

The Hindu Important News Articles & Editorial For UPSC CSE

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Two students from the College of Agriculture, Vellayani, Kerala – Ashir Kariyattil and Mohammed Nabin – have developed 'Eden Wrap', a biodegradable and edible food wrapper aimed at reducing plastic waste and promoting sustainable packaging.

Kerala duo develops eco-friendly edible wrappers

Akhila Ajayan

THIRUVANANTHAPURAM

What if we could bite into our burger without worrying about peeling off its wrapper? Two students at the College of Agriculture, Vellayani, a suburb of Kerala capital Thiruvananthapuram, have now made this possible by developing edible food wrappers.

Ashir Kariyattil, who finished his M.Sc. (Integrated) Biotechnology at the college recently, and Mohammed Nabin, a B.Sc. (Hons.) Agriculture student, are behind this invention. "We wanted to begin a start-up that is beneficial to society. The



Art and artists: Bacterial cellulose film that will be developed into edible wrappers (left); Mohammed Nabin and Ashir Kariyattil (right).



edible wrappers will help in reducing plastic waste and promote sustainable living," they say.

A material developed using cellulose-producing bacteria will act as the base product of the wrapper. Emulsifiers derived from bacteria along with essen-

tial oils extracted from specific plants will be incorporated into this material to form the wrapper.

Named 'Eden Wrap', the packaging material will also help extend the shelf life of food. The essential oils used in the wrapper will give it an anti-micro-

bial property, thus extending the shelf life. "The wrapper, which will decompose in a month if discarded, has a plastic like appearance. More awareness about edible wrappers could encourage wider public acceptance," says Mr. Ashir.

"We had initially begun the project with a different concept. However, we started modifying our plans based on the opinions and advice of industry experts and judges whom we met while attending various competitions," says Mr. Mohammed.

"Excellent mentorship helped us improve our

concept. I am extremely thankful to my M.Sc. research guide Soumya V.I. from the Department of Microbiology, who provided a stress-free atmosphere to work on our start-up along with my thesis," says Ashir. "Competition winnings also helped fund the project," they add.

Ashir and Mohammed have decided to spend the next year further developing the project, researching market trends, and acquiring a patent. "We have an opportunity to work on the next step of the product with the Council of Scientific and Industrial Research [CSIR]," says Mr. Mohammed.

Key Features of Eden Wrap:

Feature	Description
Composition	Made using cellulose-producing bacteria, emulsifiers, and plant-derived essential oils
Eco-Friendly	Biodegradable within a month, mimics plastic in appearance
Edible	Can be consumed directly with food
Anti-Microbial	Essential oils provide preservative properties, helping extend shelf life of food
Sustainable Goal Targets	reduction in single-use plastic waste

Science & Technology Relevance:

- Biotechnology Application: Use of bacterial cellulose and bio-emulsifiers
- Microbial Engineering: Application of bacteria for material production
- Green Innovation: Combines waste reduction, food preservation, and sustainable packaging

Institutional Support:

- Mentorship: From faculty at Dept. of Microbiology
- Potential Collaboration: With CSIR (Council of Scientific & Industrial Research)
- Start-up Support: Funded through competition winnings

Environment & Sustainability Angle:

- Replaces plastic wrappers, reducing non-biodegradable waste
- Promotes circular economy and green entrepreneurship
- Aligns with UN SDG 12 (Responsible Consumption and Production)

UPSC Mains Practice Question

Ques :Consider the following statements about 'Eden Wrap':

1. It is developed using plant-based cellulose.
2. It has anti-microbial properties due to added essential oils.
3. It decomposes naturally within one month.
4. It was developed with direct funding from the United Nations Environment Programme (UNEP).

Which of the above statements are correct?

- (A) 1, 2 and 3
(B) 2 and 3 only
(C) 1 and 4 only
(D) All four

Ans : B)

At the Defence Services Staff College Convocation, Defence Minister Rajnath Singh highlighted how current global disruptions, techno-strategic shifts, and economic coercion are reshaping the global order, warfare, and national security strategies.

Global order is disrupted by trade weaponisation: Rajnath

Issues such as de-globalisation, intense nationalism, resource scarcity loom large, Defence Minister says; artificial intelligence and other technology is revolutionising warfare in critical ways, he adds

The Hindu Bureau
UDHAGAMANDALAM

Defence Minister Rajnath Singh on Thursday said the weaponisation of trade and finance, anxieties created by concentration of supply chains, monopolies over disruptive technologies and lack of transparency of data flows were leading the world to “an era of self-help and unilateral decisions, leading to a decline of global institutions and order”.

He was speaking at the convocation of the 80th course of the Defence Services Staff College in Wellington, Nilgiris, comprising 479 student officers, including 38 from 26 foreign countries.

The “global geopolitical situation is marked by tremendous flux, with rapidly shifting alignments, disruptions and conflicts being the order of the day”, he said. “Issues such as de-globalisation, intense nationalism, resource scarcity, human migration, food security, climate concerns, and threat of global pandemics loom large.”

He said technologies such as artificial intelligence, robotics, military autonomy, dronery, and



Defence Minister Rajnath Singh attends the convocation at the Defence Services Staff College in Wellington on Thursday. ANI

quantum blockchains were “revolutionising” deterrence and warfare in critical ways.

“Warfare is moving rapidly, beyond the traditional domains of land, sea, and air, to space, cyberspace, the undersea and newer domains of creative endeavour. Dronery, for instance, has emerged in the Ukraine-Russia conflict virtually as a new arm, if not a transformative science. The majority of losses of soldiers and equipment has been attributed neither to traditional artillery nor to armour but to drones. Space capacities in the Low Earth

Orbit similarly, are transforming military intelligence through persistent surveillance, positioning, targeting and communications – thus taking combat to a new high,” he added.

The armed forces will “increasingly need to operate jointly in a multi-domain environment where cyber, space, and information warfare will be as potent as conventional operations”, he said adding that “we are in an age where cyberattacks, disinformation campaigns, and economic warfare have become tools that can prosecute and achieve politico-military aims without

a single shot being fired”.

Mr. Singh said India faced persistent threats along its northern and western borders, “compounded by the threat of proxy war and terrorism emanating from the epicentre of terrorism in our neighbourhood”.

He called upon the officers to develop the ability to be “critical thinkers, capable of analysing issues, extracting relevant deductions and anticipating future requirements”, while being conscious of emerging technologies, geopolitical landscape and national security requirements.

The Defence Ministry decided to observe 2025 as the “Year of Reforms”.

“This would aim at transforming the armed forces into a technologically advanced combat-ready force capable of multi-domain integrated operations. Nine broad areas have been identified, addressing the entire range of modernisation imperatives to include defence acquisition and procedural reforms. I am pleased to share that collectively we are making significant progress on the aims we have set for ourselves,” he added.

Key Themes & Insights:

1. Erosion of Global Order & Rise of Economic Warfare

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Daily News Analysis

- Weaponisation of trade and finance, dominance of supply chains and disruptive tech monopolies, and opaque data flows are weakening multilateralism.
- Global institutions are giving way to unilateralism and self-help strategies, leading to a fractured international order.

2. Key Global Challenges Identified

- De-globalisation, intense nationalism, resource scarcity, human migration, food security, climate change, and future pandemics are creating systemic shocks.
- These contribute to instability and recalibration of geopolitical alignments.

3. Transformation of Warfare through Emerging Technologies

- AI, robotics, autonomous systems, drones, quantum computing, and blockchain are reshaping the nature of war.
- Conflicts (like Russia-Ukraine) show dominance of non-traditional warfare tools:
- Drones causing more losses than artillery/tanks
- Low Earth Orbit (LEO) satellites enhancing ISR (Intelligence, Surveillance, Reconnaissance)

4. Multi-Domain Warfare: The New Normal

- Future wars will span land, sea, air, space, cyber, undersea, and information domains.
- Non-kinetic tools like cyberattacks, disinformation campaigns, and economic coercion will be used to achieve strategic goals without firing a shot.

5. IN National Security Imperatives for India

- Persistent threats from the northern (China) and western (Pakistan) borders
- Compounded by proxy warfare and cross-border terrorism
- Need for critical thinking officers equipped to anticipate techno-strategic shifts

6. Defence Reform Agenda – Vision 2025

- 2025 to be observed as “Year of Reforms” in defence sector
- Emphasis on:
 - Technological modernisation
 - Defence acquisition & procedural reforms
 - Integrated multi-domain operations

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Daily News Analysis

UPSC Mains Practice Question

Ques : Economic and technological coercion are emerging as key tools of global influence. In this context, discuss how India can prepare its defence and strategic policy to ensure national security in a multi-domain conflict environment. (250 words)



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Indoor air pollution (IAP) has emerged as a critical yet underdiscussed public health concern in India. While outdoor pollution dominates the policy discourse, urban dwellers spend over 70-90% of their time indoors, making Indoor Air Quality (IAQ) equally significant.

Indoor air pollution: can better design help protect our health?

Zubeda Hamid

Most of us tend to think of air pollution in terms of what is outside the house or building we are currently in: exhaust from motor vehicles on the streets, smoke, and industrial fumes perhaps, but is the air we are breathing inside any better? Does it pose a risk to our health? Can superior construction and design of urban infrastructure help mitigate indoor air pollution hazards?

In India, while conversations around outdoor air pollution have gained ground, the same focus has not yet been given to indoor air quality in buildings, despite the fact that most people in urban areas spend 70 to 90% of their time indoors, says Kalpana Balakrishnan Dean (Research), Sri Ramachandra Institute of Higher Education and Research, Chennai.

Understanding indoor pollution

While most of the indoor or household air pollution in India still comes from the use of solid fuels for cooking, primarily in rural areas, in urban areas, where the switch to cleaner fuels such as gas has mostly been made, there are several other sources of indoor air pollution.

Indoor Air Quality (IAQ), as per the U.S. Environmental Protection Agency (EPA), refers to the air quality within and around buildings and structures, especially as it relates to

the health and comfort of building occupants. Understanding and controlling common pollutants indoors can help reduce your risk of indoor health concerns, it says.

"Indoor air pollution is a very broad term as it comprises both indoor sources of pollution as well as pollution from outdoors that has infiltrated indoors. In India, it is very difficult to distinguish between the sources, because unlike other countries, where homes and buildings might be more insulated from the outdoors, this is not the case with most places in our country, making air pollution heterogeneous. Our biggest concern here is the penetration of outdoor air indoors," says Dr. Balakrishnan.

Outdoor (ambient) air pollution is grouped as a class I carcinogen, meaning it is cancer-causing, apart from contributing to a whole host of other diseases, including respiratory ailments, cardiovascular disease, and diabetes.

Dr. Balakrishnan explained that indoor air pollution is also caused by activities inside a building and by the structure (and materials used) itself. "For instance, smoking, cooking, use of chemical cleaners, and mosquito coils or incense sticks could all impact the quality of air indoors," she said. And then, the building itself – the furnishings, vapour from paint or plastering on walls, as well as biological contaminants such as mould – can also contribute to indoor air pol-

lution and impact the health of people using the building, she explained.

Impact of indoor air pollution

The EPA states that health effects from indoor air pollution can be experienced soon after exposure or possibly years later. Some of the immediate effects it lists are irritation of the eyes, nose, and throat; headaches; dizziness; and fatigue. Such immediate effects are usually short-term and treatable.

However, it notes that some effects may be similar to those from colds or other viral diseases, making it important to pay attention to the time and place symptoms occur. Health issues that may show up years after exposure, or only after long or repeated periods of exposure may include respiratory diseases, heart disease, and cancer, it says.

A build-up of carbon dioxide within an indoor space due to a large number of people using the same space, combined with poor ventilation, is also known to cause symptoms of sickness.

Generally, it is challenging to precisely point out to what extent poor IAQ can affect health, as information regarding the association between the two is inadequate, states a 2021 paper, 'An Investigative Study on Perceived Indoor Air Quality During COVID-19 Lockdown in India' by T.K. Bedi et al. However, it adds, this should be considered a public health issue.



The most common dangerous domestic pollutants which cause poor indoor air quality. GETTY IMAGES

Better building design

Prioritising indoor air quality in design is crucial, says Mahesh Ramanujam, president & CEO Global Network for Zero, an independent green certification body helping businesses, buildings, and cities achieve net-zero emissions. One major reason for indoor air pollution, he points out, is that there is lack of good ventilation – most buildings and houses tend to shut their doors and windows to keep the outside out, meaning there is poor airflow, resulting in the circulation of air over and over, giving pathogens a chance to spread.

In settings where it is possible, he says, opening doors and windows and bringing in sunlight as well as the use of plants indoors can help. Sunlight is known to have beneficial effects on health and aid in recovery. But where this is not possible, say in

healthcare facilities where sterile settings are important, designing and building to minimise indoor air pollution can go a long way.

When it comes to the building itself, he says, for several years now, there has been a focus on decreasing the use of volatile organic compounds like formaldehyde as a strategy to address health and well-being.

An intentional design process that incorporates, for instance, skylights, bringing daylight into pathways and hallways, and designing spaces that allow for the movement of people, can help. This can be combined with the use of air purifier units, and high quality HEPA filters to keep out particulate matter and using toxin-free cleaners and greenery where possible, to help with improved air and better health.

'Do it while planning'

Studies suggest that indoor concentrations of air pollutants are increasing, driven by factors such as the types of chemicals in home products, inadequate ventilation, hotter temperatures, and higher humidity, says the U.S.'s National Institute of Environmental Health Sciences. This may be of particular concern in India, where a spike in heat, combined with humidity in coastal cities, is already beginning to show impacts on health.

Healthy design elements are easy to incorporate while building a new structure but can also be retrofitted

in existing old buildings, though this may be more challenging, says Sumita Vasudevan, an associate at APRO-build, an architecture and interior design firm based in Chennai. "Earlier, anything that was green was more expensive, but costs have come down, making the difference only marginal; green elements are now part of the design in most buildings. Post-COVID-19, there has been a focus on filtered air, and this is incorporated now into buildings, especially places such as hospitals, through design," she points out.

Buildings that are going to have most rooms air-conditioned must focus on easy-to-maintain surfaces, separation of zones and ease of movement so that there are not too many people using the same room together, proper waste disposal, and, in settings where necessary, good air filters, said Ms. Vasudevan.

Where a sterile setting is not required and air pollution outdoors is not much of a concern, a back to basics approach may be beneficial: open your windows for ventilation and surround yourself with greenery.

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For feedback and suggestions for 'Science', please write to science@thehindu.co.in with the subject 'Daily page'

Key Issues Highlighted:

1. Sources of Indoor Air Pollution (IAP):

- Indoor sources:
 - Solid fuel combustion (in rural areas)
 - Smoking, mosquito coils, incense sticks, chemical cleaners, poor-quality paints
 - Vapours from building materials and furnishings
 - Biological agents: mould, dampness
- Outdoor-infiltrated pollutants:
 - Outdoor air pollution penetrates poorly insulated buildings, making it hard to distinguish between indoor and outdoor sources — especially in Indian cities.
 - Dr. Kalpana Balakrishnan notes the challenge of pollution heterogeneity due to open-air building designs in India.

2. Health Impacts of Poor IAQ:

- Short-term: Eye, nose, throat irritation; headaches; dizziness; fatigue
- Long-term: Respiratory illness, cardiovascular disease, diabetes, cancer
- A 2021 study highlights IAP as a public health issue but notes lack of extensive data in India.

Can Better Design Help?

- Design-Driven Solutions for Healthier Indoor Spaces:
 - Passive ventilation:
 - Open windows and doors when safe; ensure cross ventilation
 - Incorporate skylights, corridors, and daylight pathways
 - Material choices:
 - Reduce use of Volatile Organic Compounds (VOCs) like formaldehyde
 - Use toxin-free paints, safe cleaners, and natural furnishings
 - Air filtration:
 - Install HEPA filters, air purifiers in closed or air-conditioned environments
 - Prioritize zoning and crowd control in shared indoor spaces
 - Green design:
 - Use of indoor plants and surrounding greenery
 - Sunlight exposure to support healing and reduce pathogen survival
 - Sumita Vasudevan of APRObuild highlights a post-COVID shift toward filtered air and health-centric architecture.
- **Policy and Urban Planning Implications:**
 - Regulatory Gaps:
 - Unlike outdoor air, no uniform national standards exist for indoor air quality.
 - Limited awareness in urban planning and construction codes.
 - Affordable Integration of Green Design:
 - Earlier cost constraints of green architecture are diminishing.
 - Green features can now be retrofitted in older buildings or integrated at minimal marginal cost in new constructions.
 - Public Infrastructure Implications:
 - Must prioritize IAQ in public buildings (schools, hospitals, offices).
 - Government should incentivize "healthy buildings" in real estate and urban planning.

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Daily News Analysis

UPSC Mains Practice Question

Ques :While outdoor air pollution is a visible challenge, indoor air pollution is a silent crisis. Discuss how urban design and policy can help address indoor air quality concerns in India. **(250 words)**



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April 11 marks the birth anniversary of Mahatma Jyotiba Phule (1827–1890), a pioneering social reformer whose ideas continue to challenge caste orthodoxy, gender injustice, and religious supremacy in India.

BIBLIOGRAPHY

Phule: a constant gardener of social revolution

Mahatma Jyotiba Phule continues to be a source of inspiration to many progressives even today; we look back at his actions and opinions from his life and writings, where he envisions a society liberated of orthodox shell

Prathmesh Kher

Jyotiba Phule was born on April 11, 1827, in the Mali caste, a community traditionally occupied with gardening and floristry. In 1848, Phule was invited to attend a wedding of one of his Brahmin friends. The relatives of the groom insulted and abused him while referring to his 'lower' caste. Phule left the procession, having made up his mind to defy the prevailing social system and its incumbent caste oppression. He visited a girls' school in Ahmednagar run by missionary Cynthia Farrar, and also came into contact with Thomas Paine's *Age of Reason*, which had criticised Christian orthodoxy much in the same way as Phule would come to contend with its Hindu counterpart.

The very same year, Phule and his wife Savitribai cofounded the first school for girls in India. Phule was only 21 years old at the time; the couple opened 18 more schools in the next three years. By 1855, Phule had also opened night schools in Pune, intended as a centre of learning for workers, farmers, and working women who were busy during the day. Phule's rapid success in this emancipatory revolution was opposed by the orthodoxy.

In his later years, Phule had vociferously opposed first Vishnu Shashtri Chiplunkar, and then his protégé Bal Gangadhar Tilak. Phule preferred to work with the British government to improve the lot of the untouchables and the depressed castes and the emancipation of women, while Tilak and other orthodox nationalists saw the British government as an occupying force intent on changing what they felt was the fundamental character of the Hindu religion. Nonetheless, Phule had the discernment to aid the deliverance of an opponent when he bailed out an imprisoned Tilak and Gopal Ganesh Agarkar from Mumbai's Dongri Jail.

Phule also founded the *Satyashodhak Samaj* (Society of Truth-Seekers) in September 1873. The body was intended as an alternative to the largely upper-caste dominated reform movements that had been surging in India. These included the Brahmo Samaj, the Prarthana Samaj, as well as the Arya Samaj movements.

Breaking the chain

Revolution is a vehicle for change – social, economic, and political. The *Bombay Times* and *Journal of Commerce* had in 1857 called the sepy revolt "a deadly national rebellion". However, Phule could not come to affiliate with the sepy revolt, seeing it as a retrogression towards the ascendant theocracy of the Peshwa rule. He could not see a way to reconcile his social revolution with the tempest of 1857. Phule felt that the obstinacy of the orthodox upper-caste Hindus would consign the Dalits back into a state of degradation.

Writing in *Gulamgiri* (Slavery), Phule says, "This system of slavery, to which the Brahmins reduced the lower classes, is in no respects inferior to that which obtained a few years ago in America. In the days of rigid Brahmin dominance, so lately as that of the time of the Peshwa, my Sudra brethren had even greater hardships and oppression practised upon them than what even the slaves in America had to suffer. To this system of selfish superstition and bigotry, we are to attribute the stagnation and all the evils



Defiant spirit: In 1848, Phule and wife Savitribai cofounded the first school for girls in India. FILE PHOTO

under which India has been groaning for many centuries past."

"Only slaves can understand what it is to be a slave and what joy it is to be delivered from the chains of slavery. Now the only difference between them and the slaves in America is that whereas the blacks were captured and sold as slaves, the shudras and atishudras were conquered and enslaved by the bhats and brahmins," he states.

But Phule was also able to see that economic strengthening of the working poor among the lower castes could be a key to overthrowing the social imbalances. In his 'A Statement for the information of the Education Commission', Phule writes, "In villages also most of the cultivating classes hold aloof, owing to extreme poverty, and also because they require their children to tend cattle and look after their fields. Besides an increase in the number of schools, special inducements in the shape of scholarships and half-yearly or annual prizes, to encourage them to send their children to school and thus create in them a taste for learning, is most essential. I think primary education of the masses should be made compulsory up to a certain age, say at least 12 years."

In his *Satsar* (The Essence of Truth), Phule defended the right of Pandita Ramabai to convert to Christianity, the only non-Christian defence of its sort. The text is imagined as a dialogue between a Brahman and a Shudra.

"Brahman: But Tatya (younger brother), which religion do you belong to? Shudra: Forget God and serve the brahmins! Do you think this ought to be our religion? We shall adopt Christianity or Islam whenever we feel like for our convenience. Or perhaps we shall ask for a religion for us from our Creator. You do not have to worry about us."

A constructive approach

In his *Shetkaryanche Asud* (Farmer's Whip), Phule argues for a constructive

approach on the part of the administration.

Many of his ideas therein provide a secular alternative to resolving the extant questions of cow slaughter, the increase in crop production, and the development of civil infrastructure.

"The benevolent government should educate all the farmers, and until they become mature enough to use machines to do the usual things on the farms like European farmers, all the white people and the Mussalms should slaughter goats and sheep instead of slaughtering cows and oxen; or they should import cattle and slaughter and eat them here, because otherwise there will not be sufficient supply of cattle for the farms, and there will not be enough compost and other fertiliser as well, and so neither the farmer, nor the government will benefit," Phule writes.

Arguing for the involvement of military administration in the work of civil construction, Phule says, "...construct small dams and bunds in such a way that this water would seep into the ground, and only later go and meet streams and rivers. This would make the land very fertile, and the soldiers in general, having got used to working in open air, will also improve their health and become strong. Even if they labour to the value of one anna every day, this will mean an increase in the government's earnings to the tune of twenty-five lakh per year, because our careful government has, including the police department, at least two lakh sepoys."

"... the government should allow the farmer to collect all the silt and other things extracted from rivers and lakes, as in the olden times, and it should also return all the cow pastures to the villages, which it has included in its 'forest'; it should, however, make sure that no firewood is collected, or land tilled in the areas that belong to it, and it should also forbid the cutting of wood for selling as wood for construction and destroy the

oppressive the Forest Department," Phule contends.

The flowering of a true faith

Phule shared a complex and evolving relationship with both doctrinal religion and the idea of God. In his early years, he credits his childhood Muslim friends for revealing to him the fallacy of the Brahminical faith, and later still the work of the Christian missionaries likewise provides him with a robust critique of Hindu orthodoxy. Phule even wrote an abhang titled *Manav Mahammad* (Muhammad the man), which extolls the prophet of Islam as having liberated his people from the yoke of superstition and orthodoxy of his age. But Phule was also inspired by Paine's *Age of Reason*, and in his later years drew on the deistic strain of humanistic faith therein.

An echo of this rationalist tendency is most evident in his *Sarvajanik Satya Dharma Pustak*, a sort of last testament of his beliefs and convictions. In it, Phule responds to a query regarding the existence or lack thereof of a true scripture in this manner. "All the religious and revelatory books that man has produced on our planet, one and all, do not contain a consistent universal truth. This is so because in every such book are to be seen passages interpolated into those texts by certain groups of individuals as the situation in their view warranted and as their dogmatism and mulishness dictates. Consequently, those religions or faiths did not in the final analysis work towards the good of all. This in turn resulted in sects and sectarianism. Small wonder that these sects hated and turned against each other."

Rejecting sectarianism and supremacism, Phule reminds the reader that, "In sum, this solar system and naturally the planet earth which we inhabit are created by one Creator. Why is it then that the human beings living in different States and nations hate each other? How and why are the foolish passions of religions and national hatreds generated? There are any number of rivers on our planet. All of them eventually meet the sea. How and why, then can only one of those rivers be sacred? Does that sacred river ever hesitate to carry dogs' excreta to the sea?"

Denying any fundamental sacredness of some human beings over others, Phule stipulates that this is "clearly untenable". "All human beings on our planet are equipped with similar physical and intellectual facilities. How can some of them be 'sacred' generation after generation? Are they not born and do they not die like everyone else, and do they not have qualities good and bad like everyone else?" he writes.

Writing against the unevenness of polygamy, Phule presents a polyandrous argument to offset his counterposition. "Some lustful men who marry more than once, maintain almost a harem; justify their action with reference to some senseless religious text written by equally mulish men. How would they take it if some women were to marry more than one man to satisfy their lust? Would not these men think of right and wrong and be critical of their behaviour?" Phule contends therein.

Phule reminds the reader that the pernicious practice of caste is a human invention. Of it he opines, "Animals, birds, etc., all differ from each other anatomically. Likewise, two-legged human beings are different from four-legged animals. It is said that the Arya Brahma has created the four castes. He would have done so for the animals as well. Can you tell me then who are the brahmins among the donkeys, crows, etc.?"

Phule's life and times continue to be a source of inspiration to many progressives to date. His struggles, sometimes at risk to his own life and limb, and his tenacious pursuit of the ideal of a society liberated of its orthodox shell, are something worth learning from for our own age.

Key Themes & Contributions:

1. Challenge to Caste System & Orthodox Religion

- Phule faced caste-based humiliation at a Brahmin wedding at age 21, which led him to dedicate his life to social reform.
- In Gulamgiri (Slavery), he equates Brahminical dominance with American slavery, stating that Indian Shudras faced even harsher oppression.
- "Only slaves can understand what it is to be a slave and what joy it is to be delivered from the chains of slavery." — Gulamgiri

2. Revolution in Education

- 1848: Phule and Savitribai Phule started the first girls' school in India.
- Established 18 more schools in the next 3 years and night schools for workers and women.
- Advocated for compulsory primary education for children of farmers and labourers.
- "Primary education of the masses should be made compulsory up to a certain age."

3. Satyashodhak Samaj (1873)

- Founded as an alternative to upper-caste dominated reform movements like Brahmo and Arya Samaj.
- Promoted equality, truth-seeking, and rationalism, rejecting divine sanction of caste.

4. Social vs Political Nationalism

- Clashed ideologically with Bal Gangadhar Tilak and Vishnu Shastri Chiplunkar.
- Phule saw British rule as an opportunity to uplift lower castes, unlike Tilak who viewed it as oppressive.
- Despite differences, Phule bailed out Tilak and Agarkar from jail — showing principled commitment to justice.

5. Rationalism and Religious Critique

- Influenced by Thomas Paine's Age of Reason and Christian missionary work.
- In Sarvajanic Satya Dharma, rejected all religious texts that promote sectarianism or supremacy.
- Championed equality, rationalism, and a universal humanistic religion.
- "How can some be 'sacred' generation after generation? Are they not born and do they not die like everyone else?"

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6. Agrarian and Economic Thought

- In Shetkaryanche Asud, Phule advocated:
 - Scientific farming techniques.
 - Use of military for civil construction like dam building.
 - Redistribution of grazing lands and local water rights to villagers.
 - Called for abolition of the oppressive Forest Department, advocating farmer-centric governance.

Critical Evaluation

- **Relevance Today:**
 - Caste discrimination, gender inequality, and lack of access to education still persist.
 - His model of constructive engagement, rather than violent revolution, offers sustainable paths to reform.
- **Balanced Perspective:**
 - While some criticize Phule's cooperation with colonial rule, it must be contextualized as a strategic choice for social upliftment.
 - His vision of equality challenges even contemporary notions of religious and caste identity.

UPSC Mains Practice Question

Ques : Jyotiba Phule's social revolution was rooted in rationality, equality, and justice. Discuss the relevance of his ideas in contemporary Indian society. **(250 words)**

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In News : Taiwan Strait

China launches aggressive military drills in Taiwan Strait.



About Taiwan Strait

- The Taiwan Strait is a strategically significant and geopolitically sensitive body of water separating mainland China from the island of Taiwan.
- Approximately 180 kilometers (110 miles) wide at its broadest point and narrowing to about 130 kilometers (81 miles), it connects the South China Sea to the East China Sea.
- The strait is relatively shallow, with depths averaging around 70 meters (230 feet), and encompasses the Pescadores (Penghu) Islands, which are administered by Taiwan.
- The strait was named Formosa ("Beautiful") by Portuguese navigators in the late 16th century; although it is still known in the West by its European name, the Chinese and now most Westerners use the name Taiwan Strait.
- The strait is also one of the most important fishing grounds in China, and more than a hundred economically important fish species are found here.
- The Taiwan Strait is vital for global trade, with nearly 40% of the world's container ships passing through it annually.

Taiwan Strait History

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- The Taiwan Strait has been a focal point of military and political tensions since the conclusion of the Chinese Civil War in 1949.
- Following the retreat of the Nationalist government to Taiwan, the strait became a de facto boundary between the People's Republic of China (PRC) and the Republic of China (ROC).
- Notable flashpoints include the Taiwan Strait Crises of 1954–55 and 1958, during which the PRC conducted artillery bombardments of ROC-held islands, prompting U.S. intervention to deter further escalation.

UPSC Prelims Practice Question

Ques : Consider the following statements regarding the Taiwan Strait:

1. The Taiwan Strait connects the East China Sea with the Yellow Sea.
2. The strait has historically been a site of military tensions, especially during the 1950s.
3. Nearly 40% of the world's container ships pass through the Taiwan Strait annually.
4. The Pescadores (Penghu) Islands located in the strait are administered by China.

Which of the above statements are correct?

- (A) 1, 2 and 4
(B) 2 and 3 only
(C) 1 and 3 only
(D) 2, 3 and 4

Ans : B)

Drop the piecemeal ways to social security for workers

India's efforts to establish social security for online (app-based) gig workers are gaining momentum, with the central scheme awaiting Cabinet approval. Benefits announced include health coverage under Ayushman Bharat, registration on the eShram portal for access to various social security schemes, and a transaction-based pension policy, where a universal account number assigned to each gig worker helps track their earnings across platforms for deductions and company contributions. This pension scheme is particularly notable because, in a way, it acknowledges that gig workers (operating outside traditional employee-employer relationships) can have multiple employers, and ensures that each contributes, albeit in a limited capacity, towards worker welfare. In a country where social security is typically tethered to formal employment and informal workers are excluded or otherwise disadvantaged, this is clearly a step forward.

However, this progress highlights the reactive nature of current social protection systems which tend to respond only when new worker categories emerge. This underscores the need for India to proactively reimagine its social security framework to address these evolving challenges.

The flaws in the existing system

Despite being a founding member of the International Labour Organisation (ILO), India is yet to ratify the Social Security (Minimum Standards) Convention, 1952 (No. 102), the ILO's Convention aimed at establishing basic social security principles. India's Code on Social Security (Code), one of its four new Labour Codes, enacted nearly 70 years after the 102



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As India strives to make its workforce 'future ready', robust social protection systems that can withstand workforce and sectoral changes need to be in place

Convention, intends to provide a comprehensive framework for social protection. But it has faced significant criticism for its ambiguous definitions, watered down protections, and on-going implementation challenges.

One of the Code's most prominent features is its insistence on relying on welfare boards for the distribution of social welfare – a process that has long been found falling short of its intended goals. For instance, a recent Right To Information petition showed that Welfare Boards for Building and Other Construction Workers of various States were yet to use ₹70,744.16 crore worth of cess they had collected from employers for the welfare of workers. In another instance, a Comptroller and Auditor General (CAG) 2024 report found that 99 local bodies in 10 districts had delayed remittance payments to the Tamil Nadu Construction Workers Welfare Board (TNCWWB), amounting to ₹221.8 crore. Even in Kerala, with its strong thrust on worker welfare, only five out of its 16 boards were found to function effectively, with some boards (as per 2016-17 data) not reporting any beneficiaries at all. This has led to repeated calls from activists and advocacy groups for improvements in the management and the functioning of welfare boards.

The problem with incremental approaches

One of the main arguments in favour of India's fragmented, welfare-board run social welfare systems is its ability to provide targeted relief to segments of workers in need – for example, beedi and cigarette workers of Karnataka have sought the revival of a defunct welfare fund to deal with their welfare woes. Today it is the gig worker; but new worker categories are bound to

emerge with advancements in technology or other forces of disruption.

So, relying on a piecemeal approach – as opposed to a combination of universal social protection and targeted support – can fail to account for the precarious nature of all informal work. Such an approach could also create artificial distinctions between different types of informal work such as between gig work and domestic work, and in turn impose arbitrary thresholds on who is deserving of social protection, and who is not.

It is also risky to assume that focusing on just one worker segment will automatically solve the challenge of formalising informal labour. Because right now, there is understandably growing excitement about how gig work will employ more people in the future. But banking on it as a solution to formalising informal labour is overly optimistic.

Towards universal social protection systems

As India strives to make its workforce 'future ready', it is crucial to create robust social protection systems that can withstand workforce and sectoral changes. Which raises the key question: what is the most realistic way forward? The Code, despite its implementation logjam, looks here to stay. And while it leaves the bulk of the oversight to the Centre, it allows States some flexibility to enact social security measures within its framework.

A sensible starting point might be to treat the Code's mandates as the bare minimum, and use these as a foundation to build stronger, more inclusive, accessible and ultimately, universal social protection systems that leave no worker behind.

Paper 02: Social Justice

UPSC Mains Practice Question: With the rise of gig and platform-based employment in India, critically examine the adequacy of the existing social security framework. What challenges does the current model face in delivering inclusive and sustainable welfare? Suggest a roadmap for universal social protection in the context of the changing nature of work. (250 words)

Context :

- India's economy is witnessing a rising trend of app-based gig and platform workers, reflecting broader global shifts in employment patterns. In response, recent policy efforts such as integrating

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gig workers under Ayushman Bharat, registration through e-Shram portal, and proposals for a transaction-based pension system mark a significant departure from traditional models of labour welfare.

- These steps indicate a welcome policy shift. However, they also highlight deep-seated structural flaws within India's existing social security system that continue to hinder universal and equitable coverage.

A Positive Turn in Labour Policy

- Traditionally, India's social security programs have been restricted to formal sector workers. Gig workers—who operate across multiple platforms and lack conventional employer-employee relationships—were largely excluded.
- The proposed Universal Account Number system for gig workers, enabling proportional contributions from different platforms, shows a nuanced understanding of the fragmented nature of gig employment. It reflects an important shift towards recognising informal labour within the broader framework of labour rights.
- This movement is particularly significant in a country where over 90% of the workforce is informal, yet access to welfare remains skewed in favour of formal employment.

Persistent Gaps in the Existing Framework

- Despite these policy developments, India's social security architecture continues to suffer from several systemic weaknesses:
 1. Incremental and Piecemeal Reforms
 - India has yet to ratify the ILO Convention No. 102, which sets global standards for minimum social security. The Social Security Code (2020), while hailed as a reform milestone, suffers from vague provisions, lack of enforceability, and fragmented implementation.
 2. Over-reliance on Welfare Boards
 - Many state-run welfare boards, tasked with delivering benefits to informal workers, suffer from poor governance, underutilisation of funds, and inefficient service delivery. Even in progressive states like Kerala, delays and non-payment of dues to registered workers have been reported.
 3. Fragmented and Unequal Coverage
 - Each category of informal worker—beedi workers, construction labourers, domestic workers, gig workers—has separate eligibility criteria, welfare boards, and benefits. This leads to inconsistencies and inequalities in access to social protection, based more on how a worker is classified than on their actual need or vulnerability.
 4. Neglect of Older Informal Sectors

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- While gig workers receive growing attention, millions in traditional informal sectors remain on the margins of policy focus. This creates a hierarchy within informality, where visibility determines access to benefits, undermining the principle of equity.

Challenges of Short-Term Fixes

- Introducing new schemes or boards for each category of worker might offer temporary relief, but this reactive model doesn't address the core issues of governance, transparency, and long-term sustainability. The closure of several older welfare boards is a reminder that without structural reform, many such initiatives risk becoming outdated or dysfunctional over time.

The Case for Universal Social Protection

- What India needs is a universal, inclusive, and resilient social security system that can:
 - Accommodate all types of workers, regardless of sector or classification
 - Be flexible enough to adapt to future labour market shifts
 - Ensure portability of benefits across sectors and geographies
 - Include clear enforcement mechanisms and accountability structures
- The Social Security Code—though limited—can act as a foundation. States must use the autonomy granted under the Code to innovate and create context-specific, yet scalable models of welfare.

Conclusion

- India's efforts to include gig workers in its social security net represent a meaningful shift in policy thinking. However, without addressing the deeper systemic challenges—fragmentation, weak implementation, and exclusion of large worker segments—these initiatives may fall short of delivering real transformation.
 - A future-ready workforce must be backed by a future-ready welfare system—one that leaves no worker behind, regardless of whether they drive a taxi, deliver food, farm land, or clean homes.
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