DAILY CURRENT AFFAIRS

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SUNSET FOR THE U.K.'S COAL FIRED POWER, LESSONS FOR INDIA

Sunset for the U.K.'s coal-fired power, lessons for India

The shuttering of Britain's last coal-fired power plant, in Nottinghamshire, is a milestone and indicates the hastening of an ongoing paradigm shift in energy production globally. But this has by no means been a frictionless transition, as it has been portrayed in much of the press. There have also been calls to replicate the United Kingdom's coal phase-out globally. While Britain's experiment could hold good for a few developed economies, a far more tailor-made approach would be required for developing and least-developed nations.

Britain's coal phaseout must also not be viewed as beginning with its 2015 Paris pledge to bring down unabated coal-fired power to zero by 2025. It must largely begin with the disastrous Great Smog of London of 1952, leading to the enactment of environmental legislation such as the 1956 Clean Air Act and other protracted processes over a 70-year period, which included geo-political, environmental, economic and social pressures. The discovery of natural gas in the North Sea in 1965 and the desire to move away from coal imports from the Soviet Union at the height of the Cold War, as depleting domestic reserves made mining uneconomical, thereby jacking up costs of coal-fired energy production, collectively hastened the transition away from coal, which began almost 60 years ago. The subsequent forced closures of about 20 mines in the mid-1980s by the Margaret Thatcher government, despite a year-long miners' protest, led to blight and inter-generational poverty that some parts of the erstwhile coal-reliant regions of the U.K. continue to face. This is not to undermine the urgency with which nations must work toward drastically reducing their carbon emissions over the next two decades, but to appreciate and emphasise the vastly different trajectories and plans required to reach this goal.

Let us consider comparing India with the U.K.'s trajectory to achieving net zero emissions. At the 2021 Glasgow COP, India and China stood out seeking an amendment to the final declaration and having the phrase 'phasing down' and not 'phasing out' of coal introduced. India pledged to achieve net zero emissions by 2070 and meet half its energy needs from renewables by 2050.

Cumulative emissions

India is the third largest carbon emitter, behind the United States and China, emitting about 2.9 gigatons in 2023, far ahead of the U.K.'s 384 million metric tonnes in the same year. But India's population is over 20 times that of the U.K. Moreover, India's per capita emissions were at 2 tonnes in 2023, less than half the global average of 4.6 tonnes and almost a third of the U.K.'s 5.5 tonnes in the same year.

An analysis by Carbon Brief that considered historical emissions of nations between 1850 and 2024 (till the closure of the Nottinghamshire plant), took into account their carbon footprint as colonial powers. This put the U.K. at fourth place, with emissions touching 10.4 billion tonnes,

Kunal Shankar

India could learn from the U.K.'s transition, ensuring that it does not make the mistakes Britain made

which Carbon Brief said was 'more than most countries ever produced from all sources'.

Britain built the earliest known public coal-fired power plant in 1882 in the heart of London near Fleet Street. Coal became the mainstay in Britain, powering homes, industries and businesses for well over half a century until the mid 1960s. Coal employment peaked in 1920, employing 1.2 million miners at about 3,000 mines nationwide. About a 100 small coal-fired power plants dotted the landscape at this time, supplying power to nearby towns and industrial areas. And, Britain dominated coal exports in the early 20th century accounting for 30% of global exports in 1913. The U.K.'s peak thermal power consumption was in the 1950s and 1960s, when 90% of energy was generated by coal, before steadily shifting to natural gas, nuclear and, more recently, wind and solar.

India's coal story

India's first coal mine, the Raniganj coalfield, straddles present-day West Bengal and Jharkhand. While it was established as early as in 1774 by the British East India Company (and this is why historical CO_2 emissions matter), this led to large-scale coal extraction from much of India's eastern and central States of Jharkhand, West Bengal, Odisha, Chhattisgarh and Madhya Pradesh. India's first coal-fired power plant was the Hussain Sagar Thermal Power Station, established in 1920 in Hyderabad, during the Nizam's rule. It powered the twin cities of Hyderabad and Secunderabad well into the early 1980s. But it was not until 1956, when the Trombay power station near Mumbai was commissioned, that thermal power was truly heralded as India's mainstay. Moreover, the average age of India's coal-fired power plants is about 12 years, meaning they have a few decades before they could be decommissioned. While India has exported coal to neighbouring Myanmar and Sri Lanka, it has largely used its reserves for domestic power production. Of late, it has even been importing coal as power demand has been steadily rising.

India is yet to reach its peak coal production and consumption, which is expected between the years 2030-35, about 80 years since Britain reached this spot. About 70% of its energy output is currently from coal, accounting for 218 GW of installed capacity. It has more than 350 operational mines and about 120 new ones have been planned. A study by Global Energy Monitor estimates that these mines provide direct employment to almost 3,40,000 miners. This is likely an under-estimation as many from the agriculture sector are seasonal workers at mines. A Council on Energy, Environment and Water (CEEW) study estimates that India's thermal power plants employ about 4,00,000 people, again a likely under-estimation as informal employment at thermal power plants is high. This means that at its peak, about 10 years from now, the coal sector is likely to provide employment to well over a million people, which is about how

many miners alone worked in Britain more than a century ago.

Moreover, Britain's per capita energy consumption was almost three times India's in 2022, and this is despite the Russia-Ukraine war-induced energy austerity, and even as the world was at the tail end of the COVID-19 pandemic.

Having made the case that a direct comparison on coal phase-out between the two countries cannot be made, there are lessons that India could learn from the U.K.'s transition particularly in the past decade, and also ensure it does not make the mistakes Britain made in the 1980s and 1990s.

Britain's transition

After committing to phasing out coal by 2025, when Britain had already reduced its use to a fifth of its energy needs, it pursued a holistic transition of not just the workforce of the sector but also the regions and communities that depended on it. Retraining programmes focused on sectors that required skills similar to those in coal mining and power generation such as engineering, heavy machinery operation and maintenance. This was mixed with early retirement and redundancy payments; new education and apprenticeship programmes, and community and regional redevelopment of historically coal-dependent regions, or impetus to set up new industries in their place. The sighting of renewable energy projects, particularly offshore wind farms close to major coal producing regions such as the North Sea off Yorkshire, and repurposing the existing grid infrastructure to transmit wind energy along with remodelling old coal-fired power plants for other forms of energy generation such as biomass in Drax, have helped alleviate some of the fears of job loss and economic slowdown. This is not to say concerns do not remain, but the gradual decline in coal, with growing awareness about climate change, and transparent, fixed timelines to transition, enabled Britain's coal phase-out. Outliers remain, like the protests at the now shuttered Talbot steel plant as the Tata-owned facility attempts to shift from coking coal to electric furnaces, but this might likely be a temporary closure.

While India has set itself a sufficient timeline of 45 more years to attain net zero emissions, there has already been a steady and impressive growth in renewables capacity. But coal-fired energy use also has risen, and the country must begin working on fixing timelines on plant decommissioning, regional redevelopment programmes, and retraining of miners and power plant workforces, bearing in mind that India's historically coal-dependent regions are some of the poorest in the country, and have workers who have largely transitioned from agriculture to mining. Only a holistic, transparent, and early forward planning approach, would hasten a transition that is inclusive and just.

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Key Points from the Article:

❖ The closing of Britain's last coal-fired power plant in Nottinghamshire is a significant milestone.

❖ Represents a global shift in energy production towards cleaner alternatives.

❖ The transition is not frictionless as often portrayed.

❖ Calls for replicating the UK's coal phase-out globally need tailored approaches for developing nations

Britain's Coal Phase-Out: Historical Context:

- ❖ The coal phase-out predates the 2015 Paris pledge.
- ❖ The shift started after the **Great Smog of London (1952)**, leading to the **1956 Clean Air Act**.
- ❖ Factors influencing the phase-out:
- ❖ **1965**: Discovery of natural gas in the North Sea.
- ❖ Cold War era, declining domestic coal reserves, and the need to move away from coal imports.
- ❖ **1980s**: Forced closure of 20 mines under Margaret Thatcher, leading to long-term economic impacts on coal-dependent regions.

UK's Net Zero Emission Goals:

- ❖ Paris 2015: Commitment to phase out unabated coal by **2025**.

India's Coal Trajectory and Net Zero Pledge

- ❖ At COP 2021, India and China proposed "phasing down" instead of "phasing out" coal. India's pledge:
  - • **Net zero emissions by 2070**.
  - • Meet half of its energy needs from renewables by **2050**.

Comparing Emissions: India vs. UK

- ❖ India:
  - • 3rd largest carbon emitter with **2.9 gigatons (2023)**.
  - • Per capita emissions: **2 tonnes** (below the global average of 4.6 tonnes).
- ❖ UK:
  - • **384 million metric tonnes (2023)**.
  - • Per capita emissions: **5.5 tonnes**.
- ❖ Historical emissions:
- ❖ UK emitted **10.4 billion tonnes** from 1850-2024, due to its role as a colonial power.

Britain's Early Reliance on Coal:

- ❖ **1882**: World's first public coal-fired power plant in London. •**1920s**: Coal mining employed 1.2 million miners at 3,000 mines.
- ❖ Peak coal use: 1950s-60s when **90%** of energy came from coal. •Transitioned to natural gas, nuclear, wind, and solar in recent decades.

India's Coal Story

- ❖ **1774**: First coal mine in Raniganj (present-day West Bengal/Jharkhand). •India's energy dependence on coal:
  - • **70%** of energy from coal (~218 GW capacity).
  - • **350+ operational mines** with 120 new ones planned.
  - • Coal sector employs over **1 million workers**.
  - • Coal consumption peak expected between **2030-2035**.

Key Differences in Coal Phase-Out

- ❖ Britain peaked coal use ~60 years ago, while India is yet to reach its peak.
- ❖ Britain's per capita energy consumption is nearly three times that of India (2022).

- ❖ Direct comparison of coal phase-out between the two countries is not applicable.
- ❖ Lessons for India from Britain's transition:
  - • Workforce retraining.
  - • Transparent timelines for coal phase-out.

Britain's Transition Strategies:

- ❖ Post-commitment (2025 phase-out), a holistic approach included:
  - • Retraining programmes for workers in sectors like engineering and heavy machinery.
  - • Regional redevelopment of coal-dependent areas.
  - • Siting renewable projects (offshore wind) near coal regions.
  - • Repurposing coal infrastructure (e.g., Drax power plant for biomass energy).

Lessons for India's Coal Transition

- ❖ India must learn from Britain's successes and avoid its mistakes (e.g., 1980s mine closures).
- ❖ A gradual and inclusive transition should involve:
  - • Retraining miners and power plant workers.
  - • Fixing decommissioning timelines for coal plants.
  - • Developing historically coal-dependent regions.
- ❖ Early, transparent planning will ensure a **just transition** for workers and communities.

Coal Reserves in India

- ❖ India is 5th when it comes to total coal reserves in the world.
- ❖ **Types of Coal found in India.**
- ❖ **Anthracite:** It is the highest grade of coal containing a high percentage of fixed carbon.
  - • It is hard, brittle, black and lustrous. It is found in smaller quantity in regions of Jammu and Kashmir.
- ❖ **Bituminous:** It is a medium grade of coal having high heating capacity. It is the most commonly used type of coal for electricity generation in India.

Coal Reserves in India

  - • Most of bituminous coal is found in Jharkhand, Odisha, West Bengal, Chhattisgarh, and Madhya Pradesh.
- ❖ **Subbituminous:** It is black in color, dull (not shiny), and has a higher heating value than lignite.
- ❖ **Lignite:** It is the lowest grade coal with the least carbon content. It is found in the regions of Rajasthan, Tamil Nadu, and Jammu & Kashmir. The top three states with highest coal reserves in India are Odisha, Jharkhand, Chhattisgarh. They account for approximately 69% of the total coal resources.
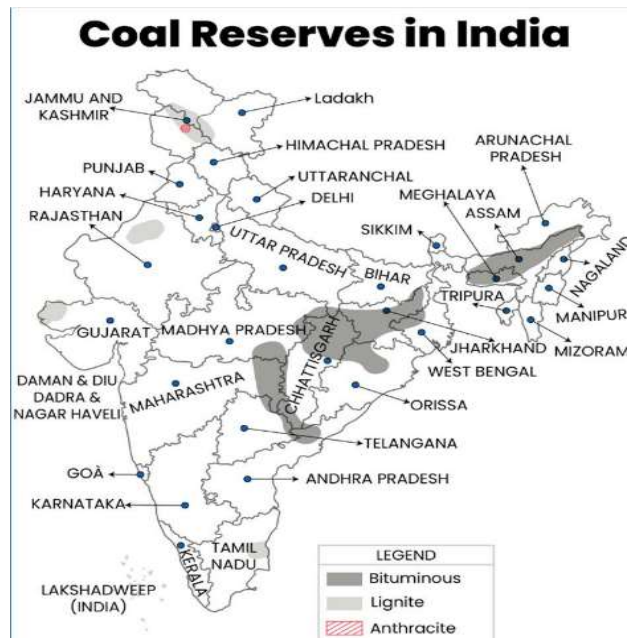
Why is coal relevant for India?

❖ Around 50% of the installed generation capacity comes from coal.

❖ Huge demand - Due to the rising population, coal consumption has nearly doubled in the last decade.

❖ Employment - Coal industry employs as many as four million people.

❖ Sectors like steel, aluminium and cement are highly dependent on coal.

❖ Large-scale sourcing of non-fossil fuels is quite challenging.

- Coal is cheaper than all other sources of energy.
- High cost of manufacturing & installation of solar energy.
- Unstable nature of Tidal, Solar energy.
- Lack of renewable energy infrastructure in rural areas.

Challenges associated with India's coal sector

Poor quality - High ash content, lack of high-grade anthracite and bituminous coal.

Virtual monopoly: Coal India Ltd commands the maximum share of coal production discouraging private investment and competition.

Environmental concern – India's coal-based power sector accounts for approximately 2.4% of global greenhouse gas (GHG) emissions, 33% of India's GHG emissions, and around 50% of the country's fuel related emissions.

Quality of captive mines: Poor quality of captive mines being awarded to private players decreases their presence as well as production.

Illegal mining which not only is detrimental to the environment but also causes the death of workers due to inhalation of toxic gasses and lack of protective gear. Also because it is considered a law and order issue, the center generally leaves it for the state government.

Other issues like issues land acquisition, green movements, strict rules & regulations.

International pressure by developed countries to phase out the coal-based plants.

What steps can India take?

1.) Attract private players

2.) Upgrading existing coal based plants

3.) Leverage technology to curb illegal mining

4.) Investing in renewable energy

PM Grati Shakti National Master Plan in Coal Sector.

↑

Recent Initiatives

Integrated Coal Logistic Policy & Plan 2024.
(by Min. of Coal → for resilient coal evacuation system)

↓

Investment in Coal gasification

85000 Cr proj.

Q.1 With reference to coal-based thermal power plants in India, consider the following statements:

1. None of them uses seawater.
2. None of them is set up in water-stressed district. 3.None of them is privately owned.

How many of the above statements are correct?

(a) Only one

(b) Only two

(c) All three

(d) None

Answer: Option (d) None

Explanation:

❖ In India, several coal-fired thermal power plants **employ seawater** for a variety of functions, including **cooling the condenser system.** Seawater is a frequent supply of cooling water for power plants near the coast. It should be noted, however, that not all power plants use seawater; others may rely on freshwater sources. **So, statement 1 is not correct.**

❖ According to a report, **40 per cent of the country's thermal power plants are located in areas facing high water stress,** a problem since these plants use water for cooling. Scarce water is already hampering electricity generation in this region. **So, statement 2 is not correct.**

❖ There are both **privately and publicly owned coal-fired thermal power stations in India.** The country's power generating is a collaboration of corporate and public companies. Many private corporations have invested in the power industry and run coal-fired thermal power facilities. **So, statement 3 is not correct.**

Q.2 Consider the following statements:

1. Coal sector was nationalized by the Government of India under Indira Gandhi.
2. Now, coal blocks are allocated on lottery basis.
3. Till recently, India imported coal to meet the shortages of domestic supply, but now India is self-sufficient in coal production.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3 only

(c) 3 only

(d) 1, 2 and 3

Answer: (a)

Explanation:

❖ Coal sector was nationalised in two phases under Indira Gandhi Government in 1972. **Hence, statement 1 is correct.**

❖ The coal blocks are allocated through auctions and not on a lottery basis. **Hence, statement 2 is not correct.**

- ❖ The coal sector is the monopolistic sector in India. India holds 5th biggest coal reserves in the world, but due to the incapacity of coal production by monopolistic firms, it imports coal to meet the shortages of domestic supply. **Hence, statement 3 is not correct.**
- ❖ Therefore, option (a) is the correct answer.

UPSC PYQ 2013

Q.3 Which of the following is/are the characteristic/characteristics of Indian coal?

1. High ash content
2. Low sulphur content
3. Low ash fusion temperature

Select the correct answer using the codes given below:

(a) 1 and 2 only

(b) 2 only

(c) 1 and 3 only

(d) 1, 2 and 3

What does USCIRF report say about Indi

What is the mandate of the United States Commission on International Religious Freedom? How does the UNSCIRF designate a country as a 'Country of Particular concern'? How has the Indian government reacted to the report?

EXPLAINER

G. Sampath

The story so far:

The Washington DC-based United States Commission on International Religious Freedom (USCIRF) on October 2 released a country update on India, flagging "collapsing religious freedom conditions". Among other things, the report highlighted how throughout 2024, individuals from minority communities have been killed and lynched by vigilante groups, religious leaders have been arbitrarily arrested, and places of worship have been demolished. The Indian government has rejected the report as coming from a "biased organisation".

What is the USCIRF?

The USCIRF is an independent, bipartisan U.S. federal government agency created under the 1998 International Religious Freedom Act (IRFA). It monitors the universal right to freedom of religion or belief (FoRB) in countries other than the U.S. Its assessments of countries are based on international human rights standards, and in particular, Article 18 of the Universal Declaration of Human Rights, which states, "Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance."

The USCIRF is distinct from the Office of International Religious Freedom (IRF), which is part of the U.S. State Department. The IRF also releases annual reports on religious freedom. While the USCIRF's reports could have a bearing on a country's image, the IRF's stance is more consequential for bilateral relations.

What does the USCIRF do?

As per its mandate under the IRFA, the

In protest: Activists burn a copy of the Citizenship Amendment Act (CAA) in Kolkata on March 12. AFP

USCIRF monitors religious freedom conditions across the world through travel, research and meetings with representatives of international human rights groups, NGOs, victims of persecution, and foreign officials with the aim of putting out a report every year, listing the countries that meet the threshold for designation by the U.S. State Department as a "Country of Particular concern" (CPC). It also shares another list of countries that, in its assessment, ought to be included in the State Department's 'Special Watch List' (SWL).

Countries that "commit systematic, ongoing, and egregious violations of religious freedom" would be designated as a CPC. Countries "whose governments engage or tolerate in severe religious freedom violations, but do not rise to the CPC standard of "systematic, ongoing,

and egregious" would be included in the SWL. If the U.S. State Department accepts the USCIRF's recommendation and designates a country as a CPC, then under the IRFA, it has a range of policy options, including sanctions, to address such kind of violations.

What does USCIRF's country update on India state?

The report, authored by Sema Hasan, Senior Policy Analyst with the USCIRF, says that religious freedom in India in 2024 has been on a "deteriorating and concerning trajectory". It stated that the Indian government, through legislations such as the Citizenship (Amendment) Act, 2019 for which the rules were published in May this year, and "through the enforcement of discriminatory legislation like anti-conversion laws, cow slaughter

laws, and antiterrorism laws", continued to "repress and restrict" religious minorities. It also details how "Indian officials have repeatedly employed hateful and derogatory rhetoric and misinformation to perpetuate false narratives about religious minorities, inciting widespread violence, lynchings, and demolition of places of worship." In its 2024 annual report, the USCIRF designated India as a CPC.

How did India respond?

Spokesperson of the Ministry of External Affairs Randhir Jaiswal rejected the report, stating, "Our views on the USCIRF are well known. It is a biased organisation with a political agenda. It continues to misrepresent facts and peddles a motivated narrative about India. We reject this malicious report, which only serves to discredit USCIRF further." He further added, "We would urge USCIRF to desist from such agenda-driven efforts."

Is the USCIRF 'biased' and 'agenda-driven'?

Its reports are backed by research and numerous citations sourced from credible domestic and international media, besides direct testimonies. In the case of the country update on India, there is no evident instance of misrepresented facts, with every claim backed by publicly verifiable documentation. However, the timing of this update has raised eye brows, and opened it up to concerns such as those voiced by the MEA, about the report being "agenda-driven".

The USCIRF, as a body that works with the U.S. government, and notwithstanding its 'independent' status, is considered by many countries as a tool of U.S. foreign policy.

Are the USCIRF's recommendations binding?

No, they are not. It is up to the U.S. Statement Department whether or not to accept them, and typically, calculations related to bilateral relations and larger foreign policy goals come into play.

THE GIST

▼

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United States Commission on International Religious Freedom (USCIRF):

❖ **Created under** the 1998 International Religious Freedom Act (IRFA).

❖ **Role:** Monitors religious freedom outside the U.S.

❖ **Framework:** Based on international human rights standards, particularly Article 18 of the Universal Declaration of Human Rights (freedom of thought, conscience, and religion).

❖ **USCIRF vs. Office of International Religious Freedom (IRF):**
  ▪ **USCIRF:** Independent, advisory role.
  ▪ **IRF (State Department):** More direct impact on U.S. foreign policy.

What does the USCIRF do?

- ❖ **Mandate:**
  - **Monitors religious freedom globally:** Via travel, research, and meetings with NGOs, victims, and officials.
  - **Reports on violations:** Suggests countries for inclusion in two lists:
    - ▪ **Country of Particular Concern (CPC):** Countries with "systematic, ongoing, and egregious" violations.
    - ▪ **Special Watch List (SWL):** Countries with severe violations but not meeting the CPC threshold.
- ❖ **USCIRF Recommendations:** Can lead to U.S. policy actions, including sanctions if the U.S. State Department agree

USCIRF's Country Update on India:

- ❖ **2024 Report Highlights:**
  - **Deterioration in religious freedom:** The report points to India's concerning trajectory on religious freedom.
  - **Legislation concerns:**
    - ▪ **Citizenship (Amendment) Act (CAA) 2019:** Rules published in May 2024, seen as discriminatory.
    - ▪ **Other discriminatory laws:** Anti-conversion laws, cow slaughter laws, and anti-terrorism laws.
  - **Government rhetoric:**
    - ▪ Alleged hateful narratives targeting minorities, inciting violence, lynchings, and demolitions.
  - **Designation:** India is recommended as a CPC in the USCIRF's 2024 report.

NOBEL PRIZE IN PHYSICS

Hopfield and Hinton, machine learning pioneers, win Nobel Prize in Physics

Vasudevan Mukunth
CHENNAI

The 2024 Nobel Prize in Physics has been awarded to John Hopfield and Geoffrey Hinton "for foundational discoveries and inventions that enable machine learning with artificial neural networks", the Royal Swedish Academy of Sciences announced on Tuesday.

While many areas of research have used machine learning models and artificial neural networks (ANNs) to process data, these terms have entered the household, thanks to the explosion of chat AI apps, including ChatGPT.

The work of this year's

Professor John Hopfield (left) and Professor Geoffrey Hinton. AP

laureates concerns the theoretical foundations of machines that can learn without humans teaching them and can use their knowledge to answer questions. ANNs are collections of neurons, or more broadly nodes capable of processing data, connected in specific ways. A connection between two neurons allows information to flow between them. In a recurrent neural network, information can flow both ways.

Professor Hopfield of Princeton University in the U.S. is credited with developing the Hopfield network, a type of recurrent neural network. Its neurons learn and process information based on Heb-bian learning – an idea in neuropsychology that if one neuron repeatedly triggers a second, the connection between the two becomes stronger.

The rules of a Hopfield network are based on the physics of a group of atoms, each producing its own small magnetic field. The processes the network performs to complete an incomplete pattern or to denoise an image are the same ones that, by analogy, would reduce the total energy of the magnetic atoms.

❖ The 2024 Nobel Prize in Physics was awarded to **John Hopfield** and **Geoffrey Hinton** for their pioneering contributions to **artificial neural networks (ANNs)** and **machine learning**, which are foundational technologies for modern AI systems like ChatGPT.
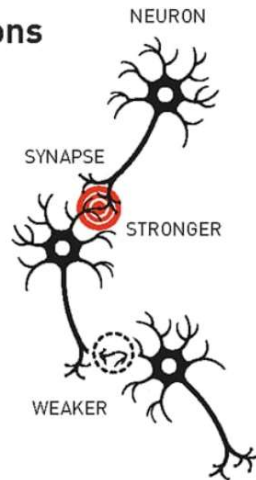
What Are Artificial Neural Networks (ANNs)?

❖ Artificial Neural Networks (ANNs) are computer systems designed to mimic how the human brain processes information.

❖ These networks consist of interconnected "neurons" (nodes) that work together to analyze data and solve problems.

❖ They are modeled after biological neurons in the brain, where information flows between connected neurons and is strengthened as patterns are recognized or tasks are performed.

What Is the Work of John Hopfield?

❖ **John Hopfield** is known for developing the **Hopfield Network**, a type of **recurrent neural network** (RNN).

- The **Hopfield Network** is capable of learning patterns and completing incomplete information by recalling learned data, similar to how the brain fills in missing pieces.

- It's based on a concept in neuroscience called **Hebbian learning**, which says that if one neuron repeatedly activates another, the connection between them strengthens.

- **Physics inspiration:** Hopfield likened the operation of his network to atoms that produce small magnetic fields. Just as magnetic atoms can reduce their energy to achieve stability, a Hopfield network reduces the "energy" or complexity of a problem to find solutions, like fixing a blurry image or completing a pattern.

Natural and artificial neurons

The brain's neural network is built from living cells, neurons, with advanced internal machinery. They can send signals to each other through the synapses. When we learn things, the connections between some neurons gets stronger, while others get weaker.

Artificial neural networks are built from nodes that are coded with a value. The nodes are connected to each other and, when the network is trained, the connections between nodes that are active at the same time get stronger, otherwise they get weaker.
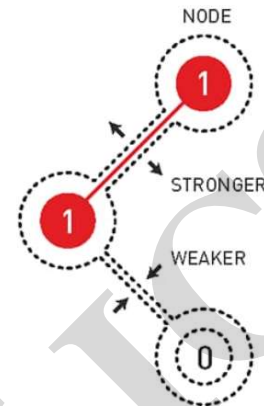
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What Is the Work of Geoffrey Hinton?

❖ **Geoffrey Hinton**, often referred to as a "godfather of AI," made key breakthroughs in how machines learn from data.
  - Hinton's research focused on **deep learning** and the development of algorithms that allow machines to adjust and improve their performance as they are exposed to more data.
  - His contributions enabled **machines to learn autonomously**, meaning they no longer rely entirely on humans to program every possible solution.

❖ Their research laid the groundwork for today's **AI systems** that can learn and perform tasks autonomously, without being explicitly taught by humans.

❖ **Artificial neural networks** now power many technologies, including: **Chatbots** (like ChatGPT), **Voice assistants** (like Siri and Alexa), **Image recognition systems**, **Self-driving cars**

❖ These systems are capable of learning from experience, improving over time, and even answering complex questions or making decisions based on data.

WHY IS THE TEXTILE INDUSTRY STRUGGLING TO PERFORM

Why is the textile industry struggling to perform better?

What caused the slump in the Indian textile sector in the last two financial years?

M. Soundariya Preetha

The story so far:

Union Minister for Textiles Giriraj Singh recently said that the Indian textile and apparel sector is aiming for a total business of $350 billion annually by 2030, which is to generate 3.5 crore jobs. However, the industry went through a tumultuous phase during the last two financial years, casting a shadow on the possibility for 10% CAGR.

What is the status now?

The size of the Indian textile and apparel industry was estimated to be $153 billion in 2021, with almost $110 billion contributed by domestic business. In FY22, India was the third largest textile exporter globally, enjoying a 5.4% share. India is also said to have the second largest manufacturing capacity, with a robust capability across the value chain. The sector's contribution to GDP is close to 2.3% (FY21) and 10.6% of total

manufacturing Gross Value Added (GVA) in FY23. About 105 million people are employed by the textile and garment units, directly and indirectly. For an industry that has 80% of its capacity spread across MSMEs and is sensitive to international developments as it is strongly linked to global markets, FY2021-2022 saw tremendous growth with $43.4 billion exports.

However, slowdown in demand that started in 2022-2023 only worsened in FY24 with a slump in exports and domestic demand. This impacted manufacturing clusters severely. For instance, Tamil Nadu, which has the largest spinning capacity in the country, saw the closure of nearly 500 textile mills in the last two years. In Tiruppur, which is a knitwear production destination, many units saw a 40% drop in business in FY23.

Why did exports slump?

Geopolitical developments and a slump in demand in buying countries hit the exporting units. This was exacerbated by

high raw material prices of both, cotton and Man Made Fibres (MMF), and the growing import of fabrics and garments.

The imposition of a 10% import duty on cotton has made Indian cotton more expensive compared to international prices. In the case of MMF, introduction of quality control orders has disturbed raw material availability and price stability. The industry is repeatedly demanding removal of the import duty on cotton at least during the off-season months of April to October. "This is an industry in which the stakeholders compete in the international market with countries that heavily support their domestic production capabilities. So, India needs schemes that run for at least five years and boost investments. Raw material should be available for the domestic industry at internationally competitive prices," says a spokesperson of a leading industry association.

What are the other challenges?

Apart from policy issues, the industry is

also staring at disruptions in its traditional business systems. Direct retailing to customers through e-commerce is a trend that is catching on among garment and home textile manufacturers, with more startups entering this space. A report by Wazir Advisors notes that "(Foreign) brands are fast-tracking the adoption of ESG sustainability across the supply chain." They are defining their sustainability targets and want to source from vendors who will meet these targets. Further, there is a rise in comfort wear, loungewear, and athleisure as the emphasis on comfortable clothing has increased among consumers. "Even in the domestic market, much has changed in the way business is done. Customers in rural and semi-urban areas prefer to shop in multi-brand outlets or hyper markets. They do not want to step into outlets of less known brands," said Palanisamy, a basic garment producer in Tiruppur.

What next?

The industry is looking at a $100 billion investment across various segments of the value chain by 2030 to augment production capacities and meet the $350 billion target. Labour constitutes roughly 10% of the production cost in the textile sector. The average daily wage of a trained textile worker is reported to be ₹550 a day. Unskilled workers earn about ₹450 a day. The industry has no option but to look at technology and skilling of its workforce to improve productivity and reduce wastages, say industry sources.

THE GIST

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The size of the Indian textile and apparel industry was estimated to be $153 billion in 2021, with almost $110 billion contributed by domestic business.

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However, slowdown in demand that started in 2022-2023 only worsened in FY24 with a slump in exports and domestic demand.

▼

Apart from policy issues, the industry is also staring at disruptions in its traditional business systems. Direct retailing to customers through e-commerce is a trend that is catching on among garment and home textile manufacturers, with more startups entering this space.

Key points from the article

❖ **Current Status (2021-2024):**

- **Size**: The Indian textile and apparel industry was valued at **$153 billion** in 2021, with **$110 billion** from domestic business.
- **Exports**: India was the **third largest textile exporter** in FY22 with a **5.4% global market share**.
- **Manufacturing Capacity**: India has the **second-largest manufacturing capacity** and a robust supply chain.
- **Employment**: The sector employs around **105 million people** directly and indirectly.
- **Economic Contribution**:
  - Contributes **2.3% to GDP** (FY21).
  - **10.6%** of manufacturing Gross Value Added (GVA) in FY23.

Recent Challenges:

❖ **Slowdown**: FY2022-2024 saw a significant slump in both **exports** and **domestic demand**, impacting manufacturing clusters.

- Example: In **Tamil Nadu**, nearly **500 mills closed** in two years due to decreased demand.
- In **Tiruppur**, knitwear units saw a **40% drop** in business in FY23.

❖ **Exports Decline**: Factors affecting exports:

- **Geopolitical tensions** and **reduced demand** in major buying countries.
- Rising prices of **cotton** and **man-made fibers (MMF)**.

❖ **Raw Material Costs**:
- **Import duty on cotton (10%)** makes Indian cotton more expensive compared to global prices.
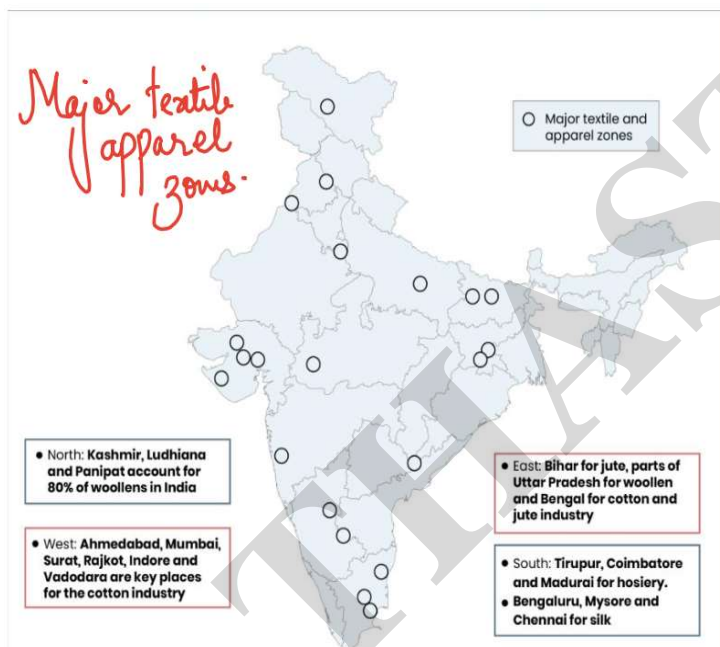- The **Quality Control Order** on MMF disrupted supply and price stability.

Policy and Market Challenges:

❖ **Policy Concerns**:
- Industry demands removal of import duties on cotton during **off-season months (AprilOctober)**.
- India faces international competition from countries that heavily support their domestic industries.
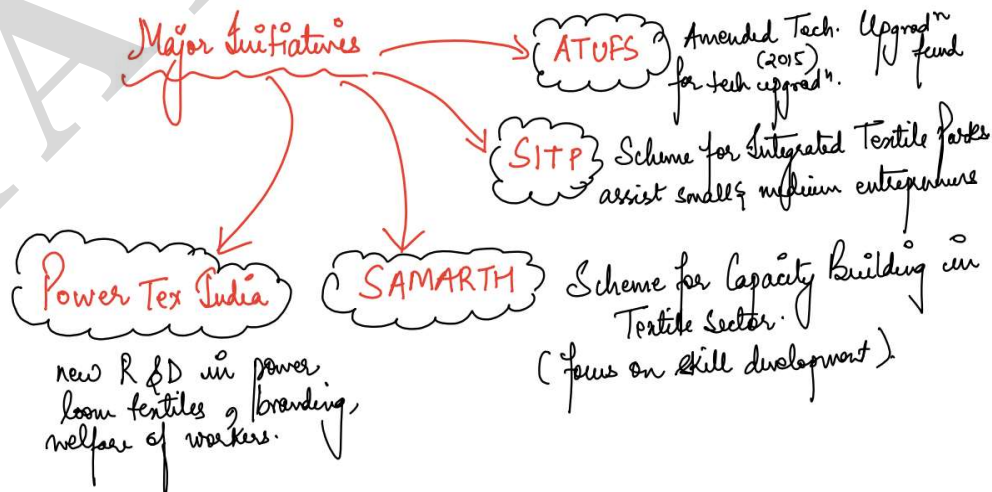
❖ **Market Shifts**:
- The rise of **e-commerce** and direct-to-consumer retailing is reshaping the business landscape.
- Increasing focus on **sustainability targets** set by global brands.
- Growing consumer demand for **comfort wear, loungewear**, and **athleisure**.

Major textile apparel zones.

○ Major textile and apparel zones

- North: **Kashmir, Ludhiana** and **Panipat** account for 80% of woollens in India
- West: **Ahmedabad, Mumbai, Surat, Rajkot, Indore** and **Vadodara** are key places for the cotton industry
- East: **Bihar** for jute, parts of **Uttar Pradesh** for woollen and **Bengal** for cotton and jute industry
- South: **Tirupur, Coimbatore** and **Madurai** for hosiery.
- **Bengaluru, Mysore** and **Chennai** for silk

Major Issues of Textile Industry

1.) Highly fragmented + dominated by unorganized sector, SMEnd.
2.) Outdated Technology.
3.) Tax Structure Issues → GST structure makes garments expensive uncompetitive in domestic international market
4.) Lack of Scale : Avg. size of units √100 machines. (Bangladesh → 500/factory).
5.) Lack of foreign investment.
6.) Stagnant Exports (from last 6 years) 40 billion USD.

Major Initiatives

→ ATUFS : Amended Tech. Upgrad^n fund for tech upgrad^n. (2015)

→ SITP : Scheme for Integrated Textile Parks assist small & medium entrepeneurs

Power Tex India : new R&D in power loom textiles & branding, welfare of workers.

SAMARTH : Scheme for Capacity Building in Textile Sector. (focus on skill development)

GETTY IMAGES

Global Digital Compact: advancing digital innovation in a sustainable fashion

The GDC is a diplomatic instrument which focuses on the potential of digital technologies, with the specific intention to harness and regulate them for the common good. The GDC rests on the idea that digital technologies are dramatically changing our world

Neethu Rajam
Krishna Ravi Srinivas

In the recently concluded 'Summit of the Future' organised by the United Nations, member countries adopted the 'Global Digital Compact' (GDC). This ambitious instrument is perhaps the first of its kind in the international arena focusing on the potential of digital technologies, with the specific intention to harness and regulate them for the common good.

What is the GDC?
The GDC is not a binding law but a diplomatic instrument with a set of shared goals for governments, institutions, firms, and other stakeholders to bear in mind. Once there is greater adherence, the terms of the compact may become soft laws in each country.

Earlier, the UN helped pilot and legitimise two other compacts: the 'Global Compact' ("a voluntary initiative based on CEO commitments to implement universal sustainability principles and to take steps to support UN goals") and the 'Global Compact for Safe, Orderly, and Regular Migration' (covering all dimensions of international migration in a holistic and comprehensive manner).

The GDC rests on the idea that digital technologies are dramatically changing our world. While they offer potential benefits for societies and for our planet – by enabling Sustainable Development Goals (SDGs) – they also pose serious challenges and concerns.

Realising the GDC
The GDC is a collaborative project with the objective of ensuring human oversight of technologies in ways that advance sustainable development. Building on the norms of international law, the Universal Declaration of Human rights, and the UN 2030 Agenda, among others, the GDC proposes global cooperation in the governance of data and digital technologies

To meet the Compact's goals, UN member countries have committed to establish two panels – an 'Independent International Scientific Panel on AI [Artificial Intelligence]' and a panel for 'Global Dialogue on AI Governance'.

These goals include closing the digital divide, including everyone in the digital economy, improving access to data, and advancing responsible and equable data governance. In the same vein, the Compact's principles are based on inclusive participation, access to data and digital technologies, sustainability, and trustworthy technologies that function within a free and competitive market.

Digital goods and services
To address the digital divide, the GDC proposes "digital public goods" that will include open-source software, open data, and open AI models, plus adherence to privacy and best practices.

This is an acknowledgment of digital public goods' ability to drive social change as elements of a "digital public infrastructure" that delivers services. Such infrastructure involves the development and use of shared digital systems according to specific priorities and needs of stakeholders. To this end, the GDC envisions partnerships, including with private entities.

What are the GDC's lacunae?
First, the extensive European experience with public-private partnerships vis-à-vis digital projects suggests openness within such partnerships is restricted between 'as open as is required' and 'as closed as is essential'. In other words, openness in the context of the digital public infrastructure may be limited by contractual requirements such as non-disclosure, confidentiality, and protection of intellectual property.

Second, the GDC adds little to existing frameworks of internet governance but importantly it calls for digital technology companies to self-regulate to keep their users safe and their users' trust. This is not an optimum solution because self-regulation has already proved to be ineffective in practice.

Third, the GDC recognises interoperable data governance as essential to foster innovation and promote economic growth. But experts have noted that the increasing collection, sharing, and processing of data – particularly for AI – may amplify risks in the absence of effective personal data protection and privacy laws.

Fourth, the Compact stresses on achieving SDGs within a paradigm where governments and private entities track, collect, and analyse data to measure progress, while underscoring the importance of governing data in the public interest. For this the Compact proposes to give corporate entities more power in data and internet governance. However, it fails to emphasise the countervailing measures required to stave off monopolistic control.

The GDC and the UN
In many sections the GDC makes wishful statements that bypass the complexity of underlying issues, assuming the comity of nations will be enough to achieve its objectives. But this stance may also reflect the UN's wish to remain a major player in governing technologies, including AI.

For example, in the 21st century data is oil: it is as valuable even as its use is embedded in extractive industries with polluting effects. Consider the ongoing explosive growth of generative AI models and the spheres, volumes, and varieties of data collected to train them. The GDC acknowledges issues in AI governance but has little to offer in terms of concrete solutions or even strategies.

Similarly, the GDC does bat for "data flow with trust" but many countries have refused to accept this idea because it goes against the spirit of digital sovereignty. Some even have specific laws that require data about their citizens to remain within their borders.

Finally, the GDC links various objectives and proposed actions with the relevant SDGs. This is a welcome move because it reflects the view that digitisation should play a prominent role in realising the SDGs. At the same time, when the SDGs were adopted in 2015, the current AI revolution hadn't started. Given the unimpressive record of nations in realising the SDGs, it is doubtful whether an add-on Compact like the GDC could make a difference.

The UN's member states are striving to find ways to work with and regulate Big Tech while also asserting their digital sovereignty. The global governance of digital technologies thus is too complex to be captured or 'fixed' by a singular entity like the GDC. We need multilateral as well as regional negotiations to go with it to address jurisdictional, regional, and/or local needs. By appealing to existing modes of digital governance as well as by combining SDGs with digitalisation, the GDC is positioning itself as an instrument of brainstorming rather than as a provider of roadmaps. Still, the GDC can help with capacity building and with South-South and North-South collaborations in the development of digital public goods.

In sum, the GDC may not result in a paradigm shift in the world's governance of digital technologies but it can facilitate significant and tangible outcomes if member states take it seriously.

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★ "Summit of the Future"

- ❖ The **Global Digital Compact (GDC)** is a diplomatic instrument, not a binding law.
- ❖ Focuses on harnessing and regulating digital technologies for the common good.
- ❖ GDC emphasizes **collaboration** between governments, institutions, firms, and stakeholders for **shared goals**.
- ❖ Building on the norms of international law, the Universal Declaration of Human Rights, and the UN 2030 Agenda, among others, the GDC proposes global cooperation in the governance of data and digital technologies
- ❖ Digital technologies are transforming the world, offering potential benefits but also posing challenges.
- ❖ The GDC aims to address these challenges while contributing to **Sustainable Development Goals (SDGs)**.
- ❖ Proposes **global cooperation** for the governance of data and digital technologies.
- ❖ The GDC envisions the establishment of two panels:
  - **Independent International Scientific Panel on AI.**
  - **Panel for Global Dialogue on AI Governance.**
- ❖ Key goals include:
  - Closing the **digital divide.**
  - Improving access to **data** and promoting responsible **data governance.**
- ❖ Ensuring **sustainable, inclusive participation** in digital technologies.

Digital Public Goods:

- ❖ Proposes the creation of **"digital public goods"** such as:
  - Open-source software.
  - Open data.
  - Open AI models.
- ❖ These digital public goods aim to drive **social change** and serve as elements of **digital public infrastructure**.
- ❖ Encourages **public-private partnerships** to develop and share digital systems.

Challenges and Lacunae of the GDC

1. Public-Private Partnerships:
  - European experience shows that openness in digital projects can be limited by non-disclosure agreements and intellectual property protection.

2. Existing Frameworks:
  - The GDC doesn't add much to existing internet governance frameworks.
  - Calls for **self-regulation** by digital technology companies, which has often been ineffective.

3. Data Governance:
  - Stresses **interoperable data governance** to foster innovation but raises concerns about the risks of increased data collection for AI without strong **data protection** and **privacy laws**.

4. **Monopolistic Control**:
   - Proposes increased role of **corporate entities** in data governance but lacks measures to prevent monopolistic control of digital platforms.

❖ The GDC may not revolutionize digital governance but has the potential to facilitate **capacity building**, **South-South** and **North-South collaborations**, and the development of digital public goods. Its success depends on the willingness of member states to take it seriously and implement its proposals effectively.

Attempt it!

Q.4 **With reference to the Global Digital Compact (GDC), consider the following statements:**
1. It aims to ensure responsible use of digital technologies and address the digital divide.
2. The principles of the Global Digital Compact are inspired by the Kyoto Protocol and the Paris Agreement.
3. The United Nations plays an important role in the development and implementation of the GDC by providing financial incentives for countries to adopt digital technologies.

How many of the statements given above are correct?
(a) **Only one**
(b) **Only two**
(c) **All three**
(d) **None**

Solution

Answer: A

Explanation –

❖ **Statement 1 is correct.** The GDC aims to promote responsible use of digital technologies, address the digital divide, and foster a secure and inclusive digital environment. One of its objectives is to improve international governance of emerging technologies, like AI, so they align with fundamental human rights and values.

❖ **Statements 2 and 3 are incorrect.** The principles of the GDC are inspired by the UN Charter, the Universal Declaration of Human Rights, and the 2030 Agenda for Sustainable Development. The UN facilitates cooperation and encourages multistakeholder involvement but does not directly offer financial incentives.

INDIA HAS ELIMINATED TRACHOMA – WHO

India has eliminated trachoma, says WHO

Bindu Shajan Perappadan
NEW DELHI

The World Health Organization (WHO) has now recognised that India has successfully eliminated trachoma, a bacterial infection that affects the eyes, as a public health problem.

In a citation shared by Saima Wazed, Regional Director, WHO South-East Asia, on Tuesday, the UN health body announced that India is the third country in the Southeast Asia Region to reach this public health milestone. "With great pleasure, I congratulate the Government of India on achieving the elimination of trachoma as a public health problem. India's success is due to the strong leadership of its Government and the commitment of ophthalmologists and other cadres of healthcare workers. They worked together with partners to ensure effective surveillance, diagnosis and management of active trachoma," Ms. Wazed said.

- ❖ It is a disease of the eye caused by infection with **the bacterium Chlamydia trachomatis.**
- ❖ **Blindness** from **trachoma is irreversible.**
- ❖ It is a **neglected tropical disease** and the world's leading infectious cause of blindness.
- ❖ **How it spreads?**
  - Infection spreads through personal contact (via hands, clothes, bedding or hard surfaces) and by flies that have been in contact with discharge from the eyes or nose of an infected person.
  - With repeated episodes of infection over many years, the eyelashes may be drawn in so that they rub on the surface of the eye.
  - This causes pain and may permanently **damage the cornea.**
- ❖ To eliminate trachoma as a public health problem, **WHO recommends the SAFE strategy**.

S: Surgery   A: Antibiotics   F: facial cleanliness   E: Environmental improvement.