AI and Climate Change

This editorial is based on **"The Climate Costs of AI"** which was published in Indian Express on 03/02/2022. It talks about the interconnection between the development of AI Technology and Climate Change.

Artificial Intelligence (AI) technologies have been often thought as a gateway to a future written in chrome, operating on a virtual cloud.

Even in the **Budget 2022-23**, AI was described as a sunrise technology that would "assist sustainable development at scale and modernise the country."

In terms of climate change, AI can prove to be immensely helpful in **developing environment friendly infrastructure, making climate predictions and decarbonising industries.** However, ironically, the AI with itself brings an environmental cost to the development of the technology.

As we look to the future, there is a need to ensure that the **benefits of using AI to tackle climate change outweigh the drawbacks.**

AI-Climate Nexus

What is AI?

- AI describes the action of machines accomplishing tasks that have historically required human intelligence.
    - In the year 1956, American computer scientist John McCarthy organised the **Dartmouth Conference,** at which the **term 'Artificial Intelligence' was first adopted.**
- It **includes technologies like machine learning, pattern recognition,** big data, neural networks, self algorithms etc.
    - AI is **different from hardware driven robotic automation**. Instead of automating manual tasks, AI performs frequent high volume computerised tasks reliably.
- The governments of **developing countries see AI as a silver bullet for solving complex socio-economic problems,** as a result, a high share of AI in technology-linked emissions would be seen in the coming decades.

What are the Global Trends for the Development of AI Technology?

- The **"race" for dominance in AI is far from fair**: a few developed economies possess certain material advantages right from the start, they also set the rules.
  - They have an advantage in research and development, and possess a skilled workforce as well as wealth to invest in AI.
  - **North America and East Asia** alone account for **three-fourths of global private investment in AI, patents and publications.**
- The current state of inequity in AI in terms of governance raises **concerns about the technological fluency of policymakers** in developing and underdeveloped countries and their **representation and empowerment at the international bodies** that set rules and standards on AI.
  - The developing and underdeveloped countries have not been much benefitted by the technology as **AI's social and economic benefits are accruing to a few countries only.**

What is the Significance of AI in Tackling Climate Change?

- AI could be most valuable in helping humankind fight its biggest threat - climate change. AI can:
  - **Strengthen climate predictions**
  - Enable **smarter decision-making for decarbonising industries** from building to transport
  - Work out how to **allocate renewable energy.**
- **Greening cities** or using **wind channel architecture** to create ventilation are ways to help cities deal with extreme heat that can be guided by AI.
- AI can also help reduce the effects of the climate crisis, such as by **making smart grid designs** and developing low-emission infrastructure.

What is the Impact of AI Technology on Climate?

- **Carbon Footprint:** The climate impact of AI can be majorly attributed to the **energy use of training and operating large AI models.**
  - In 2020, digital technologies accounted for between **1.8% and 6.3% of global emissions.**
    - At this same time, AI development and adoption across sectors skyrocketed and so did the demand for processing power associated with larger and larger AI models.
  - A main problem to tackle in reducing AI's climate impact is to quantify its energy consumption and carbon emission, and to make this information transparent.
- **UNESCO's Efforts**: The idea of sustainability is rapidly entering mainstream debates on **AI ethics** and **sustainable development**. Recently, **UNESCO** adopted the **Recommendation on the Ethics of Artificial Intelligence**, calling on actors to "reduce the environmental impact of AI systems, including but not limited to its carbon footprint."
  - In this context, tech-giants like Amazon, Microsoft, Alphabet and Facebook have **announced their "net zero" policies and initiatives** which is a good sign, but **merely scratches the surface.**
- **Issue of Developing and Underdeveloped Countries:** These countries have been specifically facing challenges as most of the **current efforts and narratives on the relationship between AI and climate** impact are being **driven by the developed West.**

What is the Way Forward?

- **Dedicated Research:** The relationship between climate change and AI is understudied, not least because the largest **companies working in this space are neither transparent nor meaningfully committed** to studying, let alone acting, to substantively limit the climate impact of their operations.
  - Dedicated studies, more investments in R&D and better policy interventions are required in this field.
  - AI needs to be **developed and deployed so it can meet society's needs and protect the environment** by saving more energy than it expends.
- **Merging Technology with Sustainable Development:** To make sure **AI is used to help, and**

not hinder the society, it's time to merge the two big debates of the present time - **digital technology and sustainable development** (in particular,the environment).
  - If we use the former to save the latter, this could be the best possible use made out of the resources available to us.
- **Exploring the Opportunities for the Developing World:** Governments of developing countries, including India, should assess their technology-led growth priorities in the context of AI's climate costs.
  - The developing nations are **not plagued by legacy infrastructure**, hence, it would be **easier for them to "build up better".**
    - These countries don't have to follow the same AI-led growth paradigm as their Western counterparts.
- **Recommendation of WEF:** In 2018, a **World Economic Forum (WEF)** report showed that while AI can address some of Earth's environmental challenges, it is important to manage it properly.
  - To prevent this, the WEF proposed that governments and companies should pursue advancements in **"safe" AI** to **ensure that humanity is not developing AI that is harmful to the environment.**
    - The AI developers "must incorporate the health of the natural environment as a fundamental dimension."

Drishti Mains Question

"It's time to start thinking about doing AI in a more environmentally friendly way". Comment.