What has to be done to get to Zero Hunger?

Why is the level of undernourishment high? What is the extent of cost increase for a healthy diet? Where is food insecurity being felt more? What are some of the suggestions offered by the Global Report on the Food Crises?

Ramya Kannan

The story so far:

The Global Report on the Food Crises (GRFC) 2023 released recently estimated that between 691 million and 783 million people in the world suffered from hunger in 2022. While the two pandemic years did not record a growth in food insecurity, the data for 2022 shows levels far higher than pre-pandemic 2019. This year's report records the historic moments that had an impact on the assessment – a pandemic and ensuing economic crisis, a war (in Ukraine), soaring prices of food, and agricultural inputs. The GRFC is produced by the Food Security Information Network in support of the Global Network against Food Crises, and involves 16 partners to achieve a joint consensus-based assessment of acute food insecurity in countries.

The report projects that almost 600 million people will be undernourished in 2030

What is food security?

Food security is defined (from the World Food Summit of 1996) thus: "When all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active, and healthy life". The prevalence of moderate or severe food insecurity in the population is based on the Food Insecurity Experience Scale (FIES).

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What are the key findings?

The Global Report starts with a qualified assertion that hunger is no longer on an alarming path upwards at the global level, but still far above pre-COVID pandemic levels, and that the world is far off track towards achieving Sustainable Development Goal 2 – Zero Hunger. It sets the global contexts preceding and during the year under assessment, particularly paying attention to the increasing phenomenon of urbanisation, and its effects on food security.

New estimates of FIES, as per the report, "confirm that for 2022, no progress was made on food insecurity at the global level. Following a sharp increase from 2019 to 2020, the global prevalence of moderate or severe food insecurity remained unchanged for the second year in a row, but remained far above pre-COVID-19-pandemic levels." In 2022, an estimated 2.4 billion people did not have access to adequate food. This is still 391 million more people than in 2019. Global hunger, measured by yet another metric – the prevalence of undernourishment – remained relatively unchanged from 2021 to 2022 but is, again, far above pre-COVID-19-pandemic levels, affecting around 9.2% of the world population in 2022 compared with 7.9% in 2019, according to the report.

Some good news is that stunting, another key metric, defined as the condition of being too short for one's age, among children under five years of age has declined steadily, from 204.2 million in 2000 to 148.1 million in 2022. Simultaneously, child wasting, caused by insufficient nutrient intake or absorption, declined from 54.1 million in 2000 to 45 million in 2022. In terms of children who are overweight or obese, the study indicated a non-significant increase from 5.3% (33 million) in 2000 to 5.6 % (37 million) in 2022.

The revised analysis presented in this year's report shows that almost 3.2 billion people worldwide could not afford a healthy diet in 2020, with a slight improvement in 2021. The cost of a healthy diet increased globally by 6.7% between 2019 and 2021. It also projects that almost 600 million people will be chronically undernourished in 2030.

What are the key drivers of food insecurity?

The report notes the following reasons as being responsible: slowing down, thanks to lockdowns, economic downturns, and other pandemic-related disruptions in 2020 that led to job losses and reduced incomes for many people; the Ukraine war; governmental policies that may not be entirely favourable; and increasing urbanisation that drives changes through the agrifood systems. The report's comparison of food insecurity among rural, peri-urban and urban populations reveals that global food insecurity is lower in urban areas.

What are the solutions ahead?

The report helps "identify vulnerable population groups, contributing to evidence to inform decision-making and effective action through the appropriate targeting and design of policies and programmes." As the authors record, sound nutrition is fundamental to the achievement of the Sustainable Development Goals and must be central in government policy and supported by civil society and the private sector. Some of its recommendations include supporting healthier food outlets as key for enabling access to healthy diets. Policy incentives are necessary to encourage shops to sell greater amounts of fresh and minimally processed foods. Another key input is on street foods, which an estimated 2.5 billion people worldwide consume every day, thanks to the convenience and cost factor. The report calls for addressing multiple infrastructure and regulatory gaps to improve nutritional safety and quality of street food.

The GRFC also suggests building rural infrastructure, including quality rural and feeder roads to connect remote farms and enterprises to main road networks. Other public investments to support linkages between (mainly small) farms and small and medium enterprises could include warehousing, cold storage, dependable electrification, access to digital tools and water supply.

It underlines several times the role of local governments as fundamental actors in leveraging multilevel and multi-stakeholder mechanisms that have proved effective in implementing essential policies for making healthy diets available and affordable for all.

HR&CE dept. to restore Chola-era temple in Budalur

B. Kolappan
CHENNAI

The Chola-era Abathsagayeswarar temple in Budalur, near Thirukkattupalli in Thanjavur district, is in a bad shape.

A dilapidated entrance and *mottai gopuram* (a bald tower) covered with vegetation alone remain as proof of the existence of the temple's outer wall, which might have collapsed a century ago. Remnants of the outer wall, covered with cow dung, can be found on one side. As the *sannidhi* of goddess Ambal is fully damaged, the idol was shifted to the main temple around 40 years ago. Only rubble remain where the *vasantha mandpam* (a temple structure) once stood. The temple and its vicinity wear a deserted look.

Now there is a ray of hope for the temple as the Hindu Religious and Charitable Endowments (HR&CE) Department has decided to renovate it. "It will be done at a cost of ₹40 lakh. A donor has come forward to repair the Ambal *sannidhi*. The work will be started in a month," said G. Sivajaran, an executive officer of the department.

In need of facelift: A dilapidated entrance and *mottai gopuram* covered with vegetation alone remain as proof of the existence of the temple's outer wall, which might have collapsed a century ago. SPECIAL ARRANGEMENT

The Department of Archaeology has already studied and submitted a report. The initiatives by the HR&CE Department and donors will give a new lease of life to the temple, but the funds are inadequate to restore the outer wall and the gopuram.

The importance of the temple is explained by inscriptions dating back to Parantaka Chola (907-953 CE) and it has been recorded in the Annual Report of the Indian Epigraphy, published in 1972-73. "Another inscription belongs to 15th and 16th regnal years of Raja Raja-I (985-1014 CE). There are two more inscriptions and one belongs to the period of Kulothunga III (1178-1218 CE) and another to the period of Pandya king Jatavarma Sundara Pandya (1250-1284)," said Vasanthi, former superintending archaeologist.

The inscriptions talk about sheep and lands being given as gifts for burning the lamp in the Bhadrakali temple in Budalur. "The temples would have existed long before the emergence of Cholas, who have converted it into a stone structure," said Ms. Vasanthi.

One-time puja

Though it had a glorious past, the temple has been reduced to a pathetic state and survives because of the oru-kaala puja (one-time puja) scheme of the HR&CE Department.

"The priest who used to perform the puja left for Chennai. Except on the days of *pradosham* (auspicious period), there will be hardly any visitors to the temple. I make it a point to perform pujas two times a day on most of the days. The deity and I subsist on the offerings made by the devotees even though temple owns land to generate adequate income," said A. Balasubramanian, the priest of the temple.

EVA STALIN IAS A

Invasive weed threatens elephant habitats in T.N.

An invasion of *Ludwigia peruviana*, an aquatic weed, has been suppressing edible forage for elephants, gaur and other herbivores, increasing the risk of man-wildlife conflict in Valparai

Wilson Thomas
COIMBATORE

An aquatic weed native to some countries in Central and South America, including Peru, is threatening elephant habitats and foraging areas in Valparai, a Tamil Nadu hill station close to the Kerala boundary, and reviving the risk of human-elephant conflicts in the region.

Ludwigia peruviana, which grows fast along waterbodies, has infested the majority of the hill station's swamps, locally known as *wayals*, where elephants used to find lush grass even in the summer. However, the Forest Department says that most of these swamps are located on private estates, which are responsible for the tricky process of removing the weed; if not done correctly, trying to pull it out will help it spread even more.

Seeking sustenance: Women plucking tea leaves as an elephant and a gaur graze in a swamp at Valparai. SPECIAL ARRANGEMENT

Suppressing forage

The rapid large-scale spread of the weed – which was probably introduced as an ornamental plant for its tiny yellow flowers – has shaken the balance of these perennial foraging grounds, limiting the growth of grass and native plants that are palatable to elephants and other animals including gaur.

T.R. Shankar Raman, wildlife scientist with the Nature Conservation Foundation (NCF) in Valparai, has been watching the weed's increasing spread over the past five years. "It mainly spreads along the swamps in the middle of the tea estates and forms thickets. These swamps are known for excellent grass covers, sedges and water sources that are very good for herbivores such as gaur and elephant in particular," he says. Even in the dry months, one could find some water in the valley and grasses and sedges all along the swamps, but the dense thickets of *Ludwigia* now suppress such edible forage. "Now as there is no forage, it is likely that they may come in closer contact with people," Mr. Raman says.

Pachyderm habitats

Located within the Annamalai Tiger Reserve, Valparai's mosaic landscape of tea estates and fragmented forest patches still serve as key habitats for the elephants. The hill station, which used to be a terrain known for human-elephant conflicts, has seen a difference due to the joint efforts of the Forest Department's rapid response team and NCF's early warning system. The last human death due to elephant attack on the plateau occurred more than two years ago.

The NCF, which has over two decades of experience in Valparai, has been flagging the *Ludwigia* invasion to the Forest Department and estate managements.

"Swamps are unique habitats that support amphibians and otters besides the large herbivores. They act as water storage areas that need to be preserved. If *Ludwigia* colonises, it completely chokes swamps and does not allow grasses to grow. The wildlife that had been depending on such swamps will move to other areas and it might lead to negative interactions," says Srinivasan Kasinathan, restoration ecologist and senior programme manager with NCF.

Though *Ludwigia* is among the 22 priority invasive plants in Tamil Nadu, the State's drive to remove exotic species from its forests is now largely focussed on *Lantana camara*, *Senna spectabilis* and *Acacia mearnsii* (wattle).

"The spread of *Ludwigia* has come to the Department's attention. Most of these swamps are located in private estates. Estate managements have an obligation to do conservation activities under the Tamil Nadu Preservation of Private Forests Act. The Department will give them appropriate directions," says S. Ramasubramanian, Conservator of Forests and chairperson for the District Level Implementation Committee for invasive species.

Mr. Raman says there is an urgent need to map all the swamps in Valparai, grading them as heavily invaded, invaded, getting invaded, or free of *Ludwigia*.

"Not all the swamps are invaded. Some swamps are heavily invaded and it is difficult to tackle them. There are some swamps where it is just coming in with just a few clumps. The focus should be on containing the spread by preventing invasion in swamps where smaller numbers are coming up," he adds.

In AI's unlimited potential, the benefits and the risks

When Artificial Intelligence radically transforms workplaces and institutions, how can productivity be evaluated and excellence of individuals and institutions be measured?

T. Pradeep

On July 28, 2022, Google's DeepMind released the structure of 200 million proteins, literally everything that exists. This is said to be the most important achievement of AI ever, namely a 'solution' to the protein-folding problem.

Proteins are composed of a linear chain of amino acids and their 3D structures determine their functions. Structure determination is laborious. One way to know the optimal folded structure of the protein computationally is to sample all its possible configurations, composed of specific angles between peptide bonds.

However, this is an impossible task as a typical protein may have about 10,300 configurations and even if a million of them were examined per second, the overall time needed will be unimaginable. That helped save about 1,000 million man-years.

DeepMind's AlphaFold made an important breakthrough in 2020. It accurately predicted the structures of about 100 proteins to atomic resolution, and no other solution came close to this feat. Many believe that the protein-folding problem is over.

Besides publishing the work in *Nature*, DeepMind also decided to place the research outcomes – source code, structures of unknown proteins – easily accessible so more discoveries can happen. Already, this has assisted the Drugs for Neglected Diseases initiative (DNDi) in addressing deadly Chagas disease and Leishmaniasis.

Since drug discovery has become faster due to AlphaFold, new drugs for rare diseases, which are of little commercial interest to pharma companies, have become possible.

Other benefits

In 2020, a robotic synthesiser read a research paper and made the compound described in it. With giant advances in computational science and 3D protein structures, discovery labs will shrink to 'AI synthesizers'.

Thousands of molecules or processes may be screened for specific functions rapidly. Robots will characterise them to 'discover' an optimised strategy, directed by non-human 'agents'. This could change chemistry.

The UNEP's World Environment Situation Room (WESR) collects and analyses, using AI, real-time sensor data from thousands of sensors spread over 140 countries to predict carbon dioxide concentration, glacier mass, sea level rise, biodiversity loss, etc.

Ultimately, we understand the health of the planet from a holistic perspective.

Large Language Models that built the likes of ChatGPT can create excellent text, music, and art. But they are not yet good at writing complicated chemical equations or new mathematical formulae to explain phenomena. When AI will eventually get there, when creativity is not exclusive to humans, the age of machines will appear.

New risks

For the scientific enterprise, in the era of 'discoveries' by 'agents' made of silicon, authorship may become meaningless. Those owning 'agents' may own knowledge.

Scientists warn that AI products must be used with caution. Tools such as ChatGPT can assist in literature search but cannot provide deep analysis and may miss profound insights central to articles.

Intrinsic biases of scientific enterprise can underrepresent minority views and could lose original thoughts, due to poor citations. Some journals have suggested authors to declare the use of AI tools in publications and have discouraged ChatGPT from being an author, with exceptions.

As compiling information and presenting them coherently by AI is easy, new paper factories may proliferate. Thankfully, such text can be identified by a new tool. AI-modified figures and images can produce a conundrum of 'data', making a nightmare for publishers.

However, AI can be an excellent aid in helping authors in better visualisation, effective communication and compiling known facts, if used judiciously.

AI helps in the democratisation of knowledge. But 'knowledge-to-things' transformation will need infrastructure and resources. Advanced medicine and cutting-edge science are unlikely to develop in resource-limited settings. This is known historically, but there is a significant difference now.

The AI-Chasm

Infrastructure enabling advanced science is increasingly sophisticated and the gap between the haves and have-nots is widening dramatically. Clearly, proliferation of AI could concentrate wealth, breeding inequality.

The 'AI being' can write music, poems, and manuscripts faster, and possibly, even better. This could create polymath 'beings'. It could radically transform workplaces and institutions. How would one evaluate productivity in the AI era? What could be the measure of excellence for individuals and institutions? The AI-divide will be far deeper than the digital-divide.

Act quickly

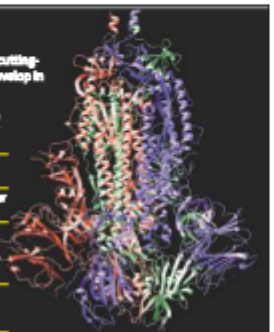
Governments at all levels must urgently assess the impact of AI on societies. They must form advisory groups and come up with AI and data-governance policy guidelines to direct institutions, industry, and society. Similar efforts must happen in each institution. An interdisciplinary environment is needed for responsible AI development. Surely, early movers will have a greater advantage.

(T. Pradeep is an Institute Professor at IIT Madras. pradeep@iitm.ac.in)

A game changer

While AI will help in democratising knowledge, cutting-edge science level applications are unlikely to develop in resource-limited settings

- The protein-folding problem may be over with the achievement of DeepMind's AlphaFold in accurately predicting the structures of proteins
- Drug discovery, especially for rare diseases, has become faster due to AlphaFold
- In 2020, a robotic synthesiser read a research paper and made the compound described in it
- UNEP's World Environment Situation Room (WESR) used AI to analyse real-time sensor data from sensors in over 140 countries to predict glacier mass, sea level rise etc
- AI-modified figures and images can become a nightmare for journals/publishers who are already struggling with image manipulation, duplication
- On the downside, AI can dramatically widen the gap between the haves and have-nots, and the proliferation of AI could further accentuate inequality



Humongous: On July 28, 2022, Google's DeepMind released the structure of 200 million proteins

Beneficiaries of pension schemes to get ₹1,200: Minister

The Hindu Bureau
CHENNAI

Beneficiaries of social security pension schemes implemented by various departments of the Tamil Nadu government will get ₹1,200 instead of ₹1,000 per month, said Finance Minister Thangam Thennarasu.

Explaining a decision taken in the Cabinet meeting chaired by Chief Minister M. K. Stalin, he said it would cost an additional amount of ₹845.01 crore per year. He said the increase will come into effect immediately and beneficiaries will get the amount from August.

Mr. Thennarasu said over 30.55 lakh beneficiaries including the elderly, widows, refugees, members of various unorganised workers welfare boards, and women who remain unmarried even after the age of 50, were getting pension and 74 lakh people have applied to the government seeking assistance.

"The Cabinet has decided to release pension to all eligible candidates. It will cost an additional ₹845.01 crore to cover the new can-

Thangam Thennarasu

The Minister said the monthly pension to the differently abled had already been increased to ₹1,500 from ₹1,000.

Centre's contribution

Asked about the Centre's contribution to the pension schemes, Finance Secretary T. Udayachandran said the Centre's share was ₹300 for pensioners over the age of 80 and ₹200 for others. The rest comes from the State government.

When reminded of the promise in the DMK's manifesto that old-age pension would be increased to ₹1,500, Mr. Thennarasu said it would be gradually done.

Students to learn about drones and AI under 'Naan Mudhalvan' scheme

Sangeetha Kandavel
CHENNAI

The Tamil Nadu Skill Development Corporation (TNSDC) will be rolling out courses on drones, 5G and ChatGPT for government college students across Tamil Nadu under the 'Naan Mudhalvan' scheme.

"For the following semester, around 4,767 students have already enrolled for ChatGPT, while 3,600 have opted for drone testing and design sessions," J. Innocent Divya, Managing Director of TNSDC told *The Hindu*.

GUVI, an IIT-M and IIM-A incubated Ed-tech company will be handling the ChatGPT course, while Vaayusastra Aerospace, incubated under IIT-M Incubation Cell and IIT-M Rural Technology Business Incubator, will teach students about basics of drone, aerodynamics, design, calibration, simulation, assembly and flying.


Vaayusastra Aerospace will teach students about basics of drones, aerodynamics, design, calibration, and flying. FILE PHOTO

Ms. Divya said the focus would be on strengthening infrastructure and connectivity (referring to mobile/Internet) in rural pockets to provide hassle-free education. "We will work with TANFINET (Tamil Nadu FibreNet Corporation Limited) and the Information Technology Department for this," she added. During May and June 2023, the TNSDC conducted around 56 job fairs across Tamil Nadu, where 26,200 students were offered jobs with various firms. Of these, 21,000 were from arts and science streams, while the rest were from engineering courses. Students from arts and science streams were placed in sectors such as banking, financial services and insurance, logistics, IT-enabled services, sales and marketing. "We want to start early hiring and we intend to start from September 2023," she said.

She further said that over 15,000 students from government and government-aided schools in Tamil Nadu who cleared their Class XII exams this year and were planning to discontinue further studies have been counselled, and have now opted for arts and science, engineering, industrial training institutes and other courses.

EVA STALIN