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JAGPREET KAUR

Rank - 101

GS Mains



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GEOGRAPHY, DISASTER MANAGEMENT AND AGRICULTURE

Time Allowed: 3 hrs.

Max. Marks: 250

Q.	Marks	Instructions to Candidate
1.		<ul style="list-style-type: none">• There are 20 questions.
2.		<ul style="list-style-type: none">• All questions are compulsory.
3.		<ul style="list-style-type: none">• The number of marks carried by a question is indicated against it.
4.		<ul style="list-style-type: none">• Answers to questions no. 1 to 10 should be in 150 words, whereas answers to questions no. 11 to 20 should be in 250 words.
5.		<ul style="list-style-type: none">• Keep the word limit indicated in the questions in mind.
6.		<ul style="list-style-type: none">• Answers must be written within the space provided.
7.		<ul style="list-style-type: none">• Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.
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Name Jagpreet Kaur
Roll No. 10

1. Invigilator Signature _____ Mobile No. _____

2. Invigilator Signature _____ Date _____

Signature Jagpreet Kaur

REMARKS

Section - A

- Q1. Discuss the major features of Tropical Rainforest Biomes. How Human activities are impacting these biomes? (10 Marks)

Tropical Rainforest Biomes are one of the most productive ecosystems of world. They have plethora of wild flora and fauna.

Major features

i) Rainfall - 200-250 cm annual rainfall and they remain overcast due to intense convectional heating.

ii) Temperature - 27-30°C with little annual variation. However, the humidity renders it unbearable.

iii) Vegetation• 3 layered canopy cover

a) Very tall tree

b) Medium length tree

c) Undergrowth - shrubs & creepers

• These forests remain evergreen because trees do not shed leaves at same time.

• Moreover, commercial exploitation is negligible as trees are not in pure stands.

Remarks

iv) Fauna

Variety of reptiles, insects, birds etc thrive in these forests.

Impact of human activities

- i) humans are disturbing these pristine habitats with infrastructural interventions like roads.
- ii) Forests are being cleared for agriculture, industry etc.
- iii) Deforestation is leading to loss of biodiversity.

Development though imperative must be carried out in a sustainable manner need to harness ecosystem services from these forests but with utmost self-restraint and nature be best left alone to follow its course here.

- Q2. India is slowly cleaving into two countries- a richer, older South and a poorer, younger North. Critically analyze. (10 Marks)

Ans. India is facing resurrection of its historical north-South disparity though in a new form. The caste based inequalities of past are now replaced by economic inequalities.

Reasons for a richer but older south and younger but poorer north are :

1) Population control measures

These have been effectively implemented in southern states & more voluntarily adopted by people owing to their higher literacy rates and awareness.

whereas northern states like UP, Bihar have Total Fertility rate of more than 3, thereby contributing to burgeoning Indian population.

2) Lack of economic diversification

Northern states are predominantly dependent on agriculture which is becoming a non-remunerative venture and is also

not able to absorb their huge population. They also lack natural resources, access to sea which render them unfit for industrialisation and sea trade.

whereas southern states have diversified into secondary & tertiary sector and a rich resource base and coastal proximity ~~augment~~ adds to it.

3) Other factors

Like literacy rate, health service, skill development etc show huge north-south disparity. South had effectively harnessed its human capital.

For "One India" need to bridge this north-south disparity by exercising popr control in northern states and absorbing the population from north into labour-intensive sectors in south. Then, we can ensure equitable & inclusive growth for India as a whole.

Q3. Critically examine the Malthus theory of population growth and discuss its relevance in context of India? (10 Marks)

Remarks

Remarks

- Q4. Critics argue that organic farming is inefficient and requires more land than conventional agriculture to yield the same amount of food. Do you agree? Critically analyze the potential of organic farming in solving hunger problem and its economic viability for farmers. (10 Marks)

Ans- Organic Farming as per FSSAI involves growing crops without using any chemical input i.e. fertilizer, pesticide etc.

North Eastern states like Sikkim and Meghalaya have made commendable progress in Organic Farming. But the overall scenario in India is gloomy with about 1% land under organic farming.

It is argued that Organic Farming is not as remunerative as conventional farming due to it's low yields & more land requirements.

This argument is flawed as organic farming does require more capital & effort initially but it is sustainable in the long run.

It can be our way out to solve the hunger problem and economic stress of farmers.

Remarks

As 87% of farmers in India are small & marginal, organic farming is an attractive proposition for them, as they would not require costly fertilizers, pesticides etc.

Moreover, organic food is being more in demand both domestically & internationally & capable of getting better returns to farmers.

Also, organic farming is environmentally sustainable and would not have impact on long term land productivity.

Govt with its schemes like SAMRADA, Raamgarh Krishi Vikas Yojana, Jairik India, Grow Safe Food etc is encouraging farmers to go for organic farming.

However, it would require handholding and support from Govt for this to be successful.

- Q5. 'Animal rearing is a key livelihood and risk mitigation strategy for tribals and small and marginal farmers, particularly across the rainfed regions of India'. Substantiate; also discuss some strategies to realize the potential of this sector? (10 Marks)

Ans. Animal rearing provides employment to 10% women, 2% men. And it augments the income of about 10% small and 20% marginal farmers.

India has the largest livestock population in the world. This sector holds great potential to reduce the livelihood risks of poor and tribal alike.

Reasons

- 1) It is less capital intensive and more labour intensive.
- 2) It yields high returns with low input costs.
- 3) It is not affected by vagaries of monsoon.
- 4) It also requires less skilling.

Strategies to boost this sector

This sector contributes about 4% to national GDP and more than 25% to Agri GDP. However, this sector is

Remarks

way below owing to our largest livestock population.

Interventions required

- 1) Better veterinary service esp in rural + tribal areas.
- 2) High quality inputs
eg. Feedstock, fodders etc
- 3) Scientific management of indigenous breeds.
- 4) Easy credit for expanding activities
and by pledging animals as assets.

Animal rearing can usher in prosperity for rural poor and tribes: all it needs is focussed attention and better implementation of govt schemes like national livestock mission, ~~value~~ Gokul Gram etc.

Remarks

Q6. What is mass movement? Discuss its various types?

(10 Marks)

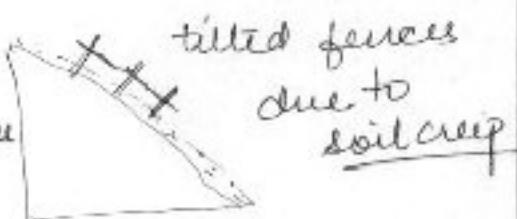
Ans.

Mass movement refers to the movement of weathered material under the primary influence of gravitation.

Type

1) Soil creep

It occurs when soil particles moist with water move over each other. It can lead to tilting of fences, poles on hill sides.



2) Soil flows (Solifluction)

It occurs when soil is completely saturated with water and it flows down the slope.

3) Landslide (Rocksliding / Slumping)

It occurs where permeable strata of rocks overlie impermeable strata.

Therefore the permeable rock layers saturated with water slip over impermeable layers under influence of gravity.

Remarks

Remarks

Q7. Recently, India's Prime Minister has appealed for a "three-pillared" approach to farming, which included crop farming, agro-forestry and animal husbandry. Discuss what needs to be done to successfully implement this approach to bring about farmer's welfare.

(10 Marks)

Remarks

Remarks

- Q8. India need significant focus in agriculture research through projects like TIGR2ESS using multi-partner approach to deliver a second, more sustainable Green Revolution. In this context, discuss TIGR2ESS project funded by Global Challenges Research Fund (GCRF) by Research Councils UK in India. (10 Marks)

Remarks

Remarks

- Q9. Why fishing industry is well developed on the western coast of India than eastern coast? Discuss the recent steps taken by the Indian government for the growth of this sector. Also discuss why commercial fishing is less developed in southern hemisphere?

(10 Marks)

Remarks

Remarks

Q10. While discussing the causes of formation of planetary winds elaborate on their major characteristics. (10 Marks)

Ans:-

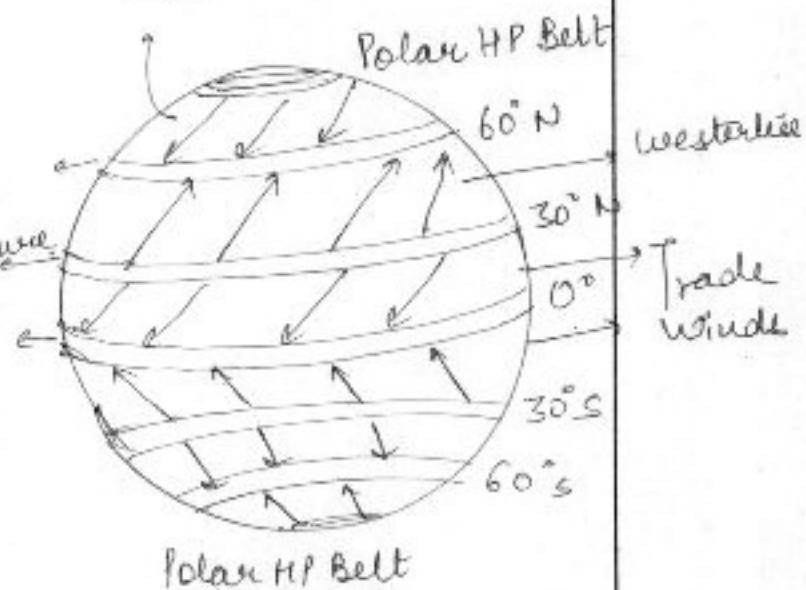
Planetary winds are global circulations that owe their origin to two major factors :-

- Pressure difference :- due to varied heating of Earth by Solar radiation, pressure belts are formed.
- Rotation of Earth - it leads to Coriolis force which deflects these winds towards their right in north and towards their left in south.

Temperate L-P Belt

Sub Tropical high Pressure Belt

Equatorial low pressure belt



a) Trade winds

- They are also known as Tropical Easterlies and they blow from Subtropical HP belt

Remarks

to Equatorial LP Belt.

ii) They are the most continuous in speed and direction.

b) Westerlies:

i) They blow from Temperate Sub-Tropical HP belt to Temperate low pressure belt.

ii) They are less constant than Trade winds and all the more wavy in Northern Hemisphere due to complex mix of land & water.

iii) In Southern Hemisphere, due to no obstruction, they gain great speed & thereby known as Roaring fifties, Shrieking Sixties etc.

c) Polar Easterlies

i) They blow from Polar HP belts to Temperate LP belts.

ii) They are the least constant due to poor insulation and small atmosphere at pole.

Remarks

Section - B

Q11. Gulf Dust storm is considered as one of the contributing factor (apart from stubble burning) behind the smog that had smothered Delhi and its neighborhood, as per Scientific Assessment of Delhi Winter Air Quality Crisis Report by SAFAR. Elaborate on the factors that increase dust storm and analyze its impact on Indian weather? (15 Marks)

Ans. Dust storms killed about 500 people in 50 cities from April to May 2018 in India. In recent past, they have increased both in intensity & frequency and aggravated the already worse problem like of Smog in Delhi.

factors leading to increase of dust storm

a) Natural factors

i) Unusual behavior of Western Disturbances
 About 10 Western disturbances reached India (as compared to earlier 2 or 3 pattern) and that too late in months of April, May. This happened due to unusual warming of Arctic Ocean which in turn affected the Jet streams.

ii) Heating of Bay of Bengal

Remarks

Bob's excessive heating led to strong moisture laden winds blowing towards Indian sub-continent.

iii) Convective heating of northern plains

This led to build up of extreme thunderstorms and also rendered the soil friable.

b) Anthropogenic factors

i) Unsustainable land management:

It leaves land/soil prone to erosion by wind.

ii) Poor management of construction dust & vehicular dust

iii) Faulty land use renders northern plains vulnerable to dust storms.
They act as scarce dust bowls.

Impact of dust storms on Indian weather

i) It aggravated air pollution, and harmful particles clinging to dust particles caused health issues.

Remarks

- 2) It hampered visibility and mobility.
- 3) It added to already intense problem of Smog.
- 4) It also led to collapse of infrastructure and crop losses.
- 5) Economic losses were augmented by lives being lost.

way forward.

With these storms becoming frequent, it is high time that we should be better prepared to mitigate the consequence.

Effective management of urban dust, prevention of land desertification, afforestation and better prediction & monitoring on part of Govt agencies can go a long way in reducing the contribution of anthropogenic factors.

Q12. Oceans are suffocating, as dead zones have quadrupled in size since 1950s. In this context, discuss the causes and effects of Ocean Dead Zones on marine ecosystem.
 (15 Marks)

Ans:

70% of Earth is covered with Oceans.
So, vast yet so vulnerable to human actions they are.

These productive oceanic ecosystems are under stress from variety of anthropogenic interventions. Ocean Dead Zones, a rare occurrence in past have become common in 20th century.

Causes for proliferation of Ocean Dead zones

Ocean Dead Zones are created due to lack of dissolved oxygen in water which further affects survival of marine flora & fauna.

This DO reduces and biological oxygen demand rise due to variety of factors:-

Demand rise due to variety of factors:-
 a) sewage flows, agricultural field runoffs, industrial pollutants effluents, pharmaceutical runoff lead to eutrophication.

Remarks

b) Thermal pollution leads to abnormal water temp. rise thereby reducing the dissolved oxygen.

All this leads to algal bloom and over growth of phytoplankton, which when die, are broken down by zooplankton and other organisms. Therefore, their aerobic decomposition increases the demand of oxygen. Moreover, they consume the already available oxygen thereby leading to creation of Dead zones (Anoxic zones).

Effects

- 1) Coral reefs get bleached due to stress of ~~zooxanthelle~~ because of shading of sunlight by algal bloom.
- 2) Moreover, marine fauna cannot survive in this oxygen deficient environment. Hence, it leads to biodiversity loss.

3) aquatic food web gets disturbed leading to extinction of many species.

way forward

Oceans - are storehouses of biodiversity and need preservation of their pristine ecosystem. Therefore, steps should be taken to prevent marine pollution and these ecosystems should be exploited sustainably.

Remarks

Q13. The United Nations Convention on the Law of the Sea (UNCLOS) not only protect the jurisdiction and economic rights of its member states overseas, but also the marine life and environment. Examine. (15 Marks)

Remarks

Remarks

Remarks

- Q14. Why are the west coast beaches receive more tourists and are more famous than east coast beaches in India? Also shed some light on India's Port led development initiatives.
 (15 Marks)

Ans:-

West coast beaches especially of Kerala and Maharashtra are major tourist destinations.

Reasons for their popularity

- 1) They are natural beaches as compared to east coast beaches, which are artificial - most of
- 2) Kerala portrays the unique beauty of backwaters i.e. Kayale.
- 3) Geographical reasons :-
 - West coast face less no. of tropical cyclones as compared to East coast
 - West coast beaches are formed naturally at
- 4) Moreover, intervention by western states to boost their tourist economy also render them conducive to footfall.

Remarks

India is looking forward to harness the immense potential that its 7500 km long coastline holds.

For this purpose, many initiatives have been started under the umbrella Scheme - "Sagarmala"

This scheme, initiated in 2015 focuses on following areas:-

a) Port development & modernisation (via IIT)

6 new major ports & 150 other port modernisation programmes are being undertaken to increase efficiency of ports.

b) Coastal Economy development

14 Coastal Economic Zones are to be set up to boost trade, exports and provide employment to coastal community.

c) Port connectivity

Efficient backward linkages in form of better rail-road linkages with hinterland for faster & fu

evacuation from hinterlands.

These initiatives aim at reducing time around time, enhancing efficiency, transparency and making ports the drivers of inclusive economic growth.

"Sagarmala" is a step in the right direction which will have domino effect on development of entire coastal ecosystem & therefore on development of India.

Remarks

Q15. Migration is a physical and social transformation and is also an instrument of cultural diffusion and social integration. Elaborate. Also, explain the nature of gendered mobility in India. (15 Marks)

Ans: Migration is an activity of residing in place away from one's birthplace due to various factors.

Push factors

- Economic instability, poor employment opportunities
- war, insurgency
- climatic conditions harsh
- social discrimination etc

Pull factors

- attractive employment or economic opportunities
- social equality
- political stability etc

These factors lead to rural to rural, rural to urban, urban to urban, ~~or~~ cross or inter-state or inter-country migration. However, rural to urban migration is the dominant phenomenon in India.

Remarks

Consequences

- Physical & social transformation occurs as people get employment, but it also increases stress upon resources of centre of migration.
- Moreover, it leads to over crowding in urban areas & skewed sex ratios in rural areas.
- Urban infrastructure bears the brunt of burgeoning migrants and so does the security scenario.
- On other hand, it also leads to cultural diffusion and social integration due to mixing of diverse cultures.
- Urban life ~~blatantly~~ gives people achievement orientation, modern values, new lifestyle which they spread to countryside.
- One striking feature of migration in India is diverse nature of mobility across genders.

Remarks

Pattern

- Fural male migrate to urban areas for employment, mostly when agriculture becomes unremunerative. They also migrate for career prospects
 - Fural female generally migrate to another rural areas on account of marriage. However, they do migrate to urban areas to do low paid jobs when compelled by economic necessity or in absence of working Head of Family.
 - Urban to urban migration is more or less similar for both the genders.
- Hence, the even migration patterns portray the deeply ingrained gender prejudice. However, the scenario is changing with more and more women getting educated and aspiring for better jobs in urban areas.

 Remarks

- Q16. Population growth and urbanization rates will have dramatic impact on food security across the world by 2050. In light of this, discuss the role of Big-data and upcoming start-ups in bringing next green revolution in the Indian agriculture? Examine. (15 Marks)

Ans: 21st century is the era of technology and innovation. I&T has revolutionised every sector and holds immense potential for addressing agricultural woes.

Major agricultural problems in present time are :-

- a) Dwindling productivity & thus the food security
- b) Unsustainable agri practices
- c) Inputs becoming costlier (e.g. seeds, fertilisers etc.)
- d) Increased pressure on land due to burgeoning population and rapid urbanisation
- e) Disguised unemployment

Technologies like nano-tech, Big-data & startups can tackle these issues in following ways :-

- a) Startups
 - * They can lead to diversification of occupation thereby reducing disguised

Remarks

unemployment and generating employment instead.

- They can provide industry to farm linkage and extension of new technology.
- They can enhance value addition to agri products thereby augmenting farmer's incomes.
- Innovative use of biotechnology can lead to creation of GM crops, climate resilient crops thereby protecting agriculture against vagaries of climate change.
- Moreover, nanotechnology interventions can lead to better prediction and forecasting of production, weather events, soil sensing etc.

b) Big Data

It can usher in data revolution in agriculture as Big Data analytics can lead to:-

- better production forecast
- better input management; e.g. usage of fertilisers as per soil requirement.

- better crop planning - e.g. when to use pesticides, how much to use.
- reduction in information asymmetry among farmers; as they can be provided with customised information, for enhancing their field's productivity . . . via e-kiosks, SMS, Kisan Portal

way forward

Technology & Innovation are promising interventions, which are indispensable for sustainability of Indian agriculture. Even NITI Aayog as partnering with tech giants like IBM for focussed interventions in agriculture.

This way we can achieve the twin objective of maintaining food security and doubling farmers income by 2022.

Q17. Every hazard is unique in terms of local socio-environment factors that control it, social response it generates and the way each social group deals with it. Citing specific examples, examine the importance of the role of local government and community in dealing with disasters. (15 Marks)

Thus "Sendai Framework" adopted in 3rd UN
Conference of UN on Disaster Risk Reduction
 specifically emphasise the indispensability
 of community participation in Disaster Risk
Reduction.

why community and local government participation
is necessary :-

- a) They are the ultimate sufferers and the first responders when a disaster strikes. Hence, they should be well-equipped to deal with such exigencies in order to safeguard their and other people's lives.
- Ex eg Van Panchayats and Joint Forest Management Committee should be involved to keep a watch on adjacent forests for forest fires.

Remarks

b) They have knowledge of local conditions in a much better way than any other agency. Hence, they can be crucial in Vulnerability mapping and risk assessment of regions.

c) Moreover, they are repositories of traditional knowledge which they have used since ages to tackle these disasters. And this includes methods which are cheap, effective and sustainable.

For eg. People in North East built houses on bamboo stilts, raised platforms to mitigate impact of floods.

- Other examples of community interventions
 - Maintenance of Chil-kaat networks in Chir pine forests of Uttarakhand to keep soil moist to avoid fires.
 - Contour bunding, terraced farming on hill slopes to reduce landslides, erosion, mud flow etc.

way forward.

Decentralised approach to disaster management across the entire cycle of Prevention, Mitigation, Preparation and Response, Recovery and Rehabilitation can go a long way in making "Building Back better" and reducing economic and life losses.

Remarks

- Q18.** Drought is a broader concept than just deficiency of rainfall. Discuss, how drought is more of a man-made disaster than a mere deficiency of rainfall. Elaborate on the consequences of desertification that drought prone regions face. Also, bring out the preventive steps need to be taken in light of targets to curb desertification as mentioned under the SDGs. (15 Marks)

Ans:-

Drought is a sporadic disaster whose initiation may be attributed to rainfall deficiency but is actually result of many anthropogenic interventions.

anthropogenic factors responsible for drought

1) Deforestation whether due to increased population pressure, unsustainable urbanisation or industrialisation disturbance the hydrological cycle and therefore the rain pattern.

2) Poverty land use practice

Overgrazing of wetlands, concretisation, unsustainable agriculture practice, flood irrigation, growing of water-exhaustive crops etc lead to loss of soil moisture and hamper recharge of groundwater.

Remarks

consequence

- Drought prone areas face extensive land degradation where ability of land as a productive resource is compromised.
- It loses its fertility and is rendered unfit for agricultural use.
- It leads to ~~the~~ socio-economic stress & dwindling food security.

The land is a limited resource and is essential both for agriculture and other development ventures, hence it's sustainable use because the sine qua non:

SDG's have called for prevention of desertification & land degradation and mitigation of its consequences through following interventions :-

a) Land Degradation neutrality

By 2030, amount of land degraded should be balanced with equal stretches being

Remarks

reclaimed and rehabilitated.

b) Sustainable land use practice

Agro-climate region based cropping, reclamation of wetlands, precision farming etc.

c) Afforestation, shelter belts

To reduce land loss due to erosion.

Way forward:

Land if used sustainably can alleviate many human miseries. Hence, this precious resource must be preserved and principle of "wise-use" should be adhered to.

its

- Q19. Cooperativization was seen as an important element in the agenda for institutional changes sought to be achieved through land reforms. Discuss. Also explain why the progress made by the cooperative movement in India largely fell far short of the goals set by its early proponents. (15 Marks)

Ans. India inherited a very backward and stagnant agriculture post independence. Land Reforms were initiated to achieve two set of goals:

- Social goals : of eliminating poverty & inequality & food insecurity.
- Economic goals : of boosting national growth by increasing agricultural productivity.

Cooperatives were integral component of traditional land reforms as they provided solutions to many issues like:-

- Land fragmentation
- Lack of economies of scale among small & marginal farmers. (who are about 87%)
- Costly inputs unaffordable to small & marginal farmers.
- Lack of institutional credit

Remarks

Co-operatives aim to provide better bargaining power to poor farmers. They maintain Custom Hiring Centres for machinery, help in accessing institutional credit, making high quality inputs like seeds, fertilisers available to farmers at affordable price, land pooling to achieve economies of scale etc.

The intervention was very well-thought one but it lacked implementation especially in northern & western states. southern and eastern states did make a considerable progress in institutionalising co-operative culture.

Reasons:

- a) Lack of political will & state policies.
- b) Lack of awareness among farmers.
- c) Lack of affluent farmers in northern and western states who monopolised over the cooperatives and thereby

Remarks

pocketed the benefits.

d) failure of other land reforms like tenancy reforms, conclusive land titles etc also contributed.

Hence, co-operatives which were meant to alleviate the miseries of poor & marginal farmers because had backyards for exercise of political influence.

Remarks

Q20. What are the various types of rural tourism? What will be the impact of promoting rural tourism in India? Elaborate the steps taken by the government so far? (15 Marks)

Ans:

Rural tourism is an innovative intervention aimed at augmenting rural income, boosting rural growth and at same time portraying rural culture.

Type of rural tourism

i) Tribal circuits:

As tribes reside in rural areas, and they have distinct lifestyle, art & culture, tribal circuits aim at harnessing their uniqueness for their upliftment.

ii) Religious circuit

Rural areas are home to many religiously important ~~places~~ structures, sculptures etc. Moreover, religious celebrations in rural areas in form of fairs, Jatras are perfect for tourism.

Remarks

iii) Home stay.

This involves providing accommodation to tourists esp. in hilly areas, so that they can live the experience of rural India.

Impact of rural tourism

- It will reduce rural inequality & poverty.
- It will provide employment a skill to rural youth and thereby reducing migration pressure in urban areas.
- It will also lead to building and maintenance of basic infrastructure in rural areas like electricity, roads etc.
- It will reduce rural areas' dependence on agriculture and thereby reduce the socio-economic stresses.
- It will lead to more global and national attention towards rural issues and need of preservation of rural ecologies.

As Mahatma Gandhi has said that "India resides in its villages".

Remarks

Hence, it is imperative to depict our rural culture & values through tourism and at same time boosting rural growth through it.

Remarks