

#### Practice question Answer it using common sense

Which of the following statements are correct as per IPCC's sixth assessment report part-3?

1. During 2010-2019, average annual GHG emissions were higher than in any previous decade
2. During 2010-2019, rate of growth of GHG emissions was lower than that during 2000-2009
3. During 2010-2019, global energy intensity (primary energy per unit GDP) fell by 2% per year
4. During 2010-2019, unit costs of wind energy fell 55%, solar energy 85%, and lithium-ion batteries 85%
5. At least 18 countries have sustained GHG emission reductions for longer than 10 years
6. In 2019, most of the anthropogenic GHG emissions were from Transport sector

Answer: 1-5 are correct. 6 is wrong.

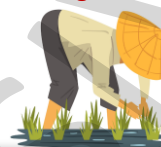
#### 34% energy supply sector



#### 24% Industry



#### 22% Agriculture



#### 15% Transport



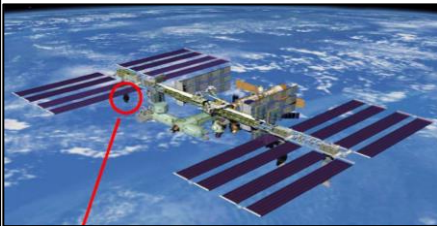
#### 5% Buildings



#### Net Anthropogenic GHG emissions in 2019

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### Methane



#### GLOBAL METHANE PLEDGE

- Launched in 2021 at COP-26
- By 2030, reduce Methane emissions by 30% below 2020 level
- Members: more than 100 (USA, EU, Australia, etc)
- India has not joined it as it can impact farming and livestock

#### To implement Methane Pledge

- ❖ UNEP launched IMEO (at G20 Summit in 2021)
- ❖ IMEO launched MARS (at CoP-27 in 2022)
- ❖ MARS uses satellites to detect large methane emissions, and alert governments about it.

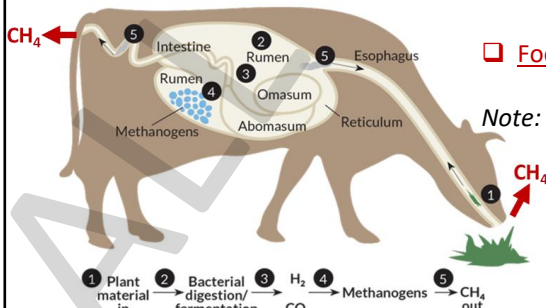
IMEO: International **M**ethane **E**missions **O**bservatory

MARS: **M**ethane **A**lert and **R**esponse **S**ystem

#### EMIT mission

Earth surface **M**ineral Dust Source **I**nves**T**igation

- Launched by NASA in 2022
- An instrument observes Earth from International Space Station.
- It uses spectroscopy to find composition of dust in atmosphere.
- Recently, it found many methane super-emitters (landfills, oil fields, animal farms, etc)



☐ Most ruminants have a 4-chambered stomach & 2-toed feet

- e.g. cow, buffalo, giraffe, deer, sheep, goats

☐ Food (Plant material having cellulose) is partially digested in rumen

- Enteric fermentation releases methane

Note: Many animals, including humans, cannot digest cellulose

#### Global Methane Assessment : 2030 Baseline Report

Launched by CCAC and UNEP at CoP-27 UNFCCC Climate & Clean Air Coalition : page-108

#### Global Methane Tracker Report

by International Energy Agency

## Sea level rise

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**The Indian EXPRESS**  
JOURNALISM OF COURAGE

**Explained: What is 'zombie ice', how it threatens to raise global sea levels by over 10 inches**

### Zombie ice / Dead ice / Doomed ice

- Ice that is not getting replenished by parent glacier.
- It's melting will increase sea level.
- It is attached to ice-sheet? Yes
- It floats on sea like ice-berg? No



### Sharm El Sheikh, Egypt

November 2022

- ✓ CMA-4 (Paris Ag)
- ✓ CMP-17 (Kyoto Pr)
- ✓ COP-27 (UNFCCC)
- ✓ SBI-57
- ✓ SBSTA-57

## COP-27

**Two permanent subsidiary bodies of UNFCCC** (for CMA /CMP /COP)

- ❑ **SBI** - Subsidiary **B**ody for **I**mplementation
- ❑ **SBSTA** - Subsidiary **B**ody for **S**cientific and **T**echnological **A**dvice

Purpose: SBSTA gives advice, SBI monitors implementation

Frequency: two meetings a year (UNFCCC meets annually since 1995)

**At CoP-27, India opposed discussions under the Koronivia Joint Work on Agriculture (KJWA)**

### Koronivia Joint Work on Agriculture

- ❑ It was established at COP-23 in Fiji in 2017
- ❑ It recognizes potential of agriculture in tackling climate change.
- ❑ It is the only program under UNFCCC to focus on agriculture and food security.
- ❑ six topics related to soils, nutrient use, water, livestock, methods for assessing adaptation, and the socio-economic and food security dimensions.

**At CoP-27, India submitted its LT-LEDS**

### LT-LEDS

- Long-Term Low Emission Development Strategy
- 2015 COP-21 (Paris) asked all members to submit LT-LEDS
- 2021 COP-26 (Glasgow) urged countries that have not submitted LT-LEDS, to do so by COP 27
- 2022 COP-27 India submitted its LT-LEDS
- Unlike NDCs, LT-LEDS are not mandatory
- Prepared by which ministry? MoEFCC

### Features of India's LT-LEDS

- Transition from fossil fuels
- Increase use of biofuels
- Sustainable urbanization
- Increase forest cover
- Lifestyle for Environment (LiFE)
- and so on...

**At CoP-27, India launched "In our LiFEtime" campaign**

- ❖ **COP-26**: "LiFE" campaign launched by India
  - Lifestyle for Environment - people should adopt sustainable lifestyle
- ❖ **COP-27**: "In our LiFEtime" campaign launched by India (with UNDP)
  - 18 to 23 years olds should become messenger of sustainable lifestyle

## Stockholm Convention

**Stockholm convention** aka Convention on POPs ( class-2 page-21 )

- ❑ **2001**: signed, **2004**: came into force, **2006**: India ratified it
- ❑ 2020: Cabinet approved ratification of seven more chemicals, and for future ratification, delegated its powers to to MEA and MoEFCC
- ❑ National Implementation Plan is submitted and updated by each party
- ❑ Global Environment Facility (GEF) provides the financial mechanism for this convention

### Did you know?

While ratifying the treaty in 2006, India chose the "opt-out" option.

Hence, any amendment in annexure (list of chemicals) cannot be enforced on us, until we approve it

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## Stockholm Conference



### Stockholm+50

- ❑ It was convened by [UNGA](#), at Stockholm, Sweden, during June 2-3, 2022
- ❑ Theme: A healthy planet for the prosperity of all - our responsibility, our opportunity

### Stockholm Conference (Theme : Only One Earth)

- ❑ UN Conference on Human Environment
- ❑ It was convened by [UNGA](#), at Stockholm, Sweden, during June 5-16, 1972
- ❑ [Stockholm Declaration](#) was adopted, which contained 26 principles
- ❑ It led to creation of [UNEP](#) (see page-4 for UNEP)

### Some facts about Stockholm Conference 1972

- ❑ It was the [first](#) global conference to make [environment a major issue](#)
- ❑ It was the [first](#) UN conference with the word "[environment](#)" in title
- ❑ It was the [first](#) UN event that supported [civil society](#) participation
- ❑ [Sweden](#) gave idea to ECOSOC to organize a conference on human interactions with environment
- ❑ [Maurice Strong](#) (of Canada) was Secretary-General of the Conference. [U Thant](#) was UN Secretary-General.
- ❑ [Soviet Union](#) and other Warsaw Pact nations boycotted the conference
- ❑ [Indira Gandhi](#) was the only Head of Govt/State at the conference (other than the host Sweden) [Link](#)

1972: Indira Gandhi attended Stockholm Conference

1972: National Museum of Natural History created

1972: Wild Protection Act enacted

1976: 42<sup>nd</sup> amendment made environment protection DPSP (48A) and FD (51A)

### National Museum Of Natural History

- It was established in [1972](#), opened in [1978](#) (5<sup>th</sup> June)
- It was at [New Delhi](#), under [MoEFCC](#)
- It was destroyed in a fire in [2016](#)
- New building is still under construction (as of May [2023](#))

### World Environment day

- ❑ Every year on 5<sup>th</sup> June, since 1973
- ❑ 2018 Host : India Theme : Beat Plastic Pollution
- ❑ 2022 Host : Sweden Theme : Only One Earth
- ❑ Not to be confused with [Earth Day](#) (22<sup>nd</sup> April since 1970)

### From class-1 page-12

1972 - UN Conference on [Human Environment](#) (aka Stockholm Conference) at Stockholm

1992 - UN Conference on [Environment & Development](#) (aka Rio Earth Summit) at Rio de Janeiro, Brazil

2012 - UN Conference on [Sustainable development](#) (aka Rio+20) at Rio de Janeiro, Brazil

### United Nations Environment Assembly

- It is [UNEP's governing body](#) (It replaced Governing Council)
- It is world's highest-level decision-making body on environment.
- It was created in [2012](#), during UN Conference on Sustainable Development ([Rio+20](#))
- It has universal membership of [all 193 UN members](#)
- 5<sup>th</sup> session took place in February 2022 (It meets every two years in [Nairobi](#), Kenya)

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# Oceans

## UN WATER CONFERENCE 2023

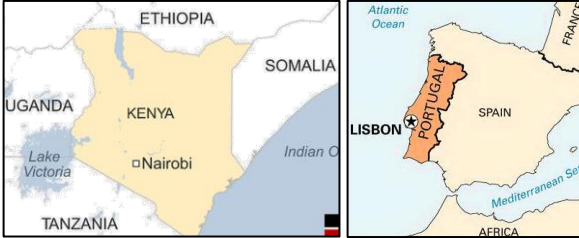
- It took place at UN HQ in March 2023
- It was co-hosted by **Tajikistan and Netherlands**

## UN OCEAN CONFERENCE

- 2017** : 1<sup>st</sup> conference at UN HQ, by Sweden & Fiji
- 2022** : 2<sup>nd</sup> conference at Lisbon, by Kenya & Portugal

### Lisbon declaration

- Signed by**: all UN members
- Title**: Our ocean, our future, our responsibility
- Voluntary commitments** were made to save oceans



SDG-14	Life below water
World Oceans Day	8 June
State of Ocean report	UNESCO
UN Decade of Ocean Science for Sustainable Development	2021-30

## GLOBAL OCEAN OBSERVING SYSTEM

- It is a program of **IOC**, started in **1991**
- Intergovernmental Oceanographic Commission (IOC) is part of UNESCO

## GOA-ON

Global Ocean Acidification Observing Network

- established in **2012**
- studies cause & impact of ocean acidification
- Impact: use common sense & mark all correct
- Page-121 : carbonic acid dissolves calcium carbonate, hence damages corals

## UN WATER CONVENTION

Convention on Protection and Use of Transboundary Watercourses and International Lakes

- It was adopted in **Helsinki** (capital of Finland) in **1992** and entered into force in **1996**.
  - It was initially launched for Europe. In 2016, it was opened for all UN members.
- It **does not replace** bilateral/multilateral agreements.
  - It encourages countries to enter into replace bilateral/multilateral agreements.
  - It promotes sustainable management of shared water resources
- It is **legally binding**
  - No country from South Asia** has joined it (as of May 2023)

# High Seas Treaty



### High sea

- Area beyond country's Exclusive Economic Zone (or national jurisdiction)
- It is about **64% of ocean** area and about **43% of Earth's** area.

### Biodiversity Beyond National Jurisdiction

- It refers to marine biodiversity in **High seas**

### Background

- UNCLOS does not have detailed rules to protect biodiversity in High Seas
- Hence, UNGA decided to create a legally binding treaty for this purpose

### High Seas Treaty (BBNJ Treaty)

- It is a **legally binding** instrument of UNCLOS
- It was agreed at UN on 4 March 2023
- It is yet to be signed and ratified



### Some objectives

- Create more Marine Protected Areas (**MPAs**)
- Sustainable use of marine genetic resources and equitable **sharing of benefits**
- Start practice of **Environmental Impact Assessments** for commercial activities in oceans



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## Great Blue Wall



### Great Blue Wall

- It is inspired from Great Green wall (class-8 page-109)
- It is an **African initiative** in Western Indian Ocean
- It was launched at 2021 **COP26** at Glasgow

### Objectives

- Create marine protected areas (MPAs) to protecting 30% of ocean by 2030
- create sustainable blue economy with millions of jobs
- and many more....

### Launched by: (don't learn names, just see location)

Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa, Tanzania and France, (La Réunion of France is in Indian Ocean)

## India's NDCs

Nationally Determined Contribution

Quantitative targets by 2030	NDC submitted in 2015	NDC submitted in 2022	Our progress
Reduce emissions intensity of GDP compared to 2005 levels	<b>33-35%</b>	<b>45%</b>	24% by 2016 28% by 2022
(Installed capacity) Electricity from non-fossil sources	<b>40%</b>	<b>50%</b>	42% by 2022
Create additional carbon sink through forest and tree cover	2.5 to 3 billion tonnes of CO2 equivalent	Same	

### NDC

- These are **non-binding** national plans to achieve Paris agreement targets
- Countries themselves design their NDCs, and updates it every 5 years

### NDC also has some qualitative targets like

sustainable lifestyle, climate friendly economic development, get funds from developed countries for mitigation & adaptation, etc

### NDC Synthesis Report

- Published by UNFCCC
- It has summary of NDC of various countries

### Carbon neutral

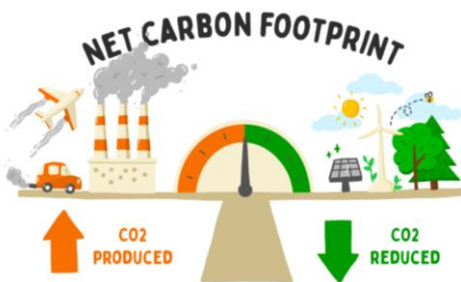
Net zero by 2070 is not India's NDC

### Panchamrit at COP-26 (page-104)

- It was just a speech by PM Modi
- It was not India's NDCs
- NDCs are submitted to UNFCCC in writing
- In 2015, we submitted NDC for the first time
- In 2022 we updated those NDCs

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## Carbon Neutral



### India's first carbon neutral

- **farm** : at Aluva in Ernakulam Kerala in 2022
  - **Panchayat** : Palli in Jammu in 2022
  - **Power exchange**: India Energy Exchange in 2022 (2008, Delhi)
- Note: Several media reports also state that in 2017 Phayeng Village of Manipur became India's first carbon neutral village.

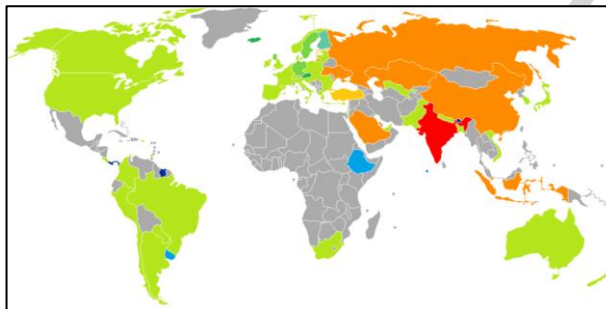
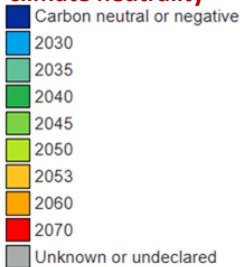
### 'Investing in carbon neutrality: utopia or the new green wave?'

It is on decarbonizing the agriculture sector. Published by

- European Bank for Reconstruction and Development (EBRD)
- FAO Food and Agriculture Organization of UN

Carbon neutrality can be achieved in two ways: reducing emissions and carbon offsetting

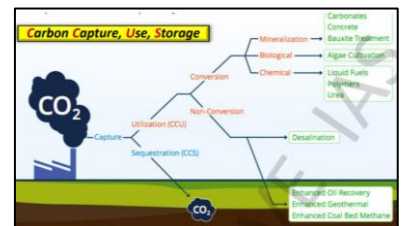
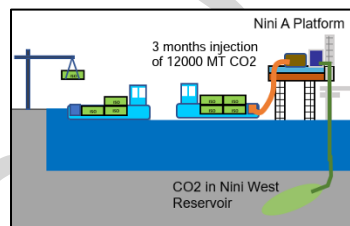
### Intended year of climate neutrality



### 8 countries have achieved or surpassed carbon neutrality:

Bhutan, Comoros, Gabon, Guyana, Madagascar, Niue, Panama, Suriname.

## Project Greensand



- ❑ It is a carbon storage project in Denmark's North Sea (page-8 CCUS)
- ❑ CO2 will be stored in depleted reservoir of Nini & Siri oil field
- ❑ It is world's first cross-border carbon storage project.

It should not be confused with Carbon Border Adjustment mechanism (class-6B page-88)

## Carbon Budget

### Carbon Budget

- It tells how much CO2 we can still emit while keeping warming below specific limit
- **IPCC 6th Assessment report (AR6)**:
  - World can emit 400 billion tonnes more CO2 before hitting 1.5OC limit
  - Hence, earth's carbon budget will exhaust in 10 years at current emissions level.
- Carbon Budget Report is release by Global Carbon Project

### Global Carbon Project

- ❑ It is a research project launched in 2001 by some international organisations
  - It calculates budget for carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).
- ❑ It releases Global Carbon Budget Report
  - Latest report says that rate of growth of GHG emissions was lower than last decade

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## Miscellaneous

### Arctic Report Card

Released by US National Oceanic and Atmospheric Administration (NOAA)

### Ozone Depleting Gas Index

Released by US National Oceanic and Atmospheric Administration (NOAA)

### Ozone

As per a UN study, Ozone layer is recovering, and will fully recover to 1980 level in next 20-50 years.

### Inclusive Forum on Carbon Mitigation Approach

- by [OECD](#) in 2023
- To help all countries in emission reduction by mutual learning, data sharing, etc

### Giving to Amplify Earth Action (GAEA)

- by [World Economic Forum](#) in 2023
- It aims to mobilize \$ 3 trillion funds (public + private) annually for climate change
- It will help in achieving net zero by 2050, protect biodiversity, etc.

### Cap and Trade

- aka Emissions Trading
- Companies are given emission target
- Companies can buy/sell carbon emissions
- See carbon trading on page-9

### Small Grants Program:

- It was launched by [GEF](#) in [1992](#)
- It is implemented by [UNDP](#)
- It gives grants up to [\\$50,000](#)
- It gives financial and technical support to programs that conserve environment while improving people's life
- In India, it is implemented by UNDP, MoEFCC and TERI

*For Global Environment Facility, see page-5*

### Mission Possible Partnership

- It is an alliance of climate leaders (not governments)
- It persuades companies to reduce carbon emissions
- World Economic Forum is one of its core partners

### Just Energy Transition Partnership

- It is a financing mechanism (grant, loan, investment)
- Developed countries will [help coal-dependent developing countries](#) to make energy transition
- 2021 COP-26 Glasgow: [South Africa](#) was promised \$ 8.5 billion finance by USA, UK, EU, France, Germany
- 2022 G-20 Bali: [Indonesia](#) was promised \$20 billion in public and private finance
- 2022 December: [Vietnam](#) promised \$15.5 billion
- [India? Not yet](#)

### Polluter pays principle

- Those who pollute must bear cost of cleaning it

### Precautionary principle

- Adequate precaution must be taken when doing something whose [results are weakly understood](#)
- e.g. environmental impact of big infra project is unknown, hence [EIA](#) study is done

### Planetary boundaries

- It is a framework to describe impact of human activities on Earth.
- Beyond these boundaries, [environment will not be able to self-regulate](#).

### Global Energy Monitor

- [US](#) based NGO founded in 2008
- Maintains database of coal fired power plants, oil extraction sites, renewable infra, etc.

### Gross Domestic Climate Risk Report

- by [Cross Dependency Initiative](#) (it specializes in climate risk analysis)
- As per this report, India has 9 states in 50 high risk states

### Terraforming of Mars

- It is a hypothetical concept of [planetary engineering](#)
- It says that we should modify Mars atmosphere to make it [suitable for human life](#)

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