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The need to protect India's linguistic secularism

According to the 2011 Census, India has 121 languages and 270 mother tongues

LETTER & SPIRIT

C.B.P. Srivastava

India's diversity in religion and language is one of the primary factors which protects the secular character of the nation, ensuring its unity and integrity. But while religion and language are the two most crucial aspects of any culture, these are also the predominant cross-cultural barriers. This is clearly visible in recent communal tensions and the violence in Maharashtra.

Secularism in India is different from what the West practises. When the concept originated in England in the mid-19th century, it was explained that there should be complete separation between the state and religion without criticising any of the prevalent religious beliefs. India too accepted this notion and incorporated the concept in the Constitution in the form of rights to religious freedom. These rights are based on the principles of religious tolerance and equality. Every person has the equal right to freedom of conscience and to profess, practise and propagate his religion. This makes India truly secular as the state does not have its own religion. However, the unique aspect of Indian secularism is not only related to religion but it is also concerned with language. Indian secularism is neither pro-religion or language, nor against. Yet it is not neutral either. It is incorporated in the Constitution as a state policy and it empowers the state to take steps against communalism, be it religious or linguistic.

Official vs national language

This is the reason why we do not and cannot have a national language. In order to protect linguistic diversity, the Eighth Schedule of the Constitution includes 22 languages. As India is a unitary federation, that is, a Union of States, Article 343 enshrines that the official language of the Union shall be Hindi in Devanagari script. The States are free to choose their own official language. This arrangement is due to the fact that in India, States are culturally integrated and no State is permitted to go out of it in the name of distinct language or culture.

Article 29 incorporates that any section of citizens of India including minority groups shall have the right to protect their language, script or culture, and that language cannot be the ground for discrimination. According to the 2011 Census, India has 121 languages and 270 mother tongues. About 96.7% population of the country have one of the 22 scheduled languages as their mother tongue. Finally, the Census says that the 121 languages are presented in two parts, languages included in the Eighth Schedule, and languages not included (99) in the Eighth Schedule.

Respecting diversity

Such diversity needs to be protected; each and every language irrespective of region or State must be shown respect. This is the only way to protect India's linguistic secularism. Many southern and northeastern States have resisted the imposition of Hindi, citing fears of cultural domination. Dravidian movements in Tamil Nadu historically opposed Hindi imposition, favouring Tamil and English. Maharashtra, however, has emerged as the most sensitive State so far as the language debate is concerned. The recent violence against the non-Marathi population is the manifestation of identity politics. Definitely, it is not to protect its cultural identity. Had it been related to the protection of culture, the "protectors" of Marathi language would have considered that 'tolerance' and 'liberality' are the two pillars of India's unity in diversity.

India has always accepted different religions, ideas, lifestyles, food habits etc., mainly because of its liberal and tolerant attitude. In a globalising world, a conservative leaning towards religion or language will lead to a fragmentation of society and tear apart the secular fabric.

Political parties have the onus to ensure the protection of India's diversity which has been well shielded by the Constitution.

C.B.P. Srivastava is President, Centre for Applied Research in Governance, Delhi

THE GIST

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- Such diversity needs to be protected; each and every language irrespective of region or State must be shown respect.

How is global shipping trying to decarbonise?

What is the goal? What are the green fuels that may be used? Why is it difficult to implement changes in shipping? What does India need to do? Why is the government encouraging green ammonia production in India? What are the challenges?

EXPLAINER

M. Kalyanaraman
Kalyan Mangalapalli

The story so far:

Global shipping is on course towards decarbonisation by 2040-50. This represents a huge opportunity for India. Merchant ships largely use Very Low Sulphur Fuel Oil (VLSFO), diesel, and methane gas stored in liquid form as fuel. LNG-powered engines with their higher efficiency of some five percentage points are likely to be a transition fuel before shipping moves to green fuels such as green ammonia, green or e-methanol and biofuels by 2040 and net zero thereon.

How are green fuels produced?

Green hydrogen is made from the electrolysis of water using renewable power. Shipping will not use hydrogen directly because of issues with storage and transportation of hydrogen, a highly volatile fuel. Green ammonia, made from green hydrogen and nitrogen, is more stable. The government is also encouraging green ammonia production in India since it can substitute LNG imports in making fertilizers. Green methanol is made from green hydrogen and carbon dioxide obtained from industrial sources.

What are the preferred fuels?

Shipping, however, is generally a conservative industry. New technology adoption is relatively slow. Ammonia engines are a novelty, so shipping is going first for green methanol, which emits some 10% of carbon dioxide, and later green ammonia, which emits no greenhouse gas. However, ammonia use requires extensive processes onboard. Besides a storage tank and tweaks to the engine and fuel handling system, green methanol is almost a drop-in replacement for VLSFO and is stored as liquid in ambient temperature unlike green ammonia or even LNG.

For cleaner seas: Cargo shipping containers in Chennai on June 30. JOTHI RAMALINGAM. B

Already, more than 360 ships capable of operating on methanol are either in service or in order. Major container shipping companies such as Maersk, CMA, CGM and Evergreen are backing methanol. A 100% sustainable e-methanol as bunker fuel costs $1,950 per tonne (of VLSFO equivalent) in February in Singapore, while VLSFO averaged at $560 per tonne. This pricing discrepancy is primarily caused by the present price of renewable electricity, with every tonne of green e-methanol using 10-11 MWh of power, and the heavy upfront capital cost for electrolyser facilities. Estimates suggest that demand for green methanol would surpass 14 million tonnes by 2028, whereas the projected supply is merely in the order of 11 million tonnes, creating additional price pressures.

What is Indian shipping's decarbonisation plans?

India has committed to decarbonising its domestic shipping. Plans have been made for supporting domestic container ships using green fuels as well as creating green fuel bunkering points such as at the Tuticorin V.O. Chidambaranar port and Kandla. The government is looking at producing and supplying green fuels to Singapore, which is a fuelling station accounting for nearly one-fourth of all global ship fuelling. Singapore has committed to being a green fuels supplier and would require therefore tens of millions of tonnes of green fuels. Given that India has the land and expertise for solar power, it can aspire to be a major supplier of green fuels to global shipping.

How can India do it?

Making a marine green fuels production hub has some challenges. Solar panels and electrolysers to make green hydrogen need to be imported. India's solar energy revolution, however, is a model of how sovereign guarantees and policy strategic frameworks can drive the adoption of green fuels. From 2014 to 2025, India's solar capacity grew from 2.82 GW to 105 GW. This achievement was made through the convergence of sovereign guarantees, off-take assurance, and strengthened supply chain support. Sovereign guarantees have emerged as a powerful de-risking mechanism for green methanol investments that can considerably reduce prices. These government-backed assurances can fundamentally transform project economics by enabling access to international capital markets at significantly lower interest rates.

Innovative financial instruments are needed for an at to scale green methanol rollout. Production-linked incentive (PLI) schemes for electrolysers can relieve supply chain bottlenecks by territorialising value chains and lessening transportation costs of raw materials. Carbon capture, utilisation, and storage (CCUS) incentives are also essential, as they increase the feasibility of the production of green methanol from sequestered CO2. Further, the government's aggressive push in creating 1.5 GW of local electrolyser manufacturing capacity and growing industrial CO2 sources positions India strategically to develop integrated green fuel hubs. Multilateral development banks offer financing at rates as low as 4%, as opposed to 11-12% by domestic lenders, and they can be leveraged.

How can green fuels help restart Indian shipowning and shipbuilding?

The government's move to inject demand-side support for shipbuilders, along with incentives for foreign cooperation, should spur economies of scale and attract global shipbuilders to the country. Partnerships with overseas shipbuilders from South Korea and Japan are being pursued to support India's shipbuilding strength. The strategy is to support new builds and retrofit current ships for green fuel compatibility. India has pledged $10 billion to support the purchase of over 110 ships. Government can provide incentives so 10-20% of these are green fuel-capable, built in Indian shipyards, and are Indian-flagged.

THE GIST

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Contesting the future of forest governance

Recently, the Chhattisgarh forest department issued a letter designating itself as the nodal agency for implementing community forest resource rights (CFRR) under the Forest Rights Act (FRA), 2006. CFRR, a transformative provision of the FRA, recognises the right of gram sabhas to manage their customary forests. It seeks to rectify the injustices of colonial forest consolidation which dispossessed local communities and supplanted their traditional management institutions with centralised state control.

Not only was this usurpation of the nodal role contrary to the FRA, but the letter violated gram sabhas' statutory authority to implement locally developed management plans in their community forest resource (CFR) areas by insisting on a model plan from the Ministry of Tribal Affairs (MoTA). This is not required by law. It also prohibited other departments or NGOs from supporting gram sabhas in CFRR management planning.

The letter was withdrawn after a spirited grassroots mobilisation by gram sabhas, local elected representatives, and Adivasi rights groups. Still, the persistent attack on gram sabhas' autonomy in managing their forests demands a closer look at how forests should be managed under the FRA.

Forest management

Historically, forests under government control (excluding wildlife sanctuaries or national parks) have been managed through forest departments' working plans. These plans are rooted in the colonial misnomer of "scientific forestry", i.e., planning and harvesting to maximise timber production. Ecologists, starting with Madhav Gadgil, questioned this approach, especially since early working plans even included clearfelling natural forests and replacing them with single-species plantations. The decline in India's forests, evidenced by the spread of invasive species and the increase in degraded forest areas, has fuelled doubts about the appropriateness of working plans. But for forest departments, they remain an article of faith to structure their operations and mobilise financial resources.

Gautam Aredath

Policy analyst at the Ashoka Trust for Research in Ecology and the Environment. Views are personal

Sharachchandra Lele

Distinguished fellow at the Ashoka Trust for Research in Ecology and the Environment Views are personal

Community forest resource rights demands shedding historical baggage and embracing new possibilities

In forest-rich central India, the continuing emphasis of working plans on timber extraction, which restricts communities' access and alters the composition of forests, was met with resistance even before Independence. While working plans have begun to consider restoration and wildlife conservation objectives, they remain products of bureaucratic writ, largely detached from local livelihoods and closed to independent scientific scrutiny.

The FRA's radically different vision recognises the integral role of local communities in the "very survival and sustainability" of forests. CFR management plans are to be developed by gram sabhas to prioritise local needs and address current problems. These plans shall be "integrated" with working plans by the gram sabha. In other words, working plans will no longer apply in CFR areas, because communities will manage forests with a different objective and at much finer scales.

Over 10,000 gram sabhas have received CFRR titles in India, but perhaps less than 1,000 have prepared their CFR management plans. Even their implementation is constrained by the refusal of forest departments to recognise their legitimacy and support gram sabhas. Instead, they have pursued a strategy of attrition, delaying or rejecting CFRR claims, attempting to revoke CFRR titles, and denying funds to CFRR-holding gram sabhas. Their aim to retain colonial power is concealed under arguments that communities lack the ability to manage forests scientifically.

MoTA's vacillating responses have not helped. In 2015, it issued guidelines that gram sabhas can use simple formats for their plans, but later came under pressure to alter its stand. A 2024 joint letter with the Environment Ministry required CFR management plans to conform to the National Working Plan Code (NWPC) and even suggested the involvement of foresters in their preparation. This violates the FRA's letter and spirit.

Addressing the bogeyman

Even according to the NWPC, a working plan should outline "the purpose with which a forest should be managed so as to best meet the interests and wishes of the owner, and indicate the means by which the purpose may be accomplished." Yet, the lengthy processes and data-intensive formats that the NWPC prescribes carry the hangover of maximising timber yield. In contrast, forest management by gram sabhas will likely pursue multiple livelihood needs, for which the NWPC provides little guidance.

Significant portions of working plans are devoted to cataloguing local conditions, but they abstract their complexities to focus on the forest crop (not ecosystem). A gram sabha's plan need not do the same because these insights are part of their lived experience. The variable impacts of climate change also challenge the linear trajectories of working plans, which need more adaptive responses that gram sabhas offer. CFRR demands shedding historical baggage and embracing new possibilities.

The path forward is evident. The Dharti Aaba Janjatiya Gram Utkarsh Abhiyan, launched by the Central government last year, introduced an indicative framework for CFR management plans. While the framework can be improved, it can be achieved through flexible and iterative practice by gram sabhas. MoTA must reject any attempt to derail CFR management through the red herring of NWPC compliance. And forest departments must provide funds and protection when required and discard a timber-oriented science in favour of a different science of a people-friendly forest management.

The U.S. established and extinguished multilateralism

Mukul Sanwal

is a former United Nations diplomat

The President of the United States, Donald Trump, is the visible part of the global transformation that is underway and the global trend supports India's re-emergence.

The current super power has marginalised the United Nations, and, with it, emasculated the collective bargaining strength of the Global South – there will be no going back. The U.S. is now engaging countries with strategic commerce-related bilateral deals that fragment the global order. The asymmetry of power is such that there was no opposition in the BRICS Summit in July 2025.

The BRICS Declaration that comprised 31 pages and included 126 outcomes failed to note the rejection of multilateralism which required a focus on South-South cooperation. Essentially, unilateral tariffs are a means to bring individual countries to the table for seeking concessions, not global consensus.

The U.S. shock

Mr. Trump is fully aware that 2025 is not 1950 and the U.S. cannot shape a new common global framework. The national interest of the U.S. now is self-sufficiency and containment of China's influence flowing from the world's reliance on its products, which is the other side of the coin. Over the last 25 years, the world has become interconnected and the spheres of influence, trade and financial sanctions provide a more effective management tool than leverage through global intuitions. As a result, no one really knows how to respond as 75 years of diplomatic history has been erased by raw power.

Where does this state of flux leave India with its young population having the potential to be the third largest economy in 2027 and overtake the U.S. by 2075, with global influence based on

As a result, India needs to frame a new compass for itself and for the Global South

leadership of the Global South? The answer lies in accepting the end of multilateralism. The answer lies in focusing on national prosperity and South-South cooperation.

The glue binding the Global South can no longer be financial benefits of a voting bloc in the UN. India needs their support in elections and positions in various committees for global influence; it has already lost the elected post of vice chair of the Executive Board of UNESCO to Pakistan. India needs to specify 'strategic autonomy' for what it is, namely, neutrality between major powers and enunciating its core interests in its own voting pattern.

Second, the challenge for a continental size 'Atmanirbhar Bharat' of one billion people is to look east, and not west, for ideas. Trade concessions to the U.S. should be tuned to trade agreements with the Association of Southeast Asian Nations.

Similarly, the loss of exports to the U.S., for example, steel, can be offset by a network of expressways, high speed rail, data centres with assured electricity and science universities reorienting consumption and exports. In 2013, China spent almost half its GDP on infrastructure; such scale alone makes for sustainable double digit growth.

Third, India's intrinsic strength is being at the forefront of the fourth industrial revolution, a new chapter in human development. According to the World Intellectual Property Organization, India has overtaken the U.K. and Germany in the number of GenAI patents published, and has a strong foundation for endogenous growth and well-being.

Fourth, the world over, military doctrines are being re-written for reliance on integrated air defence, satellites, missiles, drones and cyber. For the first time since Independence, India is in a position to be a global leader in all domains, enabling a substantial reduction in costly ground forces and imported large platforms, giving flexibility in foreign policy and spin-offs for growth.

Fifth, India is already revisiting the way it has framed border issues leftover from colonialism and needs to push this to focus on growth. Union Defence Minister Rajnath Singh's assertion that India and China should not "remain stuck in the past", achieve trust and work on the goal of demarcation of an international border has been favourably received by China that is preoccupied with Taiwan and in responding to Mr Trump. The Indus Waters Treaty, where Pakistan is keen to engage, provides a new frame to achieve similar trust. An international border in eastern Ladakh will be a decisive step to settling the international border in Jammu and Kashmir. The real lesson from 'Operation Sindoor' is the oldest one in military history – wisdom lies in knowing when to stop. In India's case, it is clear that there will not be a military solution.

Summit as opportunity

Last, the BRICS Summit in India in 2026 provides an opportunity to revitalise the Global South around cooperation jettisoning the multilateral practice of collective bargaining by the G-77 seeking benefits from the G-7. The future lies in sharing prosperity by reorienting tariffs and value chains to divert exports to meet growing consumption in the South. It should be possible at the low prices the South currently gets, and done in a manner that complements, not threatens, local production.

Certainly a seismic shift, but so was multilateralism in 1950.

More than symbolic

Legislative measures to curb unhealthy food intake are a must

In a welcome move, the Health Ministry has directed all government departments to display oil, sugar and trans-fat content in everyday Indian snacks such as *samosas*, *jalebis*, *vada pavs* and *laddoos* in a bid to highlight the health risks of their consumption on a regular basis. The campaign will be piloted in AIIMS Nagpur and then rolled out to other cities. The move comes two months after the CBSE directed all affiliated schools to establish 'sugar boards' to monitor and reduce the sugar intake of children. These will list information on the recommended daily sugar intake, the sugar content in commonly consumed foods, health risks associated with high sugar consumption, and healthier dietary alternatives. The initiatives have been driven by studies that provide evidence of increasing obesity trends in India. As in the NFHS data, obesity had increased from nearly 15% to 24% in men and from 12% to nearly 23% in women between 2005-06 and 2019-21. Since the amount of oil and sugar in Indian snacks is not apparent – and, hence, often overlooked – these initiatives will serve to fill the gap and act as "visual behavioural nudges", much like the pictorial warnings on tobacco products. However, building awareness alone cannot bring about behavioural changes, especially in the absence of essential legislative measures.

Surprisingly, while the Health Ministry has targeted Indian snacks, nothing has been done over the years to introduce clear front-of-package labels to caution people about unhealthy packaged food items, and regulate the advertising, marketing and promotion of unhealthy food to children. Also, levying additional tax on food products with high levels of fat, sugar, and salt (HFSS) can further reduce consumption, as seen in some countries. As in the national multisectoral action plan for prevention and control of common non-communicable disease (2017-22), the Food Safety and Standards Authority of India (FSSAI) Regulation was required to be amended for inclusion of front-of-pack labelling and detailed nutrient labelling. The FSSAI (Packaging and Labelling) Regulation was amended in 2020; on July 15, the Supreme Court of India again directed the agency to execute this label on packaged food. For front-of-pack labels on HFSS food and beverage products to become a reality, the FSSAI has to first define the upper limits for sugar, salt and total fat, which have not been finalised and approved so far. A 2022 study found that warning labels outperformed all other forms of front-of-pack labelling in identify unhealthy products. A study by the ICMR-NIN found that warning labels and nutri-star ratings helped deter the consumption of even moderately unhealthy foods. Measures to build awareness without essential legislative measures to curb unhealthy food intake will not be much more than symbolic.

Pain remains

Fall in food prices is only one part of the inflation story

The continued fall in inflation to a 77-month low of 2.1% in June 2025 should serve as a significant source of relief for policymakers. The general public, however, would not be too thrilled. There is some good news for them, but also a significant dose of pain. Food inflation, for example, saw a significant easing, although that too is a seasonal effect rather than a structural one. Food and beverage prices contracted 0.2% in June 2025 on a high base of 8.4% in June last year. Key items such as vegetables, pulses, spices and meat saw prices falling in June compared to their levels last year. But food is not all that people spend their money on. The data reveal that there were several items and services of common consumption that saw inflation quickening in June. The education and stationery segment saw inflation quicken to 4.4% in June, the highest in 15 months. This was driven by a jump in the prices of school, college, and private tuition. Inflation in the health-care category, too, was at a 15-month high in June. Compounding this, the personal care segment saw inflation jumping to a blistering 14.8% in June, the eighth month of double-digit inflation in the last nine months. Products such as soap, toothpaste, shampoo and sanitary napkins – items of daily or regular use and by no stretch luxuries – have become more expensive. So, overall, food is cheaper, but nearly everything else is more expensive.

This leads to an important policy question, one that has been asked several times before: is the headline inflation data adequately capturing the price rise the average Indian faces? The food basket itself carries a 46% weight in the overall Consumer Price Index (CPI), meaning that any change in this category has an inordinate impact on the headline number. The recent Household Consumption Expenditure Surveys show that food comprises a much smaller share of about 30% in the expenditure of households. Bringing the CPI weight of food down to align with this will allow the overall CPI to be more representative. To be fair, that process is on, with the Ministry of Statistics and Programme Implementation in the process of updating the CPI. The CPI base year – so far set as 2011-12 – is being updated to a more recent time period, and the weights of the different categories are also being revised. This update cannot happen fast enough, as even monetary policy is currently dependent on this outdated and unrepresentative measure. In the meantime, it is important not to get swayed by the fall in the headline number itself. The felt experience of the average Indian is described in the details, and it is still a painful one.

QUESTION CORNER

Dance of darkness

Q: What is a black hole merger?

A: A black hole merger happens when two black holes — extremely dense objects with gravity so strong that not even light can escape — get close and start orbiting each other. Over time, they lose energy by sending out invisible ripples in spacetime called gravitational waves. As they spiral closer together, their orbit shrinks until they finally crash and combine into a single, bigger black hole.

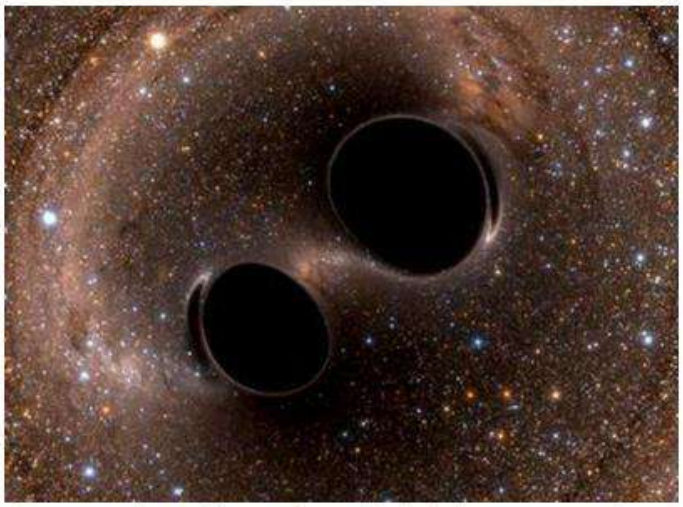
This moment releases a huge burst of gravitational waves, which can be detected on the earth by special observatories like LIGO in the US, Virgo in Italy, and KAGRA in Japan.

Think of the phenomenon like two figure skaters spinning toward each other and then grabbing hands to spin faster as one, except in extreme physical conditions.

Catching these events allows scientists to learn new things about black holes and the universe.

In fact, on July 10, an international collaboration of scientists reported discovering an especially massive black hole merger, named GW231123. LIGO, Virgo, and KAGRA had detected gravitational waves from the merger on November 23, 2023. In this event, two black holes, about 137x and 103x the mass of the sun, crashed together, forming an even bigger black hole. This was unusual because black holes in this mass range are thought to be rare.

The discovery suggests large black holes might form when smaller ones merge, not just from dying stars. GW231123 also showed both original black holes spinning really fast, which challenges existing theories of their existence.



The impending collision of two black holes is seen in this still image from a computer simulation released by the LIGO collaboration in 2016. REUTERS

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Searching for extraterrestrial life means asking the right questions first

Has the quest for alien life failed? Researchers at the Institute for Particle Physics and Astrophysics at ETH Zurich recently offered a more nuanced answer to this question – one reminiscent of an important attitude to have when doing research at the cutting edge, recognising that every observation carries with it a degree of uncertainty

Shreejaya Karantha

Since the 1990s, scientists have discovered hordes of planets outside the solar system together with tantalising hints of life – or more accurately, hints of hints of life. So far, however, there exists no proof that there's life anywhere in the universe except on the earth.

Does that mean our quest for alien life has failed?

A team led by researchers at the Institute for Particle Physics and Astrophysics at ETH Zurich, in Switzerland, recently offered a more nuanced answer to this question – one reminiscent of an important attitude to have when doing research at the cutting edge.

Writing in a recent paper in *The Astronomical Journal*, the team contended that a "no signs of life detected" conclusion can also offer valuable information to guide and refine future exoplanet studies. More broadly, the team emphasised the importance of recognising that every observation carries with it a degree of uncertainty and that it is important to ask the right questions.

A view of the Tarantula Nebula. The number of planets observed so far may suffice to establish an upper limit on the number of potentially habitable worlds. NASA HUBBLE SPACE TELESCOPE

Nothing is something

With the ultimate goal of assessing the habitability of exoplanets and finding potential signs of life, researchers have used a statistical method called Bayesian analysis. "It's a way of updating our understanding or beliefs based on new evidence," Daniel Angerhausen, a scientist in the Department of Physics at ETH Zurich and lead author of the new paper, said.

This is like making a first guess based on what one already believes, then fine-tuning it. For example, you could start by assuming life is very common in the universe. When you observe a hundred exoplanets without finding signs of life, you adjust your guess to accommodate factors that might explain how life can be common yet not found on these worlds. As you continue this process over time, your answer to "How common is life?" acquires a more informed shape.

In the new paper, the team explored how different starting assumptions affect final estimates of how common life might be.

The researchers simulated observations of 100 exoplanets, ranging from 1 to 100, to determine the minimum number of exoplanets that must be examined to conclude how many worlds are possibly habitable.

Their work suggested that if scientists examine between 40 and 80 exoplanets and find no evidence of life, they can confidently conclude that fewer than 10% to 20% of similar planets are likely to support life. That is, life would be relatively rare.

If the prevalence of life is indeed low, around 10-20%, it would be understandable for no signs of life to be found in a sample of 40-80 planets. But if life were more common, scientists should expect to observe some indications of it in that same sample. At least, this is the team's argument.

Need for better questions

This key finding suggests the number of planets observed so far may suffice to establish an upper limit on the number of potentially habitable worlds. However, the authors were careful to note that "ideal" results are likely impossible because every observation has some uncertainty.

This uncertainty can manifest in many ways (e.g., a false negative occurs when a significant sign of life is overlooked) and is related to the challenges in the questions researchers ask when they set out to find life signs.

Angerhausen explained that the question "Does this planet have life?" itself carries a significant risk of false positives. For example, a planet may have a small biosphere that doesn't alter its atmosphere in a way that can be detected from a distance. In contrast, stipulating whether "this planet has a temperature within a specific range and concentrations of certain molecules above a defined threshold" could provide more informative data.

The new paper asserts that the absence of evidence is not evidence of absence – as long as we allow the right questions to lead us

When selecting which planets to investigate, the paper emphasises the importance of asking clear and specific questions. For example, instead of posing a vague question, one might ask, "Of all the rocky planets in the habitable zone, how many show signs of water vapour, oxygen, and methane?" This would help create clear selection criteria for exoplanets as well as help experts avoid misinterpreting data from an alien world.

When observations are filled with uncertainty, the conclusion "no life detected" can be meaningless. But if the questions are thoughtfully designed, even null results can serve as powerful tools in the search for extraterrestrial life.

In sum, the effectiveness of a search depends on asking the right questions and not (solely) on the number of exoplanets observed. If scientists lack clarity on what specific indicators of life they should focus on, even the best telescopes could yield misleading results.

Significance

Angerhausen also stressed that in addition to the technological sophistication in upcoming projects like the Large Interferometer for Exoplanets (LIFE) and the Habitable Worlds Observatory (HWO) – which aim to observe dozens of earth-like planets – "our study shows that there is still a lot of work to be done on the theoretical side" and on the foundations of their knowledge. That is, how do we know a certain signal is truly a sign of life? Or what counts as dispositive evidence of a habitable planet?

The LIFE and HWO projects plan to study exoplanets for signs of water, oxygen, and other molecules that may indicate the presence of life. Angerhausen himself expressed optimism about the potential to discover habitable worlds. He said that for the first time in human history, humans will soon have the technology to systematically search for life in our cosmic neighbourhood.

In the final analysis, the new paper asserts that the absence of evidence is not evidence of absence – as long as we allow the right questions to lead us.

(Shreejaya Karantha is a freelance science writer. shreejayakaranth@gmail.com)

THE GIST

Researchers use Bayesian analysis to assess habitability. When you observe a hundred exoplanets without finding life, you accommodate factors that might explain how life can be common yet not found. As you continue this process, your answer to 'How common is life?' acquires a more informed shape

Researchers simulated observations of 100 exoplanets to determine the minimum that must be examined. They suggested that if the prevalence of life is low, around 10-20%, it would be understandable for no signs of life to be found in a sample of 40-80. But if life were more common, there should be indications of it in that same sample

When observations are filled with uncertainty, the conclusion 'no life detected' can be meaningless. But if the questions are thoughtfully designed, even null results can serve as powerful tools. The effectiveness of a search depends on the right questions and not on the number of exoplanets observed

Govt. data show fall in women at work in rural, urban areas

Govt. says this could be due to seasonal agricultural patterns and intense summer heat limiting outdoor work; unemployment rate stagnant at 5.6%

The Hindu Bureau
NEW DELHI

The unemployment rate among people aged 15 and above has remained the same at 5.6% in June and May, according to the Periodic Labour Force Survey released by the Statistics and Programme Implementation Ministry here on Tuesday.

Women's participation in labour force, both in urban and rural areas, decreased by one percentage point in June compared with May. The government said there is a "marginal decline" in the labour force participation rate (LFPR) among men too.

The Centre said the marginal decline in LFPR and worker population ratio (WPR) in June was largely influenced by seasonal agricultural patterns, intense summer heat limiting outdoor physical work, and a shift of some unpaid helpers, particularly from higher-income rural households, towards domestic chores. It said the share of rural women workers in agriculture dropped to 69.8% in June from 70.2% in May, indicating the reduced need for agricultural engagement among women, "perhaps due to a decline in rural inflation".

For females of all age groups in both rural and urban areas, the LFPR was 24.5% in June and it was 25.5% in May. AP

The Ministry said the LFPR in current weekly status among all persons aged 15 and above was 54.2% during June compared with 54.8% during May. "The LFPR in rural areas was 56.1% and LFPR in urban areas was 50.4% during June for persons of the same age group," the Ministry said.

The LFPR for males aged 15 and above in rural and urban areas were 78.1% and 75%, respectively in June, and it marked a marginal decline from the corresponding LFPR estimates of 78.3% and 75.1% for rural and urban areas, respectively in May.

For females, the LFPR for those aged 15 and above in rural areas was 35.2% in June. This was 36.9% in May and 38.2% in April. In urban areas, the LFPR was 25% in June. It was 25.3% in May. For all age groups in both rural and urban areas, the LFPR was 24.5% in June compared with 25.5% in May.

The unemployment rate for female and male of all ages above 15 was 5.6%. While for males, the rate remained same as of May, for females there was a decrease by 0.1 percentage point.

India receives second GE-F404 engine for LCA Mark-1A jets

Saurabh Trivedi
NEW DELHI

India on Monday received the second GE-F404 engine from the United States for the Light Combat Aircraft (LCA) Mark-1A fighter jet programme.

A senior Defence official confirmed the development and said that public sector firm Hindustan Aeronautics Limited (HAL) has taken delivery of the engine and is expected to receive 12 more GE-F404 engines by the end of the current financial year.

"The engines will be fitted on the LCA Mark-1A fighter jets. Their delivery had been delayed by over a year due to supply chain disruptions faced by the American engine manufacturer," the official said.

The Indian Air Force (IAF) has placed orders for 83 LCA Mark-1A aircraft. A proposal to procure 97 additional aircraft is at an advanced stage following clearance from the Defence Ministry, the official added.


LCA Tejas

Earlier this year, HAL received the first GE-F404 engine in March. The engines will be integrated with the LCA Mk-1A fighters, with HAL aiming to deliver over 10 aircraft to the Indian Air Force in the near term.

Defence Minister Rajnath Singh recently held a phone conversation with U.S. Defence Secretary Pete Hegseth to review ongoing and forthcoming initiatives aimed at enhancing defence cooperation between two countries.

SCO shouldn't compromise on terrorism: Jaishankar

External Affairs Minister says Pahalgam attack was carried out to 'sow religious divide'; SCO was founded to combat terrorism, separatism and extremism, he tells counterparts at meet in China

Suhasini Haidar
NEW DELHI

The Pahalgam terrorist attack of April 22 was carried out to hurt the Jammu and Kashmir economy and to "sow a religious divide", External Affairs Minister S. Jaishankar told the Shanghai Cooperation Organisation's (SCO) Council of Foreign Ministers (SCO-CFM) meeting in China, where other SCO Ministers – including Pakistan's Deputy Prime Minister and Foreign Minister Ishaq Dar – were present, and called for support to bring the perpetrators to justice.

On Tuesday, Mr. Jaishankar and the other SCO Ministers from Russia, Iran, Belarus and Central Asian states called on Chinese President Xi Jinping in Beijing before proceeding to the SCO meeting in Tianjin by train. The External Affairs Minister also held bilateral talks with Russian Foreign Minister Sergey Lavrov and Iranian Foreign Minister Abbas Araghchi, both of whom he met earlier this month at the BRICS summit in Brazil.

Mr. Jaishankar's comments came a month after the SCO Defence Ministers' meeting failed to issue a joint statement following differences over the references to terrorism. While no statement was issued after the SCO Foreign Ministers' meeting as well, officials said it was not the practice to do so, as the Foreign Ministers were normally tasked with finalising the agenda for the Summit of leaders on August 31-September 1. PM Narendra Modi is expected to travel to Tianjin for the summit, which would be his first such visit since the Galwan clashes in 2020.

Friendly ties: External Affairs Minister S. Jaishankar during a meeting with Chinese President Xi Jinping in Beijing. PTI

"The three evils that SCO was founded to combat were terrorism, separatism and extremism," Mr. Jaishankar said during his speech at the meeting, where he referred to the Pahalgam terror attack in which 26 men, mostly tourists, were religiously identified and killed. "It was deliberately conducted to undermine the tourism economy of Jammu and Kashmir, while sowing a religious divide," he added, calling for the SCO to take an "uncompromising position" on the challenge of terrorism, and referring to the UN Security Council resolution issued in April about the attack.

A press statement issued by the SCO secretariat said that the members exchanged views on key areas of SCO cooperation including "political, economic, trade, cultural" issues and key international and regional issues, but did not specifically mention terrorism.

Mr. Jaishankar's meeting with Mr. Xi came a day after he held bilateral talks in Beijing with Chinese Foreign Minister Wang Yi and called on Chinese Vice President Han Zheng, where he hailed the "continued normalisation" of India-China relations. The Minister said that he had apprised President Xi of recent developments in bilateral relations.

Chinese state media reported that Mr. Xi had told SCO Ministers that the organisation must play a "more proactive role" to ensure stability in a "turbulent and changing international landscape".

In his comments during the SCO-CFM, Pakistan Foreign Minister Mr. Dar did not refer to the issue of terrorism. In a post on social media, Mr. Dar said that he "underscored the importance of upholding international law and implementing relevant UNSC resolutions to resolve long-standing disputes", at the meeting and that Pakistan sought peace with "all its neighbours".

Referring to Afghanistan, Mr. Jaishankar said that the "compulsions of regional stability are buttressed by [India's] long-standing concern for the well-being of the Afghan people" and called for SCO members to increase development assistance.

Taking a swipe at Pakistan for closing transit for India-Afghanistan trade, Mr. Jaishankar said that the "lack of assured transit within the SCO space...undermines the seriousness of advocating cooperation in economic areas", and advocated for the International North South Transport Corridor (INSTC) that runs through Iran.

Happy homecoming for Shukla, 3 other astronauts after mission to the ISS

Hemanth C.S.
BENGALURU

Indian astronaut Shubhanshu Shukla and his fellow crew members on the Axiom Mission 4 (Ax-4) returned to earth on Tuesday, with their SpaceX Dragon capsule splashing down off the San Diego coast in the U.S. at 3.02 p.m. IST.

They returned from an 18-day sojourn on the International Space Station (ISS) that was a first step for India's own ambitions for human spaceflight, with Group Captain Shukla of the Indian Air Force having been selected as one of the astronauts on India's Gaganyaan Mission.

The Dragon's splashdown occurred nearly 23 hours after it departed from the ISS on Monday. The astronauts made their way out of the capsule 50 minutes later, helped by the medical crew aboard the Space X recovery vessel, *Shannon*.

The first to come out of Dragon was Ax-4 mission Commander Peggy Whitson of the U.S. She was followed by Group Captain Shukla, who was the pilot for the mission; Mission Specialist Sławosz Uznański-Wiśniewski of Poland; and Mission Specialist Tibor Kapu of Hungary.

Smiling and waving at the cameras, the astronauts were assisted by the team aboard the recovery vessel as they went for routine medical checks after spending nearly three weeks in microgravity conditions. According to the Indian Space Research Organisation (ISRO), Group Captain Shukla will undergo a rehabilitation programme for about a week under the supervision of flight surgeons to help him adapt back to gravity.

Hard ground: Shubhanshu Shukla being helped out of the Dragon capsule that splashed down off the San Diego coast on Tuesday. PTI

320 orbits of earth

The four astronauts flew to the ISS on the Dragon after it was launched by the Falcon 9 from the Kennedy Space Center in Florida on June 25. During the mission which took off from Florida after multiple delays, the crew completed 320 orbits of earth, covering 8.4 million miles of spaceflight, Axiom Space said. They also completed over 60 research activities and 23 outreach events.

"Thanks for the great ride and safe trip and happy to be back," Ms. Whitson said in her first message post splashdown.

Early on Tuesday, SpaceX announced that the Dragon was on track to re-enter the atmosphere and splash down as per schedule. At around 2.09 p.m., the deorbit burn phase of the splashdown commenced, lasting for about 18 minutes.

Following the completion of the deorbit burn, the trunk was jettisoned, and the Dragon's nose cone was secured for entry into the atmosphere. A few minutes later, the Dragon's two drogue parachutes deployed above the Pacific Ocean, followed by deployment of the four main parachutes, and the Dragon had a textbook splashdown.

Soon after splashdown, a couple of fast boats with recovery personnel approached the Dragon to ensure that the spacecraft was safe.

Medical checks

The recovery personnel then completed sniff checks to ensure there were no hazardous chemicals around the vehicle and after they picked up the main parachutes, the main recovery vessel *Shannon* approached the Dragon.

The Dragon was then lifted to the recovery vessel and placed on the recovery nest before being moved to the hangar aboard the ship for the opening of the spacecraft hatch. After the hatch was opened, the astronauts exited the Dragon one by one, completing their mission.

Axiom Space said that the crew will undergo their first medical checks onboard the recovery vessel, before flying on a helicopter back to land. From there, the crew will be flown to Houston where they will be reunited with their respective teams.

Services exports cut India's trade deficit by 9.4% in Q1

Around 11% growth in services exports helps overall trade deficit contract to $20.3 billion; current export growth on track to beat last year's record figures of $825 billion, says Commerce Secretary

The Hindu Bureau
NEW DELHI

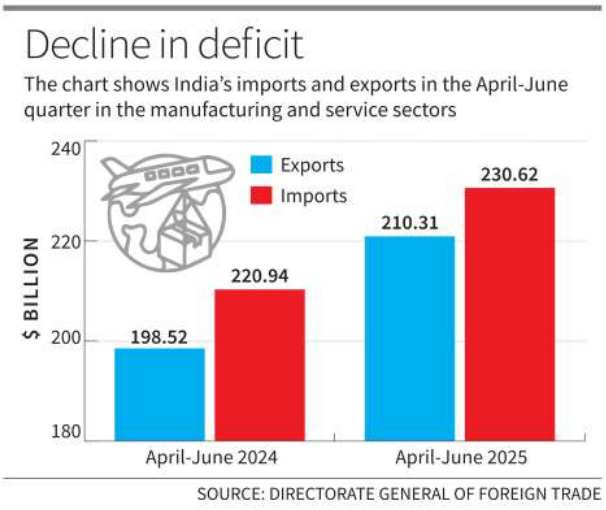
India's overall trade deficit contracted 9.4% to $20.3 billion in the first quarter (Q1) of the current financial year, driven by a nearly 11% growth in services exports during this period, according to official data.

Data released by the Ministry of Commerce and Industry on Tuesday showed that India's overall exports grew to $210.3 billion in the April-June quarter, up from $198.5 billion in the corresponding period of the previous financial year, rising about 6%.

Positive territory

"If exports grow the way they have grown in Quarter One of this financial year, then we are going to beat last year's record exports," Commerce Secretary Sunil Barthwal said at a press briefing.

"In fact, if you look at this quarter, both merchandise as well as services are in the positive territory and better than what was expected by WTO [World Trade Organisation] in terms of world trade," he added.



India's total exports stood at an all-time high of $825 billion in the financial year 2024-25.

Within India's total exports, it was services that drove the growth. Services exports rose to $98.1 billion this Q1, up nearly 11% from the $88.5 billion seen in the corresponding quarter of last year.

Merchandise exports in Q1 of this financial year grew just 2% to $112.2 billion. However, Mr. Barthwal emphasised that a large part of this slowdown was due to falling petroleum prices, since India's non-petroleum exports grew 6% during this period.

India's total imports grew 4.4% in Q1 of this financial year to $230.6 billion, with merchandise imports growing 4.2% and services imports growing 4.9% during this period.

The United States remained the top export destination for India, with exports to that country growing 22.1% to $25.5 billion in Q1 of this financial year. The others are the United Arab Emirates ($9.04 billion), the Netherlands ($5.65 billion), China ($4.4 billion).