Question No.
प्रश्न संख्या

UPSC

Geography Day 1

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सिर्फ अभ्यास के लिए

Q1 Explain the factors responsible for the origin of ocean currents. How do they influence regional climates, fishing & navigation ? (15m)

Ocean currents refer to homogenous characteristic of moving water of sea. on the basis of temperature it is of two types warm current and cold current.

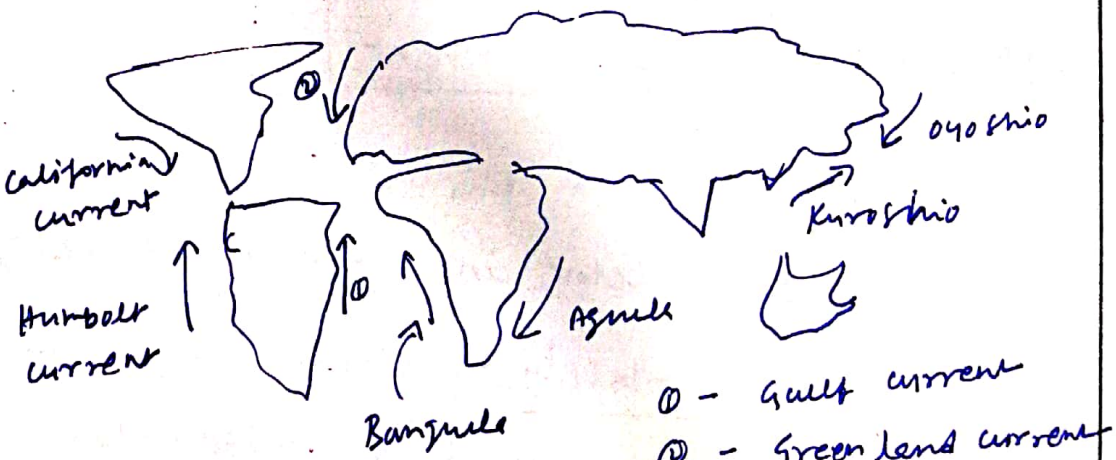


fig. major ocean currents

factors responsible of ocean currents

ocean current originate for the following reasons-

① difference in the salinity across large bodies of water e.g. Equator has ~~more~~ less salinity and

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polewards salinity increases.

② Temperature distribution due to factors such as insolation

③ Latitude of water body

④ Presence of nearby land body

⑤ wind speed

Influence of ocean current

① on climate

1.1 major factor in monsoonal climate

1.2 continentality - areas away from oceans do not have moderating effect whereas closer to shore areas have narrow range of temperature.

1.3 El-nino, La Nina & El Nino modoki

1.4 formation of cyclone.

1.5 Gulf current prevents excessive cold in western Europe

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(2) on fishing

2.1 meeting point of hot & cold current is rich fishing ground
e.g. Gulf & Labrador current.

2.2 cold current brings nutrients essential for plankton which is good for fish breeding

(3) for navigation

3.1 Earliest navigation was wind powered and also used the ocean current

3.2 Ships follow natural currents to conserve fuel.

Thus ocean current is complex geophysical phenomenon having many beneficial uses.

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Q2 Assess the impact of global warming on the coral life system with example. (10 M)

Corals are animals which make symbiotic relations with algal Zooxanthalae.

VII Coral distribution

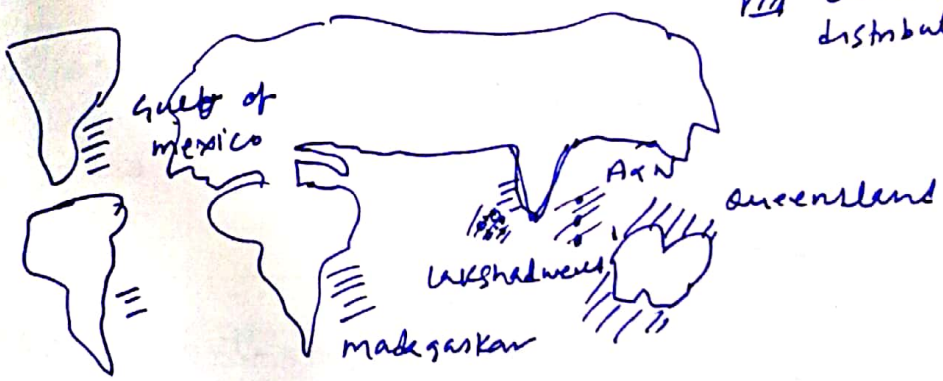


Fig: Coral distribution in world

Impact of global warming

① Coral bleaching – Queensland corals have witnessed three grounds of bleaching events in last 5 years.

② Coral Dying – Corals of Gulf of Kutch died en-masse in 2019 due to exceptional

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rise in temperature of arabian sea.

(3) loss of native species of fishes which burns nutrient for corals.

(4) Firm ~~Red~~ coral which is an invasive species started growing in coral terrain.

(5) Increase in salinity, and temperature of water is harmful on corals.

Protective measures

(1) Aichi target 10 - mandates coral preservation

(2) India's Bio rock programme at gulf of Kutch - Artificial structures made for corals.

(3) Controlling pollution, industrial waste dumping and coral mining.

Corals being keystone species are more sensitive to global warming therefore more measures are required.

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Q3 what do you understand about the 'jet streams'? How do they influence the Indian monsoon? (15m)

Jet streams are upper atmospheric air circulations which influence India monsoon.

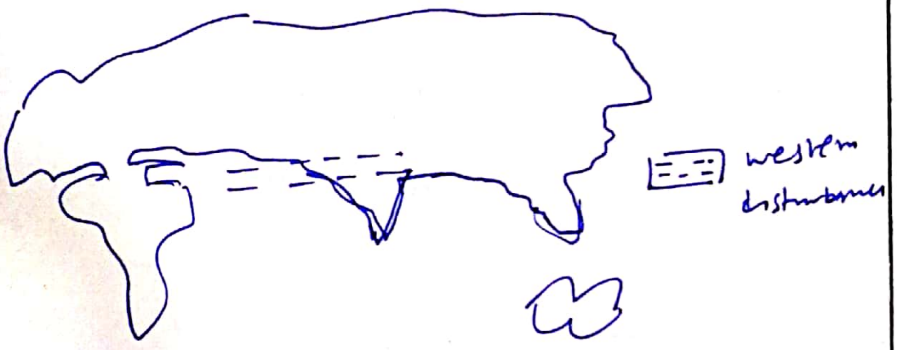


fig Jet Stream effect on Indian monsoon

Impact of jet stream on monsoon

① the onset of western ~~influence~~ disturbance is caused by mediterranean jet stream - it causes precipitation over western India, himalayan region and gangetic plains.

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② After crossing of equator the trade winds come under the influence of jet stream to turn toward India.

③ The retreating monsoon of November and december is influenced by the monsoonal winds.

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Q4 the solution to the Indian water crisis lies in water harvesting. Discuss the significance of water harvesting with special emphasis on urban areas. (15 m)

India has world's 2.4 % of freshwater sources while it needs to sustain around 18 % of its population on this meagre resource.

water harvesting is a technique to farm freshwater through techniques such as rainwater capturing, humidity capture or dew milking of water.

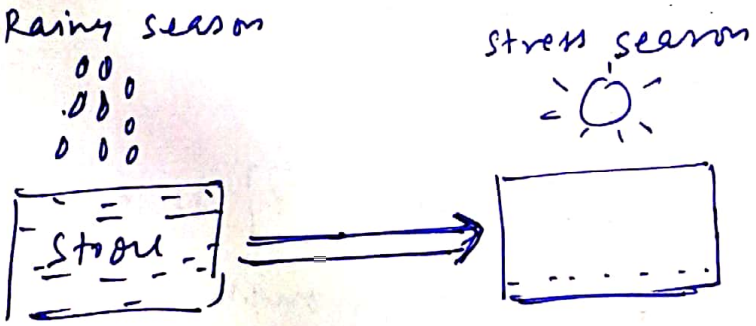
significance of water harvesting in urban areas

① Individual homes can become self sustainable through judicious use of inbuilt storage areas

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for rainwater and using that in the lean period.

② water stressed cities such as Bengaluru and Chennai have seasons of excess precipitation followed by bouts of water stress.



③ Use of humidity catchers can be used in less precipitation cities such as Jaipur and Barmer.

④ No need of transportation of water through tankers → reduces pollution in cities like Delhi.

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(5) Other ventures such as fish farming and aquaculture can be adopted in the storage tank to provide supplementary income.

(6) Sustainable goal number 6 can be realised along with 11.

SDG 6 - water, sanitation & Hygiene
SDG 11 - sustainable cities.

But it also needs to be coupled with following:

(1) water grease → e.g. kitchen used water in garden

(2) Recycling of water

(3) Reducing population stress by equal emphasis on rural development.

Considering this Atal Bhujal yojna and Jal Jeevan mission have been launched.

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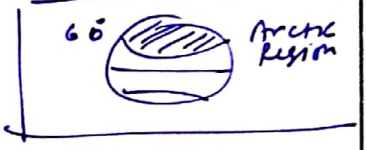
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Q5 Why is India taking keen interest in Arctic region? (10m)

Arctic region lies above 60° North latitude. Recently it has come into renewed focus due to find of new resources and opening of new routes.



India is taking interest in Arctic for the following reasons:

① Economic

1.1 Availability of huge oil reserves and gas reserves (Survey report 2017)

1.2 fishing resources

② opening of new route due to melting of arctic ice would reduce the distance between India and Europe.

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(3) Geopolitical shift

3.1 Every country is trying to increase its influence and India does not want to lose the initiative.

3.2 Chinese & Russian bonhomie may lead to monopolisation of resources.

(4) Research projects

4.1 such as Himadri in stationed in Norwegian island

4.2 Study of climate change in the future.

(5) Arctic council's observer member India has a important role to play.

India has proposed an equitable access to the resources of Arctic along with catering of needs of indigenous populations of Arctic.

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Q6 Account for the factors responsible for the variation in ocean salinity & discuss its impacts? (15m)

Ocean salinity is the concentration of salts present in the ocean water. It varies across the oceans and the lines joining regions of similar salinity are referred as haloclines.

Patterns of salinity

① Equator has lower salinity compared to polars.

② western coasts of continents in equatorial belts have lower salinity.

factors of salinity variability

① Insolation received by the water
eg. warmer water can hold less salt.

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(2) Latitude of the sea body

(3) Sea breeze - causes mixing and transportation of salt water.

(4) Inflow of fresh water through rain or river discharge

e.g. Baltic sea despite geographically seperated from other water bodies is not too saline due to river discharges.

(5) Geographical enclosement

e.g. Dead Sea has ~~land~~ no connected discharge and high evaporation and therefore it is very saline.

Impacts of salinity of oceans

(1) Causes sea current → due to sinking of saline water and upwelling of non saline water.

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(2) Influences Indian monsoon

(3) cyclone formation - Bay of Bengal less saline water results into more cyclones, Arabian Sea more saline and therefore less cyclones.

(4) El Nino - Salinity reduces and therefore fish catch reduces.

(5) Provides different species different adaptable habitats - reduces survival and enhances biodiversity

Ocean salinity is important component of earth's geophysical process which needs to be studied in more detail in wake of recent changes in Atlantic meridional overturning circulation.

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