined. Even these poor standards are not followed.
- Carbon isn't the only green house gas. Other gases such as NO_x, SO_2, HEC are hundreds of times more powerful.
- Particulate matter in Indian air is a cause of worry.
- Crop residue burning adds large amount of carbon in the air.
- Poor standards of brick kilns add large quantity of CO_2

Thus moving even to BS-6 is an appreciable step But it alone can't ensure clean air. Public transport (buses, metro) reducing CO_2 from power plants, legal liability is also required

Remarks

Q15. What is light pollution? Why is it harmful to humans? What are the measures have been taken worldwide to tackle it? (12.5 Marks)

dns -

Light pollution can be traced back to the discovery of fire by the early man. It was exacerbated by the coming of the electric bulb and artificial lighting.

Light pollution is the phenomena where by excessive use of artificial sources of light by man (such as bulbs, LEDs, computers, mobile phone screens etc) results in a kind of pollution where by the darkness is penetrated by the light; at all times.

⇒ How it is harmful to humans

- Artificial light disrupts our circadian rhythm (sleep - wake cycle) where by humans like all animals should go to sleep when it's dark & wake up with natural light to the day.
- Working late into the night : a phenomenon made popular by MNC's (Multinational companies) leads to health problems -
  - Anxiety & stress
  - Non-communicable diseases such as - diabetes, heart disease & stroke due to long working hours.
- Artificial light leads to insomnia or the inability to fall asleep.

Remarks

=> Light pollution also affects animals.—

- Olive Ridley turtles : Baby turtles in need to move towards the sea after they hatch on the sea coast. But due to lights from houses, street lights etc they start moving inland.
- Wild animals in forests : are attracted towards villages where there is electricity and may attack villagers.

=> Steps taken to counter light pollution

- Earth Hour : It celebrated every year encourages citizens around the Globe to switch off extra lights for hour (8:30-9 pm local time) to conserve electricity
- Spreading awareness by UN : among citizens about light pollution and harmful effects on human physiology.

Prompts for programme like "Taare Zameen Par" to Quantify light pollution

Light pollution like air and water pollution affects human health and that of animals around us. To tackle it, more awareness needs to be spread by governments, NGOs, civil society etc. Also people need to be encouged to use the least artificial lighting, change lifestyles, use more red light at night (with lesser side effects than blue lights), etc.

5M

Remarks

Q16. Recently NGT suspended the environmental clearance granted to the India based neutrino Observatory? Has NGT overstepped its mandate? Critically examine. (12.5 Marks)

Ans -

The Indian Neutrino Observatory was to come up at Theni Hills in Tamil Nadu. It was to be set up to study neutrinos coming from space so as to better understand the origin of the universe and the working of neutrinos.

But NGT (National Green Tribunal) has cancelled the Environmental Clearance given to the observatory as -

- It fell within 4.9 km from the Madhikettan Shola National Park (instead of the earlier estimated 5 km)

⇒ This has resulted in -

- Further delays as the project was already delayed by 5 years.
- India losing out in the race to gain knowledge about neutrinos.

⇒ Has the NGT overstepped its mandate -

- No -
- The NGT can regulate any economic, commercial or scientific activity if it threatens to harm the environment and biodiversity
- Limit of 5 km : breached : Buffer of 5 km around any wildlife National Park is mandated within which activities need to be severely restricted to save the

Remarks

- Independent view
- Supported the demands raised by protestors

bio diversity.

- Disturbance to wildlife: setting up of the observatory inside a hill would have caused immense damage to wildlife in the area because of —
  - use of dynamite to blow up the hill.
  - disturbance due to construction activities
  - large human presence during construction phase

- Yes NGT overstepped its mandate as —
  - Strict implementation of 5km limit by NGT. It could've been relaxed as the project is an extremely important one for Science & Technology.
  - least harm to biodiversity: once the project is set up the wildlife won't be hidden away from site inside a hill.
  - Scientific activities allowed: even within the core of a biosphere reserve. An exception could've been made by JNO.

Thus it seems that NGT was well within its mandate to cancel the clearance given to JNO but it implemented the law too strictly. Seeing the importance of this observatory, an exception could've been made as the project would not cause any harm to animals.

Remarks

Q17. What does the court verdict terming Ganga and Yamuna as living entity mean? What are the consequences of such directives? (12.5 Marks)

Ans-

After decades of fighting by the Maoris tribe of New-Zealand to protect their river Whanganui, it was granted the status of a living person by the court so that the tribe can fight on behalf of the river in order to protect it.

Following the order, courts in India too declared Ganga and Yamuna as living persons.

⇒ What the court verdict means-

- Right to life and to a pollution free environment: Article 21 of the constitution would now be applicable to the rivers which will now have a right to a pollution free environment.
- Recourse to courts: To protect the rights of rivers such as the right to a pollution free environment legal recourse will now be possible.
- Legal guardians: Chief Secretary of Uttarakhand and the Director of the Namami Gange Programme will now be the guardians of the river.

⇒ Positive consequences-

- Legal recourse: Now will be possible to go to courts if rights of these rivers are violated.
- Responsibility on legal guardians: To ensure the rivers remain clean and healthy.

Remarks

- Increased awareness: among the people of the need to keep the rivers clean.
- Symbolic step: That emphasizes the importance attached to these rivers
- Ordinary citizens can now fight for the rights of the Ganga & Yamuna.

⇒ But the verdict cant solve all problems & creates new ones.

- Legal guardians: are government officials, unlike for the Whanganui where ordinary Maori tribe has the guardian.
- Jurisdiction problems: as the Ganga passes through 5 states but the chief secretary of one state has been made the guardian.
- Ganga and Yamuna are treated as Goddesses in Hindu mythology. If that couldn't improve their status, declaring them legal persons will have little effect.
- No interstate co-ordination: Problems of lack of co-ordination between states has not been solved.
- Lack of infrastructure: along the rivers such as that of Sewage Treatment Plants

Declaring the rivers as legal persons is a good symbolic step but existing problems faced by Namami Gange Program such as industrial effluents, untreated waste, ~~information~~ storming drains etc need to be addressed

Remarks

6/10

Q18. With fires raging across Central Indian forests and the Himalayan Pine forests, the frequency of such blazes has risen by a drastic 55 per cent in the past year. In this reference, discuss whether forest fire is always non-desirable? What are various reasons of forest fire and How to prevent Major Fires? (12.5 Marks)

Ans- Chhattisgarh, Madhya Pradesh and Odisha face the most forest fires in India. In addition to this Hilly states of Himachal Pradesh and Uttarakhand as well as the North East states also saw a rise in Forest fires.

⇒ Reasons for forest fires.

- Climate change : which has resulted in hot dry summers more prone to forest fires.
- Hill forests changed from Broadleaf to Pine : done by the British in order to exploit commercial value of Pine trees. But Pine needles cover the forest floor which are highly inflammable due to high resin content.
- Tribals set fire to undergrowth : these fires then rage out of control.
- Tribal practise of slash and burn : leads to fires that can't be controlled.
- Extension of agriculture : done on forest fringes by setting fire to trees on the periphery.
- Spread of weeds : Like Lantana camara which are highly susceptible to fire.

⇒ But forest fires are sometimes desirable too as-

- New undergrowth : lush green plants shoot after

Remarks

The old undergrowth is burnt.

- Increase in fertility: due to ash from the fire.
- Burning of Pine needles: which didn't allow water to seep through now leads to increase in water table.
- Natural way of forest to rejuvenate itself.

⇒ But forest fire causes harm as -

- Small animals which can't run away are killed.
- Loss of biodiversity.
- Increase in air pollution.
- Life of forest dwelling communities threatened.

⇒ Steps to ~~control~~ prevent forest fires.

- Replace Pine forests with broadleaf forests eg. Oak
- Stop spread of weeds such as Lantana.
- Discourage slash & burn cultivation.
- Make tribals & forest dwellers aware about the harmful effects of fires.
- Fire lines: cleared patches of forest lands to prevent fire from spreading.
- Cloud seeding: to make it rain artificially when fire breaks out.
- Use NAVIC: satellite technology to monitor where fire can break out so preventive steps can be taken.

Remarks

Q19. India's air pollution is now surpassing China, as the deadliest in the world. Are the measures taken by India with respect to air pollution sufficient? Examine.(12.5 Marks)

Intro- WHO reports on Indian air pollution said that 1.1 million people were killed every year in India due to air pollution. This is higher than the figure in China.

- Delhi was declared the most polluted city in the world.

=> To tackle the growing air pollution, Government took a number of steps.

- To reduce pollution from cars -
  - Introducing BS4 fuel standards that use cleaner fuel and lesser exhausts of CO_2, NO_x, SO_2. BS6 to come in from 2020.
  - Odd even policy of the Delhi government to reduce the number of vehicles on roads
  - Encouraging electric cars - by imposing very less taxes on it (Budget 2017-18)
  - Encouraging mass transport through development of metros eg Lucknow was the fastest city to get a metro.
- Prohibition of crop burning : by spreading awareness, imposing fines & new technology eg Happy Seeders.
- Encouraging renewable energy : eg Target of 175 GW renewable energy by 2022. International Solar Alliance
- Afforestation programme : Under the Paris Climate Pact

Remarks

as Indian INDC (Intended Nationally determined contributions)

- ~~To counter~~ Ujjwala scheme: to counter use of wood or cow dung as fuel which is polluting.
- GRIHA (Green buildings rating system): to encourage the use & construction of green buildings which consume lesser energy & generate less waste.

⇒ But the government is still lacking in some areas such as

- Poor standards of thermal power plants: which generate 60% of the country's electricity demand are some of the most polluting in the world, causing more pollution than all vehicles.
- Polluting brick kilns: India's rapidly growing construction industry is fed by bricks from thousands of kilns which are backward & polluting.
- Land fill emissions & fires: are a growing menace & a source of methane, CO_2, CO, NO_x due to absence of waste segregation, composting & incineration of non biodegradable waste.
- Fire crackers: extensively used around festivals are highly toxic causing PM levels to rise upto 800 - 1000 µg/m³ as witnessed in Delhi last year.
- Particulate matter pollution: caused due to road dust laced with pollution, unclean fuel
- Forest fires: also immensely add to air pollution.
- Indoor air pollution: due to cow dung for burning, PVC, plastics use etc.

The government's efforts are noteworthy but to tackle air pollution more steps are needed. Strict pollution check for cars, ban on polluting fire crackers, waste processing in cities & controlling forest fires needed.

Remarks

Brief

Nyr real time monitoring of air quality

Ignore health risk

6

Q20. Indian efforts in conserving tiger population are appreciable. In this reference, discuss achievements and steps taken by government to protect this magnificent animal. Also highlight some challenges which remains and need to be addressed. (12.5 Marks)

Ans - According to the tiger census of 2014, about 2250 tigers are found in Indian jungles the highest ever since the past one century.

After witnessing widespread poaching, dwindling tiger numbers (down to 1200) and rapid deforestation, the government of India took active measures to save this majestic animal.

=) Steps taken by government & achievements

- Initiation of Project Tiger in 1976 to reverse the falling numbers & Tiger population.
- Tiger Reserves : starting from 7 reserves in 1976 a network of 50 tiger reserves has been set up by the government. eg Satyamangalam is one of the latest reserves
- Afforestation : was accompanied by demarcation of tiger reserves to provide healthy habitat to tigers
- NTCA (National Tiger Conservation Authority) : was set up to co-ordinate & manage tiger conservation efforts & to advise State governments on demarcation & management of tiger reserves.
- Census : of tigers was conducted every 4 years to gauge the success of conservation plans.
- Measures against poaching : such as shoot at sight orders given to staff of Corbett & Kaziranga parks.
- International Conventions : signed & ratified by India eg

Remarks

CITES (Convention on International Trade in endangered species)
TRAFFIC (Wildlife trade monitoring network).

⇒ Achievements

- Steady growth of tiger population: From 1700 tigers in 2010 to 2250 in 2014.
- Famous tigers: Some tigers of India gained fame such as Machali of the Ranthambore Reserve who died in 2015.
- Protection to bio diversity: along with efforts of tiger protection.

⇒ Challenges that need to be addressed

- Poaching: Despite efforts poaching & killing of tigers for skin, claws & teeth is widespread.
- Decreasing forest cover: along with degradation of forested fragmentation due to rail, road, mines is hindering Conservation efforts.
- Increasing population density: in many tiger reserves is because of worry as tigers are territorial animals that need atleast 100 km² area. In lesser area they often fight & kill each other.
- Man animal conflict: Due to decreasing forest cover, practise of agriculture by tribals inside forests, tigers turn man eaters & attack villagers.
- Reduced migration: of tigers among different forests which reduces genetic diversity and threatens inter-breeding.

Tiger conservation efforts are indeed commendable & have yielded good results. But this needs to be stepped by with anti poaching drives, wildlife corridors for migration & increase in forest area.

6

Remarks