

CLIMATE CHANGE AND INDIA: WHY WE MUST LOOK AT THE PROBLEM THROUGH OUR LENS

13

CHAPTER

Addressing anthropogenic climate change has emerged as the top global priority, with multilateral bodies, experts, and the media calling for nations worldwide to do their part in mitigating a ‘climate catastrophe’ before it’s too late. India, having partaken in the collective effort, has made major strides over the last decade, yet continues to be labelled as one of the largest polluters in the world and is frequently chastised for not doing enough. However, the criticisms of the Indian approach fail to recognise two critical points. One, India is faced with balancing economic development along with meaningful climate action akin to its developing peers, and second, the proposed solutions to climate change, which serve as the basis for criticising India, ignore how sustainable living is built into the Indian lifestyle.

Rooted in the principles of sustenance, India’s ethos emphasises a harmonious relationship with nature, which is in sharp contrast to the overconsumption prevalent in other parts of the developed world. Solutions to address climate change are based on the principles of a market society, which seeks to substitute the means to achieve overconsumption rather than addressing overconsumption itself. Such an approach thus gives importance to the label under which their lifestyle can continue instead of bringing about a change in their lifestyle.

Over the years, this has produced a slew of policies that have unintended consequences for the planet, resulting in little or no reduction in carbon emissions. If India, with its large population, chooses to go down this path, the climate consequences for the country and the world will be hugely negative. Therefore, India needs to follow its own path and look at the problem through its own lens if the nation is to empower its citizens through economic development while simultaneously addressing the issue of climate change.

These considerations served as the foundation for Mission LiFE, a unique initiative announced by the Hon’ble Prime Minister at the 2021 UN Climate Change Conference. Mission LiFE seeks to bring individual responsibility to the forefront of the fight against climate change. Deriving its principles from ancient Indian philosophy, the tenets of this approach are based on making pro-planet choices without compromising on quality of life. It is about making deliberate choices in the present while remaining conscious of the generations to come. Mission LiFE seeks to address the ‘wants’ of the people without letting them hurt Nature.

INTRODUCTION

*Mata Bhumi Putroham Prithivyah
Earth is my mother and I am her son*

13.1. Sustenance is at the core of Indian ethos. This principle underlies our relationship with Nature, with other people, with materiality, and within ourselves. Recognising and buttressing such ethos is important in today's world since India now comes face to face with it in a shiny new wrapper and a limited scope, ironically mandated from the part of the world that has otherwise relied on overconsumption as a pathway to growth. As the clamour for sustainability resonates across the world, India finds itself surprised at the crossroads of having to address economically, what it has always believed and practised philosophically.

13.2. As the world's most populous country, currently globally the 5th largest economy, India is headed to become the 3rd largest by 2030. Naturally, this means that our energy needs are expected to grow - about 1.5 times faster than the global average in the next 30 years¹. Instead of appreciating the task at hand and the achievements already made by the country (Box 1), India is being called one of the largest polluters², and hectored to do more even as a significant portion of the world does less.

Box XIII.1: India's achievements against targets for climate change

- Successfully reduced the emission intensity vis-à-vis its GDP by 33% between 2005 and 2019, thus achieving the initial NDC target for 2030, 11 years ahead of scheduled time.
- Also achieved 40% of electric installed capacity through non-fossil fuel sources, nine years ahead of the target for 2030. Between 2017 and 2023, India has added around 100 GW of installed electric capacity, of which around 80% is attributed to non-fossil fuel-based resources.
- India's contribution to climate action is significant through its international efforts - International Solar Alliance (ISA), Coalition for Disaster Resilient Infrastructure (CDRI), creation of LeadIT, Infrastructure for Resilient Island States (IRIS), and Big Cat Alliance.

13.3. With Climate Change as the new North Star for the world, it is now well-established that 196 countries must meet their individual commitments under 'Nationally Determined Contributions' towards reducing carbon emissions '*to limit the global temperature increase to 1.5 degrees Celsius above pre-industrial levels*'³. Since globally all efforts hover on channelling precious resources towards attaining this artificial golden mean, with little clear idea of what happens if it doesn't, it naturally begets the question - 'Is the strategy adopted, both optimum and in everyone's interest?'

13.4. This essay purports to examine this peculiar situation under three sections - assessment of global pathways to achieve climate change goals, inherent dissonance in the global strategy,

¹ IEA

² Why India is key to heading off climate catastrophe, Yale Climate Connections, May 2024 (<https://tinyurl.com/yfvahws>)

³ The Paris Agreement, adopted by 196 parties at the United Nations Climate Change Conference (COP21), December 2015

and the need for a complementary but more sustainable strategy centred on key tenets of existence (Mission LiFE).

CLIMATE CHANGE AND THE GLOBAL APPROACH

13.5. As the literature goes, greenhouse gas (GHG) emissions, particularly carbon dioxide (CO₂), primarily contribute to adverse climate change. The Intergovernmental Panel on Climate Change (IPCC)⁴ paints a dire picture - emissions pose a serious threat since CO₂, once released into the atmosphere, can hang for 300 to 1000 years⁵, causing global warming and environmental destruction such as the melting of polar ice caps.

13.6. To achieve the stated objectives, the world has adopted a strategy that comprises a set of pathways, popularly called ‘climate adaptation’ and ‘climate mitigation’. Most of this includes shifting to energy sources other than fossil fuels, enhancing energy efficiency through innovative and environment-friendly design, adopting regenerative and environmentally sensitive agricultural practices, as well as protecting and restoring the natural ecosystems (See Box XIII.2).

Box XIII.2: WEO-2023 proposes a global strategy for getting the world on track by 2030

The Five Key Pillars to this proposal include:

- Tripling global Renewable Energy Capacity.
- Doubling the rate of Energy Efficiency improvements.
- Slashing methane emissions from fossil fuel operations by 75 per cent.
- Innovative, large-scale financing mechanisms to triple clean energy investments in emerging and developing economies.
- Measures to ensure an orderly decline in the use of fossil fuels, including an end to new approvals of unabated coal-fired power plants.

WHY IS THE CURRENT APPROACH FLAWED?

13.7. To inform the design of emission-limiting pathways, IPCC has quantified the remaining carbon space available as the “carbon budget.” As per their estimates, from the beginning of 2020, the world has approximately 500 GtCO₂ left for a target of 1.5°C and 1150 GtCO₂ for a target of 2°C (with a likelihood of 50% and 67%, respectively). With each passing year, the budget gets smaller, and the time available to act slips away. Nations are then expected to commit to “*accelerated and equitable mitigation pathways*” while walking the tightrope of developmental demands. The alarmism sounds quite dreadful, with the IPCC stating, “*there is a rapidly closing window of opportunity to secure a liveable and sustainable future for*

4 The Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) states, “Human-caused climate change is already affecting many weather and climate extremes. This has led to widespread adverse impacts on food and water security, human health and on economies and society”. The half-life of CO₂ and a stock of the damage already caused has thus given rise to a need for collective action if we are to limit temperature rises and the consequent environmental damage.

5 The Atmosphere: Getting a Handle on Carbon Dioxide, Alan Buis, NASA’s Jet Propulsion Laboratory, October 2019 (<https://tinyurl.com/4hjfxzev>)

all”. Such forebodings notwithstanding, the purported climate solution has some fundamental issues.

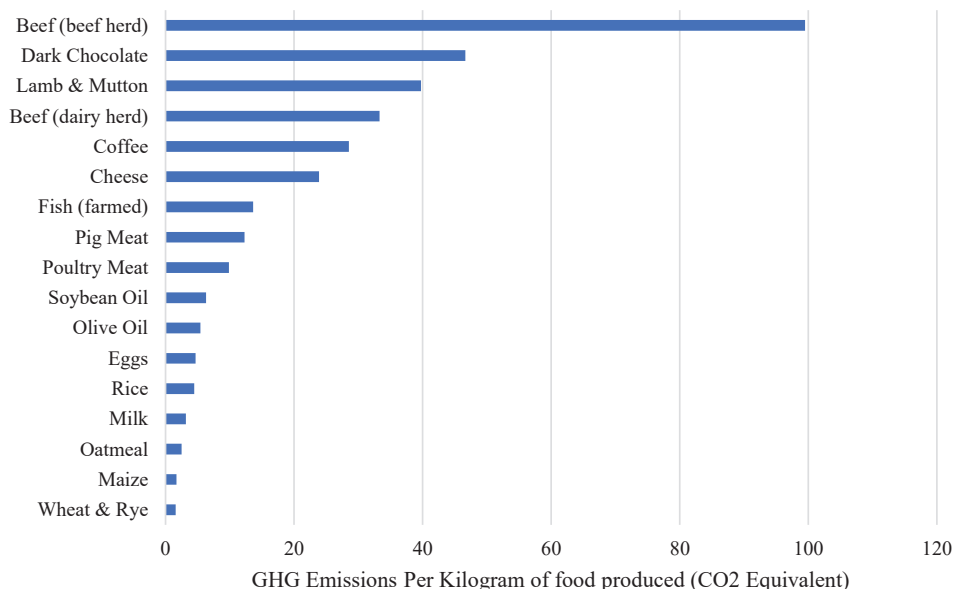
Little principled understanding of laws of Life

13.8. Life exists only in the form as we know it today. Hence, any strategy that aims to confuse man-made actions as entire solutions by themselves is extremely short-sighted in nature. Ultimately, we cannot ignore the reality that we come from nature, and the systems required for life must necessarily be linked to the organic flow of nature and life. No artificial mechanism is a workable system in its entirety because as much as we can ingeniously tinker with manufacturing processes, two simple principles stand paramount- 1) Humans cannot create a new element, cannot change any law of nature, and cannot synthesise a process that doesn't take or release to the environment. 2) Fundamentals of existence remain the same eternally. This means humans will continue to want oxygen, water, and food in the form we know it. Yet, we continue to disrupt the same for both us and other species. That's why the adopted strategy for addressing climate change suffers from foundational issues.

13.9. Climate change strategies continue to be prescriptive in the acceptable mandates for geographically, economically, and climatically different countries. Without cross-learning, many natural ideas relevant to sustainable development, such as consumption patterns, lifestyles, plant vs meat-based diet, etc., are not factored in.

13.10. Globally, Power and Transport industries have the maximum contribution to GHG emissions, followed by Industrial combustion, Agriculture, and Waste industries. Of the latter, Beef production has the highest emissions per kilogram of food product as seen in Tab XIII.1. Despite this, there is not even a call for change, let alone a mandate.

Chart XIII.1: Greenhouse gas emissions across the supply chain for various food products (2018)



Source: Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992.– processed by Our World in Data (<https://tinyurl.com/3xja4ajs>)

13.11. The entire developed world uses toilet paper made of ‘virgin wood’ for the most regular body activity, every single day, multiple times over. One of the best global sustainability blogs ‘TreeHugger’ states that ‘Making one single roll of toilet paper uses 1.5 pounds of wood⁶, 37 gallons of water and 1.3 kWh of electricity. Many Asian countries provide valuable lessons around these, yet their non-capitalist strategies often remain excluded from mainstream discussions because Behavioural and Lifestyle Change seems to be more difficult than Climate Change.

13.12. Man, and Nature (gross forms of Purush and Prakriti in the Samkhya Tradition) are indestructible entities that interact to provide meaning to consciousness in the form of reality as we know it. Hence, any strategy that aims to alter things far beyond the comprehension or control of man, such as ensuring that the planet’s temperature doesn’t cross 2 degrees Celsius, must travel the journey inwards and not outwards.

Ignores the interconnected nature of existence

13.13. Climate is nature’s reality so inherently interconnected in ways that science hasn’t even discovered its nuances. Surprisingly, our accepted pathways seem to ignore this unmissable reality to focus on siloed solutions, unintegrated with natural value chains. A case in point is the substitution of energy – to renewables from fossil fuels.

13.14. There is hardly any inequivalence foundationally between extracting earth for one resource over another. Solar panels may generate renewable energy, but solar batteries are formed of materials extracted from the earth’s crust⁷, particularly Lithium, Cobalt, Nickel, and some rare earth minerals⁸. According to some estimates⁹, this not only leaves ‘large scars in the landscape’ but requires substantial water, releasing about 15 tonnes of CO₂ per tonne of mineral¹⁰. Bringing the extracted ore to usable forms requires heat between 800-1000 degrees Celsius¹¹, temperatures that can, ironically, be cost-effectively brought out by only burning fossil fuels (Chart XIII.2).

13.15. Cobalt and Copper, used extensively in Li-ion batteries, electric vehicles, and mobile phones, have a raging sustainability crisis at the heart of their extraction. About four-fifths of the world’s cobalt supply is buried deep within a single country that is also one of the world’s poorest – the Democratic Republic of Congo (hereafter referred to as Congo). About 80% of the country’s cobalt production is controlled by Chinese companies who refine in China, and subsequently sell to battery manufacturers globally. Siddharth Kara, a fellow at Harvard’s T.H Chan School of Public Health, states in his book ‘Cobalt Red’ that much of Congo’s Cobalt extraction is done by “artisanal miners” – a new-age euphemistic term for freelance workers

6 Stop Using Toiler Paper; Get the Blue Bidet, Treehugger, October 2018 (<https://tinyurl.com/3rmjz8kn>)

7 Most of the minerals extracted are from hard rock mines or underground brine reservoirs through a process that requires energy generated from CO₂-emitting fossil fuels.

8 Some of the magnets used in their production comprise rare earth minerals like neodymium-iron-boron (NdFeB) and samarium cobalt (SmCo). They are not ‘rare’ in the actual sense of the word but abundant in the earth’s crust. However, since they occur in relatively low concentrations in the ores compared to other normally extractable metals, they pose significant difficulty in mining and refining, which again does huge damage to the environment.

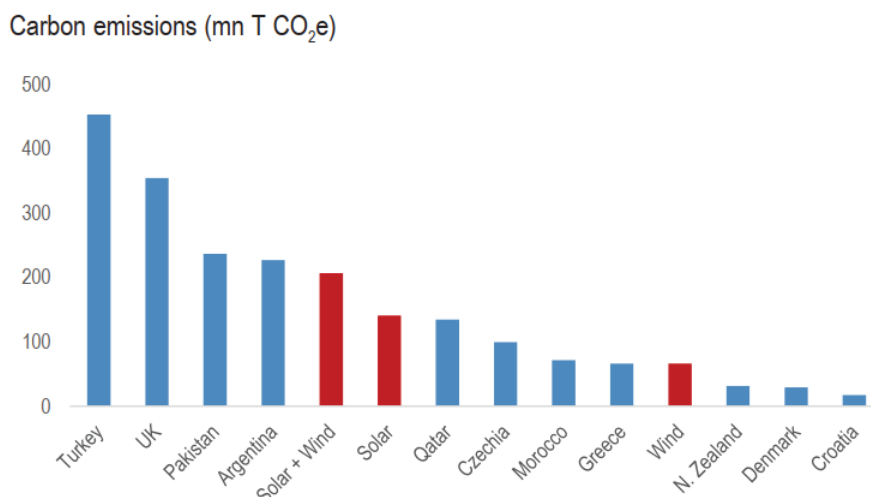
9 The new ‘gold rush’ for green lithium, BBC, November 2020 (<https://tinyurl.com/mrjsuw9w>).

10 Analysis by raw materials experts Minviro for the lithium and geothermal energy firm Vulcan Energy Resources.

11 How much CO₂ is emitted by manufacturing batteries?, MIT Climate Portal, March 2022 (<https://tinyurl.com/pvbxkx44>).

who work in dangerous mines for the equivalent of few dollars a day¹². It is sad and ironical that all of this is done in the name of sustainable electric vehicles, which may contain up to 3.5 times as much copper as a gas powered cars¹³.

Chart XIII.2: Energy Intensity of Transition



Source: J.P. Morgan Global Energy Strategy: The Energy Transition (April 2024), Figure 8: Energy Intensity of transition, Page 6

13.16. The generative value chain of ‘clean energy’ products such as solar panels and windmills, stretching from mining to manufacturing to transportation to use to the last stage of disposal, has similar emission effects as other fuels would, depending on material and distances travelled. Additionally, it consists of the disruption of existing supply chains made over decades and creating new pathways involving monumental environmental externalities such as emissions during extraction, transportation, the establishment of new factories involving new land, machinery production, and ancillary development, transportation of mobile renewable units to individual consumers, rendering existing infrastructure and pathways redundant.

13.17. For example – switching to EVs requires uprooting the existing network of petrol pumps and creating a new network of charging stations involving all of the above. Unfortunately, all of these “hidden costs” – both from a monetary, and an environmental perspective are not accounted for in the lifecycle costs when advocating for the displacement of fossil fuels with renewable options. Their greatest ‘climate-friendly’ emission control rests only in end-user emissions, which makes the comparison of climate costs across the options incomparable.

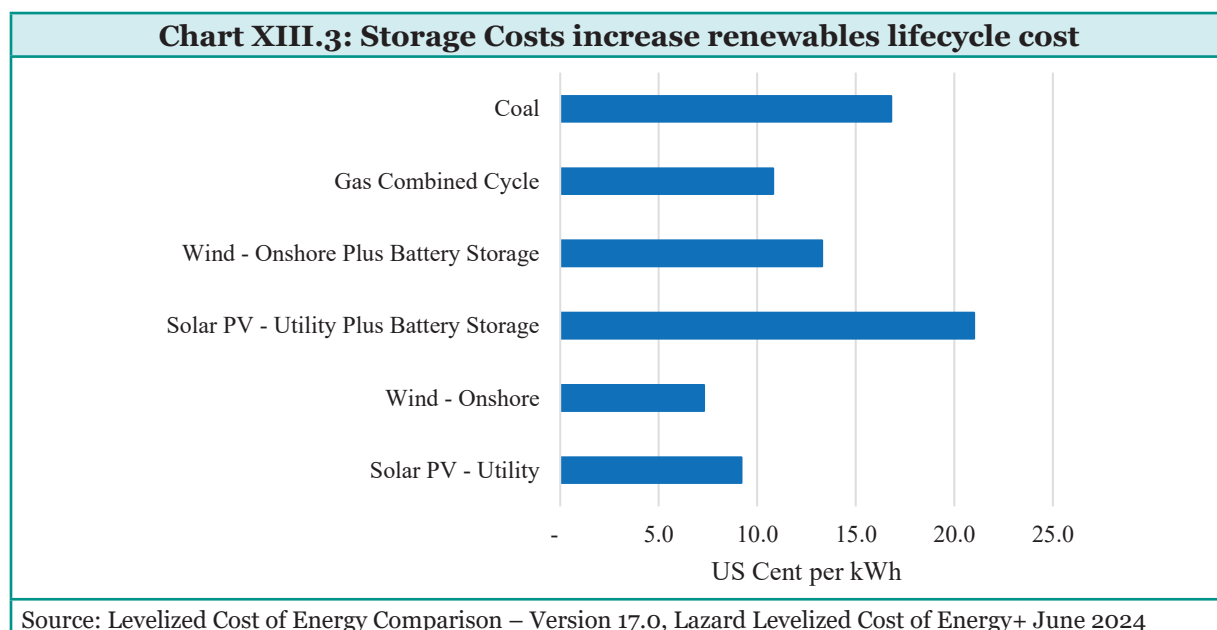
13.18. There is not enough research on how much the end-to-end lifecycle costs. Land is finite, but demand is not. Solar can need 300 times as much space as nuclear, and biomass more than 8,000 times¹⁴. At the same time, wind turbine blades and solar panels have to be replaced every couple of decades, resulting in potentially enormous waste problems. Apart from space and

¹² How ‘modern-day slavery’ in the Congo powers the rechargeable battery economy, NPR, February 2023 (<https://tinyurl.com/28nuum3e>).

¹³ In Congo’s Cobalt Mines, Nicolas Niarchos, The New York Review, December 2023 (<https://tinyurl.com/tfphf988>).

¹⁴ Climate action: Our energy transition need not follow preset pathways, V. Anantha Nageswaran & Bjorn Lomborg, 21st February 2024 (<https://tinyurl.com/5bv5272t>)

waste issues, the main challenge preventing swift transition is that solar and wind power are only cheaper than fossil fuels when the sun shines and the wind blows. Industrialisation and development require power and energy 24/7. Even factoring in four hours of storage makes solar and wind go from the cheapest power available to much more expensive than gas and coal power (Chart XIII.3).



13.19. Moreover, to provide firmly reliable power, studies¹⁵ show that a 100% solar and wind system would need a large storage capacity, which is impossibly expensive. Overall, there are critical sustainability issues connected to the production of wind turbines, solar photovoltaic modules, electric vehicles, and lithium-ion batteries, such as the use of conflict minerals, toxicity, limited availability or supply chain governance issues of rare earth elements, cobalt & lithium¹⁶. What the strategy excludes is indeed as noteworthy as what it includes.

Insufficient for the ordained purpose

13.20. In normal parlance, energy and power are often used interchangeably. However, their difference is another factor that makes climate change strategy a difficult one to follow. Matthew L Wald, an independent energy analyst, says in ‘The Myth of Solar Power’:

“In November 2022, France passed a law requiring that all parking lots with 80 spaces or more install roofs with solar panels to cover at least half the spaces. According to estimates, the initiative will result in 11 GW of power—an amount, Grist gleefully reported, that would be enough to power 8 million homes. In fact, it’s enough to power zero homes.

If you have a small rooftop solar panel that can generate 50 watts of power, it wouldn’t matter how long the generator runs for or how much energy it produces and stores—on a

¹⁵ Fekete, B. M., Bacskó, M., Zhang, J., & Chen, M. (2023). Storage requirements to mitigate intermittent renewable energy sources: analysis for the US Northeast. *Frontiers in Environmental Science*, 11, 1076830.

¹⁶ Huber, S. T., & Steininger, K. W. (2022). Critical sustainability issues in the production of wind and solar electricity generation as well as storage facilities and possible solutions. *Journal of Cleaner Production*.

very sunny day in Arizona in the summer, for example, it might be able to produce 300 watt-hours, or 0.3 kilowatt-hours, over a 24-hour period—at any given moment, it would only be able to power two of the lightbulbs.”

13.21. Vaclav Smil goes so far as to say in a 48-page report¹⁷ published by Fraser Institute, “Net Zero Carbon is a highly unlikely outcome”.

“In terms of final energy uses and specific energy converters, the unfolding transition would have to replace more than 4 terawatts (TW) of electricity-generating capacity now installed in large coal- and gas-fired stations by converting to non-carbon sources; to substitute nearly 1.5 billion combustion (gasoline and diesel) engines in road and off-road vehicles; to convert all agricultural and crop processing machinery (including about 50 million tractors and more than 100 million irrigation pumps); to find new sources of heat, hot air, and hot water used in a wide variety of industrial processes (from iron smelting and cement and glass making to chemical syntheses and food preservation) that now consume close to 30 percent of all final uses of fossil fuels; to replace more than half a billion natural gas furnaces now heating houses and industrial, institutional, and commercial places with heat pumps or other sources of heat; and to find new ways to power nearly 120,000 merchant fleet vessels (bulk carriers of ores, cement, fertilizers, wood and grain, and container ships, the largest one with capacities of some 24,000 units, now running mostly on heavy fuel oil and diesel fuel) and nearly 25,000 active jetliners that form the foundation of global long-distance transportation (fuelled by kerosene)... On the face of it, and even without performing any informed technical and economic analyses, this seems to be an impossible task given that:

- *We have only a single generation (about 25 years) to do it;*
- *We have not even reached the peak of global consumption of fossil fuels;*
- *The peak will not be followed by precipitous declines;*
- *We still have not deployed any zero-carbon large-scale commercial processes to produce essential materials;*
- *The electrification has, at the end of 2022, converted only about 2 per cent of passenger vehicles (more than 40 million) to different varieties of battery-powered cars, and that decarbonisation is yet to affect heavy road transport, shipping, and flying.*

Earth has enough for needs but not for greed

13.22. The current Climate Change strategy seems to say that given that our energy needs will continue to rise, we must try replacing conventional fuel with renewables and clean energy – thus making it a substitution issue rather than a global lifestyle issue. This replacement must be done only in the way we know – through swapping of one preferred industry to another, through the creation of new transportation and supply lines in place of existing ones, to penalising the low-emitters with disproportionately higher payments.

13.23. What this strategy doesn't do is attack the root of the problem – overconsumption, which is starker among developed countries. Moreover, do each of us really need multiple screens, even if they are charged by renewable energy sources, or must everyone fly off to

¹⁷ Halfway Between Kyoto and 2050: Net Zero Carbon is a Highly Unlikely Outcome, Fraser Institute, May 2024.

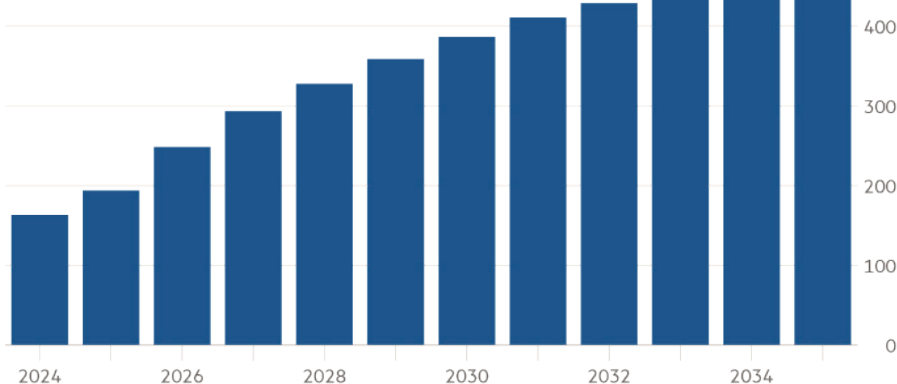
a fancy destination in fancy planes for a great conversation on reducing climate impact, or that we must eat for taste what we shouldn't eat for health or environment. As Derek Bower says in FT¹⁸, *“If we want oil companies to stop selling fossil fuels, we should consume less of them and we should vote for governments that make them more expensive, not less. Yes, our physical infrastructure has been built over decades around petroleum use. Yes, oil companies have lobbied forever to preserve this arrangement and slow down alternatives. But no one is compelling those of us in the rich world to fly so much, drive Escalades, devour so much meat, or buy so much stuff.”*

13.24. It doesn't encourage a genuine cathartic approach to nature but instead focuses on creating another industry out of sustainability – instead of imbibing sustainable practices in the way we live, we worry more about carrying PETA labels on our bags. The fact of the matter is organisations, people, and countries are less bothered about ensuring virtuosity in the process of production than about getting a “Fair Trade” global label in the fear of being shut out of premium places. This exclusive club does not question the drive towards overconsumption – more energy, more video entertainment, more houses, more transportation but questions the labels under which this happens. That is the hypocrisy in-built under the modern climate change strategy.

Global pursuit of energy-guzzling technologies

13.25. On the one hand, developing nations are forcefully nudged to sign up for climate commitments that they are not ready for. On the other hand, the developed world is in a mad ‘Scramble for Africa’ kind of rush to usher in the latest and the most expansive AI (Artificial Intelligence) ecosystem. The fact is that AI is an energy guzzler. Even as the data centres are ramping up energy demand, cloud storage facilities, crypto mining, and AI are all expected to increase this exponentially (Chart XIII.4).

Chart XIII.4: Power Demand from data centres and other large loads (in Tera-watt hours)*



Source: Financial Times (<https://tinyurl.com/4teb29ck>); S&P Global Commodity Insights

*Includes cryptocurrency mining and manufacturing facilities and electrification of oil and gas operations

¹⁸ The Energy Transition will be volatile, Financial Times, accessed on 25th June 2024 (<https://tinyurl.com/52syuz7j>).

13.26. As per a broad estimate by the International Energy Agency, a single Chat-GPT search consumes 10 times more energy than a similar query on Google. One large data centre in Iowa owned by Meta is estimated to burn just in one year, the equivalent of 7 million laptops working 8 hours a day¹⁹. FT reports that power demand from data centres globally could reach up to 1,000 TWh by 2026 (Chart XIII.4). To put this figure in perspective - Germany's and France's net power demand today is roughly around 500 TWh each respectively²⁰. Elon Musk, most famously said recently at Bosch Connected World Conference, *"I've never seen any technology advance faster than this. The chip shortage may be behind us, but AI and EVs are expanding at such a rapacious rate that the world will face supply crunches in electricity and transformers next year"*. By 2034, global energy consumption by data centres is expected to top 1,580 TWh, about as much as is used by all of India²¹.

13.27. This electricity demand is rising more exponentially than green energy production can keep pace with. Already, there seems to be a movement to push away green commitments and delay retiring of some coal-fired plants – in the Salt Lake City region, a coal plant retirement has been pushed back by a decade to 2042 and another delayed to 2036. While there are talks by tech leaders of attempting nuclear fusion startups to power the tech's *Bakasur*²² -like hunger, practically, it seems to be much farther away in the future, given that the solution is not yet viable.

13.28. The incompatibility of the two major movements of AI and Green energy being pushed by the West is not unseen by the global world. It seems like little thought has been put into the inevitable discordance in the chosen economic and sustainable strategies.

Pretends to be data-driven but is shy of per-person data

13.29. It is said that India is the 3rd largest emitter after the US and China and, therefore, is repeatedly asked to accept a greater share of responsibility. What is constantly de-emphasised is that since the period of the first settlement of societies, western nations with a forward position on the industrial revolution indulged in fossil-fuelled development with reckless abandon that led to the position the world is in today. Despite advocacy by developing nations on this, a sanitised reference to 'historical emissions' is submerged deep within abstruse literature and is met with a casual indifference towards its real role and impact on the emerging countries' climate targets. Even copious amounts of data inundation cannot change a basic fact: energy is a per-capita phenomenon. To put it simply:

*Energy Consumption (at time T) = Energy consumed by 1 person (E1) * Number of people (N) + Energy consumed by common activities required for N (EN)*

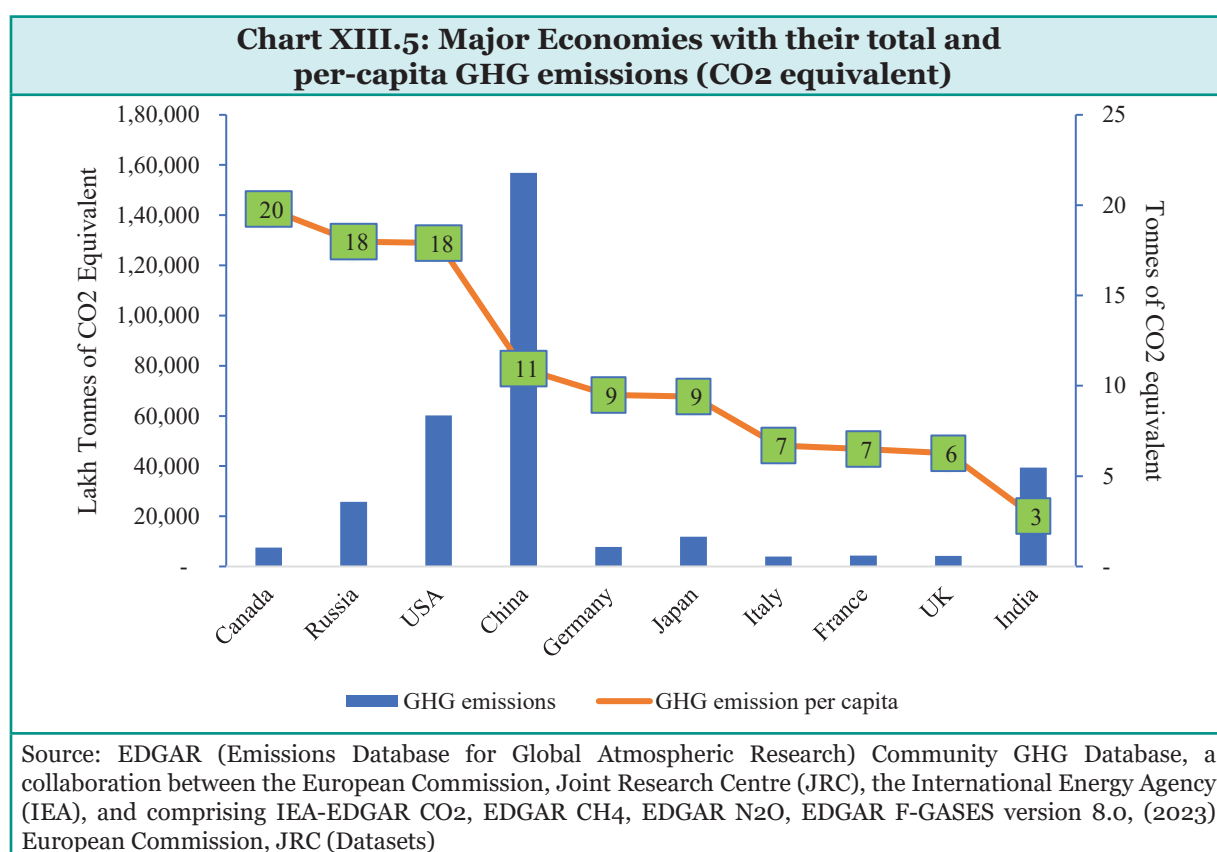
19 AI is exhausting the power grid. Tech firms are seeking a miracle solution, The Washington Post, June 2024.

20 Statistisches Bundesamt Gross Electricity Production in Germany and RTE France Electricity Analysis and Data, Accessed on 8th July, 2024.

21 AI is already wreaking havoc on global power systems, Bloomberg, June 2024 (<https://tinyurl.com/56494s6a>).

22 Bakasur is a figure from Indian Mythology, symbolizing limitless hunger and greed. The demon would force the king of the city to send him an unending supply of food every day, which he promptly devoured along with the people who delivered it to him.

13.30. Because all modern policy-making starts from baseline assessment, it is essential that the climate target for each country is proportional to its economic status. On the contrary, it is observed that the top 10% of the per-capita emitters averaged 22 tonnes of CO₂ in 2021, which is over 200 times what the bottom 10% emits²³. 85% of the current largest emitters live in advanced economies like the US, Europe, and China, and the bottom 10% of emitters live in developing countries of Africa and South Asia where even access to electricity is a challenge²⁴. Illustrating this stark difference in per-capita consumption and emissions, the Economist highlights that the average African consumes 185 kilowatt-hours (kWh) a year while Europe and the United States consume 6500 kWh and 12700 kWh, respectively²⁵. On the contrary, India's historical cumulative emissions and per capita emissions are very low despite being home to more than 17% of the global population – contributing only about 4% of the global cumulative greenhouse gas emissions between 1850 and 2019 (Chart XIII.5).



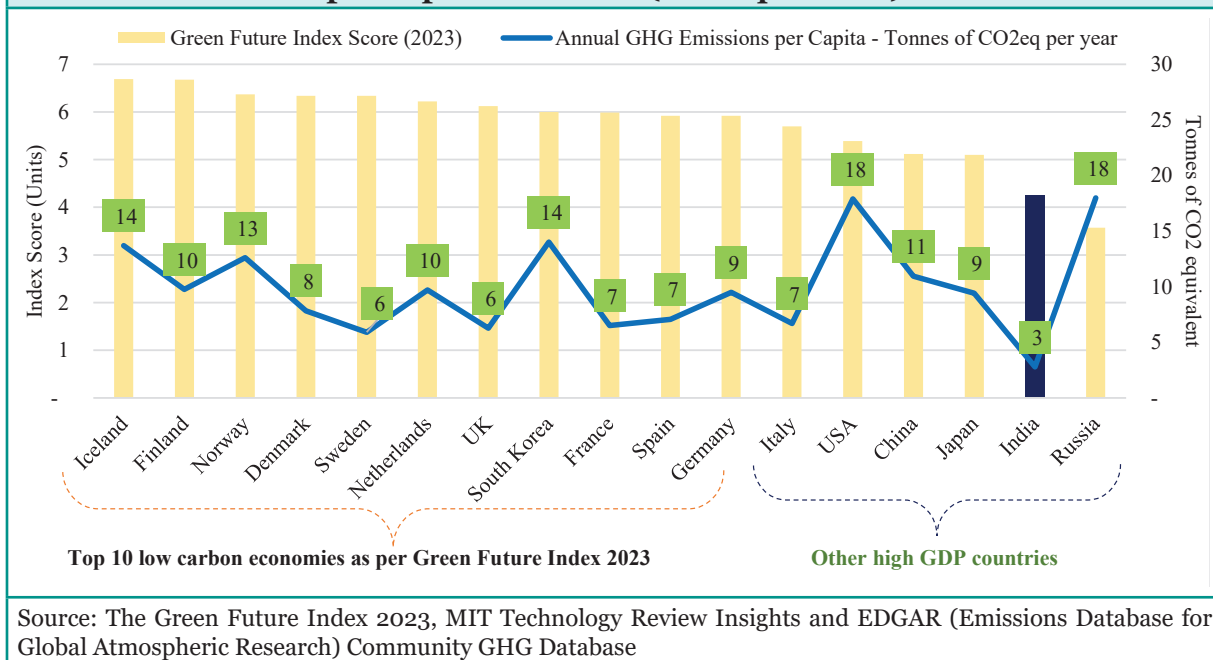
13.31. In this wonderland, Alice would have remarked, '*Curiouser and Curiouser*' – for even though global comparison of countries uses data such as per-capita income or per-capita consumption, the same is not followed while assessing energy emissions, even when it is directly dependent on per-person use. Countries assumed to be 'greener' by various international indices turn a dark shade of brown when the filter of per capita is applied.

²³ The world's top 1% of emitters produce over 1000 times more CO₂ than the bottom 1%, IEA, February 2023 (<https://tinyurl.com/bdtf4tda>)

²⁴ IEA estimates state that as of 2022, approximately 774 million people lacked access to electricity, with more than 80 per cent of them living in Sub-Saharan Africa; Data & Statistics – IEA (<https://tinyurl.com/4atwv4d2>).

²⁵ Africa will remain poor unless it uses more energy, Published in The Economist (<https://tinyurl.com/yzpkzecm>).

Chart XIII.6: Low-Carbon Economies and their per-capita emissions (CO₂ equivalent)



13.32. Comparatively, India's per capita emissions have consistently remained low between 2.5 and 2.8 Tons CO₂eq/ year, despite substantial economic growth over the last decade. Per capita emissions of EU27 nations (8 Tons CO₂eq/ year)²⁶ were almost 3 times that of India. Even in the three scenarios for demand estimation employed by World Energy Outlook 2023, it was reported that the '*per-capita energy demand of emerging countries remains well below that of developed countries, even by 2030*'²⁷. A point that casually falls through the crevices in the discussions around climate change.

13.33. With such extreme disparities and large and persistent inequalities in historical and current global energy consumption, the targets and strategies for the attainment of zero emissions should not be dictated or mandated. It is important for countries to take ownership of the climate problem and work through a collaborative approach for meaningful climate action, unencumbered by external pressure or excessive criticism.

Historical Blindspot and a surprising lack of Guilt

13.34. Globally, there seems to be a tendency to overburden oneself with the need to set right today, the wrongs of the past. This is also complemented by a moralistic angle taken by the developed world on governance and policy towards countries with different understandings, including sustainability. However, in the case of climate change, where the data is as clear as

²⁶ Emissions Database for Global Atmospheric Research, GHG Emissions of all world countries 2023 Report

²⁷ "Global energy demand per capita is around 80 gigajoules (GJ) today, a level that has remained broadly stable over the last decade (Figure 3.3). It remains stable in the STEPS (Stated Policies Scenario) to 2030, but it declines by 7% in the APS (Announced Pledges Scenario) and by 15% in the NZE (Net Zero Emissions) Scenario. In advanced economies, per capita demand declines in all scenarios to 2030. In emerging market and developing economies, it continues to rise in the STEPS as economic growth drives an increase in energy services demand." IEA World Energy Outlook 2023, Figure 3.3: Energy intensity and energy per capita in selected regions in the Stated Policies and Announced Pledges scenarios, 2022 and 2030.

chalk and cheese, the origin of the problem and the actual privilege enjoyed for a large number of decades (exploiting resources with a gay abandon to achieve economic progress) are also ignored. As Alice says in her Wonderland²⁸, “*But that's just the trouble with me. I give myself very good advice, but I very seldom follow it.*”

13.35. A significant disparity in energy access and carbon footprints can be observed among developed and developing countries. While developed nations have built their infrastructure at a leisurely, uninterrupted pace, many countries in Africa and South Asia are still striving to achieve regular electricity supply in urban areas. About 55 per cent of the population in least-developed countries still lack access to electricity²⁹. Research alludes that high-income countries use 6 times more resources and generate 10 times larger climate impacts than low-income countries.³⁰ This disparity makes it unfair to have a single deadline for zero emissions across countries.

13.36. Low- and middle-income countries face triple threats in terms of increasing energy demand, unaffordable costs of clean technologies, and a deep dependence on fossil fuels. This calls for a genuine recognition by developed nations of their historical contribution to environmental degradation and transfer of resources, technology, as well as technical capacity to developing countries which helps in closing the financing gap and progressing towards the shared goal of combating climate change.

Inadequate climate financing

13.37. The West turns a March Hare³¹ - *I have an excellent idea! Let's change the subject* - every time the subject of real climate financing due to historical reparations comes into play. Research shows that developing countries require ~USD 6 trillion by 2030 to achieve just about half of their existing NDC targets. Against this, only USD 100 billion was pledged by developed countries till 2020³², of which only USD 83.3 billion was provided³³. This level of financing still does not match up to the scale of the challenge faced – climate adaptation needs of developing countries are expected to reach USD 300 billion by 2030 and USD 500 billion by 2050³⁴, which is 5-10 times greater than the current fund flows.

13.38. Robert Burns in his poem says “*There is no such uncertainty as a sure thing*”. The surety of such climate pledges looks far more problematic once the lens is zoomed. Most of the current funding comprises loans to middle-income countries that are already struggling with heavy public debt burdens to meet their essential service requirements. Over two-thirds of the climate finance received by middle-income countries between 2015 and 2020 was in the form of loans³⁵. Moreover, profits and returns on investments are often prioritised over long-term

28 Alice in Wonderland by Lewis Carroll.

29 UNCTAD calculations based on data from the International Energy Agency and UNCTADstat (<https://tinyurl.com/53cxctsz>).

30 Global Resources Outlook 2024, UNEP.

31 Alice in Wonderland by Lewis Carroll

32 A climate finance goal that works for developing countries, UNCTAD, June 2023 (<https://tinyurl.com/2vpxe86k>).

33 Climate Finance and the USD 100 billion goal, OECD (<https://www.oecd.org/en/topics/climate-finance-and-the-usd-100-billion-goal.html>)

34 UNEP Adaptation Gap Report 2020

35 Climate finance programme funnelling billions of dollars back to rich countries, Frontline Research, May 2024 (<https://tinyurl.com/ycyp7ybv>)

environmental sustainability during fund allocation.

13.39. They say the devil lies in the details. Under the golden wrapper of a committed USD100bn financing, the elves are at work polishing the quirks, as is evidenced in this small fact reported by Hindustan Times³⁶ - At the Cartagena Ad Hoc Work Programme (AHWP) talks — in the run-up to the actual negotiations at the Conference of Parties (CoP) — the United States and other western countries have reportedly pushed to make the New Collective Quantified Goal (NCQG) contributions “voluntary” for those who “choose to pay”. They have also advocated widening the pool of contributors to include developing nations based on the latter’s “economic realities” and “current emission share”. So, the reason behind this vacillation on ‘Who’s to pay’ is well-indicated through Box XIII.3.

Box XIII.3: Willingness to Change and Willingness to pay for Environmentally Sustainable Policies

One would imagine that given most of the climate sustainability debate largely stems from the developed world, they would be the first ones to accept the financial impact of changing their consumption-oriented lifestyle. However, research says otherwise. Almost 63% of respondents of the OECD Environmental Policies and Individual Behaviour Change Survey in 2022 (administered to over 17,000 households) feel that sustainable choices should not impact them financially and therefore ‘they are unwilling to pay extra’. Contrast this directly with the CBAM tax that EU is willing to impose on products such as steel, for the so-called ‘fair price on carbon emitted’ during production, imported from developing countries. In the same survey, ~43% of respondents reported regular consumption of red meat and showed resistance to changing this lifestyle attribute with a large impact on climate change. The analysis further indicates that households’ general proclivity to the environment, does not influence their frequency of red meat consumption.

At this rate, the question seems less about sustainable choices, but more about a new play for capitalism. Having exhausted the extant industrial networks and saturation in product consumption, one can only create space for a whole new dynamic of industrial consumption - new industrial products, new markets, and new ways of taxing the ones still struggling to survive, so that the old status quo keeps thriving, and the ‘emerging’ are in a perpetual state of question.

ADOPTING THE WESTERN PRACTICES HAS NEGATIVE ENVIRONMENTAL IMPLICATIONS FOR THE DEVELOPING WORLD

13.40. With the largest population in the world, India has only the 7th largest area, culminating in a significant resource constraint. And yet this country consistently delivers not only on sustaining its vast population but also on touching the pinnacles of an aspirational society. The authors would like to argue that a principal reason for this inherent ability of the country to be resilient to economic, social, and historical challenges, is its inherent ‘Dharmic’ nature that

³⁶ Retrieved from Hindustan Times (<https://tinyurl.com/2zpr2rfn>)

makes it want to become an efficient Market Economy, but not a Market Society. The difference between the two was first described by Karl Polanyi, who described the two³⁷ as follows:

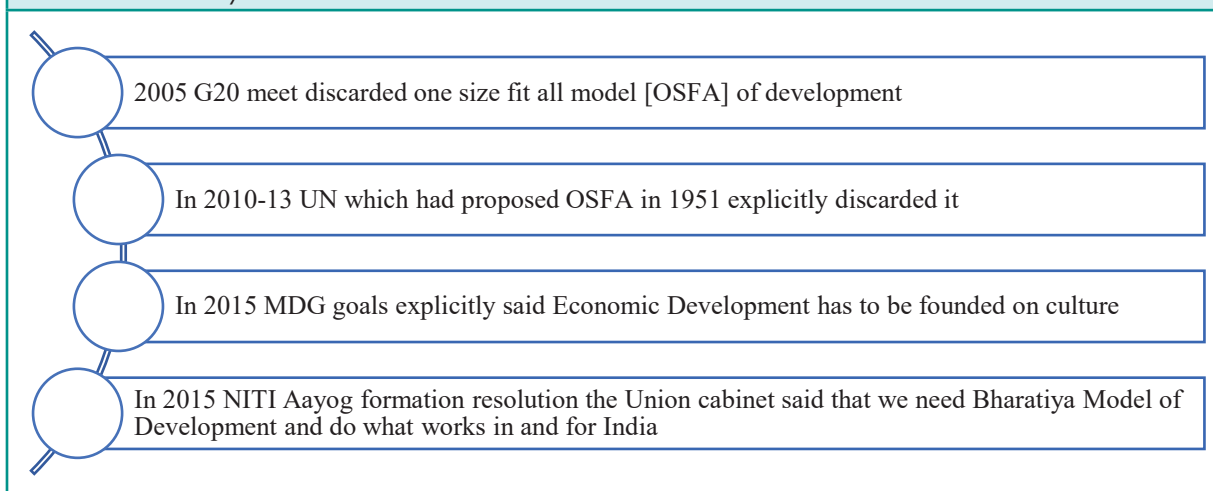
“This institutional gadget, which became the dominant force in the economy—now justly described as a market economy—then gave rise to yet another, even more extreme development, namely as a whole society embedded in the mechanism of its own economy—a market society.”

13.41. Simply put, a market economy - dominating the world economy today- is centred on the notion that supply and demand drive the production of goods and services, and prices are derived from the ‘invisible hand of free markets.’ A market society is often the culmination of a long-standing culture of market economics, whereby the social mores become heavily permeated by market values, leading to the commodification of areas that were traditionally governed by non-market norms.

13.42. India is not only not a market society but also at its root, a unique society where our culture, economy, societal norms, and environment are interlinked in a circuitous manner. As the forces foreign to us continue to shape our thought processes, India must be cautious in changing both lifestyle and user behaviour learning from societies different from ours, lest it impacts us in the future on 3Es - Equity, Environment, and Economics.

13.43. That market economics must not follow a universally-designed golden mean and must adapt to local conditions, is a point brought out well on several international platforms such as the 2005 and ensuing G20 declarations, the 2010-13 UN agreement that explicitly discarded One-Size-Fits-All (OSFA) and the 2015 Millennium Development Goals (Chart XIII.7).

Chart XIII.7: International Declarations that committed to different ideas



13.44. It’s time to acknowledge the market economy’s limitation in achieving emissions mitigation. Market discipline exists in theory as seen in numerous financial market busts. The market mechanism is pro-cyclical. Hence, it foments instability rather than being a force for stability. It seldom rewards a ‘good choice’ principally, but always the good choice financially.

³⁷ For more description on the subject, the paper by Frank Cunningham serves as a revelatory read: <http://individual.utoronto.ca/frankcunningham/marketEco.pdf>

The Meat Production Process and the destruction of the food-feed balance

13.45. Meat, due to its calorie density, has played a catalytic role³⁸ in the evolution of humans and was an important source of nutrition until the development of agriculture approximately 10,000 years ago. As societies settled and civilisations oriented around agriculture emerged in various parts of the world, the human race moved to a blend of plant- and animal-based cuisines over time. With time, improvements in agricultural research facilitated a significant expansion of the available plant-based food options, which are rich in nutrients and offer significant health benefits. Agricultural research has made it so that today, if one chooses to do so, it is completely possible for a human to meet all the nutritional requirements of their body from an exclusively plant-based diet and live a long, healthy life.

13.46. However, since the preference for meat is part of our evolutionary process and our digestive systems being clearly selected for an omnivorous diet, meat remains an important part of the nutritional mix. As societies moved towards affluence, the quantity of meat demanded also rose. North America and Europe saw their meat production grow by 2.5 times and 1.7 times, respectively, between 1961 and 2000³⁹. More important is the fact that increased production in these regions was facilitated by the emergence of the modern mass-scale feed industry, which now presents a credible and significant threat to food security around the globe.

13.47. The feed industry has emerged as such a massive undertaking that 33 per cent of the total arable land on the planet is now being utilised for feed crop production⁴⁰, and new land being added through deforestation⁴¹ or repurposing existing farmlands⁴². Further, the reliance on human-edible crops under the Western method of meat production has set into motion a food-feed competition⁴³ as more than one-third of the global cereal produced is utilised as animal feed. At the same time, one in ten humans still do not get enough to eat⁴⁴.

13.48. A recent analysis published in 'Nature' highlighted that only 37 per cent of the harvested area of major crops is used for direct food consumption,⁴⁵ while a large share of the human-edible crops is now facing competing uses, primarily from the livestock industry. This is because 1 kilogram of beef requires 25 kilograms of feed crop while 1 kilogram of lamb requires 15 kilograms of feed crop⁴⁶. Among the crops serving as the primary source of feed in the Western

38 Despite our ancestors being "hunter-gatherers", it is often believed that foraged plants were relied upon as fallback options when meat availability was scarce.

39 Food and Agriculture Organization of the United Nations

40 Livestock's Long Shadow: Environmental Issues and Options, Food and Agriculture Organization of the United Nations.

41 Demand for meat is destroying the Amazon, The Washington Post, March 2022. (<https://www.washingtonpost.com/climate-solutions/2022/03/09/amazon-rainforest-deforestation-beef/>)

42 Livestock and Landscapes, Food and Agriculture Organization of the United Nations. (<https://www.fao.org/4/ar591e/ar591e.pdf>)

43 Makkar, H. P. S. (2018). Feed demand landscape and implications of food-not feed strategy for food security and climate change. *Animal*, 12(8), 1744-1754.

44 Hannah Ritchie, Pablo Rosado and Max Roser (2023) - "Hunger and Undernourishment" Published online at OurWorldInData.org. Retrieved from: (<https://ourworldindata.org/hunger-and-overnourishment>)

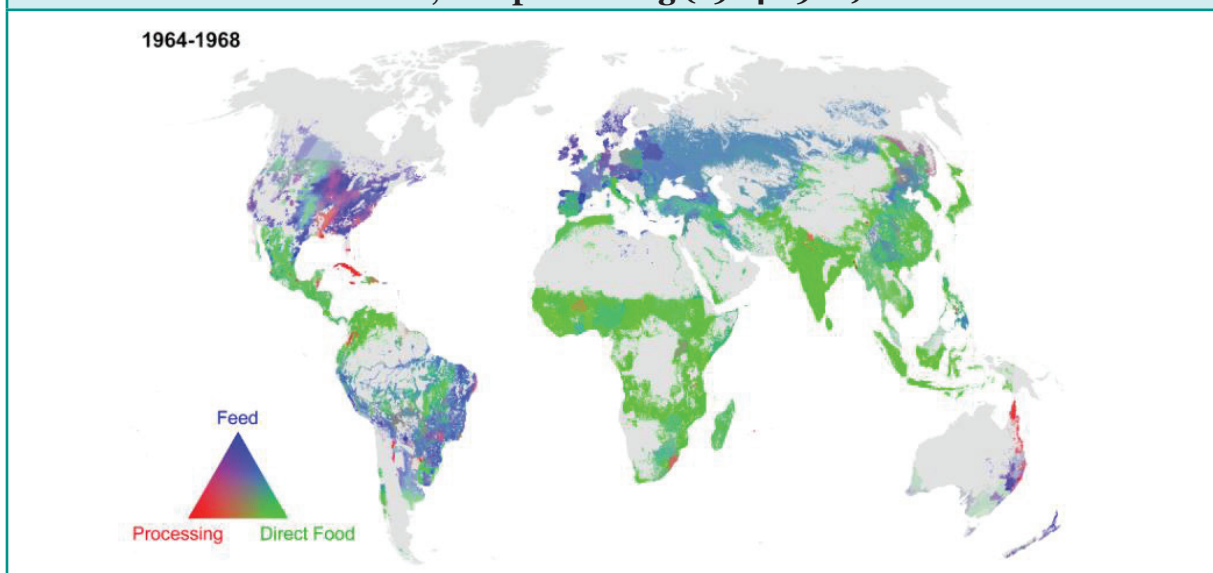
45 Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN's food security goal. *Nature Food*, 3(5), 367-374.

46 Alexander et al. (2016). Human appropriation of land for food: the role of diet. *Global Environmental Change*.

livestock industry are maize (corn), soybean, legumes, bran and oilcake. These five crops are among the ten global crops that provide 83 per cent of all harvested food calories⁴⁷.

13.49. Furthermore, while croplands and crop yields have increased around the world, the proportion of crops being grown for food consumption has been declining since the 1960s (right around the time the feed industry began expanding in the West)⁴⁸. For example, the United States, with its abundance of cropland, was once thought of as the “food basket”, but today, with the rampant appropriation of arable land for feed crops, it is more likely to be termed the “feed basket.”⁴⁹.

Chart XIII.8: Average fraction of harvest used for Direct food, feed, and processing (1964-1968)



Source: Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN’s food security goal. *Nature Food*, 3(5), 367-374.

13.50. Similar trends have begun emerging in other developing nations adopting the Western methods of animal husbandry, as rampant deforestation and shifting agricultural practices towards feed crop cultivation are presenting themselves as a major risk to food security in the developing world, especially with projected population growth trends. By 2030, many developing countries will not be able to fulfil the calories required for nourishment of the growing population due to the deficit in calories harvested as direct food crops⁵⁰. Many non-direct food crops not grown in wealthy countries are grown in developing countries for export to wealthy countries to supplement Western-style diets (such as feed for the meat industry)⁵¹. This is grim since land is already scarce, and arable land is even more so.

47 Tilman, D., Balzer, C., Hill, J., & Befort, B. L. (2011). Global food demand and the sustainable intensification of agriculture. *Proceedings of the national academy of sciences*, 108(50), 20260-20264.

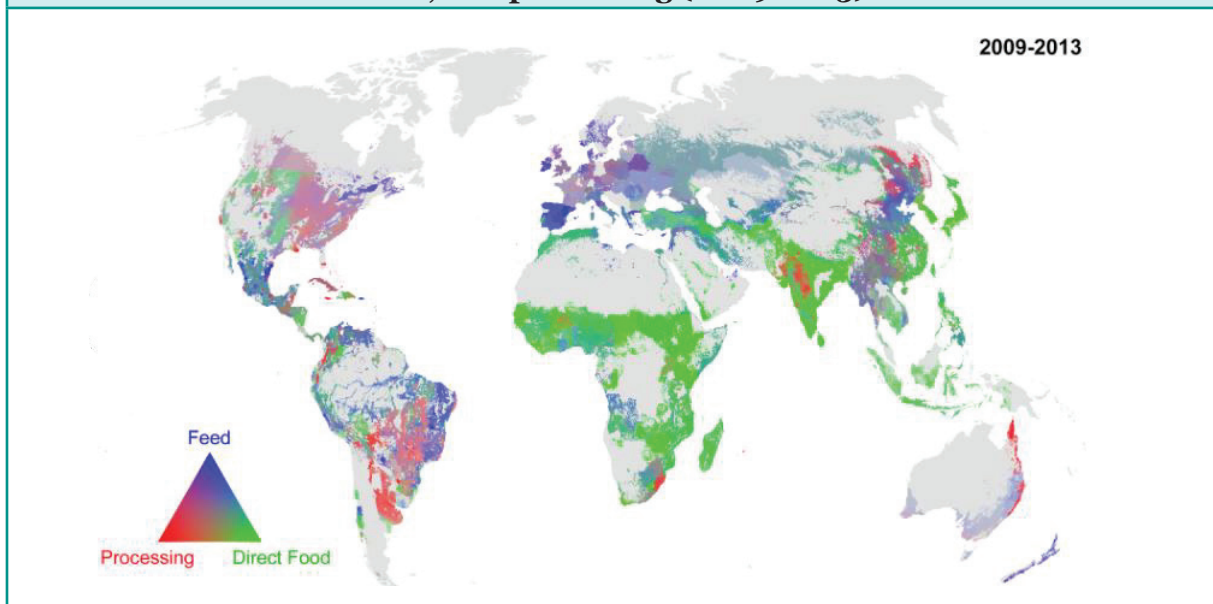
48 The World is Growing More Crops - but Not for Food, World Resources Institute, December 2022 (<https://www.wri.org/insights/crop-expansion-food-security-trends>)

49 Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN’s food security goal. *Nature Food*, 3(5), 367-374.

50 The World is Growing More Crops - but Not for Food, World Resources Institute, December 2022 (<https://www.wri.org/insights/crop-expansion-food-security-trends>)

51 Ibid.

Chart XIII.9: Average fraction of harvest used for Direct food, feed, and processing (2009-2013)



Source: Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN's food security goal. *Nature Food*, 3(5), 367-374.

13.51. This shortage of land is now leading to a land squeeze around the world, as just feeding the growing population would require an additional 600 million hectares (nearly twice the size of India) by 2050⁵². With more and more land being dedicated to growing animal feed rather than feeding each of the 828 million undernourished people affected by hunger⁵³, is now not the time to arrest this trend? We should ponder for a minute to ask ourselves if this is really the best use of our scarce natural resources.

13.52. In addition to resource scarcity and food security threats looming over the horizon, the established methods of livestock cultivation are also highly unsustainable for the environment. Growing feed has been facilitated through industry standard practices such as monocropping, restricted crop rotation, incessant freshwater withdrawals⁵⁴, excessive tillage, threatening local biodiversity⁵⁵, and the application of synthetic pesticides and herbicides⁵⁶. As one would expect, such practices are depleting farmland of its nutrients permanently, causing soil erosion and degrading the water quality⁵⁷.

13.53. These practices cannot continue in the developed world. With the demand for meat expected to increase by 2050 due to rising incomes in the developing world, they definitely

52 How to Manage the Global Land Squeeze?, World Resources Institute, July 2023

53 State of Food Security and Nutrition 2022, Food and Agriculture Organization of the United Nations

54 Accounting for 8 per cent of Global human water use as highlighted by UNFAO

55 Approximately 306 of the 825 terrestrial ecoregions identified by the Worldwide Fund for Nature (WWF) reported livestock as one of the major threats they face

56 Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992.

57 Livestock's Long Shadow: Environmental Issues and Options, Food and Agriculture Organization of the United Nations.

cannot adopt the same practices established by the Western feed industries. These concerns had already been elucidated 22 years ago by Gerbens-Leenes & Nonhebel (2002)⁵⁸. They stated, “*In Western countries, the influence of food consumption patterns on related land requirement is substantial, resulting in large regional as well as inter-generational differences...On a global scale, it should be realized that a large part of the population is undernourished...If patterns in developing countries shift towards the affluent menus of western countries, related per capita land requirements will rise substantially.*” India is already among the largest producers of meat in the world. Adopting the same practices followed elsewhere would result in disastrous consequences for the environment and the people at large.

13.54. Traditional farming practices from the developing world, where several agricultural activities are integrated with livestock rearing, offer one solution to the problem. Taking the example of India, our agricultural sector, primarily small and medium farm undertakings that engage in agriculture and livestock cultivation, has been practising sustainable farming for decades now (also called Integrated Farming System)⁵⁹. By recycling farm waste and by-products from other agricultural activities to serve as inputs for another activity (human inedible sources of feed such as grass and weeds plucked from fields, chaff and stubble collected post-harvest, and other agro-waste), farming enterprises within India have been able to lower costs of production and enhance the productivity of their undertakings without upsetting the natural cycle. Similarly, the Integrated Farming Systems tested in African countries demonstrated that livestock-based integration not only helped the daily agricultural processes but also helped mitigate food security and malnutrition risks in humans as well as livestock⁶⁰.

13.55. Shifting livestock to human-inedible feed can free up significant shares of global arable land to address global hunger. More food crops can be directed towards human consumption and alleviate food security risks worldwide. While such a strategy has obvious climate change mitigation benefits, one cannot ignore the adaptation benefits this strategy offers, too. Empowering farmers to reduce wastage and cultivate multiple income streams through an integrated farming system would help make a stressed sector within most developing countries a significant employment generator.

13.56. How meat is cultivated will heavily influence the risks associated with food security and our environment. While it is utopian to assume that the world would abandon meat consumption altogether and take up a completely vegan diet, in this hypothetical scenario, doing so would reduce the total land requirements for agriculture from 4.1 billion hectares to 1 billion hectares

58 Gerbens-Leenes, P. W., & Nonhebel, S. (2002). Consumption patterns and their effects on land required for food. *Ecological Economics*, 42(1-2), 185-199.

59 Shanmugam, P. M., Sangeetha, S. P., Prabu, P. C., Varshini, S. V., Renukadevi, A., Ravisankar, N., ... & Gopi, M. (2024). Crop–livestock-integrated farming system: A strategy to achieve synergy between agricultural production, nutritional security, and environmental sustainability. *Frontiers in Sustainable Food Systems*, 8, 1338299.

60 Erick, O. O., Mlingi, F. T., Nyonje, B. M., Charo-Karisa, H., and Munguti, J. M. (2013). Can integrated livestock-fish culture be a solution to East Africa's food insecurity? A review. *African J. Food, Agric. Nutr. Dev.* 13, 8058–8076. doi: 10.18697/ajfand.59.12920

(an area the size of North America, plus Brazil)⁶¹. The purpose of this hypothetical is not to agonise over whether to eat meat or not but to demonstrate that many more efficient ways are available to feed the planet.

13.57. Feeding an expected 10 billion people by 2050 is not trivial. Changes need to be brought about to the meat production processes without any delay, and the developing world should not only avoid emulating the environmentally and climatically unsustainable practices of the West but also point the way to the West, with its own food-feed balance practised for aeons.

13.58. To reiterate, a better food-feed balance will only need a fraction of the land that is currently used for food production. The entire world can still be well-fed and leave more land for other purposes, such as renewable power generation. Instead, what we face is the danger or prospect that Western practices of cattle-rearing will spread to the rest of the world, just as the Western obsession with Artificial Intelligence and feeding it with copious quantities of data for it to become truly intelligent is consuming vast amounts of energy and water and upending energy generation plans in many countries. Developing countries are falling line, lest they fall behind in a chimeric race for technological competitiveness, unmindful of social and environmental consequences. The parallel cannot be any more uncanny than this.

Housing

13.59. As countries move towards economic development, one of the changes they experience is in the social fabric of society which in today's world, is a Western model of living, i.e., nucleated families and single-person residences. It is estimated⁶² today that nearly 50 per cent of all households⁶³ in India are nuclear (1-4 members), up from 38 per cent in 2008. On average, a typical nuclear family in India had an average of 3 members vis-a-vis 7 in a joint family setup – nucleation rising in South India as opposed to North India. This is a major shift from our older societal norms of multi-generational living with Hindu undivided families (HUF) living under the same roof. Chapter 8 of this survey on India's labour markets notes that a report by the United Nations Population Fund and the International Institute for Population Sciences emphasises the importance of elderly people living in multi-generational households. Indians did not really have to learn this from a United Nations report. It was part of our tradition. Naturally nucleated living gives rise to demand for additional housing units, smaller and more independent in nature. Given that the demand is only expected to double by 2050⁶⁴ and the sheer complexity involved due to urban areas in size ranging from over 15 million to a few thousand people as well as local vs new settlements, and different housing-building practices, India has a looming housing issue on the horizon.

61 Hannah Ritchie (2021) - "If the world adopted a plant-based diet, we would reduce global agricultural land use from 4 to 1 billion hectares" Published online at OurWorldInData.org. Retrieved from: (<https://ourworldindata.org/land-use-diets>).

62 As per data from Kantar Worldwide in 2022.

63 12.98 crore nuclear out of 24.88 crore households as per Census 2011.

64 World Bank article (<https://www.worldbank.org/en/topic/urbandevelopment/overview>)

13.60. Land, on the other hand, remains constricted, but aspirations are not so. Many high-income urban nucleated settlements give rise to the tendency of urban sprawl⁶⁵, which is linked to higher energy consumption, elevated pollution levels, and increased traffic congestion causing significant negative environmental externalities⁶⁶. The correlation between household size and adverse impact on sustainability is being recognised all over the world. A 2021 research paper⁶⁷ says that the decrease in average household size in China over the past few decades is leading to a loss of scale economies. The paper further states, “*CO₂ emission, water withdrawal, smoke ash emission, SO₂ emission, NO_x emission, and industrial wastewater discharge were found to increase with a smaller household size. For example, a household size reduction of 0.5 (to 2.5 members) by 2030–2035 could result in a 0.5% increase in CO₂ emission and a 0.3% increase in water withdrawal as compared with the levels in 2015. The increase in CO₂ emission is almost equal to the entire emissions of Portugal.*”

13.61. Despite this, our living dwellings today mimic a universalised model of living – dominated by concrete, closed spaces, less ventilation, and a higher need for air conditioning, as opposed to multi-generational family homes in older times. Traditional Indian living spaces were built far more sustainably – a central courtyard that allowed for ventilation, natural lighting and cooling, and more co-habitation, usage of local building materials that prevented the need for transporting the high amount of concrete over long distances, building practices that did not require highly mechanised environments and had local labour filling in the gap. Unfortunately, much of this is not documented as ‘sustainable practice’.

13.62. The world knows sustainable housing as one that is characterised by solar and wind-powered energy, specially manufactured low-energy windows, and the use of LEDs. Unfortunately, keeping only these norms as a measure of sustainability is a false positive due to two reasons – 1) it requires reengineering of the entire building and construction ecosystem which is difficult in a resource-constrained environment 2) the impact of small measures is over-calculated in place of the lifecycle cost of higher-density, non-nucleated living with traditional building homes.

13.63. With more and more changes in Indian lifestyles of living, the environmental impact of these activities of a large population is only going to exacerbate the climate change issue.

65 Rapid geographic expansion of urban areas, characterized by low-density residential developments, single-use zoning, and increased dependence on automobiles.

66 Expanding urban footprint leads to habitat destruction and the fragmentation of natural areas, imposing external costs on ecosystems.

67 Wu, W., Kanamori, Y., Zhang, R., Zhou, Q., Takahashi, K., & Masui, T. (2021). Implications of declining household economies of scale on electricity consumption and sustainability in China. *Ecological Economics*, 184, 106981

THE INDIAN WAY: A SUSTAINABLE LIFESTYLE

“*mātā bhūmih putruahan prthivyā*:⁶⁸” (Prithvi Sukta, Shlok 12)

13.64. Time and again, when a major adversity shakes the world out of its stupor, the relative resilience of Indians is a subject of great surprise⁶⁹. The natural resilience emanates from this land’s deep, spiritual, and philosophical understanding of the concept of cycles of creation and destruction.

13.65. Nowhere, it is greatly reflected than in our relationship with ‘Nature’ that not only has tremendous power, but also a mind and temper of its own. We need to be in sync with its order because nature is not going to change its laws for the assumed strategies of man. Hence, global environmental and sustainability strategy must be in accordance with the cyclic temperament of Nature rather than in the misplaced belief that our industrial siloed actions can alter even a sliver of its fabric. It is here where India can help.

13.66. Even as the traditional scientific approaches to climate change are welcome, it’s high time that India adopted and disseminated its wisdom of pursuing a life of sustainability. While India agrees with the need for top-down policy-level changes, we also believe in the collective power of small individual actions. That each person contributes to both emission generation as well as emission reduction is a simple fact that we must take into account while designing policies, and awareness programmes, or even while tabulating statistics related to the environment.

13.67. In Sukla Yajurveda (36-17), the sages recited the verse:

“पृथिवी शान्तिरापः शान्तिरोषधयः शान्तिः ।
वनस्पतयः शान्तिर्विश्वेदेवाः शान्तिर्ब्रह्म शान्तिः
सर्वं शान्तिः शान्तिरेव शान्तिः सा मा शान्तिरेधि ॥
ॐ शान्तिः शान्तिः शान्तिः

Peace and Balance in Earth, Water, Plants, Trees, and Gods. May there be balance in you, in space, and in everything.

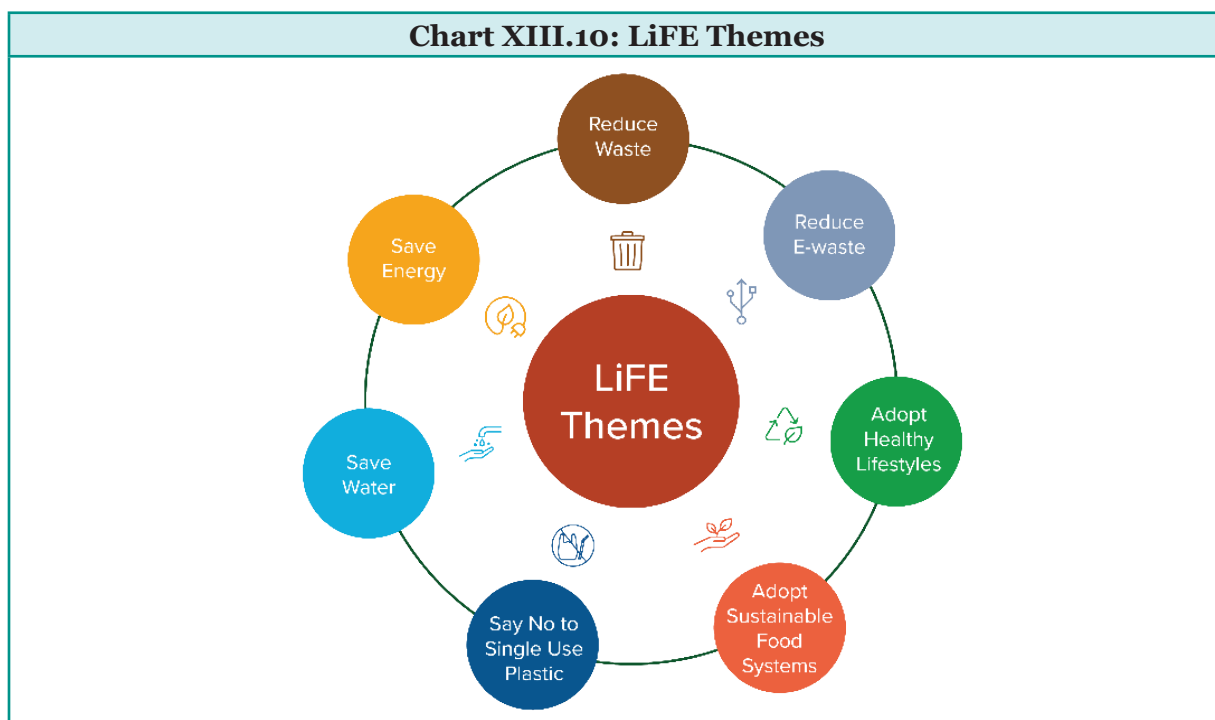
MISSION LIFE (LIFESTYLE FOR ENVIRONMENT)

13.68. This thought process was at the base of Mission LiFE⁷⁰, announced by Prime Minister Modi, at the 2021 UN Climate Change Conference (UNFCCC COP2026) which seeks to bring individual responsibility to the forefront of the global climate narrative. It derives its philosophy from ancient Indian philosophy that espouses a naturally sustainable lifestyle in accordance with nature, steering individual actions and collective demand towards pro-planet choices. It encompasses a comprehensive but non-exhaustive list of 75 LiFE Actions for adoption by individuals to live more sustainably.

68 (Rigveda,1/90/6,7,8) invokes divine intervention to bliss and protect the environment. “*madhu vātāh ritāyate madhu ksaranti sindhavah mādviḥ nah santusadhi. madhu naktamutusāsu madhumatpārthiva rajah madhu ksorastu suryah mādhirgābo bhavantu nah*”

69 The Subprime Crisis (<https://tinyurl.com/5hdy2s82>), The Covid-19 Pandemic (<https://tinyurl.com/yzx5nw72>)

70 Mission focuses on 7 themes - Saving Energy and Water, Reducing Single Use Plastic and E-waste, Adopting Sustainable Food Systems, Reducing Waste and adopting Healthy Lifestyles

Chart XIII.10: LiFE Themes

13.69. Taking this philosophy forward, LiFE should have a doctrine for the world, resting on 5 fundamental principles.

Individual action is the core of Climate Responsibility

13.70. As described in the previous sections, no economic or industrial strategy is going to be successful without the world's population changing its approach to climate and environment. Hence, before compelling poorer nations to change their developmental journey, it's necessary for individuals, especially in the developed world, to alter their lifestyle in favour of simple behavioural changes, all of which directly contribute to mitigation efforts.

13.71. India has great experience in individual-led sustainable behaviours - using a cloth for kitchen cleaning instead of tissue papers, leaves instead of disposable plates and packaging material, water-based toilet cleaning systems, reuse and upcycling of household items, and even ancient home remedies of pest control focussed on route deviation rather than killing. Practising a lifestyle where we indulge in less of 'fast fashion', getting things repaired than thrown at the first sight of discomfort, turning off lights when not using the room/area, etc, and digital consciousness in the form of accepting bills as e-bills rather than paper bills, conserving electricity through the purchase of energy-efficient products, switching off when not in use, adopting cleantech products, virtual meetings but physical activities like outdoor run, use of solar water heaters. This is not even taught, and it's imbibed, learned, and passed on to successive generations. Unfortunately, this is changing in favour of capitalistic practices derived from market societies, since they are, unfortunately, seen as symbols of upward migration.

13.72. At the core of it, it does seem duplicitous to talk about sustainability to poorer countries without changing anything about global lifestyle driven by overconsumption, beef-eating, and

fast fashion. Individuals must be encouraged to give up voluntarily these energy sins and bring their actions in line with their stated purpose. A change in demand will automatically cause a change in supply by relevant industries.

13.73. Voluntary relinquishment is not new in India. With a historical ashram-based⁷¹ culture where householders give up their material desires voluntarily to advance towards devotion to society and God, the principles have been used for greater community welfare even in present times. The ‘Give It Up’ LPG Subsidy Scheme is perhaps the best example of this theory in practice at scale. #GiveItUp’ campaign launched in 2015, aimed at motivating 5.7 million Liquefied Petroleum Gas (LPG) users who could afford to pay the market price for LPG to voluntarily surrender their LPG subsidy to help pay for LPG cylinders to those rural women who depended on firewood for cooking food. Cooking on open fires and on inefficient wood-burning stoves emits close to 25% of global black carbon emissions. This brilliant individual renunciation for a higher cause not only reduced ill-health incidences in women but also directly impacted climate change.

13.74. Voluntary planting of trees and keeping surroundings clean and minimalistic contribute directly to environmental impact. Usage of locally sourced nature-based artisan choices like pattals, and bamboo bottles, refraining from excessive plastic use, and, making conscious choices in favour of sustainability will go a long way in curbing large-scale demand for environmentally adverse things.

13.75. One area where individual action is most desired and most needed is water reuse, less wastage, and water conservation. Water is not only the elixir of life but a non-negotiable as far as existence is concerned. The greatest news about Mars was the possibility of water on that planet⁷², such is its importance. So, even as governments step in to increase water supply, bring in efficiency, and redirect non-potable water to other uses, Individuals must drastically reduce their wastage of this extremely precious resource. Small actions such as collecting kitchen water to water plants, not leaving taps endlessly open, and using rainwater harvesting to utilise rainwater are both doable and desirous in the context of climate change.

Collective policy reflective of Individual pro-planet choices

13.76. Consistency. Compounding. Two words when practised can make and break empires. Small but consistent actions have a large compounding effect observable across time. The Japanese even have a term for it – ‘Kaizen’. As described above, individual choices on a daily basis can help in sustainability, but even greater is a collective policy of pro-planet small everyday choices, but nudged and mandated by the government. These are reflected in several actions as follows:

71 Four ashrams or stages (25 year each) in life of an individual – Balavastha (Childhood and Learning), Grihastha (Householder’s life of pursuing material desires), Vanaprastha (giving back to society), Sanyas (Renunciation and Oneness with God)

72 Retrieved from NASA (<https://www.nasa.gov/news-release/nasa-confirms-evidence-that-liquid-water-flows-on-todays-mars/>).

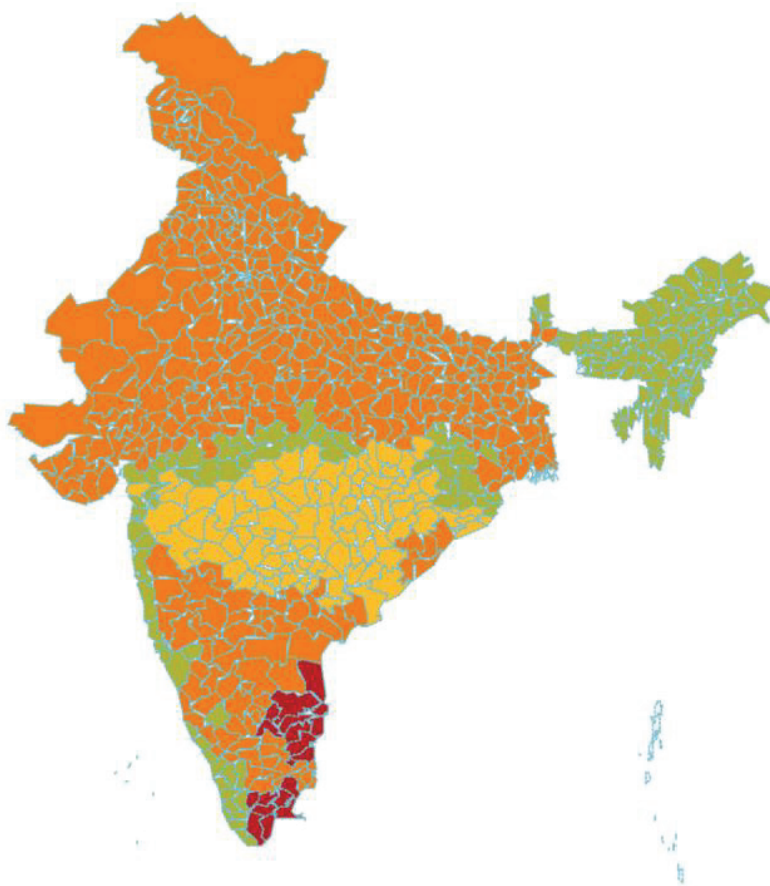
- (a) Using air-conditioning and thermostats at more optimum and sustainable temperatures⁷³:** As pointed out by the Prime Minister of India, there is little sense in keeping temperatures artificially low to 17-18 degrees and then using a blanket. Default settings on ACs and temperatures in public places like malls, offices, and airports can be increased from 18 to 24-25 degrees. Popularly called the ‘Air conditioning paradox’⁷⁴, as this article⁷⁵ beautifully describes, it is a Catch-22 situation “*One of the great ironies of climate change is that as the planet warms, the technology that people need to stay cool will only make the climate hotter.*” With a large population cramped in small places, India cannot afford to go down the individual air-conditioning route, where every small room has an AC and makes the neighbouring air so worse off that they require another, thus setting off a vicious circle. Not earlier than 15 years ago also, most households in India did not have access to ACs and instead relied on a combination of approaches – khus cooling with intermittent use of water coolers and earthen pots for water. The capitalist approach to solving any problem requires manufacturing at scale, thereby ushering in modern air-conditioners, which seem to have made the problem worse. India must vote to bring in a mix of modern air-conditioners and our traditional mechanisms – ventilated construction, large windows, use of local materials, water-based cooling systems, and usage of fans wherever possible.
- (b) Reducing the need to carry disposable plastic bags repeatedly on errands,** both by decreasing consumption and replacing them with reusable fabric bags. More than 1 million bags are used every minute with an average working life of 15 minutes, but stay on the earth’s surface forever, unless recycled.
- (c) Building a culture of water reuse through individual behaviour change** and mandated design specifications in favour of structures like rainwater harvesting. Water is becoming scarcer and scarcer resources. Some regions of the world have almost no access to fresh water. Governments should mandate water-efficient technologies and re-examine water-wasting ones (e.g., Reverse Osmosis water machines, single flush toilets).
- (d) Practicing sustainable agriculture through the use of local seeds and natural farming practices.** Agriculture residue to be used for mulching and composting.
- (e) Fiscal Incentives for large households rather than single or two-person households,** indirectly nudge societies to favour sustainable choices.

13.77. Increased demand will re-energise the market for sustainable, traditional products that were made by local skilled workers and did not require industries from across the world to produce. Moreover, products of ivory, leather, and those made of endangered species must be individually discouraged and policy-banned. Circularity and reuse of waste products must be incentivised by the government. A good example will be the Government’s mandate for ethanol blending in petrol, achieving the target of 10% in 2022.

⁷³ Use of AC continuously can increase city temperatures by up to 2 degrees Celsius.

⁷⁴ The air conditioning paradox, Vox, May 2022 (<https://www.vox.com/science-and-health/23067049/heat-wave-air-conditioning-cooling-india-climate-change>).

⁷⁵ How to prevent air conditioners from heating the planet, Scientific American, June 2021 (<https://www.scientificamerican.com/article/how-to-prevent-air-conditioners-from-heating-the-planet/>).

Chart XIII.11: Per-capita Water Availability 2025

Source: India Climate & Energy Dashboard, NITI Aayog

13.78. Another area where individual choices and government action must converge is Fashion and Textiles. As per UNEP, the fashion industry is the second-biggest consumer of water and is responsible for 2-8% of global carbon emissions, 24% of insecticides, and 11% of pesticides. Apart from voluntary reuse and upcycling of clothes, there is a strong need for a Policy on Circularity in Textiles in India, as currently, less than 50% of textile waste in India undergoes any kind of reuse, repair, or remanufacture.

Incorporation of local and sustainable geography and culture

13.79. ‘Annam Brahman’ or Food is God. Ancient India wrote this in black and white and left it for successive generations to ponder upon. However, in the flurry of everything that is ‘not us’ being better, local food gave way to packaged fast-food and food choices different from the geography of our existence. Even today, Indian cuisine is primarily plant-based. This doesn’t mean that everyone is a vegetarian; it means that the bulk of our food base remains vegetarian – rice, dal, roti, and meat are an added separate delicacy. It is the same in our packaged food such as chips which are almost 99.99% plant-based, given the diverse food people eat across a country this large. Most of the cuisines are heavily dependent on local geography which not only provides a medicinal value to food but also reduces ecological footprint and reduces energy requirements. This is opposed to the global practice of industry-supplied veganism where in

order to eat more sustainable food, one has to be dependent on avocados flying from halfway across the world or soy milk which has previously caused Amazon rainforest degradation⁷⁶.

13.80. Good health is a great economic contributor also because all episodes of ill health cause double economic losses – reduction of productive time and costs spent on recovery. While modern medicine has done a great job of germ-based infection recovery and biological engineering, India has practised Ayurveda for years, which emphasises existence in accordance with nature, prevention rather than cure, and natural remedies rather than clinical supplements with an unclear understanding of their long-term damage. ‘Popping the pill’ culture must give way to a greater curiosity around the ‘why’ of ill health (which is not due to any accident / congenital issue/toxicity) and the role that our local food and medicinal systems will play in bringing down their incidences.

13.81. It’s time that the world adopted this Golden Principle of sustainable ingestion – eat local, eat fresh, eat sustainably:

- More plant-based diet.
- Use of leaf-based disposable plates instead of Styrofoam and single-use plastic.
- Use of fermented products (as is dominant in Asian cultures) that use natural sun storage for achieving the desired state.
- Upcycling food waste, or organic composting food waste (sour milk to paneer and reuse of whey water for lentils).
- Growing medicinal herbs such as Tulsi, and neem around us.
- Afforestation of water-table saving trees.
- Eating seasonally and locally – e.g. more millets than quinoa.
- Production of natural varieties and seed harvesting are to be publicly incentivised.

Public Policy and not the Market at the helm of undertaking the ‘right’ decision

13.82. This approach focuses on influencing individual behaviours through policy approaches. How individuals behave and choose to consume is shaped by the surrounding norms, policies, incentives, and infrastructure, and herein there is a role for governments, community leaders, and media.

13.83. The Ujala program, launched in 2015, to encourage energy-efficient LED lights has resulted in energy savings of around 48 billion kWh per year and estimated savings of USD 2.5bn per year. People were incentivised to adopt these LED lights by bringing down buying costs for people. This was possible through govt. plans for bulk procurement and supply. By harnessing individual and collective awareness efforts, including even of children, the program brought about widespread change. Thus, a people-behaviour lifestyle change approach directly helped in climate mitigation.

⁷⁶ Retrieved from Greenpeace (<https://www.greenpeace.org/usa/victories/amazon-rainforest-deforestation-soy-moratorium-success/>)

13.84. According to the International Energy Agency's modelling, the adoption of the kinds of actions and measures targeted by the LiFE initiative worldwide would reduce annual global CO₂ emissions by more than 2 billion tonnes (Gt) in 2030 (20% of the emissions reductions needed by 2030) and in consumer savings of about USD 440 billion. That is non-trivial.

*"... transformation on the supply side will not be enough; demand-side transformations will also be essential to stay within planetary boundaries. Energy requirements for providing decent living standards to the global population can be drastically reduced, but in addition to the use of the most efficient available technologies, this implies a radical transformation of consumption patterns, including political procedures to prioritise between competing consumption claims."*⁷⁷

13.85. The importance of public investment in undertaking transformational projects cannot be emphasised enough. Our world's history is replete with such examples - post-WW II reconstruction, exploration of space, the development of the internet (during its prototype stages), and the Highways construction project in the USA in the Sixties – were handled and executed by the public sector, based on government funding or funding by public authorities – domestic, international or multilateral. Similarly, today, there is a need for public investment in carbon sequestration, carbon sinks, battery storage technologies, and green hydrogen will obviate problems with intellectual property rights and help assert the global public nature of solutions.

13.86. However, this must be accommodated by awareness campaigns towards Mission LiFE in all relevant areas, starting early from school onwards, as was done for behaviour change towards Open Defecation Free (ODF) campaign in Swachh Bharat.

Mindful consumption of resources, based on need and not greed

13.87. It is unfortunate that the predominant measure of a country's worth comes from an ever-increasing GDP, which is driven primarily by consumption in a capitalist world. Derek Brower, Amanda Chu, and Myles McCormick say in FT⁷⁸, that *"Capitalism won't deliver the energy transition fast enough. For all the cleantech advances and renewable deployment in recent decades, fossil fuels' share of total global energy use was 86% in 2000 and 82% in 2023."*

13.88. Countries must therefore look at encouraging sustainable lifestyles – emphasis on low wastages on adjusting life in a way that 'wants' don't become 'needs'. That's living well but harmoniously. Excesses of materialism only have negative externalities - more wastage, more littering, more eternal garbage sitting on the earth's surface, less happiness – the law of diminishing marginal utility of the happiness-ownership curve can be seen in everyday lives. Most of the generation that is between ages 30 and 70 has seen a life where disposability and

⁷⁷ Energy Dilemma, Cedric Durand, November 2021 (<https://tinyurl.com/2kekb8dm>)

⁷⁸ The Energy Transition will be volatile, Financial Times, accessed on 25th June 2024 (<https://tinyurl.com/52syuz7j>).

dispensability were not a part of existence. Materiality was linked to long periods of sacrifice and the rare acquisition that fuelled feelings of happiness.

13.89. It's a philosophical shift from the way we understand life. A large body of research⁷⁹ has brought forward the theory of the 'Paradox of Choice' that runs counterintuitive to the ideas of Capitalism. Even though choice is good for us, its relationship to contentment is quite complicated, and choice overload⁸⁰ leads to a large set of negative outcomes. These range from indecisiveness to confusion to complications to dissatisfaction. In the Picture of Dorian Gray, Oscar Wilde says "*Nowadays, people know the price of everything and the value of nothing.*"

13.90. The final principle of LiFE implores us to enjoy the intrinsic value of things and experiences, without overburdening ourselves with overconsumption. It is not about living ascetically but living mindfully. When leaving half a bottle of water, and picking up another, it's time to remember that this plastic will not only outlive us, but also our children and our grandchildren, and that is probably not the future we wish to bequeath them.

CONCLUSION

13.91. The most important human factor in enlivening these principles to life is also one of the most elusive in modern life – Thahraav (तह्राव) or Settlement/Contentment that comes with Equanimity. It is not stoppage, it is not stagnation, and it is not even a compromise. It is a human's ability to have the confidence and the power to opt for internal stability to prepare for and accept outside change. It is only when humans can channel this energy that they can stop asking for more. It is the absence of such contentment that has made erstwhile communal things in the home become individual – e.g., television. Things unavailable didn't cause grown men to cry and children to shrink from playing with others. This stands in contrast with the consumption-oriented living of today, where every individual is a consumer (especially children⁸¹), instead of a family. That's why households, today, need more devices per person as compared to a single television earlier. Within that one statement lies the entire linkage between social mores, overconsumption, disposability, and growing mountains of trash. As per IFC, '*world generates over 2 billion tons of municipal solid waste annually⁸², and is expected to increase 70% by 2050.*'

13.92. The hunger to consume more and more means we keep missing the bus in the global discourse on sustainability, by constantly suggesting rewiring the pathways to renewables rather than attacking the root of the problem. Treating the symptoms to cure a growing disease.

79 More Isn't Always Better, Barry Schwartz, Harvard Business Review, June 2006 (<https://hbr.org/2006/06/more-isnt-always-better>)

80 Reutskaja, E., Iyengar, S., Fasolo, B., & Misuraca, R. (2020). Cognitive and affective consequences of information and choice overload. In Routledge handbook of bounded rationality (pp. 625-636). Routledge.

81 Committee on Communications; Children, Adolescents, and Advertising. Pediatrics December 2006; 118 (6): 2563-2569. 10.1542/peds.2006-2698.

82 The World has a waste problem, International Financial Corporation, April 2024 (<https://www.ifc.org/en/blogs/2024/the-world-has-a-waste-problem>)

13.93. It's time to rebuild societies with equanimity.

13.94. Internal equanimity contributes to more acceptance of others and, therefore to better human relations, which we now know, is also more conducive to larger, cohesive families, and consequently better social and sustainable impact. Access to more material choices and economic betterment shouldn't throw us so off-balance that we forget we come from Nature and must return to it. Our conscious and unconscious choices should not be divorced from the drivers of life on earth. Hence, the global movement on climate change must be accommodative of sovereign choices and economic needs, but centred on individual behaviour - 'LiFE'.
