

Geography Optional

QUESTION PAPER ANALYSIS (PHYSICAL GEOGRAPHY -PAPER-I)

1991 - 2023

PHYSICAL GEOGRAPHY (SYLLABUS)

1. Geomorphology: Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth's crust; Fundamentals of geomagnetism; Physical conditions of the earth's interior; Geosynclines; Continental drift; Isostasy; Plate tectonics; Recent views on mountain building; Volcanicity; Earthquakes and Tsunamis; Concepts of geomorphic cycles and Landscape development ; Denudation chronology; Channel morphology; Erosion surfaces; Slope development ; Applied Geomorphology : Geohydrology, economic geology and environment.

2. Climatology: Temperature and pressure belts of the world; Heat budget of the earth; Atmospheric circulation; atmospheric stability and instability. Planetary and local winds; Monsoons and jet streams; Air masses and front genesis, Temperate and tropical cyclones; Types and distribution of precipitation; Weather and Climate; Koppen's, Thornthwaite's and Trewartha's classification of world climates; Hydrological cycle; Global climatic change and role and response of man in climatic changes, Applied climatology and Urban climate.

3. Oceanography: Bottom topography of the Atlantic, Indian and Pacific Oceans; Temperature and salinity of the oceans; Heat and salt budgets, Ocean deposits; Waves, currents and tides; Marine resources: biotic, mineral and energy resources; Coral reefs, coral bleaching; sea-level changes; law of the sea and marine pollution.

4. Biogeography: Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Factors influencing world distribution of plants and animals; Problems of deforestation and conservation measures; Social forestry; agro-forestry; Wild life; Major gene pool centers.

5. Environmental Geography: Principle of ecology; Human ecological adaptations; Influence of man on ecology and environment; Global and regional ecological changes and imbalances; Ecosystem their management and conservation; Environmental degradation, management and conservation; Biodiversity and sustainable development; Environmental policy; Environmental hazards and remedial measures; Environmental education and legislation.

QUESTION TREND (1991 - 2023)

Compilation of questions asked in UPSC Main Examination from 1991-2023 is to help you in comprehending the question trend and mould your answer writing skills accordingly
Geomorphology: Factors controlling landform development; endogenetic and exogenetic forces; Origin and evolution of the earth's crust; Fundamentals of geomagnetism; Physical conditions of the earth's interior; Geosynclines; Continental drift; Isostasy; Plate tectonics; Recent views on mountain building; Vulcanicity; Earthquakes and Tsunamis; Concepts of geomorphic cycles and Landscape development ; Denudation chronology; Channel morphology; Erosion surfaces; Slope development ; Applied Geomorphology : Geo hydrology, economic geology and environment.

1991 : Analyze the sequential development of landforms in either Karst or Coastal region.

1992 : Discuss, with examples, the influence of volcanism and diastrophism on the evolution of landscape.

1993 : Explain the factors causing rejuvenation in landscape and describe the resultant landform.

1994 : Discuss the concept of cycle of erosion and bring out clearly the difference between the views of Davis and Penck.

1995 : Discuss the limitations of the theory of Continental Drift and show how the theory of Plate Tectonics is an improvement over it.

1996 : Discuss the processes of mechanical and chemical weathering and show their relationship with soil formation.

1997 : Discuss the concept of polycyclic landforms and present an analytical study of the polycyclic landforms of a selected region.

1998 : Discuss the concept of volcanicity and show how the theory of Plate Tectonics explains the mechanism of volcanism and volcanic eruptions.

1999 : Bring out the distinctions between the 'continental drift' theory and the 'plate tectonics' theory.

2000 : With reference to the theory of plate tectonics, explain the origin and growth of young fold mountain

- 2001 : Present a critical analysis of the theory of isostasy. 2002 : Provide a critique of the 'geographical cycle' model propounded by Davis.
- 2003 : Explain the sequential development of landforms associated with the coastal areas.
- 2004 : Describe the landforms which are products of endogenetic forces.
- 2005 : "Structure is a dominant control factor in the evolution of Landforms" Discuss with suitable examples.
- 2006 : Critically evaluate the continental drift hypothesis of A.Wegener.
- 2007 : Define the concept of isostasy and discuss the postulations of Airy and Pratt.
- 2008 : Critically examine the concept of geomorphic cycle and discuss the views of W.M.Davis and W.Penck.
- 2009 : Highlight the geomorphic features essentially found in topographies under the Second Cycle of Erosion.
- 2009 : Discuss views on slope development provided by L.C.King.
- 2010 : Karst Topography (Short Notes)
- 2010 : Bring out the relevance of seismic study in determining the structure of earth's interiors
- 2010 : Weathering is a complex phenomenon involving a number of the process and is influenced by various factors.
- 2011 : Name the climatically controlled agents of erosion. Explain how they differ in terms of properties of matter. Compare the landforms produced by each one of them
- 2011 : Explain the concept of Isostasy as postulated by Airy and Pratt.
- 2012 : Palaeozoic glacial evidence for Continental Drift.
- 2012 : Systems approach to landforms analysis.
- 2012 : Explain how Bosche and Haldenhang lead to the Theory of Slope Replacement.
- 2012 : Characteristics of the standard epigene cycle of erosion.
- 2012 : Programmes initiated by the International Council of Science on Earth System Studies.

- 2013 : Differences between Normal cycle and Arid cycle of Davis.
- 2013 : What is 'Base level'? Explain the types of base level.
- 2014 : Define the term 'meander' and describe the basic characteristics of entrenched meander and in grown meander.
- 2014 : State the concept of plate tectonics. How does it help in explaining the formation of the Himalayas and Appalachian Mountains?
- 2014 : Explain weathering and mass wasting, and describe their geomorphic significance.
- 2015 : Attempt a classification of geomorphic processes from the zonal point of view.
- 2015 : Discuss the contributions of the American School of Sub aerial Denudation in geomorphology.
- 2015 : Explain with examples as to how channel dynamics has been responsible for the development of alluvial fans and cones.
- 2015 : "Present-day landforms bear more complexity than simplicity." Elucidate.
- 2016 : Describe the "Basket of eggs topography".
- 2016 : "In explaining the concept of 'Pediplanation', King combined the ideas of Davis, Penck and Wood with his own." Elaborate.
- 2016 : "Geological structure has a dominant control on landforms and is reflected on them." Discuss.
- 2017 : Write a note on pseudovolcanic features.
- 2017 : "The knowledge of slope analysis has limited field application in the slope management". Explain.
- 2017 : Discuss the concept of Periglacial cycle as propounded by Peltier.
- 2017 : "Climate, slope gradient and rock structure influence the avulsion of channels". Explain.
- 2018 : "Landscape is a function of structure, process and stage." Critique the statement.
- 2018 : Evaluate how far Kober's geosynclinals theory explains the mountain building process.

- 2019 : Describe phreatic eruptions and their consequences.
- 2019 : How are sand spits and tombolos formed?
- 2019: Compare and contrast different types of plate boundaries.
- 2019 : Discuss the methods of measuring the intensity and magnitude of earthquakes. How are seismic zones demarcated?
- 2019 : The impact of floods on life and property can be most effectively reduced by hazard mapping. Comment.
- 2020 : Why is mapping important for geo-hydrological investigations? Explain with relevant examples.
- 2020 : Write an essay on evolution of continents and oceans using various theories and models.
- 2020 : Discuss the problems of erosion surfaces and explain the different methods to identify them with suitable diagrams.
- 2021 : Describe the concept of Altiplanation.
- 2021 : The concept of Plate tectonics has been derived from the isostasy and continent drift theory. Elaborate citing suitable examples.
- 2021 : Stream basins and drainage divides are important components to delineate a watershed area, explain.
- 2022 : Define 'speleotherm'. Discuss the various forms and features of speleotherms.
- 2022 : Explain how various aspects of channel morphology are used in transportation, settlement and land use planning, flood control and flood management?
- 2022 : Discuss the role of Slope, Altitude and Relief (SAR) in the landscape development.
- 2022 : With the help of suitable sketches describe the mountain genesis and mountain types. Give suitable examples from various mountain systems of the world.
- 2023 What are the environment implication of economic geology ? Discuss.
- 2023 "Evidences from palaeomagnetism and sea floor spreading have validated that continents and ocean basins have never been stationary." Elucidate with suitable diagrams.

2023 Define Peneplains. Describe the landscape features associated with peneplains under different geomorphic cycles.

Climatology: Temperature and pressure belts of the world; Heat budget of the earth; Atmospheric circulation; atmospheric stability and instability. Planetary and local winds; Monsoons and jet streams; Air masses and fronto genesis, Temperate and tropical cyclones; Types and distribution of precipitation; Weather and Climate; Koppen's, Thornthwaite's and Trewartha's classification of world climates; Hydrological cycle; Global climatic change and role and response of man in climatic changes, Applied climatology and Urban climate.

1991 : Explain the origin, distribution and characteristics of tropical cyclones.

1992 : Discuss the origin, movements and characteristics of air masses and explain their role in influencing world climates.

1993 : No question.

1994 : Explain the basis of Koppen's classification of climates. Also mention its merits and limitations.

1995 : Explain and illustrate the life-cycle of a temperate cyclone and also describe the weather associated with it.

1996 : Examine critically the drawbacks of Koppen's Classification of climates. Explain how Thornthwaite attempted to overcome Koppen's limitations.

1997 : Define air masses. How do they originate? Classify them and state the characteristics of any one type.

1998 : Discuss the nature and composition of earth's atmosphere.

1999 : Make a comparative study of the tropical and temperate cyclones.

2000 : Discuss the distribution of precipitation in the world.

2001 : Discuss the concept of air masses and present their classification.

- 2002 : Discuss the criteria which Thornthwaite adopted in his 1948 classification of world climates.
- 2003 : Discuss the mechanism and significance of tricellular meridional circulation of atmosphere.
- 2004 : No question.
- 2005 : Discuss the main features of the climatic classification system evolved by Koppen. Also point out its anomalies.
- 2006 : Compare the structure and associated weather conditions of tropical cyclone with that of temperate cyclone
- 2007 : Discuss the development of local winds, and their influence on local weather, giving three examples of the well-known local winds in the world.
- 2008 : Discuss the mechanism and origin of Monsoon winds and explain the role of El Nino on Monsoon circulation.
- 2009 : How does Climate Change affect urban areas ?
- 2010 : Inversion of temperature
- 2010 : What is polar front and How does cyclone develop along this front ? Describe the weather conditions associated with it.
- 2010 : Examine the various kinds of atmospheric humidity and their associated forms.
- 2011 : Give an account of global distribution of precipitation.
- 2011: " Contemporary global climate change is an anthropogenic phenomenon." Discuss
- 2012 : Compare and contrast tropical cyclone and temperate cyclone.
- 2012 : Classify air mass and explain how ' cP ' air mass affects global climate.
- 2012 : Impact of Cryosphere on global climate.
- 2013 : Differentiate Storm Surges and Seiches.
- 2013 : With suitable examples, bring out the impact of local winds on the climate of an area.

- 2013 : Discuss Dew point and the various forms of condensation.
- 2014 : Discuss the salient features of 'sirocco' and 'mistral'.
- 2014 : Describe the origin and development of thunderstorms with examples.
- 2014 : Discuss the nature and origin of Indian monsoon and recent techniques of its prediction.
- 2015 : Discuss as to how frontogenesis contributes to weather instability.
- 2015 : What is Potential Evapotranspiration? Explain how it is used in assessing the water balance in an area.
- 2015 : Discuss the basis of Koppen's climatic classification. Bring out the salient characteristics of 'Cs' type of climate.
- 2015 : Explain the meridional circulation of the atmosphere and its importance in world climate.
- 2016 : Differentiate between insolation and temperature and explain anomalous temperature.
- 2016 : Compare the origin and weather conditions associated with the tropical and temperate cyclones.
- 2017 : Discuss the impacts of ocean currents on air mass behaviour.
- 2017 : Discuss the forces which govern the air movement on the Earth's surface.
- 2018 : Explain the role of evaporation in the hydrologic cycle.
- 2018: Critically examine the basis and scheme of climatic classification proposed by Trewartha.
- 2018 : Explain the origin, progress and retreat of the Indian monsoon and discuss its impact on the Indian economy.
- 2019 : Explain the techniques to calculate potential evapotranspiration suggested by Thornthwaite.
- 2019 : Explain the nature of urban climates and their impact on global environmental change.
- 2019 : Discuss in detail the tri-cellular model of atmospheric circulation.
- 2020: Write a geographical note on Halloween Storm.

2020: Explain how various factors influence the origin and development of Indian monsoon system.

2020: Explain the characteristic features of Frontogenesis and Frontolysis.

2021: What are important factors in air masses modifications?

2021: Examine major influencing factors for varied patterns of precipitation on the continents.

2021: Indicating causes of lightning, describe the threats associated with it.

2022 : What is pollution dome? Discuss its formation and impacts.

2022 : With suitable examples describe the impacts of movement of airmasses on weather and winds in different parts of the continents.

2022 : Describe how short term variations in temperature are related to the processes of receiving energy from the sun to the Earth's surface and dissipating it to the atmosphere.

2023 What is " Geostrophic Wind" ? Explain the relationship between barometric slope and air circulation.

2023 Explain the characteristics and weather conditions associated with 'Anticyclones' giving suitable examples.

2023 What are the causes of origin of local winds? Discuss their significance on prevailing weather and climate in various regions, with suitable examples.

2023 How does inversion of temperature occur? Explain its significance on local weather with suitable examples.

Oceanography: Bottom topography of the Atlantic, Indian and Pacific Oceans; Temperature and salinity of the oceans; Heat and salt budgets, Ocean deposits; Waves, currents and tides; Marine resources: biotic, mineral and energy resources; Coral reefs, coral bleaching; sea-level changes; law of the sea and marine pollution.

1991 : Draw a hypsographic curve to represent the major physiographic units of the ocean and comment on their permanently.

1992 : No question.

1993 : Give a reasoned account of the distribution of salinity in the oceans and partially enclosed seas.

1994 : No question. 1995 : No question.

1996 : Explain the illustrate the ocean floor topography and give a detailed account of the Mid-Atlantic Ridge.

1997 : Examine critically the theories of the formation of coral reefs and atolls.

1998 : Explain and illustrate the submarine relief of the Atlantic Ocean.

1999 : No question. 2000 : No question. 2001 : No question. 2002 : No question.

2003 : Present a concise account of bottom relief of the Indian Ocean.

2004 : Discuss the mid-Atlantic Ridge in terms of its origin extent and relief.

2005 : No question. 2006 : No question.

2007 : Discuss the different bases for classifying the ocean deposits and give a detailed account of pelagic deposits of the oceans.

2008 : Describe the ideal conditions for coral reef formation and discuss the glacial control theory of coral reef formation.

2009 : Examine economic significance of the resources of the Continental shelf of the Indian Ocean.

2009 : Comment on marine heat budget and the oceanic circulation system.

2010 : Ocean Deposits

2010 : Methods (Scientifically sound)of bathymetry and account of bottom topography of Atlantic ocean

2011 : ‘‘Temperature, salinity and density differences in ocean water are the prime causes of ocean water circulation.’’ Elaborate.

2012 : Different layers of ocean water above abyssal plain.

- 2012 : ‘Atolls present the most challenging explanation in the evolution of coral reefs’. Discuss
- 2013 : “Offshore Acoustic Study helped the development of the concept of sea floor spreading.” Explain.
- 2013 : Compare the Subsidence and Glacial control theories on the formation of coral reefs.
- 2013 : Analyze the reasons for a comparatively poorer development of fishing grounds in tropical areas.
- 2014 : Illustrate the origin and nature of Sargasso Sea and Lagoon.
- 2014 : Give an account of recent observations on coral bleaching with reference to Clive Wilkinson’s Report.
- 2015 : Describe the characteristics of different types of pelagic deposits.
- 2016 : Discuss Maritime Zones.
- 2016 : “The relationship between the winds and the currents is best seen in the Indian Ocean.” Justify.
- 2016 : Bring out the various ecological problems associated with the exploitation and use of oceans and their resources.
- 2017 : Distinguish between low energy coasts and coral coasts.
- 2017 : Describe the configuration of the Pacific Ocean floor.
- 2018 : Describe the causes and consequences of sea level changes.
- 2018 : Describe the potential marine energy resources with reference to their benefits, harvestability and environmental impacts.
- 2019 : How are ocean waves formed? Distinguish between a wave of oscillation and a wave of translation.
- 2020: Marine resources are economically very significant. Discuss citing suitable examples.
- 2020: Discuss the concept of coral bleaching, its recovery and macroalgal regime shift due to this process.

- 2020: Explain the currents of the North Atlantic Ocean and their significant role in the climate of Western Europe.
- 2021: Give a detailed account of the bottom topography of Pacific Ocean.
- 2021: Maritime security is being neglected. Indicate the major challenges and suggest solutions in context of Laws of the seas
- 2022 : When corals are affected by stress it causes them to turn completely white. Explain the reasons of such an occurrence.
- 2022 : What is the relationship between ocean currents and global surface wind systems? Explain with examples how does the gyre in the Northern Hemisphere differ from the one in the Southern Hemisphere.
- 2022 : Rise of Surface temperature brings severe consequences. Elaborate the potential changes and threats associated with it in the world.
- 2023 What is ocean ranching? How are aqua- Cowboys related to such activities?
- 2023 How are ocean currents generated? Discuss their effects on costal climates with special reference to the Pacific Ocean.
- 2023 Given an account of marine resources and their economic significance. How has marine pollution affected such resources?

Biogeography: *Genesis of soils; Classification and distribution of soils; Soil profile; Soil erosion, Degradation and conservation; Factors influencing world distribution of plants and animals; Problems of deforestation and conservation measures; Social forestry; agro-forestry; Wild life; Major gene pool centers.*

1991 : No question.

- 1992 : Present a classification of the soils of the world and give their economic significance.
- 1993 : Define ecosystem and describe briefly its various components. Also discuss how and to what extent the modern man has affected the various types of ecosystems.
- 1994 : Indicate the major biotic regions of the world and discuss the ecological aspects of the monsoon region.
- 1995 : 'Man must realize the importance of maximizing agricultural production without destroying the ecological basis on which our entire food production system rests.' Explain with examples.
- 1996 : No question. 1997 : No question. 1998 : No question.
- 1999 : Discuss the relevance of 'watershed', as an ecosystem for the purpose of sustainable development.
- 2000 : No question.
- 2001 : Discuss the concept , components and functioning of an ecosystem.
- 2002 : Write in detail on the concept of biosphere as an ecosystem.
- 2003 : No question. 2004 : No question. 2005 : No question. 2006 : No question.
- 2007 : No question. 2008 : No question.
- 2009 : Give a brief account of the principal land biomes and their latitudinal distribution.
- 2010 : Floristic kingdoms based on their global distribution
- 2010 : Account of the structure of ecosystem and describe its functional aspect.
- 2011 : Define the term biome. List the terrestrial biomes and describe the characteristics of Savanna biome.
- 2012 : Major components of IGBP.
- 2012 : Adaptation and distribution of animals in the Ethiopian realm.
- 2013 : Uniqueness of fauna in the Notogean realm.
- 2013 : Bring out the relationship between climate and vegetation in the Mountain Biome.

- 2014 : Give an account of the nature of biosphere as an ecosystem.
- 2014 : State the uniqueness of the Eurasian Steppe Biome.
- 2014 : Define zoogeographic region. Also describe the basic faunal makeup of the Neo-Arctic zoogeographic region.
- 2015 : Explain the characteristics of ecological succession.
- 2015 : Classify soils based on their zonal distribution and describe the characteristics of pedocals.
- 2015 : Explain the different stages of ecological adaptation of man and bring out the changing balance between man and environment.
- 2016 : Bring out the ecological significance of Tropical Rainforest Biome.
- 2016 : Describe Newbigin's scheme of Floristic regions of the world and explain the Mediterranean Floristic region.
- 2017 : Distinguish between the characteristics of Chernozem and Sierozem soils.
- 2017 : Give a classification of plants based on the amount of water requirement.
- 2018 : Distinguish between intrazonal and azonal soils.
- 2018 : Describe in brief the characteristics and importance of azonal soils.
- 2018 : Discuss the causes of degradation of tropical rainforests and suggest remedial measures for their prevention, conservation and development.
- 2019 : Amensalism is a biotic factor that determines the geographic limits of species. Explain.
- 2019 : Why is it necessary to conserve genetic diversity of species? Do protected areas serve any useful purpose in this context?
- 2019 : How are soil acidity and alkalinity related to soil fertility?
- 2020: Which factors influence the growth of wild plants in India? Discuss their economic significance.
- 2020: Explain the effects and causes of deforestation and its impact on pattern of agriculture in India.

2021: Gene Pool centers are Good Hope for biodiversity conservation elucidate.

2021: Describe how ecosystem services of Himalayas are essential for Highland-Lowland sustainability in Asia.

2022 : Well developed soils typically exhibit distinct layers in their soil profile. Elaborate.

2022 : Plants and animals that exist in a particular ecosystem are those that have been successful in adjusting to their habitat and environmental conditions. Elucidate with examples.

2023 Explain the natural processes of soil enrichment and its impact on food production.

2023 Differentiated between the characteristics of organic horizons and mineral horizons in a generalised soil profile.

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2000 : No question.

2001 : No question.

2002 : Write an essay on 'sustainable development' from the perspective of geography.

2003 : No question.

2004 : How would the impact of global warming differ from one part of the earth to another Give a reasoned account.

2005 : Bring out the major problems of environmental pollution at global scale and suggest measures to check it.

2006 : Discuss the global ecological imbalances and their managements.

2007 : No question.

2008 : No question.

2009 : Explain factors contributing to the Global Climate Change.

2010 : No Question 2011 : No Question

2012 : Discuss how different types of mining lead to different types of environmental problem

2013 : Impact of Pleistocene Ice Age on the crust of the Earth.

2013 : Types of endemic plants and their degree of vulnerability to extinction.

2013 : What are the characteristics that make CHC a serious threat to the ecosystem? Give examples.

2013 : Explain the levels of Noise pollution and the legislative measures to control it.

2013 : “Urban Solid Waste Management poses the greatest challenge in Metropolitan planning.” Elaborate.

2014 : Enumerate the major causes of increasing degradation of environment in hills and hill slopes, and state its down-valley impact.

2014 : Give a critical account of reasons and consequences of marine pollution.

2015 : Comment on the impact of environmental education on quality of life.

2015 : Discuss the methods of conserving biodiversity for sustainable development.

2015 : “Man-induced famines are becoming more common than nature-induced ones.” Comment.

2016 : Explain the hydro-meteorological hazards in the Himalayas.

2016 : Give a reasoned account on how the impact of Global Warming differs from one part of the Earth to the other.

2016 : Discuss the significance of World Climate Research Programme (WCRP) and its core projects in the understanding of climatic change.

2016 : Write a critical note on the tendency of “use and throw” in the context of economic status and environment.

- 2017 : Describe the characteristics of biological deserts.
- 2017 : Explain the concept of micro carbon sink and its relevance.
- 2017 : “Climate change is a reality”. Explain with suitable e examples.
- 2017 : Discuss the Perception, Attitude, Value and Emotion (PAVE) Theory of environmental management.
- 2018 : Explain the natural and anthropogenic causes and mitigation measures of frequent flooding in Mumbai.
- 2018 : Discuss the objectives and principles of environmental education. Describe the basic concerns of formal and non-formal environmental education in India.
- 2018 : ‘Geomorphologic changes are largely responsible for environmental hazards in the Himalayan region.’ Comment with relevant examples.
- 2018 : “Controlling population growth is the sustainable solution to environmental problems.” Express your views with suitable arguments.
- 2018 : Explain the ecosystem approach to environmental management and highlight its advantages and disadvantages.
- 2019 : How do mountaineers constitute a threat to Mount Everest?
- 2019 : “The web of life is seamless and the consequences of disruption to one part of the ecosystem ripple throughout the whole.” Elaborate.
- 2020: Discuss the problems associated with the living environment in million plus cities in India. How these can be managed?
- 2020: Land use/ Land cover and soil type's influence forage quantity and quality in semi arid regions of the world. Discuss with relevant examples.
- 2020: Discuss the human response to and management of hazards and disasters in India.
- 2021: Discuss the hazard associated with rise in sea surface temperature.
- 2021: oil erosion and soil degradation are threat to food supply, discuss.

2021: Explaining the concept of carbon neutrality, describe the measures taken by carbon positive and carbon negative nations.

2021: With suitable examples, elaborate human ecological adaptations. Explain its impacts on ecology and environment in various parts of the world.

2022 : What are the high altitude environmental hazards? Explain with suitable examples.

2022 : Sequential changes in land use and land cover have brought global and regional ecological changes and imbalances. Elucidate.

2023: How is Deep Ecology as a concept different from ' Shallow Ecology'? Explain

2023 : What are the factors affecting regional ecological changes ? How do these affect human health ?

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