

UN Environment Emissions Gap Report 2017

Relevancy

- GS Prelims, GS Mains paper III
- Carbon level reductions, Environment
- UN Environment Emissions Gap Report 2017

UN Environment Emissions Gap Report 2017

- The UN Report 2017 tells that a big carbon emissions gap exists between the levels that can be achieved in 2030 with present climate commitments.
- It also suggests what needs to be done using set pathways to limit increases in global average temperature to less than 2° Celsius, preferably 1.5° C by the 2100.
- Full implementation of the unconditional Nationally Determined Contributions (NDCs) could result in a temperature increase of about 3.2° C by 2100 relative to pre-industrial levels.
- Whereas full implementation of conditional NDCs would marginally lower that projection by about 0.2°C.
- The report also indicates that governments will need to make stronger pledges to cut greenhouse gas emissions while their revision in 2020.
- Number and intensity of extreme weather events such as hurricanes, droughts and floods in 2017 has increased, which requires urgent action.
- Fossil fuels and cement production account for about 70% of greenhouse gases.

CO2 Target levels

- A large gap exists between targeted 2030 emission levels and those leading pathways to the 2°C and 1.5°C goals.
- The 2°C emissions gap for the full implementation of both the conditional and unconditional NDCs for 2030 is 11 to 13.5 gigatonne CO2 equivalent (GtCO_{2e}).
- The gap in the case of the more ambitious 1.5°C target is 16 to 19 GtCO_{2e}.

Green options with countries

- The Paris accord only a third of what is needed to avoid climate catastrophe.
- Paris Agreement pledges leave deficit that could raise temperature by 3°C
- Countries should adopt new technologies in key sectors.
- Investments of under \$100 per tonne of emissions could cut them by up to 36 gigatonnes per year by 2030 which is more than sufficient to bridge the current gap.
- Much potential to close the emissions gap lies in:
 - solar and wind energy
 - efficient appliances and passenger cars
 - afforestation and stopping deforestation
- Above factors hold a total potential of cut up to 22 GtCO₂e per annum.
- Other agreements like the Kigali Amendment to the Montreal Protocol stating strong action on plugging other greenhouse gases, such as hydrofluorocarbons (HFCs) also contribute to the major cause.

Conclusion

- One year to the Paris Agreement yet we are not doing nearly enough to save hundreds of millions of people from a miserable future.
- CO₂ emissions have remained stable since 2014 due to use of renewable energy mostly by China and India.
- CO₂ Emissions might have peaked but other greenhouse gases, such as methane, are still rising.
- Still there still are fears of CO₂ emissions rise due to global industrial growth.

China-Pakistan nuclear axis

Relevancy

- GS Mains paper III
- International relations
- Security of India, no first use policy
- Nuclear capabilities of India, Pak, China
- Causes, concerns, challenges

Background

- The five permanent members of the UN Security Council, led by the US and the Soviet Union, tried to ensure the implementation of nuclear non-proliferation treaty.
- But their own nuclear arsenals steadily increased and pleas for disarmament were arrogantly disregarded by others.
- In today's time, nuclear stockpiles have steadily grown.
- Israel, Pakistan, India and North Korea have joined the 'nuclear club'.
- While Japan and Iran are capable of doing so when needed.
- There are an estimated 14,900 nuclear warheads in nine countries.
- 93 per cent of nuclear weapons are in the possession of the US and Russia.

Nuclear capabilities of India, China and Pakistan

- **India:**
 - India crossed the nuclear threshold after it received threat from Pakistan during tensions over military exercises named Operations Brasstacks in January 1987.
 - Instructions were issued in 1988 to nuclear scientist PK Iyengar and scientific adviser VS Arunachalam to assemble a nuclear arsenal.
 - India demonstrated its nuclear weapons capabilities ten years later, with the Pokhran nuclear tests.
 - Pakistan followed a fortnight later.
 - India is estimated to possess 110-120 nuclear warheads.
- **China:**
 - China tested and acquired nuclear weapons in the 1960s.

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- China now has approximately 280 nuclear warheads for delivery by 150 land-based and 48 sea-based missiles and fighter aircraft.
- **Pakistan:**
 - Pakistan too commenced its quest after the 1971 Bangladesh conflict.
 - Pakistan has 130-140 nuclear warheads.
 - Its warheads are designed for delivery by ballistic and cruise missiles and aircraft.
 - Pakistan's stockpile could potentially grow to 220-250 warheads by 2025, making it the world's fifth-largest nuclear weapons state.
 - Pakistan's missiles, with ranges up to 2,750 km, are all of Chinese design.
 - They are produced at the National Defence Complex facilities in the Kala Chitta Dhar mountain range, to the west of Islamabad.
 - The development, production and test-launching of missiles is done at south of Attock, using mobile Chinese designed missile launchers produced in Fateh Jang.

Causes of concern for India

- **Pakistan-China nexus:**
 - China has provided Pakistan with designs and equipment to manufacture nuclear weapons.
 - It has also given Pakistan the know-how and materials for manufacturing missiles capable of carrying nuclear weapons to every part of India, including the Andaman Islands.
 - According to analysts Pakistan's nuclear programme is nothing without China.
 - Zulfikar Ali Bhutto's prison memoirs suggest that he was guaranteed Chinese assistance after his meeting with Chairman Mao in 1976.
 - China benefited from designs stolen by Pakistani nuclear physicist AQ Khan from European (URENCO) enrichment facilities.
 - China was providing Pakistan designs for nuclear weapons by the early 1980s.
 - Not only China trained Pakistan but also the Saudis, North Koreans and Algerians.

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- Ironically, the US (pioneer of NPT) covered up and did nothing to curb the Chinese activities.
- Pakistan has received liquid-fuelled ballistic missiles from North Korea in exchange for information on uranium enrichment with the help of China.
- **Public unaware:**
 - These facts are not much known to the public as there has never been a debate about it in Parliament.
 - Parliament should promote awareness of the challenges the nation faces from two hostile neighbours working together.

India's 'No first Use Policy'

- Though Pakistan has not enunciated a formal doctrine but it has time and again stated that its nuclear weapons are "aimed solely at India".
- According to Pakistan it would use nuclear weapons if India:
 - conquers a large part of Pakistani territory
 - destroys a large part of its land and air forces
 - tries to "economically strangulate" Pakistan
 - pushes it to political destabilisation
- India has declared that it will not be the first to use nuclear weapons.
- India will use them only if its territory or armed forces face an attack in which nuclear, chemical or biological weapons are used.
- Since India has no desire to conquer Pakistani territory or destroy its armed forces there lies lesser possibility of India provoking a nuclear conflict.

Challenges for India

- According to Chinese sources, missile and nuclear proliferation by China to Pakistan will continue in its efforts to "contain" India.
- Pakistan has tested a sea-based missile and China is to strengthen Pakistan's navy with substantial supply of submarines and frigates.
- China uses Pakistan to fulfil its maritime ambitions, to promote its OBOR projects in the Indian Ocean.
- India has to deal with China for whom "containing" India has been a strategic effort for over four decades.

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- Balancing Chinese power involves developing partnerships with others across the Indo-Pacific region.
- China's policies are multi-faceted and will likely avoid open hostility.
- Yet it continues to keep up the pressure along its borders with India and uses proxies across India's immediate neighbourhood.
- India needs to review its nuclear policy considering China's recent aggressiveness towards India.

Drug price control and its after effects

Relevancy

- GS Mains paper III
- Drug price control
- Online pharmacies

What happened till now?

- Government has made an attempt to extend the scope of essential medicines to bring a larger number of them under price control.
- Secondly, it put a cap on the prices of medical implants which are coronary stents and knee implants.
- As a reaction by foreign manufacturers of implants, they are now seeking to withdraw some products from the Indian market.
- The Government has refused permission to leave for six months.
- Over time the original applicants have submitted fresh applications to withdraw their products after six months.
- Debate revolves around how to prevent manufacturers from withdrawing their products and introduce their newest products in India in future when they are globally released.

Aftermath of price control

- Sales hit bad:
- US brand Johnson & Johnson has taken a \$10 million hit in the latest quarter on sales of knee implants as a result of price control in India.
- The company described it as an “extreme example” of such action occurring periodically around the world.
- Effect on Indian imports:
- AdvaMed, a lobby of US medical device manufacturers, is pleading the US trade representative to cut duty concessions to Indian imports into the US under the ‘generalised system of preferences’ (GSP).
- The sole reason for this is capping cardiac stents and knee implant prices by India.

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- India has protested saying that GSP is a multi-country arrangement and U.S. cannot tinker it unilaterally.

Current measures being adopted

- The Maharashtra FDA has sent a report to the National Pharmaceutical Pricing Authority on overpricing in balloons and guiding catheters, used for angioplasty.
- Till now patients are paying up to five times the imported cost of these devices.
- The Government has made it mandatory for doctors to prescribe medicines using generic names.
- Also, Government is considering limiting the number of brands of a drug a company can manufacture.
- Government is also planning on ending contract or loan licensing of MNCs.

Problems faced by Chemists and public

- **Chemist-manufacturer nexus:**
 - All Government efforts are to help those who can't read the doctor's prescription.
 - In such cases, the chemists pass across the counter the product of a company which offers high margins.
- **Online pharmacy:**
 - Online pharmacies could provide an alternative.
 - But in India lies the problem of substandard and spurious drugs.
 - Therefore only way to ensure one is getting genuine stuff is to rely on the old offline chemist.
 - And online pharmacies need to be regulated and watched over.
 - Government could get them to upload all their trade transactions onto a central portal.
 - That will make transparent what is being sold at what price and who has manufactured it.
 - But online pharmacies complain about a level playing field and demand for offline pharmacies do the same.

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Way forward

- There is no end to the controls a government can impose and business ingenuity in getting around them.
- In the process, the price fixing bureaucracy will become both complex and slow, and court cases will follow.
- There is no getting around the need to have a multilayered and extensive public health service in order to contain private hospitals, clinics and diagnostic centres.
- A public agency can procure in bulk at a negotiated price and do the job of price control at a fraction of the cost and paperwork of direct price control.
- Operational and governance-related waste can be reduced by transparent and efficient public procurement of pharmaceuticals.
- The scope for corruption in public procurement can be reduced by seeking out more transparent pricing of medicines and consolidating requirements at the central level through joint initiatives.

What are droughts? Causes and mitigation

Relevancy

- GS Prelims, GS Mains paper III
- Droughts in India, 2014 drought, disaster management
- Reasons, protection, mitigation

What is a Drought?

- IMD defines drought as situation occurring in any area where mean annual rainfall is less than 75% of the normal rainfall.
- It is referred to as relatively long time where there is not enough water than there usually is, as a result of dry weather, to support human, animal and plant life.
- While India is a country rich in natural resources and manpower, it is far behind other developed countries of the world in matters of conquering the forces of nature.
- India is often visited by long spells of drought or abundance of rains causing floods, most recent in 2014.

The drought of 2014

- The Indian summer monsoon rainfall is referred to as the rainfall occurring in the months of June to September.
- The convergence and divergence of water vapour are important factors governing the Indian summer monsoon.
- India recorded a 12% seasonal rain deficit with a record drought in June 2014.
- According to scientists the divergence of water vapour was one of the main reasons for the drought.

Rainfall statistics of 2014 drought

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- Data from analysis showed that all parts of the country had received scanty monthly rainfall at least once during the four months in 2014.
- The overall seasonal rainfall over India was 775.5 mm which is a 12% less than the normal.
- There was only 57.5 % of the average rainfall in the month of June.
- The divergence of moisture flux caused the low rainfall in June.
- In August 2014 there was a break in monsoon with rainfall only over northeastern and central parts of India.
- The regions with rainfall showed convergence of moisture and in the areas with no rainfall there was divergence.
- In September the rainfall over many parts of India showed significant increase and also excess in some parts.
- The overall rainfall was 108.1% of the average.

Causes of drought

- **Inadequate Rainfall:**
 - Failure of monsoons is a major reason for droughts in India.
 - Inadequate rainfall causes crop failure leading to famines.
 - There is not much water in the soil or water reservoirs for the rain cycle and hence a drought is caused.
- **Moisture flux:**
 - The process of water vapour transport is an important physical process influencing the monsoons.
 - Our oceans are getting warmer and the temperature gradient between land and ocean is becoming lesser.
 - There are changes in the mechanism of moisture availability to land from sea.
 - Studies show that by measuring the convergence and divergence patterns of the water vapours we can predict the rainfall and drought trends.
 - The magnitude of convergence agreed with the rainfall in quantity and divergence caused drought.
- **Climate change:**
 - The increasing heat during the summers causes more water to evaporate and unless there is rains to compensate for the loss, droughts are imminent.

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- Burning of fossil fuels is contributing to climate change and imminent rise in temperature, thus evaporating more and more water from the land surface.
- **Ocean temperatures and El Nino:**
 - The El-Nino effect is responsible for controlling monsoons in the Indian subcontinent.
 - Abnormally high sea surface temperatures have resulted in increased evaporation and heavy rains across many places in India.
 - But, instead of the high pressure air mass above the southern part of the Indian Ocean, the El-Nino creates a low pressure which pulls out dry air from Central Asia and dehydrate the Indian landmass.
 - The El Nino effect on 2014 monsoon rainfall was very small as the air-sea coupling weakened the effect, resulting in ENSO neutral conditions.
- **Changes in Jet Stream:**
 - Jet streams are narrow bands of air that move around the earth at very high speeds.
 - Jet streams can stall high pressure system resulting in sunny weathers and no rain.
 - This is again a major contributing factor to droughts.
- **Changes in local landscape:**
 - Deforestation, changes in the vegetation type and drainage causes changes in the landscape that can cause droughts.
 - Due to these factors, the water retention capacity of the soil is reduced and hence droughts are caused.
- **Erosion and human activities:**
 - Human activity directly triggers factors such as over farming, excessive irrigation, and deforestation.
 - Soil erosion adversely impact the ability of the land to capture and hold water.
 - Soil loss due to erosion can be as much as 6100 times greater in drought years than in wet years.
- **Other factors:**
 - Studies show that there is very small relationship between Indian monsoon seasonal rainfall and other factors.
 - The intrusion of western Asian desert air towards central India ia an important feature for the dry spells.

Protection, mitigation and relief

- **Public awareness:**
 - People should be educated regarding the importance of water, so that they do-not misuse the stored water in drought situations.
- **Dams:**
 - Dams and their associated reservoirs supply additional water in times of drought.
 - All efforts should be made to preserve rain waters in various ways and tap ground water sources to meet unexpected drought situations.
- **Cloud seeding:**
 - It is a form of intentional weather modification to induce rainfall in severe conditions.
- **Drought monitoring:**
 - Continuous observation of rainfall levels and comparisons with current usage levels can help prevent man-made drought.
 - Careful monitoring of moisture levels can also help predict increased risk for wildfires, using such metrics as the Keetch-Byram Drought Index or Palmer Drought Index.
- **Land use:**
 - Carefully planned crop rotation can help to minimize erosion and allow farmers to plant less water-dependent crops in drier years.
 - New improved methods of irrigation should be introduced.
- **Outdoor water-use restriction:**
 - Regulating the use of sprinklers, hoses or buckets on outdoor plants, filling pools, and other water-intensive home maintenance tasks.
- **Rainwater harvesting:**
 - Collection and storage of rainwater from roofs or other suitable catchments.
 - Other latest and improved rain-water harvesting methods should be deployed.

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- **Miscellaneous:**

- Deforestation should be discouraged to increase the ability of the soil to hold water.
- Former wastewater (sewage) that has been treated and purified could be put to reuse.
- Building canals or redirecting rivers can be a good option used for irrigation in drought-prone areas.