

Que-1 Seismic noise refers to the vibrations within the earth, which are triggered by natural and manmade phenomenon like earthquakes, volcanoes and bombs. It is the unwanted components of signals recorded by a seismometer.

This noise includes vibrations ^{caused} due to human activity, such as transport & manufacturing and makes it difficult for manufacturing, makes it difficult for scientists to study seismic data that is more valuable.

Significance of recording seismic noise

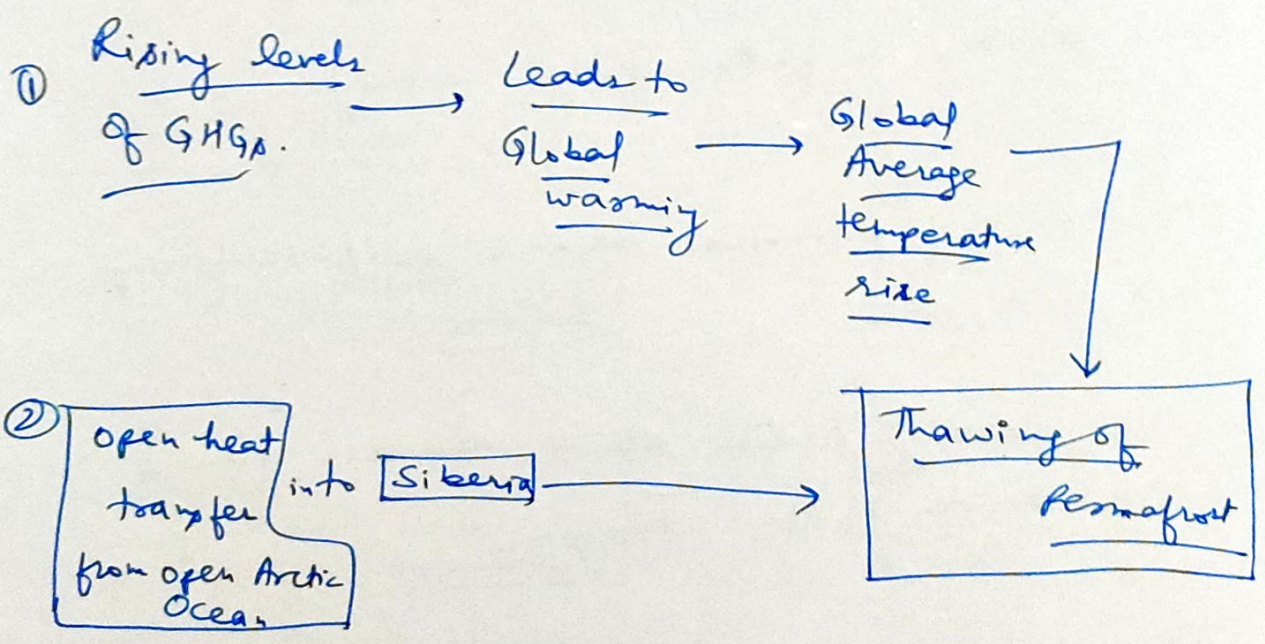
- Due to this, scientists will be able to spot weaker signals.
- Such small signals tell us about a geological fault making seismic hazard assessment more accurate.

- Apart from geology, seismic noise is also studied in fields of oil exploration, hydrology and earthquake engineering.

- Scientists would be able to detect smaller earthquakes & tremors.

Ques 2 Permafrost refers to the ground that remains completely frozen at 0 degree celcius or below for at least 2 year. Due to increasing temperature as a result of climate change, there are rising incidents of thawing of permafrost.

Causes of thawing of permafrost



Impact of thawing of permafrost

① On Infrastructure :-

As the frozen ground is melting due to global warming, the infrastructure lying over it can get

destabilised.

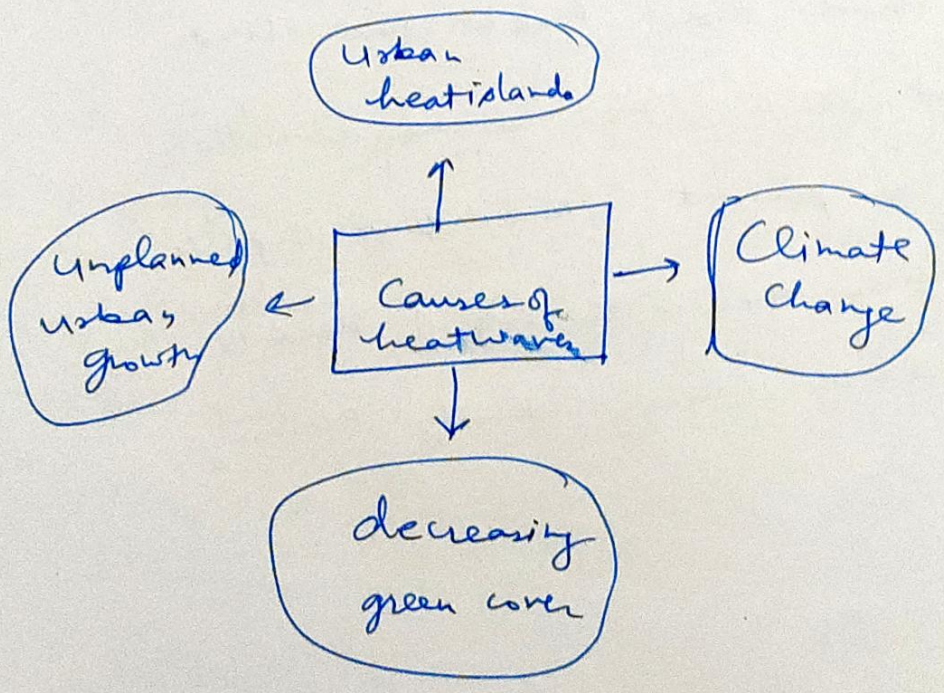
② On global climate :-

- There are approximately twice as much as carbon in permafrost than in currently in the Earth's atmosphere.
- An increasing thawing because of global warming leads to release of CO_2 & CH_4 in the atmosphere & hence leading to further global warming.
- So, thawing of permafrost becomes self-reinforcing and unstoppable.
 - i.e. loss of carbon sink & increase in carbon & CH_4 source in the atmosphere.

It raises our concern towards rising global warming & hence the need to control it & focus on our INDC targets & switch to green practices.

Que-3 Heat waves refer to the period of abnormally high temperature, more than normal maximum temperature. Heat waves typically occur between March to June. According to IMD, heat wave is considered if maximum temperature for plains exceeds 40°C , for coastal areas exceeds 37°C or more & for hilly regions exceeds 30°C or more.

Causes of heatwaves



- Impact of heatwaves :-

① On human health

- heat stroke
- diarrhoea & dehydration
- headache, vomiting, muscle cramps.

② On animals

- impacts their health & make them prone to diseases & hence loss of their lives & loss of livestock income to the farmer.

Heat waves have direct link with the climate change and its impact on extreme climatic events. So to prevent the adverse impacts of heat waves there is an urgent need to switch to lesser energy intensity economy.

Ques 4 Landslide refers to the movement of rocks or land surface due to natural or manmade causes like earthquake, floods, deforestation, mining etc. In Uttarakhand, in 2013, floods & landslide is one of the most disastrous landslide event.

Factors responsible for landslides

In Himalayan region
↓

- rising Himalayas & fast flowing rivers
- deforestation
- Earthquake
- steep slopes of Himalayas
- Mining
- Terrace cultivation

In Western Ghats
↓

- less steep as compared to Himalayas but landslides occur because of
 - mining
 - deforestation
 - Earthquakes
 - river flooding

Suitable measures to tackle landslide

- Terrace farming : Can prevent land & soil degradation & erosion because of farming at perpendicular to the slopes.
- Afforestation : increased tree cover will hold & bind the soil together.
- Landslide susceptibility mapping.
- Avoid construction in hazard prone areas.

So, National Disaster Management Authority needs to enhance its capability to map the landslide susceptibility mapping of the areas & hence mitigating the risk of the landslides.

Ques-5 Tropical cyclones refer to the cyclonic violent storms that originate oceans in the tropical areas & move over to the coastal areas. They move from ~~west~~ east to west & cyclonic winds rotate in the ~~anticyclonic~~ anti-clockwise direction. For eg:- Cyclone Fani, cyclone Nivar etc.

There have been found the more frequent cyclones in Bay of Bengal than in Arabian sea. Because -

① Temperature difference

The tropical cyclones need an ideal temperature of about 27°C and a continuous supply of heat energy. Bay of Bengal is warmer than the Arabian sea, hence able to provide the heat energy.

② Cyclones from Pacific Ocean

The low-pressure system originating from the Pacific ocean travel towards the Bay of Bengal & due to absence of large landmass between the Pacific & Bay of Bengal, more cyclones occur here.

③ Constant inflow of fresh water

- Bay of Bengal receives heavy rainfall & constant inflow of fresh water from the Ganga & Brahmaputra rivers.
- So, the surface of Bay of Bengal water keeps getting refreshed, making it impossible for the warm water to mix with the cooler water below, making it ideal for depression.
- While Arabian sea receives less tropical cyclones because of lack of constant fresh water supply & hence reducing the temperature.

So, need to have cyclone preparedness on western coast of India more. As in the case of cyclone Nivar in TN, large no. of people were evacuated & hence the casualty was avoided.

Que-7 Ocean currents are the continuous movements

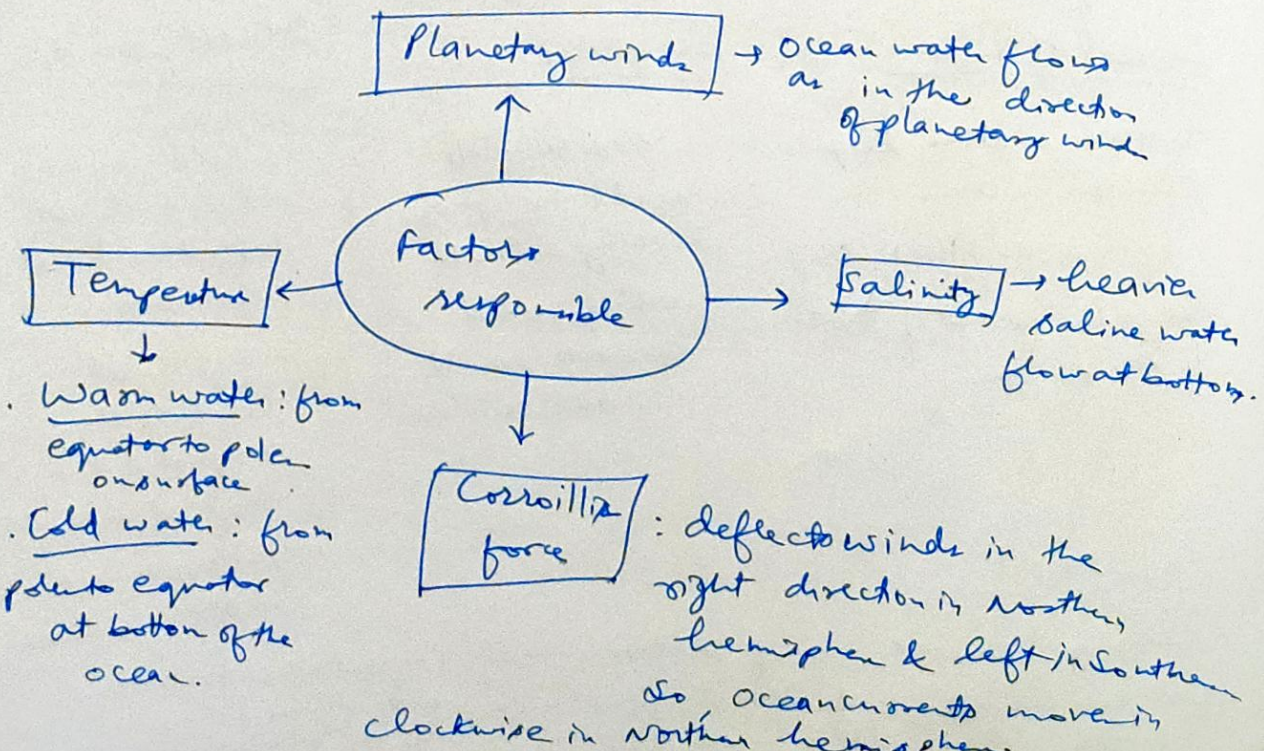
of water in the ocean that follow set paths, kind of rivers in the ocean. There are 2 types of ocean currents based on depth

- surface currents (10% of all water of the ocean)
- deep water currents (thermo-haline 90%)

- Based on temperature, ocean currents

- warm ocean currents (Eg: Gulf current)
- cold ocean currents (Eg: Oyashio current)

Formation of ocean currents



Economic significance of ocean currents

- ① Fishing :- - upwelling in the areas of cold ocean currents. are good grounds of fishing
- intermixing of cold & warm water - good ground for fishing

- ② Navigation :- ocean currents aids navigation.

Impact on regional climate

Local climate

- warm waters keep climate warm.
- Eg: North Atlantic Drift keeps the coast of North sea warm.

Precipitation

- warm currents result in warm & rainy climate while cold currents result in arid conditions.

Desert formation

- Cold currents have direct effect on desert formation.
- Eg: West coasts of the tropical & sub-tropical continents
- Eg: Peru current, → Atacama desert.

Not only there are no. of factors which impact the formation of ocean currents, but also the ocean current themselves play a major role in determining regional as well as global climate.

Ques - 8 India has only about 4% of the world's renewable water resources but is home to nearly 18% of the world's population.

As per NITI Aayog's "Composite water management Index", held that all Indian cities, including Delhi, Chennai & Bengaluru will run out of groundwater by 2020.

Water scarcity

- declining per capita availability of water.

- declining quality of drinking water or deteriorating

↑ increased irrigation
↓ salinity
→ Asbestos content, Uranium "on side".

Importance of traditional knowledge of water conservation.

- Traditionally, we have a tradition of water purification & conservation :-

• Can be seen through Great Baths during Harappan civilization.

• Bawadis & kunds built by kings. (Hauz Khas)

• Rainwater harvesting practice

So these practices can be imitated in recent times to deal with the issue of water scarcity.

Projects for watershed management like

— Neson Meem project of Andhra Pradesh.

— Aravali Pani Sansad of Rajasthan.

— Hariyali project by central govt.

— Because of concentrated rainwater availability i.e. just in 4 months, requires rainwater harvesting to use it judiciously to use this water directly & recharge the ground water aquifers.

— As watersheds & floodplains have been encroached upon, so there are needs to increase the absorption capacity of specially urban areas through 'sponge cities'.

— There is a need to change our crop patterns, i.e. in less (water scarce areas, water intensive crops like rice, sugarcane needs to be avoided.

To address this problem, govt. has designed

Jal Shakti Ministry and Atal Bhujal Yojana

to preserve & improve the quality of ground

water. MGNREGA is also used to design the

rainwater harvesting techniques like restructuring

community-owned Bawadis, kunds etc.