



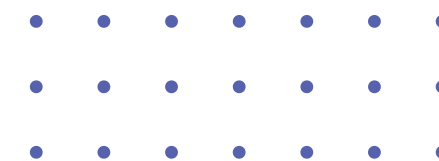
Topics



- Telemedicine:
- ~~Volga, Orenburg region~~
- **IMPACT OF CLIMATE CHANGE ON WOMEN**
- urbanisation
- climate change and fundamental right
- **Approved List of Models and Manufacturers of Solar Photovoltaic Modules**
- **GOD PARTICLE**
- Mains



By saurabh pandey sir





Target Mains 2024/25

Q“ Climate change impact is not gender neutral ” Discuss.

।प्रश्न"जलवायु परिवर्तन का प्रभाव लिंग तटस्थ नहीं है" चर्चा करें।

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Answer review



UPSC

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis. (Specimen Answer Booklet - For Practice Purpose Only)

Q Explain the factors responsible for earthquake in Taiwan. [10M]

An earthquake is a phenomenon that occurs without warning and involves violent shaking of the ground and everything over it. It results from the release of accumulated stress of the moving lithospheric or crustal plates, according to NDMA.

Recently Taiwan faced such earthquakes and the responsible factors are as follows:-

- Taiwan lies along the Pacific 'Ring of Fire', the line of seismic faults encircling the Pacific ocean, world's most earthquakes occurs.

UPSC

Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis. (Specimen Answer Booklet - For Practice Purpose Only)

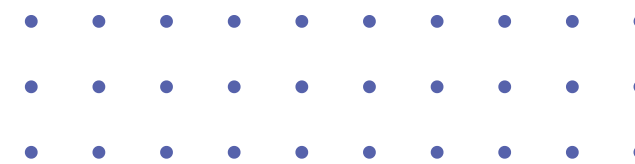
② Presence of Major and minor plates - Taiwan, particularly vulnerable to tremors due to the tensions between two tectonic plates - (a) Philippine sea Plate (b) Eurasian Plate.

Philippine due to a sea plate ~~is~~ is more denser than Eurasian Plate and thus, subduction of sea plate is occurred.

③ Topography - The region's mountainous landscape can magnify the ground shaking, leading to landslides. Such landslides occurred in Taiwan's Eastern Coast, Hualien launtry.

Due to above factors, the island has implemented strict building codes, a world-class seismological network, and widespread public education campaigns.

"Taiwan's earthquake preparedness is among the most advanced in the world."



Health sector can't ignore green gains from telemedicine: study

Vehicular emissions are a major contributor to local pollution and global warming. In India, about 88% of the carbon dioxide emissions come from traffic. Across cities alone, over a three-month period, the study found that teleconsultation led to 1,666 fewer kilometres of travel and an average reduction of 176.6 kg of carbon dioxide emissions

Sayantan Mitra

A study by researchers at the L.V. Prasad Eye Institute (LVPEI), Hyderabad, has found that around 70-80% of people who visit an eye hospital can benefit from teleconsultations because their problems aren't serious enough to require attention at a hospital. The study was published in the journal *Eye*.

Telemedicine has emerged as a viable alternative to in-person consultations with doctors in many contexts because it saves patients' time and expenses, which can be considerable if they are located in remote areas and/or are not well to do. But as more people pick this option, another advantage is coming to the fore: lower emissions.

Footprint of healthcare delivery
Studies in high-income countries have shown that telemedicine is a patient-friendly means of healthcare service delivery. It is also environment-friendly.

It is relevant to India, where 70% of the population lives in villages. A hospital visit often requires expensive long-distance travel to urban centres, which have their own carbon footprint.

Vehicular emissions are a major contributor to local pollution and global warming. In India, about 88% of the carbon dioxide emissions come from road traffic. Across cities alone, over a three-month period, the study found that teleconsultation led to 1,666 fewer kilometres of travel for patients and an average reduction of 176.6 kg of carbon dioxide emissions – figures the healthcare sector can't afford to ignore.

According to one analysis, India's healthcare sector emitted 74 million tonnes of carbon dioxide in 2014, or around 3% of India's total emissions of the gas that year.

It is likely to have increased since: as the demand for health services increases, so too will the paradoxical harm to health due to their emissions.

"Every healthcare system should work towards carbon neutrality," Padmaja Kumari Rani, the lead author of the study and network head of teleophthalmology at LVPEI, said. "Teleophthalmology is an efficient and effective tool that can help the eye health sector to achieve that goal."

The teleophthalmology process
For the study, LVPEI researchers evaluated teleophthalmology, a specialised form of telemedicine that is customised for eye care.

In a teleophthalmology session, a patient remotely consults with an



Positive impact: Telemedicine has emerged as a viable alternative to in-person consultations with doctors in many contexts because it saves time and money. GETTY IMAGES/ISTOCKPHOTO

ophthalmologist over an internet-based video chat.

The teleconsultation is mediated through a smartphone app or facilitated by a technician at a primary healthcare centre.

If the patient uses an app, they can book an appointment with a doctor, have an online consultation, and receive an e-prescription through the app.

"This system is primarily designed for follow-up patients, so they do not have to travel to a tertiary hospital for subsequent visits after treatment," Dr. Rani said. "A lot of new patients tend to use teleconsultations for a second opinion before committing to a treatment plan at a hospital."

If the teleconsultation is facilitated by an eye-care technician, the technician will first perform a comprehensive examination, take good-quality pictures of the eye, and upload the data to a server in the cloud.

Many kilometres away, a doctor will download the data from the server, study it, and prescribe treatment or refer the patient to a higher-level hospital for additional diagnostics or treatment.

"Most Indians live in rural areas while most doctors operate from urban locations. This leads to a gap in health care access. Teleconsultations bridge this gap," Dr. Rani continued.

"By helping to defer travel, we can also save a significant amount of carbon emissions. All we need is a stable internet connection."



Around 70-80% of people who visit an eye hospital can benefit from teleconsultations because their problems aren't serious enough to require attention at a hospital

Impact of teleophthalmology

The study involved 324 patients who received teleconsultations within a three-month period. This included 173 patients who visited LVPEI's rural primary eye centres and 151 that visited urban tertiary hospitals. The researchers assessed their carbon footprint based on the type of transport the patients used to commute to the clinic. They also evaluated the economic impact using estimated cost savings from travel, food, and lost wages.

Patients at rural centres were tagged 'green,' 'yellow' or 'red' based on the severity and urgency of medical intervention required. Around 70% of such patients were tagged 'green' because they could benefit from a teleconsultation alone. The remaining 30% travelled to a hospital. Their travel and emission costs were used to validate emissions and costs avoided by those tagged 'green'. Patients in urban centres were classified as 'new' or 'follow-up'; modes of travel and costs were evaluated and included in the study.

Half of the patients in rural areas (49.5%) said they would have travelled by bus, while 38.7% would have used a two-wheeler to access care. Researchers estimated that teleophthalmology saved 80 km of travel and reduced 2.89 kg of carbon dioxide emissions per rural-area patient on average. That translated to around 1.2 litres of petrol saved per person over three months (with an emission factor of 0.1135 kg of carbon dioxide per passenger per km).

The numbers were more pronounced for urban tertiary-care hospitals. Care-seekers from around India came to LVPEI's tertiary centres in four southern Indian cities. Some 41% of them travelled by train; 19% flew; and 11% took buses. Each deferred patient visit saved an average of 1,666 km of travel and reduced carbon dioxide emissions by 176.6 kg over three months. Each decision to defer also saved around 76 litres of fuel.

Similarly, on average, each rural patient saved ₹370 and each urban patient ₹8,339 on travel expenses alone. When the researchers factored in indirect costs like food and lost wages, total savings among rural patients ballooned to ₹29,100 and ₹3.45 lakh among their urban counterparts. "Patients with minor eye problems like mild refractive errors or regular preventive eye check-ups are the target demographic for teleconsultations," Dr. Rani said.

(Sayantan Mitra is a science writer associated with the L.V. Prasad Eye Institute.)

THE GIST

Telemedicine is a patient-friendly means of healthcare service delivery. It is relevant to India, where 70% of the population lives in villages. A hospital visit requires expensive travel to urban centres, which creates its own carbon footprint

India's healthcare sector emitted 74 million tonnes of carbon dioxide in 2014. And since emissions would have increased with the demand for health services since then, the impact on health will also have grown

Using teleophthalmology every rural patient saved ₹370 and each urban patient ₹8,339 on travel. When costs like food and lost wages were factored in, total savings among rural patients ballooned to ₹29,100 and ₹3.45 lakh among their urban counterparts





Telemedicine:

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- It is relevant to India, where 70% of the population lives in villages.
- A hospital visit requires expensive travel to urban centres, which creates its own carbon footprint ☐
- India's healthcare sector emitted 74 million tonnes of carbon dioxide in 2014.
- And since emissions would have increased with the demand for health services since then, the impact on health will also have grown ☐

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WHAT IS TELEMEDICINE

According to WHO, telemedicine is the delivery of healthcare services by using information and communication technologies for the exchange of information for diagnosis, treatment and prevention of disease



WHY TELEMEDICINE

The practice cuts down one-on-one interactions between the patient and the doctor or healthcare provider, and is useful when handling infectious diseases

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- When costs like food and lost wages were factored in, total savings among rural patients ballooned to ₹29,100 and ₹3.45 lakh among their urban counterparts.
- Teleophthalmology may potentially provide health services to underserved and remote rural populations who otherwise may not have access to specialized eye care.

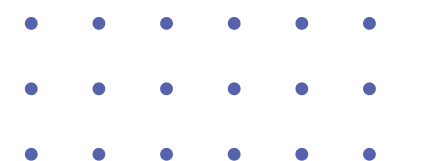
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BIG SHOT



Residents being evacuated from the flooded city of Orsk, in Orenburg at the southern tip of the Ural Mountains, on Monday. Russia said more than 10,000 residential buildings were flooded across the Urals, the Volga area, and western Siberia as emergency services evacuated cities threatened by rising rivers. The previous day, the country had declared a federal emergency in the Orenburg region. AFP



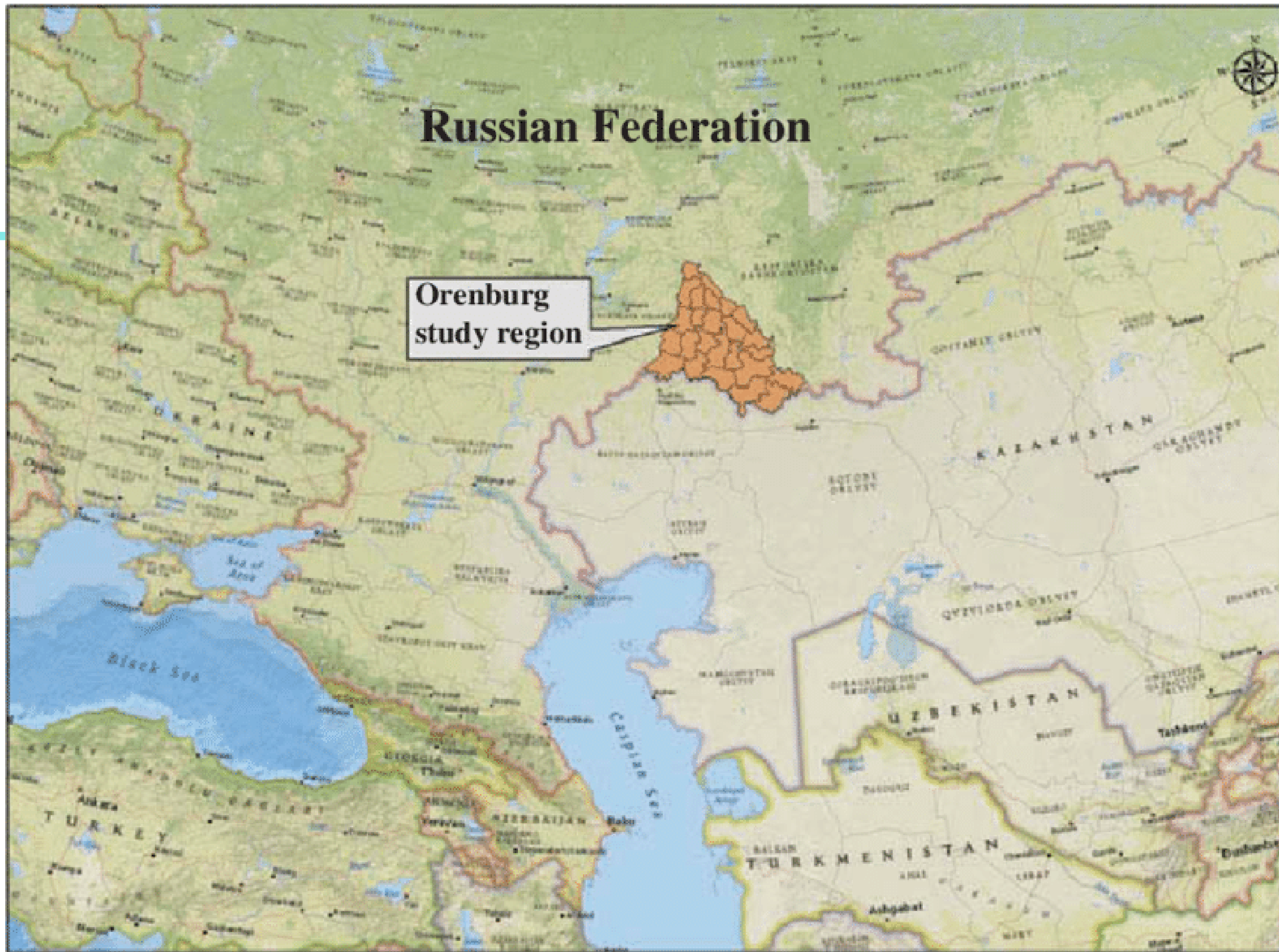


Volga, Orenburg region

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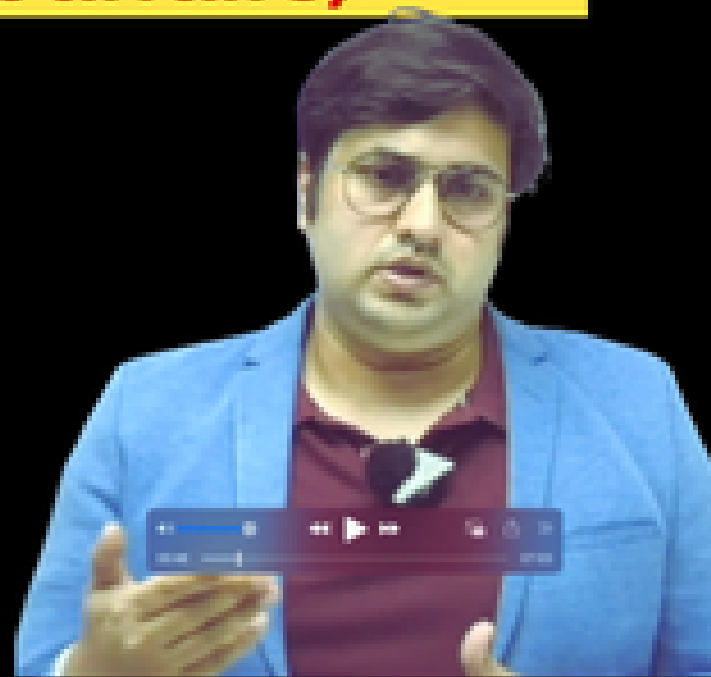
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The climate crisis is not gender neutral

The climate crisis is already here and does not impact everyone equally. Women and girls experience disproportionately high health risks, especially in situations of poverty, and due to existing roles, responsibilities and cultural norms. According to the United Nations Development Programme (UNDP), women and children are 14 times more likely than men to die in a disaster. The Supreme Court of India has just ruled that people have a right to be free from the adverse effects of climate change, and the right to a clean environment is already recognised as a fundamental right within the ambit of the right to life.

Agriculture is the most important livelihood source for women in India, particularly in rural India. Climate-driven crop yield reductions increase food insecurity, adversely impacting poor households that already suffer higher nutritional deficiencies. Within small and marginal landholding households, while men face social stigma due to unpaid loans (leading to migration, emotional distress, and sometimes even suicide), women experience higher domestic work burdens, worse health, and greater intimate partner violence. In fact, when compared to districts without droughts in the past 10 years, National Family Health Survey (NFHS) 4 and 5 data showed that women living in drought-prone districts were more underweight, experienced more intimate partner violence and had a higher prevalence of girl marriages. For women, the increasing food and nutritional insecurity, work burdens and income uncertainties lead not only to poor physical health, but also impact their mental health and emotional well-being.

Extreme events and gender-based violence

The world is witnessing an increasing frequency of extreme weather events and climate-induced natural hazards. A report from the Council on Energy, Environment and Water (CEEW) in 2021 found that 75% of Indian districts are vulnerable to hydromet disasters (floods, droughts and cyclones). NFHS 5 data showed that over half of women and children living in these districts were at risk. Studies are increasingly showing a direct correlation between these natural disasters and gender-based violence against women. Also, extreme weather events and subsequent changes in water cycle patterns severely impact access to safe drinking water, which increases the drudgery and reduces time for productive work and health care of women and girls.

The past decade has been the hottest ever



Dr. Soumya Swaminathan

is Chairperson,
M.S. Swaminathan
Research Foundation,
Chennai

While climate action requires 100% involvement of the population, at the same time, empowering women would mean better climate solutions

recorded in human history and countries such as India are likely to face unprecedented heatwaves. Prolonged heat is particularly dangerous for pregnant women (increasing the risk of preterm birth and eclampsia), young children, and the elderly. Similarly, exposure to pollutants in the air (household and outdoor) affects women's health, causing respiratory and cardiovascular disease, and also the unborn child, impairing its physical and cognitive growth. One of the most worrying aspects of air pollution is its impact on the growing brain. Emerging data from cohort studies in India show that for every 10 micrograms per cubic meter increase in PM_{2.5}, the risk of lung cancer increases by 9%, the risk of cardiovascular deaths on the same day by 3%, and stroke by 8%. For dementia, the risk increased by 4% for 2 micrograms increase in annual PM_{2.5}.

Of course, not all women are equally at risk, even within the same geographic or agro-ecological zone. Thus, though climate change has a distinct gender dimension, there is a need for more evidence on the intersectionalities that make certain sub-groups more vulnerable and therefore in need of more protection.

Why does climate action need women?

Climate action requires 100% of the population if we want to achieve the Paris Agreement goal of limiting global temperature rise to 1.5° C. At the same time, empowering women means better climate solutions; when provided with the same access to resources as men, women increased their agricultural yields by 20% to 30%. Tribal and rural women, in particular, have been at the forefront of environmental conservation. Giving women and women collectives (Self-help Groups and Farmer Producer Organisations) the knowledge, tools and access to resources would encourage local solutions to emerge. Adaptation measures will necessarily be different in rural and urban areas as exposure to heat, air pollution and access to water and food will vary by context.

On heatwaves and water shortage

While gaps in data (sex disaggregated data for multiple social outcomes) and knowledge need to be filled by more research, there are areas where immediate action is needed. First, we should reduce the impact of prolonged heat on priority groups (outdoor workers, pregnant women, infants and young children and the elderly). Data from many Indian cities show that there are excess deaths during the heat wave days, though they may not be recognised as such. Loss of productivity will impact small and large businesses and our economy. Urban local bodies,

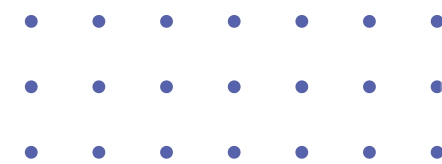
municipal corporations and district authorities in all vulnerable districts need to have a plan and provide training and resources to key implementers. Heat wave warnings (based on local temperature plus humidity), change of timings for outdoor work and schools, cooling rooms in health facilities, public drinking water facilities, and immediate treatment of those with heat stroke will minimize deaths. In addition, urban planning to improve tree cover, minimising concrete, increasing green-blue spaces and designing housing that is better able to withstand heat are longer-term actions. The Mahila Housing Trust in Udaipur showed that painting the roofs of low-income houses with reflective white paint reduced indoor temperatures by 3° C to 4° C and improved quality of life.

Water shortage is probably the biggest threat to our very existence and needs concerted societal action. Traditionally, India had one of the most advanced systems for rainwater harvesting and storage with a system of ponds and canals. Work done by the M.S. Swaminathan Research Foundation in a few districts of Tamil Nadu showed that using geographic information systems, the panchayat could map key water sources, identify vulnerabilities and climate hazards and develop a local plan to improve water access by directing government schemes and resources.

Working at the village level

Convergence of sectors and services and prioritisation of actions can happen most effectively at the village or panchayat levels. Devolution of powers and finances and investing in building the capacity of panchayat and SHG members can be India's way of demonstrating how to build resilience in a community-led and participatory way.

Finally, a gender lens needs to be applied to all State-action plans on climate change. The National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC) highlight the impacts on women, yet often default to portraying them as victims, missing deeper gender dynamics. A review of 28 SAPCCs showed a lack of transformative approaches, with only a few recognising women as agents of change. Recommendations for the ongoing revision of SAPCCs lay stress on the need to move beyond stereotypes, recognise the vulnerabilities of all genders, and implement gender-transformative strategies, ensuring a comprehensive and equitable approach to climate adaptation. Instead of being labelled as victims, women can lead the way in climate action.



IMPACT OF CLIMATE CHANGE ON WOMEN



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- The Supreme Court of India has just ruled that people have a right to be free from the adverse effects of climate change, and the right to a clean environment is already recognised as a fundamental right within the ambit of the right to life.
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- **For women, the increasing food and nutritional insecurity, work burdens and income uncertainties lead not only to poor physical health, but also impact their mental health and emotional well-being.**
- **Studies are increasingly showing a direct correlation between these natural disasters and gender-based violence against women.**
- **Also, extreme weather events and subsequent changes in water cycle patterns severely impact access to safe drinking water, which increases the drudgery and reduces time for productive work and health care of women and girls**

- **Prolonged heat is particularly dangerous for pregnant women (increasing the risk of preterm birth and eclampsia), young children, and the elderly.**
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STEPS

- **First, we should reduce the impact of prolonged heat on priority groups (outdoor workers, pregnant women, infants and young children and the elderly).**
- **Urban local bodies, municipal corporations and district authorities in all vulnerable districts need to have a plan and provide training and resources to key implementers.**
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The corridor of Kolkata's bypass urbanism



Urbanisation in India is shaped by three important factors. First, colonialism played a catalytic role in creating urban spaces, which continued even after Independence until the 1960s. Second and third, the Green Revolution and neoliberalisation in the 1970s and 1990s have consolidated these urban spaces into concrete enclaves. Metropolitan cities such as Chennai, Mumbai, and Kolkata, which are products of colonial urbanism, metamorphosed radically in later years.

These cities have expanded quite substantially and witnessed rapid urbanisation to accommodate more people and their demands. The wealth generated due to the Green Revolution and neoliberal policies has further accelerated urban expansion, albeit in an unequal manner. Newer forms of consumer culture have seeped effortlessly into these urban spaces, thus bringing revolutionary changes in the housing, health, and education sectors.

A city within a city

With reference to Calcutta, in the initial years of Independence, the city was called entangled, congested, and decaying by the then State government. A political decision was initiated to build Salt Lake City, a city within Calcutta city, eventually envisioned as a supposedly clean Tabularasa city. The entanglements in the existing city, notably pertain to its poor infrastructure facilities, such as water, sanitation, and slums, with poverty, traffic, and, with oblivious governance, and minimal accountability for public city spaces.

In the process of expanding the city, the State further developed by building the Eastern Metropolitan Bypass (EM Bypass) in the 1980s, connecting Kolkata's north-east part with its southern part. The construction of the MAA flyover and EM Bypass roads certainly eased or 'bypassed' the congestion, poverty, and, of course, the free flow of traffic. The infrastructural developments around the road yielded enormous benefits by significantly increasing the flow of goods, people, and ideas too. But they also resulted in a host of other problems. The economist, the late Kalyan Sanyal, along with Rajesh Bhattacharya from the Indian Institute of Management Calcutta, made the brilliant observation that approaching urbanisation



Satish Chennur

is Assistant Professor of Sociology Centre for Studies in Social Sciences, Kolkata

Urban infrastructural developments have created estrangements, rather than integration, based on social and class identities

through the 'bypass route' was to replace the old with a new class of producers and consumers. This replacement also brought up a relevant question: 'whose city is it'?

'Urban outcasts'

Seven-star hotels, luxury residential apartments, clubs, international schools, hospitals, and malls are all situated on this 40-kilometre stretch of bypass. It is evident that the echo system built around (parallel to) the bypass, either with or without the intervention of the state, was meant solely for the consumption of the rich. The clear outcome (of this replacement) is the creation of a socio-spatial hierarchical system that creates neighbourhoods that are stigmatised. Some of the high-rise building complexes have blocks that are demarcated based on income groups: high income group (HIG), middle income group (MIG), and lower income group (LIG). These demarcations point to an urban crisis.

The problems are much worse for the social groups that live outside these ivory towers. They embraced mutely to these uninvited social problems just by living adjacent to these swanky hotels and apartments, only to become urban outcasts – a phrase used by Bourdieuan sociologist Loic Wacquant (2008). The socio-spatial techniques of inquiry make it evident that the inhabitants living in these ghettos may be insiders of the city but are still outsiders – a mix of dispossessed and dishonoured people. The small *padas* have turned into territories of deprivation, subjugation, and inequality, disrupting respectful social life. It is vital to understand the negative effects of the growth of urbanisation to unpack the breadth and depth of these disruptions. The bourgeois capitalist economy and the public policies of the communist regime created a 'servicing class' and labour market pockets to cater to the needs of elites within arm's reach.

The moral right they possess, historically and sociologically, to choose a neighbour was snatched by the remarkable development called real estate that created swanky condominiums that sit right next to shanty houses, more so in the last three decades. The combination of the sociological matrix of caste, class, and religion has come together to produce urban marginality, not to forget the importance of different avatars

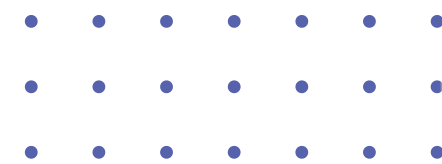
of the state. The 'wretched' of the city were deeply exploited in neoliberal globalisation policies, along with colonial and nationalist policies that eventually broke their socio-spatial premises. Kolkata became a place where anti-colonial movements sprang, and which later became a communist bastion, thus making it a textbook case to examine the contemporary dynamics of urbanisation. Importantly, the newer dimensions, such as the construction of a single new town, a city within the city, a real estate project, or an ensemble of various independent but related projects, all of them either adjacent to or parallel to the road or bypass, not in a systematic manner but in a sporadically or sparsely manner, can be called 'bypass urbanism', manifestly a slow but strongly emerging concept in urban studies.

Roads and change

Roads are traditionally meant to be a means for the circulation of goods, ideas, and human beings. For historian David Arnold, their functions are much more than that. He interpreted them as "a manifestation of linear modes of power and... as a salient site of social observation, engagement, and friction". They have different nomenclatures, reflects heterogeneity. For instance, a bypass is a road that avoids or 'bypasses' built-up areas to let traffic flow through without any interference or congestion.

They are called truck routes in the United States which are intended to create hassle-free routes for the transportation of goods. In a number of European countries, the Americas, and a few Asian countries, these bypasses are quite popular. In these places, they are referred to as circular roads or orbital roads. Historically speaking, the roads in India, especially since Independence, have brought a significant 'dynamism and assumed a new sociability' that reiterates the past (Arnold, 2013).

Urban infrastructural developments, instead of creating assimilation or integration between different sections, have invariably created estrangements based on their social and class identities. The bypass is not just a road that connects one point to another by avoiding bottlenecks. It also, unintendedly, does socio-economic bypassing in everyday life.





urbanisation

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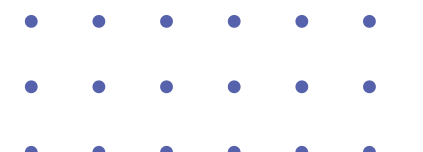


A distinct right

Right to be free of climate change effects comes amid a conservation dilemma

In recognising the right to be free of the adverse effects of climate change as a distinct fundamental right, the Supreme Court of India has advanced the case for a healthy environment and sustainable development. The apex court had long ago recognised the right to live in a clean environment as part of the right to life under Article 21 of the Constitution. However, the Court has now reasoned that the right to be protected from climate change and the right to a wholesome environment are two sides of the same coin; and given the increasing threat from climate change year after year, the time has come to treat the former as a distinct right. It has explained how the vagaries of climate change have an adverse impact on life through factors ranging from rising temperatures, storms and droughts to food shortages due to crop failure and shifts in vector-borne diseases. If environmental degradation and climate change lead to acute shortage of food and water, the right to equality will also be violated, as the poorer, under-served communities will not be able to cope with the adversity. The Court's emphasis on climate change came in a case that pitted the concern over multiple deaths of the Great Indian Bustard due to solar power transmission lines against India's international obligation to meet its emission reduction and increase its energy capacity through non-fossil fuel sources.

The context is a conundrum peculiar to some parts of the country. The Bench was faced with a plea by three Union Ministries – Environment, Power, and New and Renewable Energy – seeking modification of the Court's April 2021 order that sought to protect the critically endangered Great Indian Bustard from being killed in collisions with power transmission lines put up by solar energy companies in Rajasthan and Gujarat. The earlier order had directed that all low-voltage power lines in both 'priority' (where the bird is known to live) and 'potential' (where conservation efforts are going on) areas be laid underground and existing overhead lines converted to underground lines. It had also directed that high-voltage lines in identified areas be shifted below the ground. The modification was sought as conversion to underground lines was technically not possible and too expensive and the renewable energy sector was adversely affected by the order, especially because the area had considerable solar and wind energy potential. The Court has now asked an expert committee to decide on the extent of underground and overground lines and recalled its earlier orders. It is unfortunate that the goal of reducing the country's carbon footprint and the need to protect a critically endangered species are at odds with each other. The sooner a solution is found the better.



climate change and fundamental right



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The Hindu analysis by saurabh.pandey sir

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The 'import restrictions' on solar PV cells

What is the Approved List of Models and Manufacturers of Solar Photovoltaic Modules? Why was it re-implemented after being 'kept in abeyance' for two years? How did China become a dominant player in the import of solar PV modules?

EXPLAINER

Kunal Shankar
Saptaparno Ghosh

The story so far:

Recent government orders on attempts to increase local sourcing of solar modules to support India's renewables manufacturing ecosystem has been widely reported in the media as 'import restrictions'. This follows the Ministry of New and Renewable Energy's (MNRE), March 29 order to re-implement its 2021 notification of an 'Approved List of Models and Manufacturers of Solar Photovoltaic [PV] Modules', also called the ALMM list.

What is the ALMM list? Why is it being re-implemented?

This list consists of manufacturers who "are eligible for use in Government Projects/Government assisted projects/projects under Government schemes & programmes.... including projects set up for sale of electricity to the Central and State Governments." However, this notification was "kept in abeyance" two years after it was issued, for the past financial year. While the government did not give an explicit reason for this, it has been reported that it stems from concerns and demands of renewable power producers who had secured sale contracts with the government before these rules were issued, when solar modules and cells were overwhelmingly imported from China at highly competitive rates. India's domestic renewables sector, at the time, was unlikely to meet the spike in demand for solar power production equipment at rates offered by Chinese manufacturers.

The government's re-introduction of this rule has been premised on the estimation that following measures, such as the Production Linked Incentive (PLI) scheme, India's domestic sector has boosted its production capacities and bettered price competitiveness to meet local demand. This is an import



Towards the sun: Solar panels in Pavagada Solar Park in Kyataganacharulu, Karnataka. GETTY IMAGES

substitution effort, and not an attempt to restrict imports.

Does India rely on solar PV imports?

India is overwhelmingly import dependent to meet its demand for solar cells and modules – with China and Vietnam being the country's major suppliers. According to a reply by the Minister for New and Renewable Energy in Parliament in February last year, India imported about \$11.17 billion worth solar cells and modules in the past five years. This is worth 0.4% of India's total exports in the same period. And until January of 2023-24, data from the Ministry of Commerce's Import-Export showed that China accounted for 53% of India's solar cell imports, and 63% of solar PV modules. Ratings agency ICRA estimates that China commands more than 80% share of the manufacturing capacity across polysilicon, wafer, cell and

modules. "In comparison, the manufacturing capacity in India is relatively low and is largely restricted to the last manufacturing stage," ICRA stated in its November 2023 report, adding that the PLI scheme is expected to change this, with integrated module units expected to come up in India over the next 2-3 years.

How have our policies responded?

To address this over dependence, India made three significant efforts over the past five years. It began with the notification of the ALMM order in January 2019. But the issue attained centre stage in the wake of severe global supply chain disruptions during the COVID-19 pandemic. Finance Minister Nirmala Sitharaman proposed the ₹19,500 crore PLI scheme in the Union Budget of 2022-23. This was to scale domestic manufacturing of the entire solar supply

chain – from polysilicon to solar modules. The government also introduced a steep 40% customs duty on PV modules and 25% on PV cells. These duties were halved as solar capacity additions slowed and as *Reuters* had reported, developers had quoted "aggressively low tariffs" to win power purchase contracts based on imports of Chinese equipment that put cost pressure on about 30 GW capacity worth projects.

Why is China a leading exporter?

In a July 2022 report, the International Energy Agency (IEA) noted that China was the most cost-competitive location to manufacture all components of the solar PV supply chains. This is mainly because of the lower cost of power supplied to the industry, the agency observed, as electricity accounts for more than 40% of production costs for polysilicon and almost 20% for ingots and wafers. The IEA also observed that "Chinese government policies prioritised solar PV as a strategic sector, and growing domestic demand enabled economies of scale and supported continuous innovation throughout the supply chain."

What is the scope for solar in India?

The government's ambitious target of 500 GW of installed capacity from non-fossil fuels by 2030 is the main driver to scale solar power in India. India also accounts for the fastest rate of growth for demand of electricity through 2026 among major economies, according to the IEA. This is because of strong economic activity and expanding consumption of products to mitigate extreme weather. Solar power accounted for about one-third of all energy generated from renewables between April last year and February this year. "The country has an estimated solar power potential of 748.99 GW. Hence, the potential of solar energy is not fully tapped, so far. The government is making efforts to harness the available potential through various schemes & programs," MNRE Minister R.K. Singh said in Parliament last year.

THE GIST

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- This is an import substitution effort, and not an attempt to restrict imports.

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Peter Higgs, who proposed existence of 'God particle', dies

Associated Press
LONDON

Nobel prize-winning physicist Peter Higgs, who proposed the existence of the so-called "God particle" that helped explain how matter formed after the Big Bang, has died at age 94, the University of Edinburgh said Tuesday.

The university, where Mr. Higgs was emeritus professor, said he died on Monday "peacefully at home following a short illness."

Mr. Higgs predicted the existence of a new particle – the so-called Higgs boson – in 1964. But it would be almost 50 years before the particle's existence could be confirmed at the Large Hadron Collider.

Mr. Higgs' theory related to how subatomic particles that are the building blocks of matter get their mass. This theoretical understanding is a central part of the so-called Standard Model, which describes the physics of how the world is constructed.

Edinburgh University said his groundbreaking 1964 paper demonstrated how "elemental particles achieved mass through the existence of a new subatomic particle" which became known as the Higgs boson.



Peter Higgs

In 2012, scientists at CERN, the European Organization for Nuclear Research, announced that they had finally found a Higgs boson using the \$10 billion particle collider built in a 27-km tunnel under the Swiss-French border.

Mr. Higgs won the 2013 Nobel Prize in Physics for his work, alongside Francois Englert of Belgium, who independently came up with the same theory.

Edinburgh University Vice-Chancellor Peter Mathieson said Mr. Higgs, who was born in Newcastle, was "a remarkable individual – a truly gifted scientist whose vision and imagination have enriched our knowledge of the world that surrounds us."

"His pioneering work has motivated thousands of scientists, and his legacy will continue to inspire many more for generations to come."





GOD PARTICLES

- Researchers at the Large Hadron Collider at CERN discovered the particle in 2012.
- Noble prize-winning physicist Peter Higgs, responsible for the one the greatest scientific discoveries in the last century, died at the age of 94 .
- In 1964, he theorised the existence of the Higgs boson, a fundamental force-carrying particle, which gives other particles their mass. His ground-breaking work helped explain how everything in the universe has mass.

-

What is Higgs Boson?

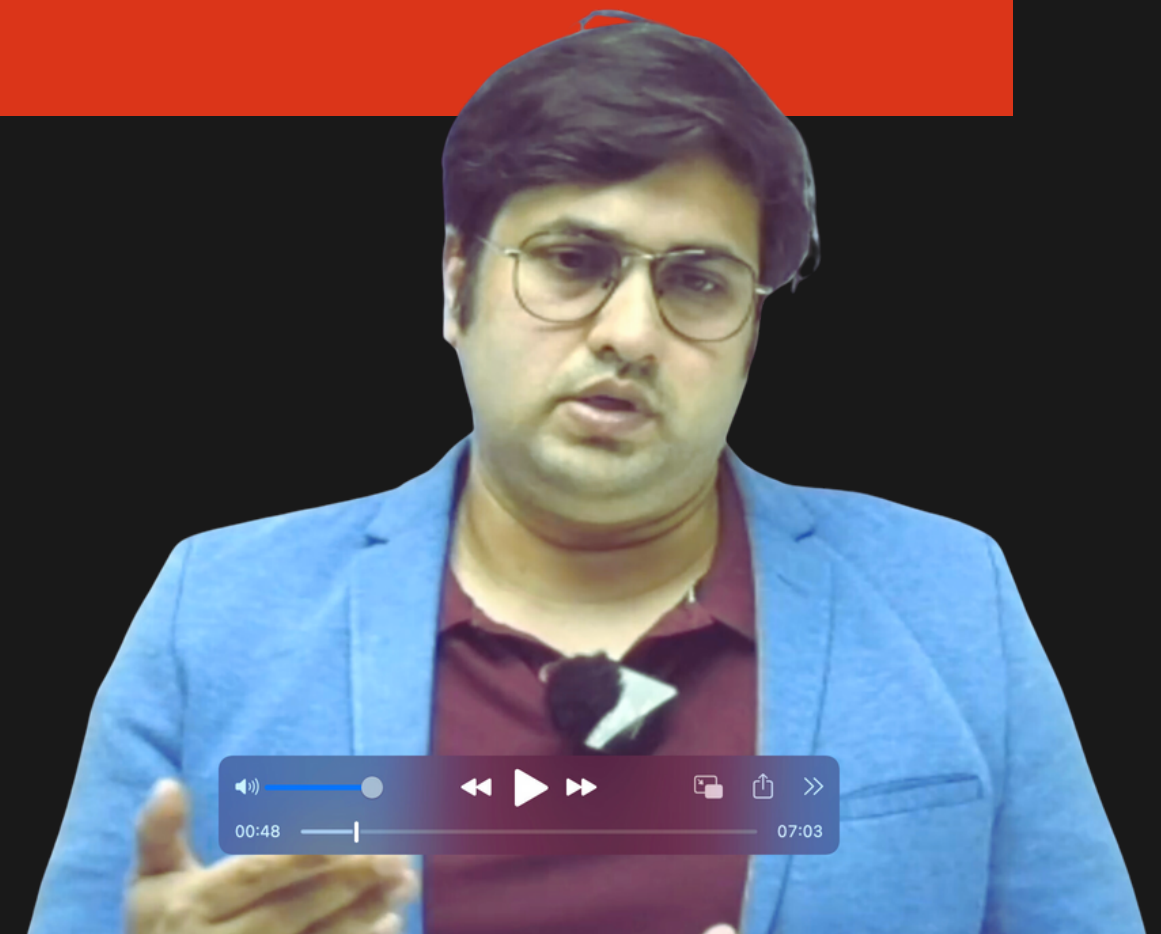
- Particles make up everything in the universe but they did not have any mass when the universe began. They all sped around at the speed of light, according to the European Council for Nuclear Research (CERN).
- Everything we see -- planets, stars and life -- emerged after particles gained their mass from a fundamental field associated with the particle known as the Higgs boson.
-

Why is it called the God Particle?

- The Higgs boson is popularly known as the "the God Particle".
- The name originated from Nobel Prize-winning physicist Leon Lederman's book on the particle which he titled the "Goddamn Particle" -- owing to frustration over how difficult it was to detect.

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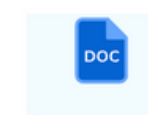


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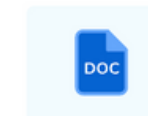


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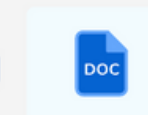
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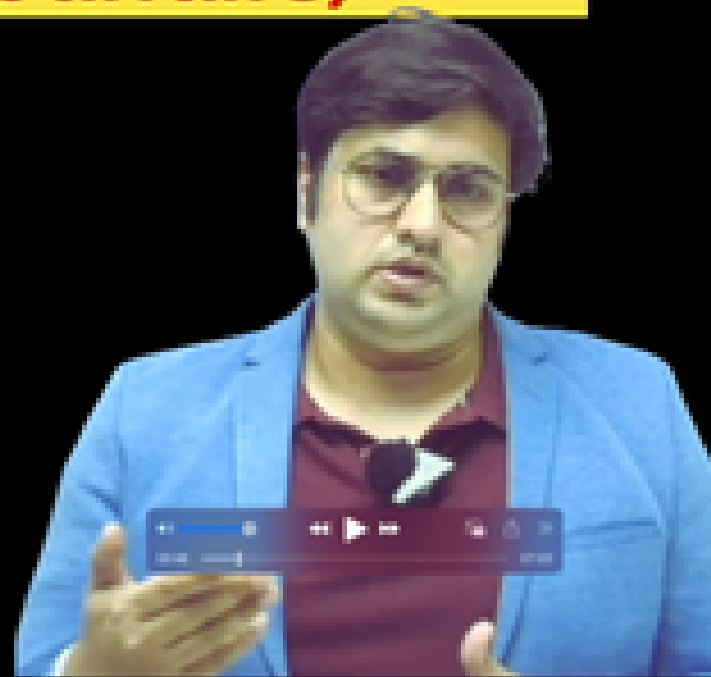
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Q“ Climate change impact is not gender neutral ” Discuss.

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