



Topics



- **P versus NP problem**
- **Liquid Nitrogen**
- **Spices board of india**
- **Red sea**
- **Venture capital**
- **Mains**



By saurabh pandey sir



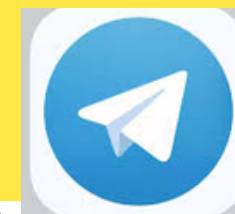
Target Mains 2024/25 - essay topic



Q Explain the role of spice board of india
can play in agricultural diversification in
North eastern part of india .

प्रश्न भारत के उत्तर पूर्वी भाग में कृषि विविधीकरण में
स्पाइस बोर्ड ऑफ इंडिया की क्या भूमिका हो सकती है,
इसकी व्याख्या करें।

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Q. 'Climate change will alter the pace of economic growth'. Discuss (150 words)

Ans.

RBI's Department of Economic and Policy Research has mentioned in its recent report that the climate change in India could cost 2.8% of its economy and will depress the standard of living of nearly half of its population by 2050.

Impact of Climate Change on Economic Growth

1) Agriculture :- As climate change occurs, the weather patterns, rainfall, increase in temperature all leads to decrease in the generation of crops yield.

2) Energy Crisis :- As the temperature keeps on rising the demand for energy increases, (more will be produced via coal based thermal power plants).

Acc. to International Energy Agency - India's primary energy demand will be doubled by 2030.

3) Health Complications :- With increase in heat the incidents of deaths due to diarrhoea, malaria and heat stress have increased by many folds, thus a threat to the working population of the country.

4) Labour Force Exposure :- labours indulged in

working at construction & building sites (12% of India's workforce) faces extreme heat effects due to urban heat island effect at these sites. As a result of which:-

- * No. of working hours are reduced
- * More exposure of heat have negative impact on their over all well being.

(5) Damaged Infrastructure :- Due to climate change ^{extreme} weather events takes place, which results into ~~the~~ damaging of the infrastructure of roads, bridges, ports, power plants, thus will directly impact the economic trade activity, connectivity

Way Forward :-

(i) Need to amend laws - to include in → safety and health aspect of the working force to free from adverse effects of the climate change (Recognised as Fundamental Right by SC recently)

(ii) Climate resilient infrastructure & agricultural practices

(iii) More of awareness generating campaigns & initiatives, like National Action Plan on Climate Change

A computer science conundrum that could transform healthcare

While it may sound like a cryptic puzzle reserved for computer science mavens, the implications of the P versus NP problem stretch beyond algorithms and data structures, rippling through diverse fields, including antimicrobial resistance, cancer care, and medical insurance

C. Aravinda

In the 17th century, a Dutch draper named Anton van Leeuwenhoek used a small handmade microscope to peer into a world previously unseen by the human eye. Thus he discovered microorganisms and gave rise to the field of microbiology. It offered solutions to challenges in healthcare that until then had seemed intractable.

Today, we face a new set of complex problems in healthcare that seem more intractable than others before for their inherent complexity and the constraints they threaten to impose on resources.

P versus NP

It so happens that an unsolved problem in computer science, simply called the P versus NP problem, could hold the key to these modern-day conundra. While it may sound like a cryptic puzzle reserved for computer science mavens, its implications stretch beyond algorithms and data structures, rippling through diverse fields including healthcare. But what exactly is this puzzle, and how could its resolution unlock a new era in medical science?

Let's start with a simple arithmetic example. Say you're asked to multiply 17 with 19. With some time, you'd arrive at the answer: 323. This is a 'P' problem; you can solve it reasonably quickly. ('P' stands for polynomial time.) Suppose you're presented with 323 and asked to identify the two prime numbers multiplied to get this. In this case, you will have to take the trial and error route until you arrive at 17 and 19. This is an 'NP' problem: it takes longer to solve, but once you have the solution, you can verify it quickly. ('NP' here is nondeterministic polynomial time.)

Healthcare is filled with complex issues. Consider scheduling in a hospital: assigning doctors and nurses to shifts, booking operating theatres for surgeries, and organising patient appointments. It is an intricate puzzle that requires considering various factors – staff availability, urgency of medical cases, etc. – and potential changes such as emergency cases and cancellations.

The P vs NP question is this: could there be a shortcut to solve 'NP' problems as quickly as 'P' problems? Because the implication is that if P equals NP, we could quickly find the optimal solution to these scheduling problems, thus significantly improving patient care.

The implications of resolving this question are profound and wide-reaching, including for healthcare.

Implications for healthcare

The P vs NP question is a problem in mathematics and computer science, but that does not mean it will be confined there. If an existing problem can be given a faithful mathematical representation and is found to be an 'NP' problem, the shortcut in question could help by turning it into a 'P' problem.

For example, antibiotic resistance is a significant global health concern. If P equals NP, we may have a way to quickly analyse bacterial genomes and predict their resistance patterns, helping doctors prescribe the most effective antibiotics. This would improve patient outcomes and help combat antibiotic resistance, including new antibiotics discoveries for



Healthcare is filled with complex issues like assigning doctors and nurses to shifts, booking operating theatres for surgeries, and organising patient appointments. GETTY IMAGES/STOCKPHOTO

emerging diseases. Of course, patients' adherence will still matter.

Cancer is a complex disease with myriad mutations. Deciding the best treatment plan is an NP problem because it involves considering all possible combinations of drugs and therapies. If P equals NP, we may have an opportunity to swiftly identify the optimal treatment for each individual cancer patient and potentially save many lives. The catch here is that we will still need a large volume of data.

Insurance companies grapple with NP problems when they have to determine premiums and packages based on considering numerous variables like age, health status, lifestyle, and medical history. Having a shortcut to crack the P vs NP problem could help these companies optimise their decision-making and pave the way to fairer and more accurate premiums and conditions. Further, government spending on healthcare can also be utilised with minimal leakage while programmes like Ayushman Bharat can contribute more effectively to achieving universal health coverage.

By solving these complex problems more efficiently, we could potentially dramatically reduce resource constraints and improve health outcomes.

Surprising sources of progress

While the P vs NP problem is a topic of ongoing study in computer science, the consensus among most experts is that P probably does not equal NP, implying that some problems will remain very difficult to crack, even if a solution – once it is found – will be easier to verify. But this has not deterred researchers from exploring this question, and in the pursuit



If P equals NP, we may have a way to quickly analyse bacterial genomes and predict their resistance patterns, helping doctors prescribe the most effective antibiotics. This would improve patient outcomes and combat antibiotic resistance

of which they have unearthed improvements to algorithms and new approaches to dealing with complex problems.

Throughout history, there have been many instances of seemingly insurmountable problems being overcome with innovative thinking. Before the discovery of electricity, for example, candlemakers lit our world. Yet most of them may never have foreseen the revolutionary consequences of Thomas Edison's incandescent bulb, which brought light to more people and for longer hours.

Similarly, following the invention of calculus and expanding the binomial theorem to negative integers and fractions, Isaac Newton considerably improved our understanding of the irrational number pi. Why, the technology giant Apple has been transforming our expectations of what a watch can be expected to do in ways that Swiss watchmakers may never have anticipated.

Not all will be winners

This said, one potential drawback of P being equal to NP, if ever that outcome comes to pass, lies in the realm of cryptography. Many encryption schemes

and algorithms rely on problems that are currently hard to solve, believed to be in the set of 'NP', not 'P' problems. That is, these schemes protect secrets by hiding them behind a problem that is very hard to solve but easy to verify. If P equals NP, these problems will become easy to solve, rendering these encryption schemes vulnerable to attacks and compromising digital security.

This said, healthcare isn't the sole beneficiary of this problem-solving. The barrier that the P vs NP problem stands for encompasses every field where the solution to a problem is blocked by the availability of significant computational resources. So these fields include logistics, finance, and even climate modelling, all of which could experience paradigm shifts if the P vs NP problem is solved in favour of the P = NP outcome.

The Clay Mathematics Institute in Colorado continues to offer a million dollars to anyone who can definitively solve the P vs NP problem. But for anyone who does, a million dollars will pale in comparison to the rewards they stand to collect by revolutionising various human enterprises, potentially driving human progress in unimaginable ways.

As we look to the future, let us remember that problems that seem insurmountable today might not be so tomorrow. As with the candlemakers, the watchmakers, and even Anton van Leeuwenhoek, the solution often comes from where we least expect it. Today's brightest minds grappling with the P vs NP problem may be on the brink of a breakthrough that could redefine healthcare as we know it.

(Dr C. Aravinda is a public health physician and student at IIT Madras pursuing a BS degree in data science.)



P versus NP problem

- The P versus NP problem is to determine whether every language accepted by some nondeterministic algorithm in polynomial time is also accepted by some (deterministic) algorithm in polynomial time.
- An algorithm is said to be solvable in polynomial time if the number of steps required to complete the algorithm for a given input is for some nonnegative integer n , where n is the complexity of the input. To define the problem precisely it is necessary to give a formal model of a computer.

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- In computer programming, a nondeterministic algorithm is an algorithm that, even for the same input, can exhibit different behaviors on different runs, as opposed to a deterministic algorithm.
- There are several ways an algorithm may behave differently from run to run

- The standard computer model in computability theory is the Turing machine, introduced by Alan Turing in 1936 [37].
- Although the model was introduced before physical computers were built, it nevertheless continues to be accepted as the proper computer model for the purpose of defining the notion of computable function.
- Informally the class P is the class of decision problems solvable by some algorithm within a number of steps bounded by some fixed polynomial in the length of the input.



Liquid nitrogen being poured from a container into a bowl. [COPY DOCTOROW/FLICKR](#)

Liquid nitrogen in foods draws Tamil Nadu's ire, yet again

R. Sujatha

A week ago, a video of a child screaming went viral on social media. There were visuals of adults spewing white smoke from their mouth and nose. What the child said was garbled but it was soon apparent the child had consumed a food item infused with liquid nitrogen.

Television channels and online media took up the issue. The Tamil Nadu government issued an advisory banning the use of liquid nitrogen in food and warned of stringent action against violators.

In 1991, *The Hindu* reported that a London-based company developed a system to improve the quality and shelf life of food by introducing droplets of liquid nitrogen in the packaging. When nitrogen evaporates, it displaces oxygen in the food pack, preventing microbial action and preserving freshness.

The technique was useful in packing coffee, potato crisps, peanuts and peanut butter, milk products, cheese, and dried potatoes, the article said.

As with every novelty, some chefs also experimented with liquid nitrogen to make food more interesting. In 2016, a few upmarket restaurants and eateries in Chennai and elsewhere used it to entice customers.

But in August 2017, the then Union Environment Minister Harsh Vardhan said in Rajya Sabha the government would investigate the addition of liquid nitrogen

The Tamil Nadu Food Safety Department has issued a circular on the use of liquid nitrogen saying the substance can only be used to preserve packaged food

in food and drinks served in some restaurants.

Six months ago, in Tiruchirappalli, a vendor's shop was sealed after authorities found liquid nitrogen in food, the city's designated food safety officer said.

"Liquid nitrogen, an inert, colourless, odourless cryogenic fluid has traditionally been used in the management of many benign pre-cancers and cancers since the 1960s," Arvind Krishnamurthy, professor and head of surgical oncology at the Adyar Cancer Institute, said. "This form of treatment is generally used to manage cancers wherein conventional surgery is not possible or can be used as an adjunct to conventional surgery."

The procedure involves using the element at a frosty -196 degrees C to freeze and destroy cancer cells. "The treatment is scientifically described as cryotherapy. It can also be used to obtain biopsies from cancer tissues for further molecular analysis. Another application is to use it as cryo-adhesion to remove foreign bodies," he explained.

Cryotherapy has been attempted to treat many cancers, including those of skin, bone, breast, cervical, eye, kidney, liver, lung, and prostate.

"Liquid nitrogen should be handled by trained professionals with proper protective gear, preferably in a controlled lab or industry, as improper handling or consumption of liquid nitrogen can cause severe damage to the skin, mucous membranes, and internal organs," the surgeon said.

A day after the viral video, the Tamil Nadu Food Safety Department cited the Food Safety and Standards Regulations, and the Drug Administration department issued a circular on the use of liquid nitrogen saying the substance can only be used to preserve packaged food.

The department also warned of stringent action, including fines and legal proceedings, if it is used for other purposes.

(sujatha.r@thehindu.co.in)



Liquid Nitrogen

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- **When nitrogen evaporates, it displaces oxygen in the food pack, preventing microbial action and preserving freshness.**
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DIFFERENCE BETWEEN

LIQUID NITROGEN **VS** NITROGEN GAS

- > IT IS MAN-MADE
- > N₂ IN LIQUID PHASE
- > LIQUID STATE
- > TOUCH MAKES MATERIALS BRITTLE
- > HAZARDOUS FOR LIVING TISSUES
- > Preservation of semen, blood samples and other biological samples, freezing food, cattle branding, skin treatment, and cryotherapy

- > MAKING UP 78% OF ATMOSPHERE
- > N₂ IN GASEOUS PHASE
- > GASEOUS PHASE
- > NORMALLY NOT HAZARDOUS
- > NO EFFECT ON MATERIALS
- > Preservation of food products from oxidation, transporting hazardous products, tire tubes, beer kegs

LIN & Nitrogen gas has got inerting properties. Both of them widely used in food packaging, making ammonia, fertilizers, pharma.

- **“Liquid nitrogen, an inert, colourless, odourless cryogenic fluid has traditionally been used in the management of many benign pre-cancers and cancers since the 1960s.**
- **The procedure involves using the element at a frosty -196 degrees C to freeze and destroy cancer cells.**
- **“The treatment is scientifically described as cryotherapy.**

Why are Indian spices facing the heat?

Why have countries such as Singapore, Hong Kong and the U.S. announced an investigation into possible contamination of spice mixes sold by MDH and Everest? How has the Spices Board of India responded? What has the U.S. FDA said?

EXPLAINER

Saptaparno Ghosh
Saumya Kalia

The story so far:

At least five countries – including Singapore, Hong Kong and the U.S. – have announced an investigation into possible contamination of spice mixes sold by Indian brands, MDH and Everest. The complaints cite the presence of ethylene oxide (EtO), a toxic chemical used as a food stabiliser, beyond permissible limits. The Spices Board of India in response has initiated mandatory testing of products shipped abroad and is reportedly working with exporters to identify the root cause of contamination.

Which countries have flagged safety of Indian spices?

The domino first shook on April 5, when Hong Kong's Centre for Food Safety suspended the sale of three MDH spice blends (Madras curry powder, Sambhar masala and Curry powder masala) and Everest Fish curry masala. The spice mixes had high levels of ethylene oxide, the regulator said, and advised consumers against purchasing these products. Days later, Singapore ordered a recall of the Everest spice mix, stating that it is unfit for human consumption.

MDH has called allegations over EtO contamination “baseless and unsubstantiated”. “We reassure our buyers and consumers that we do not use ethylene oxide at any stage of storing, processing, or packing our spices,” the company said in a statement. It added that neither the Spices Board nor the Food Safety and Standards Authority of India (FSSAI) have received communication or test reports from Singapore or Hong Kong authorities.

The U.S. Food and Drug Administration (FDA), which had previously rejected food and spice imports from India, told *Reuters* that it is “aware of the reports and is gathering additional information about the situation”. Regulatory bodies in Maldives, New Zealand, Bangladesh and Australia have announced similar plans.

What are the health concerns?

MDH and Everest's spice mixes allegedly contain high levels of EtO, a prohibited pesticide. EtO is a colourless, flammable gas that was originally intended for sterilising medical devices. It is used as a chemical in industrial settings, agriculture, and as a sterilising agent in food products, including spices, dried vegetables and other commodities. The chemical lends life to the spice industry – it reduces microbial contamination, and in turn, extends products' shelf life.

However, this process is not always airtight. The improper and excessive use of EtO may leave behind residues, causing toxic and even carcinogenic compounds to form, thus contaminating the product. One such compound is ethylene glycol, an ingredient which was found in Indian-made cough syrups that were linked to the deaths of more than 300 children in Cameroon, Gambia, Indonesia and Uzbekistan. Long-term exposure to ethylene oxide is associated with cancers including lymphoma and leukaemia, some evidence shows.

Is there a history of rejections in U.S.?

A scrutiny of FDA's import refusal report, for the calendar year 2023, cites at least 30 instances wherein entry was refused because the products appeared to contain salmonella.

Indian spices and herbs rejected by the U.S. FDA in 2023

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Company	Products rejected	Reasons for rejection
Ramdev Food Products Pvt Ltd	Cumin	Appears to contain salmonella, a poisonous and deleterious substance which may render it injurious to health
	Mixed spices and seasoning	Salmonella
	Coriander	Salmonella
	Nutmeg	Salmonella
	Cumin	Salmonella
	Ginger	Salmonella
	Fennel	Artificial colouring, misbranding
Mahashian Di Hatti (MDH)	Paprika	Filthy, putrid, or decomposed substances otherwise unfit for food; and salmonella
	Mixed spices and seasoning	Salmonella
	Mixed spices and seasoning	Misbranding + salmonella
	Capsicums (cayenne chili, hot peppers) spice	Salmonella
	Spices and seasoning, ground, cracked with salt	Salmonella
	Capsicums (cayenne chili, hot peppers) spice	Salmonella
Everest	Spices and seasoning, ground, cracked with salt	Labelling violation of FPLA because of its placement, form and/or contents statement
	Black pepper	Salmonella
	Curry powder, ground, cracked without salt	Salmonella
MTR Foods Private Limited	Spices and seasoning, ground, cracked with salt	Salmonella
	Spices and seasoning, ground, cracked with salt	Labelling violation
Dharampal Satyapal Ltd. (DS Group Catch)	Mixed spices and seasoning	Appears to be misbranded in that the label or labeling fails to bear the required nutrition information; appears to contain a poisonous or deleterious substance which would ordinarily render the article injurious to health
Patanjali Ayurved Ltd.	Natural extract or flavour	Appears to be a new drug within the meaning of Section 201(p) without an approved New Drug Application (NDA)
Nestle India	Spices and seasoning, ground, cracked with salt	Salmonella
Badshah Masala Pvt. Ltd.	Spices and Seasoning, ground, cracked with salt	Labelling violation
Tulsi Foods	Black pepper	Filthy and salmonella
Speciality Indian Food Parks & Exports	Black pepper	Filthy and salmonella

U.S. FDA's Import Refusal Report



ISTOCKPHOTO

food-borne illness. Other than this, there have been at least 11 counts of products being rejected because of misbranding, adulteration, artificial colouring or incorrect labelling. The two causes have existed in combination as well. The report tabulates Ramdev Food Products to have had the maximum rejections in 2023 (about 30), followed by MDH (about 19), MTR (7), Everest (5), makers of Catch: DS Group (2) and Badshah (1).

In fact, in September 2019, a recall of MDH's Sambhar Masala was initiated in the U.S. after FDA discovered the product was contaminated with salmonella. The recall terminated in December 2021. Another such recall involved Everest's Garam Masala and Sambhar Masala, and Maggi's Masala-ae-Magic in June last year.

The U.S. Dept of Agriculture had in February 2022 stated that India and Mexico were the top sources of pathogen-based food import refusals. Their study, from 2002-19, held Indian imports had the maximum number of

pathogen-related violations. With 5,115 refusals – the figure represented 22.9% of overall import refusals for pathogen/toxin related violations.

How has India responded?

On April 25, the Spice Board in India announced a slew of corrective measures including initiating mandatory testing of consignments shipped to Singapore and Hong Kong and gathering technical details and analytical reports from the relevant food and drug agencies. It also sought to propose corrective measures to the concerned exporters and initiate inspections to ensure adherence to relevant standards. A circular dated April 30 contains guidelines to exporters on preventing EtO contamination. The guidelines prescribe norms for testing at raw and final stages, storage of EtO treated products and use of alternate methods curtailing the use of the chemical compounds. The Spices Board issued a similar advisory in September

2021, after the EU observed EtO contamination in certain Indian exports. Furthermore, the FSSAI has directed state regulators to collect samples of major spice brands, including MDH and Everest, to test for EtO.

Activists have called for stringent safety checks of curry powders and spices to detect and control the use of EtO in food products and ensure proper implementation of regulatory norms. A recent CUTS report also recommended updating food safety standards to align with global practices, and improving information flow to food industries so that they better comply with regulations.

Is food safety in India lacking?

Simi T.B., who works with CUTS International, a global advocacy group for consumer welfare told *The Hindu*, notwithstanding stringent food laws in place, that the recent controversies “collectively underscore the persistent nature of food safety challenges across various sectors of the food industry”.

One challenge is operational – India's diverse food landscape, the lack of standardised record-keeping and intentional food fraud may prevent manufacturers from tracing ingredients and assessing potential risks which compromise the safety of the entire food supply chain. Traceability is particularly challenging for small and medium sized businesses with limited resources.

Some are logistic barriers. At least 10 States/Union Territories lack government or private notified food testing labs, as mandated under the Food Safety and Standards Act 2006. These labs are distributed unevenly across regions; have insufficient number of food safety officers; and were found to operate ineffectively due to resource constraints, showed the FSSAI Annual Report of 2021-22. FSSAI's operations often lack transparency, which “hinders efforts to meet safety standards”, build accountability and trust, adds Ms. Simi.

What next?

Delhi-based think tank Global Trade Research Initiative (GTRI) in a recent note held, “With nearly \$700 million worth of exports to critical markets at stake, and potential losses soaring to over half of India's total spice exports due to cascading regulatory actions in many countries, the integrity and future of India's spice trade hang in delicate balance.” According to the think tank, the issue demands urgent attention to uphold the reputation of the entire ecosystem.

Vijoo Krishnan, General Secretary of the All-India Kisan Sabha explained that the chain of events could put other small companies or co-operatives' exports under a cloud of suspicion. Importantly, Mr Krishnan explained that in the event of potential losses, farmers of such crops too could find themselves at the receiving end. “We have instances where companies have not paid appropriate prices to farmers even when they were making profits,” he stated, adding, “Should the companies make losses now, it could be used as a pretext to reduce prices, thus, burdening the farmer.”

GTRI also assessed that if regulators in China follow their peers in Hong Kong, and ASEAN based on that by Singapore, Indian exports could see a “dramatic downturn”. This could affect exports valued at \$2.17 billion – about 51.1% of the country's global spice exports. The paradigm could further worsen if the EU, which it states, “regularly rejects Indian spice consignments over quality issues”, follows suit. The impact could be an additional \$2.5 billion, bringing potential losses to 58.8% of India's global exports.

THE GIST

▼ On April 5, Hong Kong's Centre for Food Safety suspended the sale of three MDH spice blends (Madras curry powder, Sambhar masala and Curry powder masala) and Everest Fish curry masala.

▼ MDH and Everest's spice mixes allegedly contain high levels of EtO, a prohibited pesticide. EtO is a colourless, flammable gas that was originally intended for sterilising medical devices.

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contamination of spices

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- The complaints cite the presence of ethylene oxide (EtO), a toxic chemical used as a food stabiliser, beyond permissible limits.
- The Spices Board of India in response has initiated mandatory testing of products shipped abroad and is reportedly working with exporters to identify the root cause of contamination.

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- Ethylene oxide is an organic compound with the formula C_2H_4O .
- It is a cyclic ether and the simplest epoxide: a three-membered ring consisting of one oxygen atom and two carbon atoms.
- Ethylene oxide is a colorless and flammable gas with a faintly sweet odor

SPICES BOARD OF INDIA

- **Spices Board was constituted on 26th February 1987 under the Spices Board Act 1986 (No. 10 of 1986) with the merger of the erstwhile Cardamom Board (1968) and Spices Export Promotion Council (1960).**
- **Spices Board is one of the five Commodity Boards functioning under the Ministry of Commerce & Industry.**
- **It is an autonomous body responsible for the export promotion of the 52 scheduled spices and development of Cardamom (Small & Large).**

Main Functions

- Research, Development and Regulation of domestic marketing of Small & Large Cardamom
- Post-harvest improvement of all spices
- Promotion of organic production, processing and certification of spices
- Development of spices in the North East
- Provision of quality evaluation services
- Export promotion of all spices through support for:-
- Technology upgradation.
- Quality upgradation
- Brand promotion
- Research & product development

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Maersk raises profit guidance on strong demand and Red Sea conflict

Reuters
COPENHAGEN

Shipping group Maersk raised its full-year profit guidance after reporting first-quarter earnings on Thursday, citing strong demand and longer sailing times to avoid conflict in the Red Sea.

The company, viewed as a barometer of world trade, said that shipping disruptions caused by Houthi militants' attacks on vessels in the Red Sea were expected to last at least until the end of the year, adding that growth in

Maersk posted a third straight quarterly loss in the ocean container shipping division

demand for container shipping had been stronger than forecast.

High volumes

"The container volumes we see today are quite high compared to GDP growth in the world economy," said CEO Vincent Clerc. "At one point or another, we will see a normalisation of volumes," he added.

Maersk and rivals have diverted ships around Africa since December to avoid attacks by the Houthi militants, sending freight rates higher because of the longer sailing times.

'Adjusted networks'

"We have only seen an escalation of the situation in the area and therefore we can see that not only Maersk but all shipping lines have adjusted their networks more or less permanently," Mr. Clerc said.

Maersk now expects full-year underlying EBITDA between \$4 billion and

\$6 billion this year, compared with previous guidance between \$1 billion and \$6 billion.

EBITDA stood at \$1.59 billion in the first three months of the year, compared with \$1.46 billion expected by analysts in an LSEG poll, and \$3.97 billion a year earlier when freight rates were boosted by a pandemic-related boost to demand.

Still, Maersk posted a third straight quarterly loss in its ocean container shipping division, mainly owing to higher costs related to the Red Sea disruptions.





Outlook for venture capital, private equity has improved: TVS Capital

Mini Tejaswi
BENGALURU

The outlook for India's private equity and venture capital market appears positive this year, compared with last year, as 'normalcy' has returned in the lives of investors, said Anuradha Ramachandran, Managing Partner, TVS Capital Funds.

'Excess funding'

Ms. Ramachandran said, there had been excess funding during 2020 and 2021 as both investors and business owners had got carried away. The pandemic had brought about structural changes. Edtech boomed because students could not go to school and



Anuradha Ramachandran

they required digital education, while consumer goods had to be mostly bought online and therefore B2C ventures did well.

"Now, the question is how do you sustain growth when structural disadvantages no longer exist. That is the conundrum both investors and businesses always faced and are still fac-

ing," she added.

'Return to normalcy'

Ms. Ramachandran observed a lot of 'normalisation' had happened among investors and entrepreneurs and conversations were now getting better with realistic expectations from both sides.

"This scenario will boost the growth of the domestic funding market. We hope, from now on, things are going to be easier for both parties," she commented.

Funding winter, set in a couple of years ago after many global funds dialed down their investments in India because of a lack of private fund availability, coupled with the global

economic uncertainty.

"However, India by itself is an attractive market, and we do attract capital in the early stage investments. But in terms of return on capital, our funding markets are yet to gain maturity," she observed.

'Credit averse'

On lending to women, she said, women were credit averse and were very responsible, yet opportunities available for them could be fewer, and that could also be one of the reasons why a lesser number of women became entrepreneurs.

However, "it is encouraging to see some start-ups having women co-founders," Ms. Ramachandran added.



Venture capital (VC)

- **Venture capital (VC) is a form of private equity and a type of financing for startup companies and small businesses with long-term growth potential.**
- **Venture capitalists provide backing through financing, technological expertise, or managerial experience.**
- **VC firms raise money from limited partners (LPs) to invest in promising startups or even larger venture funds**

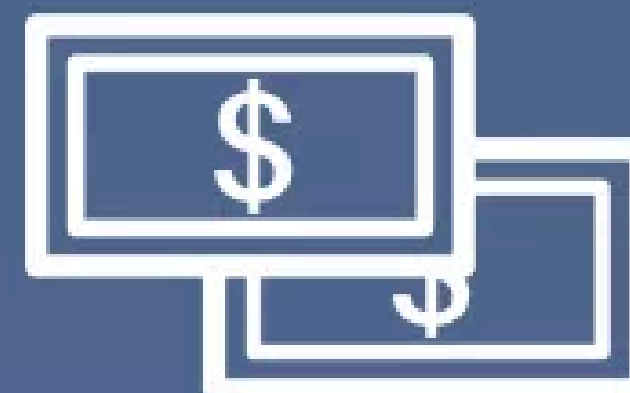
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PRIVATE EQUITY



VS

VENTURE CAPITAL



- 01 Invest in solid businesses.
- 02 Mostly buy 100% ownership of the companies in which they invest.
- 03 Capital invested in a company or other entity that is not publicly listed or traded.

- 01 Invest in small businesses /start-ups.
- 02 Venture capital firms invest in 50% or less of the equity of the companies.
- 03 Funding given to startups or other young businesses that show potential for long-term growth.

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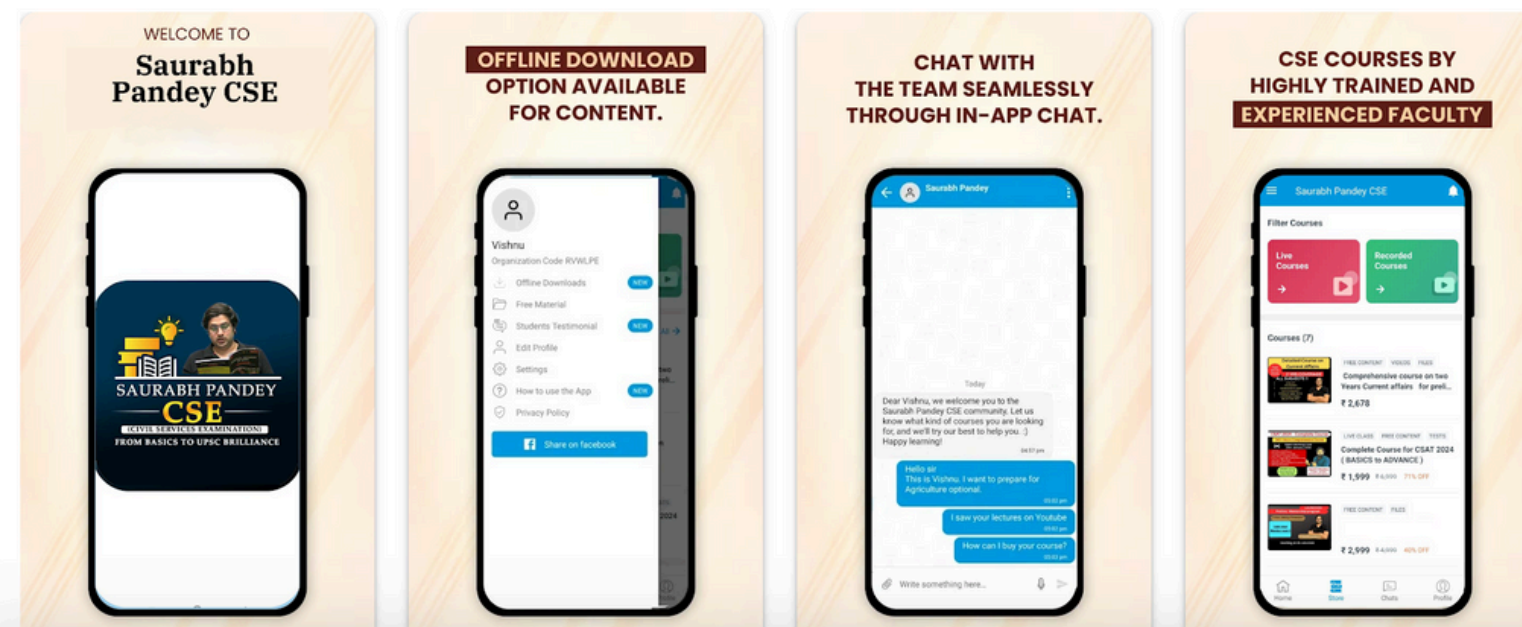
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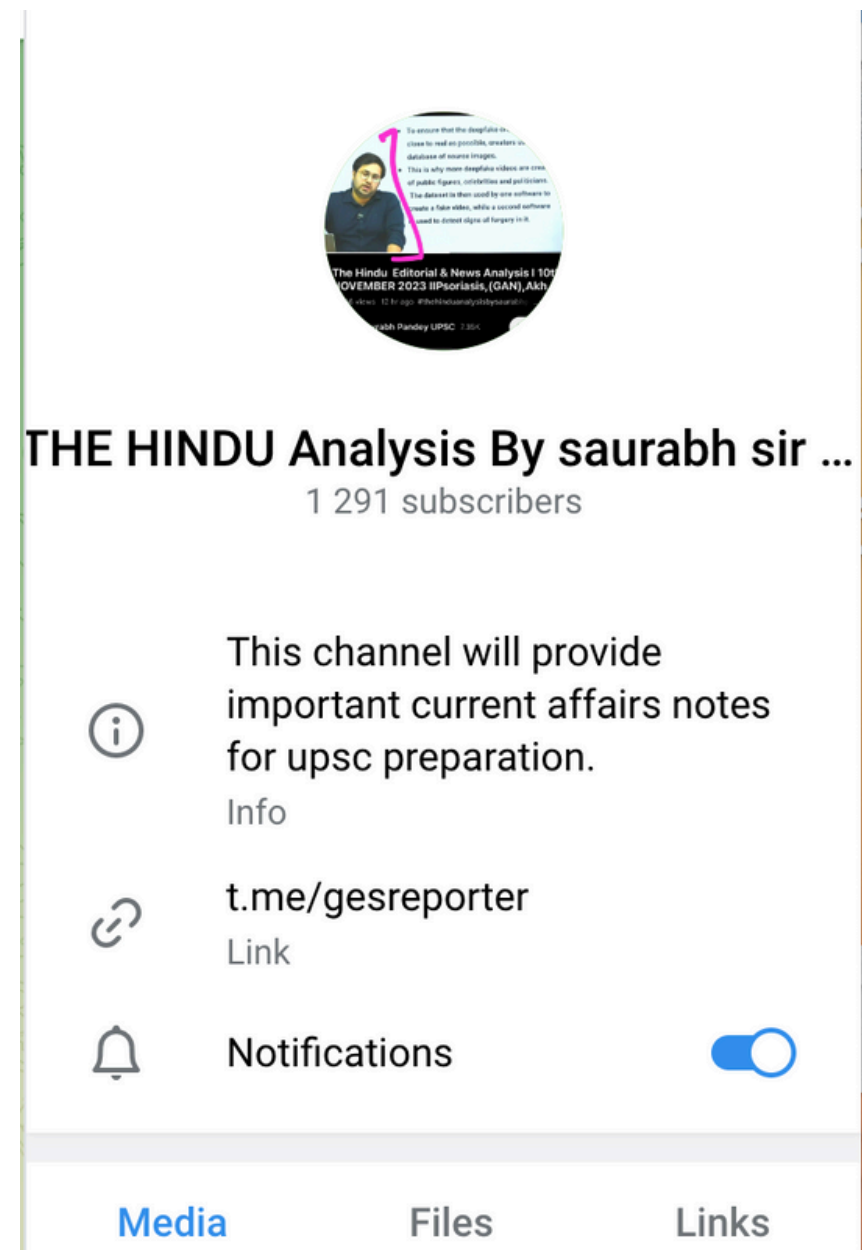
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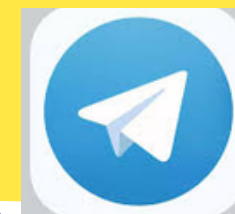
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Towards a less poor and more equal country

In March, World Inequality Lab, a global research centre focused on inequality and public policies, published a working paper titled, ‘Income and Wealth Inequality in India, 1922-2023: The Rise of the Billionaire Raj’. The authors – Nitin Kumar Bharti, Lucas Chancel, Thomas Piketty, and Anmol Somanchi – combined data from national income accounts, wealth aggregates, tax tabulations, rich lists, and surveys on income, consumption, and wealth to present their results.

Income and wealth inequality

First, let’s look at income inequality. By 2022-23, the report states, 22.6% of India’s national income went to just the top 1% in the country, the highest in the last 100 years. And just the top 0.1% of the population earned nearly 10% of the national income in India. The share of the top 1% in the national income is among the highest in the world.

In terms of wealth inequality, the share of the top 1% in wealth was 40.1% in 2022-23, the highest level since 1961. The share of wealth among the top 10% increased from 45% in 1961 to 65% in 2022-23. Conversely, the share of the bottom 50% and middle 40% in wealth declined. In short, the rich got richer and the poor got poorer in wealth. “About 10,000 individuals out of 92 million Indian adults own an average of ₹22.6 billion in wealth, 16,763 times the average Indian,” the report states.

India’s wealth inequality is not as extreme as Brazil and South Africa where the top 10% hold 85.6% and 79.7% of the national wealth, respectively. However, its wealth concentration increased threefold between 1961 and 2023. Additionally, as India’s income inequality is among the highest in the world, even higher than South Africa, Brazil and the U.S., it will only add to the wealth inequality.

The report says between 2014-15 and 2022-23 “the rise of top-end inequality has been



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The twin objectives of high economic growth and reduction of inequality can only be achieved with improvements in human development and poverty reduction

particularly pronounced in terms of wealth concentration”. It states that “the ‘Billionaire Raj’ headed by India’s modern bourgeoisie is now more unequal than the British Raj headed by the colonialist forces.” Inequality undermines both growth and reduction of poverty.

Between 1960 and 1980, inequality was dropping. The pattern of growth and its objectives ensured that outcome. However, inequality began increasing with the beginnings of liberalisation in the 1980s, and faster after the 1991 economic reforms in India.

The dynamics of income and wealth inequality are interwoven with the dynamics of economic growth and human development. India’s average income adjusted for inflation and purchasing power differentials were on a par with China and Vietnam until 1975. In the next quarter century, incomes in China and Vietnam increased by 35-50% compared to incomes in India. Post-2000, China’s income started to grow at an astonishing rate and became 2.5 times India’s income. However, growth in China has been broad-based compared to growth in India. In 2022, the share of the top 1% in income in India was nearly 50% higher than that of China. The Chinese economy has been maintaining a higher growth rate over the years with a moderate growth in economic inequality while India’s growth has been moderate coupled with extreme growth in economic inequality. That is why India is a “poor and very unequal country”.

Here, we would like to emphasise that the twin objectives of high economic growth and reduction of inequality can only be achieved with improvements in human development and poverty reduction. This is what China and Vietnam achieved. Additionally, improvements in human development should precede economic growth if economic growth is to be sustained in the long run. At the national level, the

States that sustained high growth over three decades (over 7% GSDP per year) were relatively advanced in human development. These include Kerala, Tamil Nadu, Andhra Pradesh, and Karnataka in the south; Maharashtra and Gujarat in the west; and Punjab and Delhi in the north. States that are relatively backward in the Human Development Index ranking include Jharkhand, Chhattisgarh, Bihar, Madhya Pradesh, Odisha, Uttar Pradesh, and Rajasthan. These States were only able to register a growth rate of less than 5% per annum post-liberalisation.

Human development

The Human Development Report (HDR) 2023-2024 ranked India 134 out of 193 countries. India is now the fifth largest economy but it still ranks lower than Sri Lanka, Bhutan, and Bangladesh in human development. Its economic growth has not translated into growth in human development.

The poor should not have to wait for the benefits of economic growth to trickle down; human development should be given priority in promoting inclusive growth. In the absence of improvement in human development, enhancement of capability and functioning, and poverty reduction, the growth process cannot be inclusive and will only add to inequality. Economic growth therefore does not need to be at a higher pedestal in terms of policy objectives.

As per the HDR 2023-2024, India’s score comes down by 31.1% if we account for economic inequality. The extent of economic inequality is such that it cannot be overcome by the Pradhan Mantri Garib Kalyan Anna Yojana, which provides a few kilograms of free foodgrains to about 81.35 crore beneficiaries. Sops without jobs cannot be the basis for sustained and inclusive growth. As the paper says, “It is unclear how long such inequality levels can sustain without major social and political upheaval”.

