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India's Journey to Low Carbon-Emissions

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ABSTRACT

Nature provides a free lunch, but only if we control our appetites." —William Ruckelshaus India has gracefully met its promise to cut the carbon emissions in order to meet the goals put forth in the Paris Agreement. Over the decades, the country has made efforts not to rely on fossil fuels regarding economic growth. India's renewable energy capacity has grown from 27 GW in 2000 to about 93 GW in December 2016. The ability of the country is expected to increase to 175 GW by 2022. Further the nation is hoping to achieve its renewable energy capacity by 600% within the upcoming two decades. Despite these successful efforts, India has been struggling to reduce carbon transitioning as many complex matters are intertwined which need to be addressed on priority basis if India desires to promise low carbon economic transition. India is the fourth largest emitter in the world of greenhouse gases, but in terms of accumulated emissions, it has caused minor damage. The various sectors like power and thermal sector, large renewable- energy projects, inefficiency in coal sector, inefficiency in waste management, improved approach to transportation sector and replacement with alternative fuel resources. Considering the above-mentioned circumstances, India is in dilemma to promise net zero emissions by 2050 as these long-term projects have socio-economic impacts on large sections of society. India is vulnerable to the impacts of climate change and more than half of its population still depends on agriculture (climate sensitive sector) for its livelihood. The authors through this research paper aim to understand the hurdles faced by India in order to achieve low carbon transition and the possible solutions to remove the same.

Keywords: *Environment, CO2, Carbon emissions.*

I. INTRODUCTION

Over the past 50 years, India's economic transformation has been remarkable. The past year 2020- 2021 saw a major turmoil in the world due to coronavirus pandemic. In 2017 at Paris agreement for climate action, the former US President Donald Trump had expressed his desire to withdraw from the state from the Paris Climate Agreement[3] which showed the country's void commitment towards emission reduction. On the other hand, China promised to reduce its

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[3] The Paris Agreement, often referred to as the Paris Accords or the Paris Climate Accords, is an international treaty on climate change, adopted in 2015. It covers climate change mitigation, adaptation, and finance.

 [ISSN 2581-5369]

carbon emission intensity by at least 60 percent by 2030 through usage of fossil fuels. Due to the move taken by the US, China and India were looked upon as new nations to achieve the goals of Paris Accord as both the countries were already performing overwhelmingly. Though these successes are commendable for India, achieving India's low carbon emission at the cost of economic development remains a complex issue. The various sectors like power and thermal sector, large renewable- energy projects, inefficiency in coal sector, inefficiency in waste management, improved approach to transportation sector and replacement with alternative fuel resources. Considering the above-mentioned circumstances, India is in dilemma to promise net zero emissions by 2050 as these long-term projects have socio-economic impacts on large sections of society. India is vulnerable to the impacts of climate change and more than half of its population still depends on agriculture (climate sensitive sector) for its livelihood. The Indian government's fight with climate also includes combating air pollution and creating independence in the energy sector as the nation visualises to be self-reliant. The year 2018, India saw large installation of new solar projects, taking a step towards being self -reliant.

India is home to 1.25 billion people in the world, and soon India shall rank top in the most populous country overtaking China. The nation is witnessing several changes affecting the urban population and power sector. The government is targeting to change its economic structure of not merely depending on the agricultural and service sector, by implementing Make in India and Skill in India schemes to speed up the progress in the manufacturing and industrial sector in the country. These policies have been recognised positively in the global world for creating employment opportunities however these shall also significantly impact the energy future of India. The industrial sector demands its increase to rise by 4.4% annually and shall occupy 50% of energy consumption in India by 2040.

The shift from the agricultural sector has also led to an increase in settlement in the urban sector and further is expected to double by 2030. There shall be a consequential increase in consumption of electricity, more usage of modern fuels, more and more construction sites. This whole urban transition is expected to make 60% of energy consumption by 2040 and emission of greenhouse gases. As of 2013, India made up only 5.7% of the world's energy demand, despite having 18% of the world's population. Today, greenhouse gas emissions have become a central topic of any discussion about the choice of energy systems of any country, and advances in technology have brought a growing number of fuel and technology alternatives to the fore that can be used on a commercial scale. In addition, there is an urgent need to eliminate the dependence on fossil fuels that is recognized throughout the world today. There is a greater focus on innovative policies to avoid further dependence on fossil fuels in the future and ensure

 [ISSN 2581-5369]

long-term sustainability. We need to highlight areas where India's energy sector does not have enough opportunities to fully decarbonize by 2050. We offer through this paper, it in the hope that the results of this study will stimulate further reflection on the energy sub sectors that will benefit developers. policies and planners in describing the sustainable energy of India that could come up in the Future and should save up for the future's Generation[4]. (By Graham Mott)

II. ECONOMIC TRANSFORMATION AND CENSUS IN INDIA

India is among the few reforms that are expected to directly affect its power sectors and urban areas. Already inhabited by 1.25 billion people, India will soon overtake China as the world's most populous nation. The structure of the world economy is changing too, with a concerted effort to abandon the traditional Indian dependence on agriculture and services. For now, The Indian government has implemented certain policies - such as 'Make in India' and 'Skill India' efforts, designed to assist in the development of the manufacturing sector. Aimed to move low skill jobs away from the agricultural sector and bring the Indian economy to the herd, efforts have been widely recommended.

Policies are expected to have significant implications for India's future power, however. The amount of energy required by the industrial sector is expected to increase annually by 4.4% and to do so will increase by more than 50% of India's total energy expenditure by 2040. Young people, collectively and from the agricultural sector, have four understandably led to an increase in urban migration in India. Indian people in urban areas are expected to more than double by 2030. Its homes will be asked to hold more than 300 million people, which will accelerate the use of modern fuel, resulting in an increase in equipment and vehicle ownership, and provide for the demand for building materials, which are expected to increase in size greenhouse gas (GHG) emissions.

Urban change also means that there will be a shift from the use of biomass fuels, currently used for heating and cooking petrol in about 65% of Indian households in 2013.Electricity and oil are expected to generate more than 60% of the energy used in these households in 2040.

As of 2013, India created only 5.7% of the world's energy demand, although it had 18% of the world's population. Upcoming changes in the Indian population, economic structure and urbanization. The cosmetics are guaranteed to increase India's rapid energy expenditure, however. Already below the global average energy level of 78.7%, estimated for national

[4] Goldfield GS, Harvey ALJ, Grattan KP, Temple V, Naylor PJ, Alberga AS, Ferraro ZM, Wilson S, Cameron JD, Barrowman N, Adamo KB. Effects of Child Care Intervention on Physical Activity and Body Composition. Am J Prev Med. 2016 Aug;51(2):225-231. doi: 10.1016/j.amepre.2016.03.024. Epub 2016 May 11. PMID: 27180030.

 [ISSN 2581-5369]

energy. The system needs to be quadrupled in size to accommodate 600 million new electricity users will be added in 2040. This will require India to add an additional 900 GW of new energy, as produced by the International Energy Agency (IEA) under its Policy Framework,

In order to meet the perceived energy needs, India has set significant goals to increase its capacity. Now that it has achieved its 15-year target by 15%, India seems to be on its way to the summit of short-term requirements. India has reaffirmed its commitment to a low carbon footprint power through plans to increase its renewable energy capacity to 175 GW in the medium term.

III. OPPORTUNITIES FOR A LOW CARBON TRANSITION

While the major sources of carbon emissions in India have been identified, and the issues that could prevent India from effecting a meaningful low carbon transition have been discussed, it is important that the opportunities that are available to India are also examined. In the renewable energy field, possible opportunities to increase funding include the use of financial instruments, increased government incentives and wholesale policy changes eradicating many of the legal and bureaucratic roadblocks. Newer plant technology and updated methodologies could provide opportunities to reduce emissions from the coal sector. Investing in infrastructure and domestic capabilities in both the natural gas and nuclear energy sectors could also give India the opportunity to use cleaner alternative energy sources in the future. Careful management of India's urban transition and the use of recapture technologies in the waste & waste water sector could also provide the opportunity for India to successfully achieve its ambitions of a low carbon transition.

IV. ISSUE AND CHALLENGES

The fragmentation of GDP and greenhouse gas emissions in many countries reflects the potential for an increase in the number of changes in clean business practices. This classification of the country led the global trend towards segregation in 2014 and 2015. In addition to the integrated approaches described here, more information is needed about the potential losses of carbon emissions to other countries as countries export their industries overseas. as well as complete eradication and what is needed to support significant pollution reduction.

Economic development achieved in the last six decades, coupled with rapid global population growth, has resulted in significant environmental costs. While (Pandey)e global GDP has almost tripled since 1960, CO2 emissions have quadrupled over the same period.

 [ISSN 2581-5369]

Today, the three largest broadcasters in the world - China, the United States and India[5] - account for 50% of global CO2 emissions, and the 20 largest publishers in the world are 80%.

For example, the average person in the United States is twice as likely as a Chinese person, five times as much as another in Mexico and eight times as much as an Indian.[6]

With business as usual, as developing countries develop, each output will increase. This, combined with the possible increase in population, will further exacerbate the global problem.

Given the current and historic relationship between economic growth and carbon growth, developing countries can view the current output of developed countries as a stick, the price they have to pay for economic progress. Such a view would ruin the earth's efforts to reduce pollution.

This worrying trend highlights the real need for developed and developing countries to "separate" the prosperity of CO2 emissions. Developed countries need to accelerate their individual decentralization, and developing countries must get the technical and financial support needed to reverse the trend of green and low carbon emissions. This benefits everyone.

The challenge of advancing the construction industry in a sustainable manner is represented by the continued emission of CO2 due to the use of renewable energy resources in construction, construction and property management. CO2 is also extracted from several land uses through the urbanization process. Energy from fossil fuels is not sustainable, but it generates a lot of energy used in construction and operation. Sustainable or renewable energy sources account for only 6% of the total energy used in the sector, while fossil fuels used in construction projects account for 40% of global greenhouse gas emissions. Although a number of measures have been proposed to reduce CO2 emissions, especially in densely populated urban areas, these challenges have not been adequately addressed. The use of renewable energy sources directly affects the environment and is directly proportional to the amount used. The structure emits CO2, directly or indirectly. Direct CO2 emissions come from the burning of natural gas, diesel, petroleum and other petroleum products, while indirect CO2 emissions come from electricity consumption. Globally, indirect CO2 emissions represent 85% of total CO2 emissions, while only 14% from direct emissions. The 2030 climate and energy framework states that 27% of energy should come from sustainable energy sources, while energy efficiency should be increased by 27%. However, there are challenges in finding sustainable solutions with low

[5] Carbon emissions anywhere threaten development everywhere, UNCTAD (June 2, 2021), https://unctad.org/news/carbon-emissions-anywhere-threaten-development-everywhere.
[6] Tyler L Shearer, Locating Extraterritoriality: Association for Accessible Medicines and the Reach of State Power, 1001501 BOSTON UNIVERSITY LAW REVIEW 1501-1552 (2020).

 [ISSN 2581-5369]

productivity and efficiency. One solution is to elaborate on the processes of construction and operation in order to conduct a detailed assessment. Construction involves assembling building materials, building buildings and foundations, and moving and operating machinery. The process covers aspects of construction and maintenance of infrastructure. Life cycle testing requires a detailed calculation of these processes at all stages of structural life. The evaluation will highlight strategies that can be made more productive and efficient.

V. IMPACT AND CONSEQUENCES

"They keep saying that climate change is an existential threat and the most important issue of all. And yet they just carry on like before. If the emissions have to stop then we must stop the emissions. To me, that is black or white."[7]

"Why are we not reducing our emissions? Why are they, in fact, still increasing? Are we knowingly causing a mass extinction? Are we evil? No, of course not. People keep doing what they do because the vast majority doesn't have a clue about the consequences of our everyday life. And they don't know the rapid changes required."[8]

"When you think about "the future", you don't think beyond the year 2050. By then I will not even have lived half of my life. What happens next? The year 2078 I will celebrate my 75th birthday. What we do or don't do, right now, will affect my entire life, and the lives of my children and grandchildren."[9]

"Some people say that I should study to become a climate scientist so that I can" solve the climate crisis". But the climate crisis has already been solved. We already have all the facts and solutions. All we have to do is to wake up and change."

"Why should I be studying for a future when no one is doing anything whatsoever to save that future? And what is the point of learning facts within the school system when the most important facts given by the finest science of that same school system clearly means nothing to our politicians and our society?"[10]

*"**Today we use 100 million barrels of oil every day. There is no politics to change that. There are no rules to keep that oil in the ground. So, we can't save the world by playing by the rules.***

[7] We Donâ, Greta Thunberg: The rebellion has begun, We Don't Have Time (Oct. 31, 2018), https://medium.com/wedonthavetime/the-rebellion-has-begun-d1bffe31d3b5.
[8] Ibid.
[9] Claire Sanford, Greta Thunberg Ted Talk Transcript: School Strike For Climate, (Dec. 12, 2018), https://www.rev.com/blog/transcripts/greta-thunberg-ted-talk-transcript-school-strike-for-climate.
[10] The Truth About The Biodome Experiment Gone Wrong, Celeb Tattler (June 18, 2020), https://www.celebtattler.com/news/news/net_worth/27293/the-truth-about-the-biodome-experiment-gone-wrong/.

 [ISSN 2581-5369]

Because the rules have to be changed. Everything needs to change."[11]

– Said by Greta Thunberg in her famous Extinction Rebellion Rally, London, October 31, 2018

Greta highlighted our problem in her speech and its consequences if we did not take steps to seriously protect ourselves, our community and our environment. By absorbing heat from the sun, greenhouse gases maintain the earth's climate for humans and millions of other species. But those gases are now in balance and threaten to drastically change which species can survive on this planet -- and it has.

The atmospheric levels of carbon dioxide - the hottest and hottest gas - are the highest ever recorded. Today, climate change is the term scientists use to describe heavy shifts, driven by the concentration of greenhouse gases, now affecting our planet's climate and weather systems. Climate change not only includes rising temperatures such as global warming but also extreme weather events, changing wildlife communities and habitats, rising sea levels, and other impacts.[12]

Understanding how India can continue to make a significant contribution to reducing greenhouse gas (GHG) emissions, coupled with equity and fairness, is crucial given the upcoming climate summit, where we will be expected to delive (SAHA) (Chandra) (Climate change report card: These countries are reaching targets)r on a renewed commitment. It is well-known that CO2 emissions contribute to global warming and climate change, which can have far-reaching effects on humans and the environment. CO2 emissions act as a blanket on the air, trapping heat in the atmosphere, and warming the Earth. This layer prevents the Earth from cooling, and thus raises the earth's temperature. Global warming will affect environmental conditions, food and water, climate patterns, and sea levels. According to the National Oceanic and Atmospheric Administration (NOAA) Global Climate Summary, the combined global and sea temperatures since 1880 have risen by 0.07 co. over a decade. Temperatures have continued to rise since 1981, with an average temperature of 0.18 co., twice as high as in previous years. Figure 2 shows the effect of CO2 emissions due to global warming. CO2 emissions alter water supply and change harvesting times. For example, climate change undermines coastal and marine areas with rising sea levels, creating a growing demand for food crops. CO2 also causes acid rain, which harms trees and the environment. These effects and effects of CO2 emissions can be seen now. They are rising above global warming, affecting ecosystems and communities

[11] Phil Stubbs, Greta Thunberg quotes, The Environment Show (Apr. 7, 2020), https://www.environmentshow.com/greta-thunberg-quotes/.

[12] Carbon Dioxide Levels Are at a Record High; Here's What You Need To Know, https://education.nationalgeographic.org/resource/carbon-dioxide-levels-are-record-high-heres-what-you-need-know/.

 [ISSN 2581-5369]

around the world. These gases are a major cause of climate change and pollution occurring worldwide with no substitute for alternative emissions to reduce these emissions.[13]

Carbon dioxide (CO2): Carbon dioxide is the main greenhouse gas, responsible for about three-quarters of the emissions. It can stay in the atmosphere for thousands of years. Carbon dioxide emissions mainly come from burning organisms: coal, oil, gas,

Methane (CH4): A major component of natural gas, methane is extracted from landfills, natural gas and petroleum industries, and agriculture (especially in grazing systems for grazing animals). The methane molecule does not stay in the atmosphere for as long as the carbon molecule - about 12 years - but has at least 84 times more energy than 20 years. It accounts for about 16 percent of all greenhouse gas emissions.

Nitrous oxide (N2O): Nitrous oxide is a small fraction of the world's greenhouse gases - about 6 percent - but it is 264 times more potent than carbon dioxide in 20 years. According to the IPCC, agriculture and livestock, including fertilizer, compost, and the burning of agricultural residues, as well as fossil fuels, are major sources of nitrous oxide emissions.

Industrial gases: Refined gases such as hydrofluorocarbons, perfluorocarbons, chlorofluorocarbons, sulphur hexafluoride (SF6), and nitrogen trifluoride (NF3) have a potential trace of heat greater than several thousand years and remain in CO2 and remain. About 2 percent of all emissions, used as refrigerators, solvents, and in production, sometimes occur as products.

Other greenhouse gases include water vapor and ozone (O3). Water vapor is actually the world's largest heat sink, but it is not tracked in the same way as other greenhouse gases because it does not directly emit human activity and its effects are not well understood. Similarly, global or tropospheric ozone depletion (not to be confused with the protective layer of ozone stratospheric) does not emit directly but results from complex interactions between air pollutants.[14]

Greenhouse gases allow the sun’s light to shine onto Earth’s surface, and then the gases, such as ozone, trap the heat that reflects back from the surface inside Earth’s atmosphere. The gases act like the glass walls of a greenhouse—thus the name, greenhouse gas.[15]

[13] Chris Deziel, Global Warming, Causes, Effects And Measures, Blogger (Mar. 27, 2023), https://freyaniviaddress.blogspot.com/2023/03/global-warming-causes-effects-and.html.
[14] Friday, Governor Cuomo Urges New Yorkers to Prepare for Extreme Heat, News https://ocfs.ny.gov/main/news/article.php?idx=1943.
[15] *Supra* Note 11.

 [ISSN 2581-5369]

According to scientists, the average temperature of Earth would drop from 14˚C (57˚F) to as low as –18˚C (–0.4˚F), without the greenhouse effect.[16]

Greenhouse gas effect is one of the most life-threatening things happening all over the world. Greenhouse gases have a wide range of environmental and health effects. They cause climate change by trapping heat, and they also contribute to respiratory infections from fog and air pollution. Extreme weather, disruption of food supplies, and rising wildfires are just some of the effects of climate change caused by greenhouse gases. The normal weather conditions we grew up expecting would change; some species will disappear; others will move or grow.

Some greenhouse gases come from natural sources, for example, evaporation adds water vapor to the atmosphere. Animals and plants release carbon dioxide when they respire, or breathe. Methane is released naturally from decomposition. There is evidence that suggests methane is released in low-oxygen environments, such as swamps or landfills. Volcanoes—both on land and under the ocean—release greenhouse gases, so periods of high volcanic activity tend to be warmer.

The amount of CO_2 in the atmosphere far exceeds the naturally occurring range seen during the last 650,000 years.Most of the CO_2 that people put into the atmosphere comes from burning fossil fuels. Cars, trucks, trains, and planes all burn fossil fuels. Many electric power plants do as well. Another way humans release CO_2 into the atmosphere is by cutting down forests, because trees contain large amounts of carbon. People add methane to the atmosphere through livestock farming, landfills, and fossil fuel production such as coal mining and natural gas processing. Nitrous oxide comes from agriculture and fossil fuel burning. Fluorinated gases include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs). They are produced during the manufacturing of refrigeration and cooling products and through aerosols.[17]

All of these human activities add greenhouse gases to the atmosphere. As the level of these gases rises, so does the temperature of Earth. The rise in Earth's average temperature contributed to by human activity is known as global warming. Even slight increases in average global temperatures can have huge effects. Perhaps the biggest, most obvious effect is that glaciers and ice caps melt faster than usual. The meltwater drains into the oceans, causing sea levels to rise.

Glaciers and ice caps cover about 10 percent of the world's land masses. They hold between

[16] Ibid.
[17] Ibid.

 [ISSN 2581-5369]

70 and 75 percent of the world's freshwater. If all of this ice melted, sea levels would rise by about 70 meters (230 feet). The Intergovernmental Panel on Climate Change states that the global sea level rose about 1.8 millimetres (0.07 inches) per year from 1961 to 1993, and about 3.1 millimetres (0.12 inches) per year since 1993.Rising sea levels cause flooding in coastal cities, which could displace millions of people in low-lying areas such as Bangladesh, the U.S. state of Florida, and the Netherlands.

Millions more people in countries like Bolivia, Peru, and India depend on glacial meltwater for drinking, irrigation, and hydroelectric power. Rapid loss of these glaciers would devastate those countries. Greenhouse gas emissions affect more than just temperature. Another effect involves changes in precipitation, such as rain and snow. Over the course of the 20th century, precipitation increased in eastern parts of North and South America, northern Europe, and northern and central Asia. However, it has decreased in parts of Africa, the Mediterranean, and southern Asia.

As climates change, so do the habitats for living things. Animals that are adapted to a certain climate may become threatened. Many human societies depend on predictable rain patterns in order to grow specific crops for food, clothing, and trade. If the climate of an area changes, the people who live there may no longer be able to grow the crops they depend on for survival. Some scientists also worry that tropical diseases will expand their ranges into what are now more temperate regions if the temperatures of those areas increase. So, the life of all biotic and abiotic beings in the world happens to be very much in danger and life time hard situations live peacefully and healthy.[18]

VI. INDIA'S TAKE ON ITS LOW- CARBON EMISSION POLICIES

India is unlikely to bind itself to a net-zero greenhouse gas emissions goal by 2050, government sources told Reuters, despite diplomatic pressure from the United States and Britain to do so to help slow global warming.[19]

India is the world's third-biggest carbon emitter after China and the United States and thus is vital in the fight against climate change currently focused on reaching zero emissions by mid-century or thereabouts.

But India's energy demand is projected to grow by more than any other nation over the next

[18] (Dec. 14, 2020), https://wedocs.unep.org/bitstream/handle/20.500.11822/34438/EGR20ESE.pdf.
[19] India baulks at 2050 carbon neutral target even as pressure from America, Britain grows, (Mar. 31, 2021), https://energy.economictimes.indiatimes.com/news/coal/india-baulks-at-2050-carbon-neutral-target-even-as-pressure-from-america-britain-grows/81770606.

 [ISSN 2581-5369]

two decades and the worry is that it may have to cut back on consumption if it were to tie to the only use of technology and factories harming the environment.

Phasing out coal, investing in renewables and promoting energy-efficient production of food and other consumables can help India reduce its emissions, the study suggested. India has already set a target to increase the share of non-fossil fuel energy in its total energy mix to 40% by 2030.[20]

India should promote public transport and introduce carbon pricing of goods and services to manage carbon-friendly consumption if economic growth were to move more middle-class Indians into the high-income category, the study added.

But carbon pricing, a tax or cess on goods and services that score high on carbon emissions, could be a tricky concept in the Indian context, said experts. "Many countries have been toying with this idea for years but there is a concern that levying a tax can burden the poor if not done properly," said Soumya Dutta, co-convener, South Asian People's Action on Climate Crisis, a coalition of organisations and individuals focussed on raising awareness about and influencing climate policies. "For instance, India has been increasing tax on diesel for the past few years but it harms the small farmer using the fuel to run an irrigation pump more than a rich SUV owner. Carbon pricing can only work properly if it's focussed and prohibitive. A tax of Rs 25,000 on cars will not stop people from buying them. A Rs 2 lakh tax can be prohibitive but is not feasible due to political compulsions."

How can India contain emissions caused by food consumption, second highest after energy? "There are many options that can be easily applied at home. Food-related transport emission is not so big, but diet shift, less wastage, and less carbon-intensive production are critical to reducing food-related emissions,"[21].

India's agricultural greenhouse gas emissions can fall up to 25% if families include coarse cereals, such as millets, and leafy vegetables in their diets, a change that can also help combat nutritional deficiencies.

The study found that since the advent of the Green Revolution in 1960s, the Indian government has been promoting more high-yielding but low-nutrient varieties of wheat and rice that also emit more greenhouse gases, as we said earlier. This shift came at the cost of more nutritious indigenous varieties of cereals with lower carbon footprints. Emission reductions can thus be

[20] Manu Moudgil, In India, the rich cause seven times more emissions than the poor, (Jan. 20, 2021), https://scroll.in/article/984472/in-india-the-rich-cause-seven-times-more-emissions-than-the-poor.
[21] Jemmying Lee, the first author of the study, told *India Spend.*

 [ISSN 2581-5369]

achieved by moving away from rice to wheat, maize, bajra and ragi; and from beef and eggs to chicken and legumes, the study said.

"Rich and upper-middle classes should replace exotic, imported and energy-intensive food items with more climate-friendly crops like millets. Reducing food wastage and purchasing food suited to our climate, soil and water would help reduce the adverse impact of our consumption habits on our natural resources."

VII. LIMITATIONS OF THE STUDY

India's large informal economy does not allow the building of a comprehensive dataset on consumption and carbon emissions, experts pointed out.

However, just looking at carbon may be misleading especially in the Indian context, "For (Manu Moudgil) (Government Of India. Intended Nationally Determined Contribution) (NUNEZ) instance, while the use of electricity for pumping water to irrigate fields gets accounted for as emissions, how that pumping impacts the groundwater availability does not," he said. "For that, we need to have a water footprint. In measuring emissions and global warming, we should not lose [sight of] the issue of local resource scarcity which impacts the most vulnerable."

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 [ISSN 2581-5369]