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CLIMATE CHANGE HAS BECOME AN IMPENDING DISASTER IN THE MAKING: AN ANALYSIS OF THE IMPACT OF A CONSENSUS ON THE REDUCTION OF CARBON FOOTPRINTS WITH SPECIAL REFERENCE TO EMERGING ECONOMIES LIKE INDIA

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ABSTRACT

An attempt has been made to understand the reasons for the increasing impact of climate change for both developing and developed economies. In spite of the fact that the use of fossil fuels is the easiest way of achieving high GDP growth for developing economies like India, the worldwide adverse impact of climatic conditions on the agricultural sector has resulted in complete reversal with respect to the use of fossil fuels as an energy source. This might be an expensive alternative but the downsize is much worse.

Research Question: Climate change has suddenly become extremely visible and apparent all over the world. The impact is being felt in everyone's daily life. The disastrous aftermath of these changes has made life extremely uncomfortable, and is thus calling for consensus amongst all the countries of the world to find solutions in reducing its detrimental impact. This agreement is between both developed and emerging economies. How fair is it for emerging economies to be placed at the same level as developed nations is a question that will be attempted to be answered in this study. An attempt will be made to reduce the impact without affecting the pace of Gross Domestic Product (GDP) growth.

1. Introduction

Climate change has resulted in mayhem throughout the world resulting in extreme temperature variations. There has been a continuous rise in the temperature of the Earth's surface by about 1.8°C. This is with respect to both land and ocean temperatures and if one discusses the comparison from the industrial decade of Europe and America there has been a vast change

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compared to the present decade.

The data which is alarming is with respect to greenhouse gas concentration (GHG), temperature rise, sea level rise, and other unheard impacts on the environment withrespect to flora and fauna.

This has impacted the citizens of all countries bringing in its wake the realisation that governments have to sit together and find a consensus solution. These impacts are so severe that it can no longer be brushed under the carpet neither dictatorship by developed countries on others be accepted. Solutions have to take into account changes that would affect the GDP of an economy. This may not be as important for a developed economy as it would be for an emerging economy.

The solution for an emerging economy might be an adverse trade-off between saving the environment and growth. The cost of an environment friendly growth process could be an extremely expensive process for such economies. On the otherhand, developed economies have already achieved high levels of social development the trade-off maybe negligible. Most of the world climate meetings need to take these basic assumptions into account before deciding on path to be followed by both set of countries.

The path cannot be the same for both.

Figure 1: Logo of COP 27

Source: Google Images

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The fact that the disastrous effects of climatic change have become extremely important and disturbing is unacceptable, it has eventually led to greater participation with the intention of a solution in the Conference of the Parties (COP)meetings that are held every year.

2. The Impact of Climate Change in the past decade

The last decade has seen warmer temperatures, changing weather patterns, all of which have disrupted the usual balance of nature. This is an extremely disturbing phenomenon leading to risks to humans and all other forms of life on Earth.

2020 was one of the hottest years on records. Extremely high temperatures lead to heat related illnesses and spread wild fires across the globe. Besides increasing temperatures there have been severe storms that have caused in its wake floods, land-slides, which have destroyed homes and communities. The financial impact ofall of the above has been quite high. Severe droughts have led to water shortage leading to deserts expanding and land for food reducing. Water levels of oceans have been rising mainly due to extreme heat which has resulted in the melting of ice sheets. Oceans absorb carbon dioxide and as they expand the extent of carbon dioxide increases which is detrimental to marine life.

The effects of these extreme temperatures have adversely impacted crop production, fishery, and livestock, leading to increasing hunger in the world. The sectors which are most vulnerable to climate risk are:

- The agricultural sector: Flooding due to climatic changes have led to many fields being washed away and livestock drowned, draught conditions on the otherhand due to the same reasons have led to reduction in agricultural output and livestock dying due to lack of water. A large number of crops for example corn, soya beans, wheat, rice, and cotton do not grow well if the temperatures are too high. The reason being inadequate water, increased pests and weeds and fire risk.

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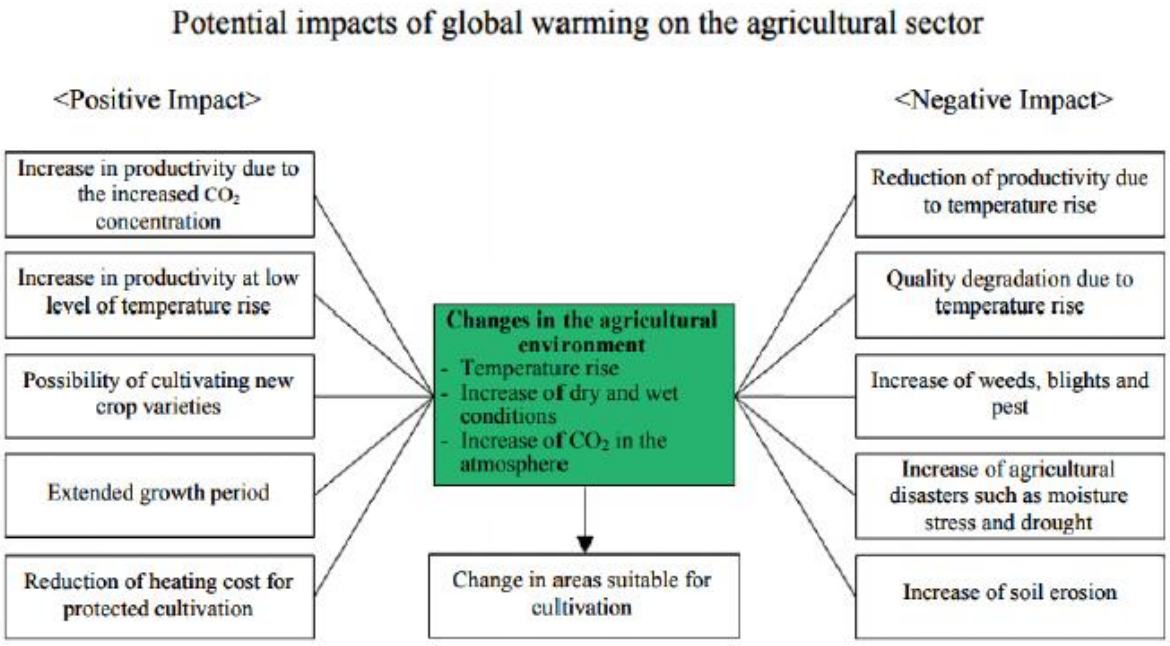
Figure 2: Impact of climate change on the agricultural sector



Source: Farms.io

- Infrastructure: As the sea level rises, it tends to impact the foundation on which these structures have been built. This impact is clearly seen in India in theJoshimath township, where cracks have been observed increasing at an alarmingrate both on the roads as well as in the residential areas due to clear disregard of climatic impact.

Figure 3a: Joshimath (India) disaster

Source: Timesofindia.timesofindia.com

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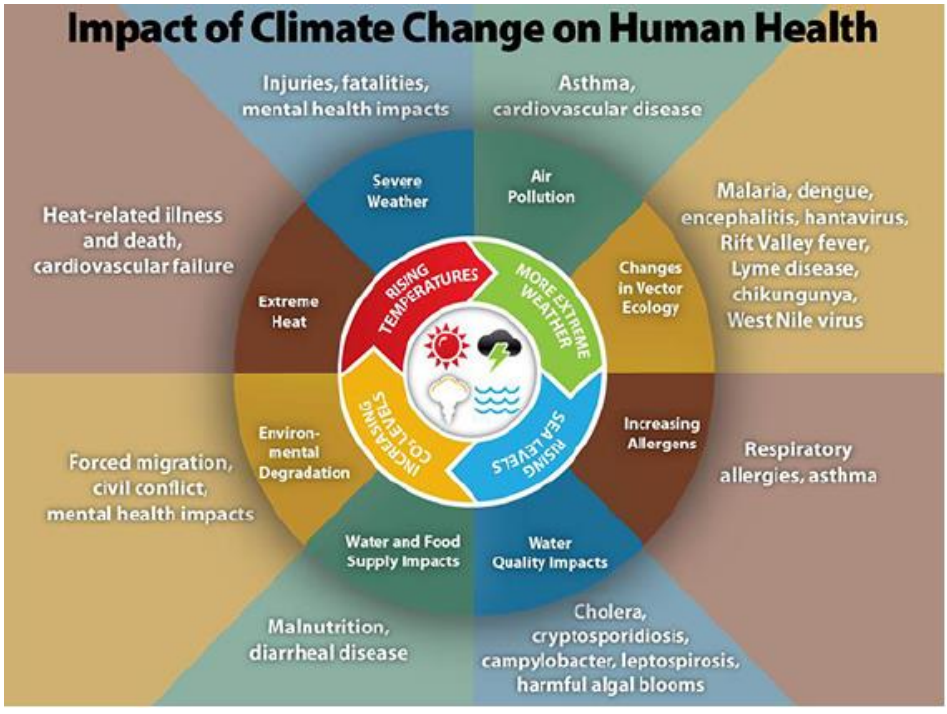
Figure 3b: Joshimath (India) disaster

Source: thehindu.com

- Human health and productivity: Increasing temperatures are likely to lead to higher water and food borne diseases and allergies like Zika, Dengue, and various new strains. Extreme weather conditions also impact mental health specially of the elderly, children, and low-income communities.

Figure 4: Impact of climate change on human health



Source: cdc.gov

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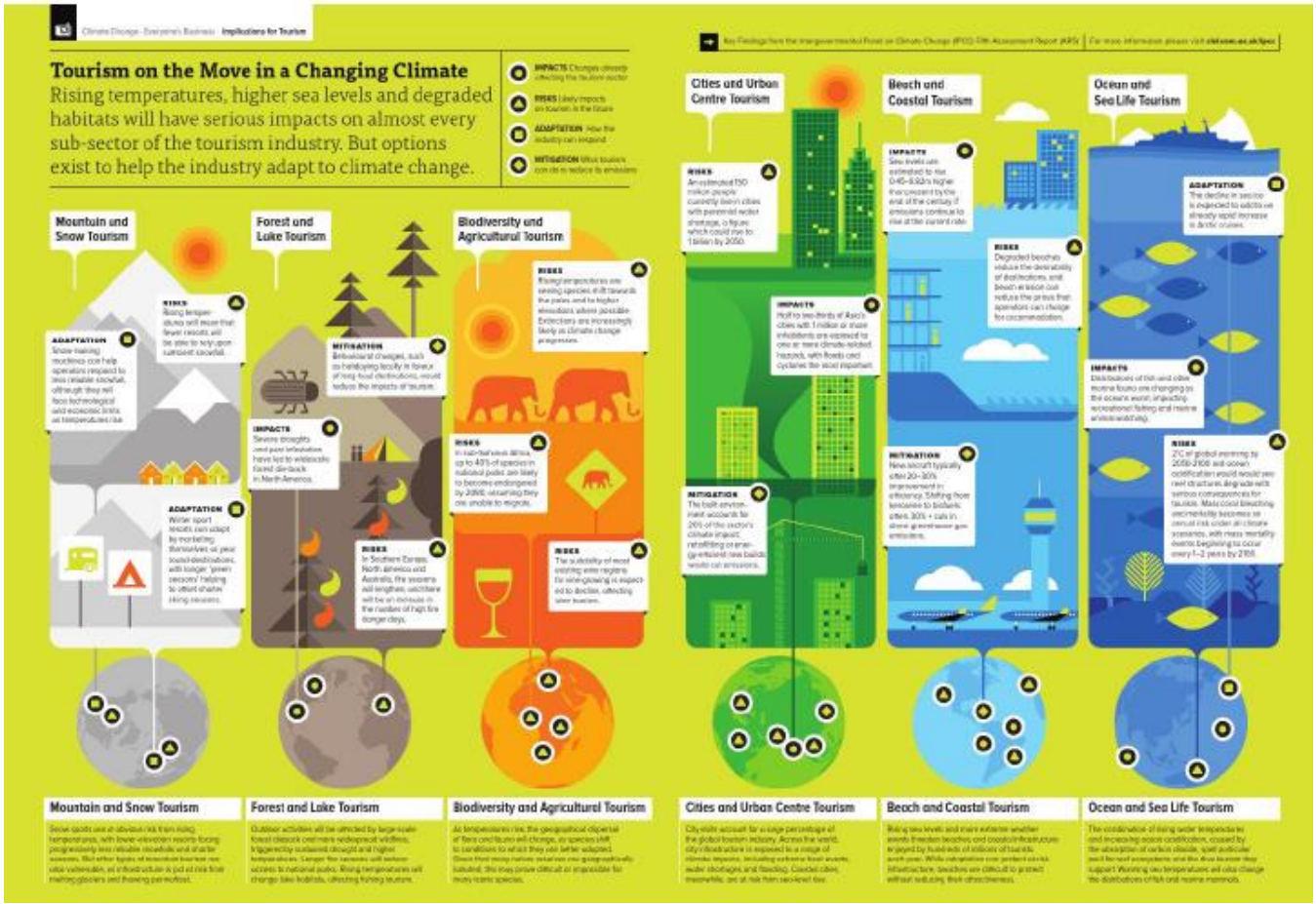
- Tourism: Fluctuation in temperatures could lead to toxic air, curtailment ofrecreational water activities, submerging of quaint islands and deforestation, leading to certain tourist destinations becoming unattractive.

Figure 5: Impact of climate change on tourism



Source: issuu.com

3. Developed Economies

Developed economies have achieved high rates of development from the 18th century to the early 20th century. Britain was the first country that embarked on thepath of development and subsequently countries in Europe, the USA, Japan, and countries in Southeast Asia, have trodden the same path. All these countries havedone so by using fossil fuels which emit a large number of greenhouse gases and carbon footprints in the atmosphere leading to adverse climatic conditions.

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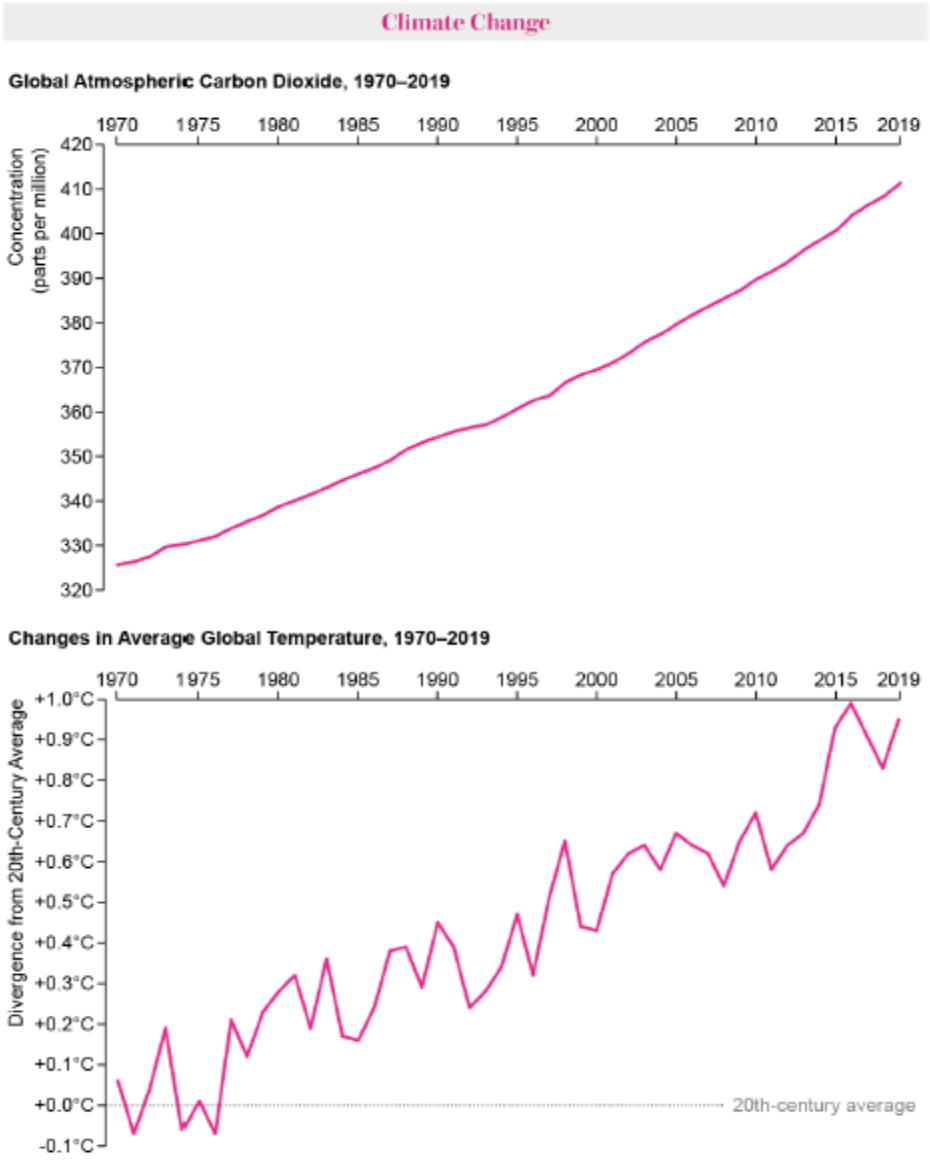
While these countries were achieving high rates of GDP, they were not too concerned with the impact that this was having on the environment. As most ofthese countries developed in the 18th, 19th, and 20th centuries, none of them imagined the impact that continuous use of fossil fuels would have on the environment. It is only in the late 20th and early 21st century that the disastrousimpact is being felt all over the world.

Figure 6: The direct impact of atmospheric carbon dioxide on global temperature



Source: scientificamerican.com

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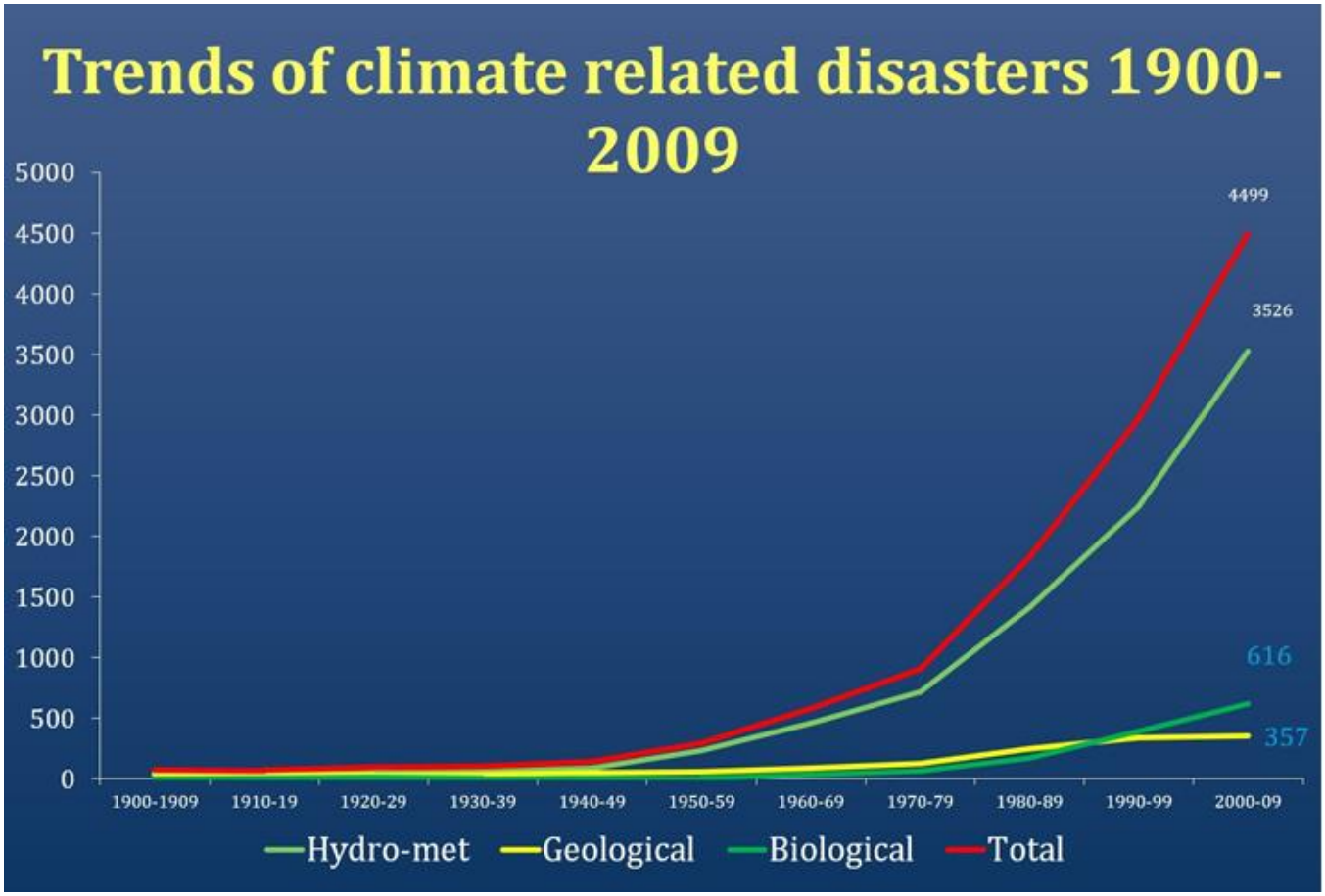
Figure 7: Trends of climate related disasters



Source: thethirdpole.net

Greenhouse gases are those that absorb and emit radiant energy. These gases which are carbon dioxide, methane, nitrous oxides, and ozone are the ones that trap heat. During the day the sun shines through the atmosphere warming the Earth's surface, and at night when the Earth's surface cools down it releases heat back into the air, but the heat is trapped by the greenhouse gases. As the economies use fossil fuels, harmful gases are emitted in the atmosphere which increase temperatures, having an adverse impact on climate.

3.1- Environment

When the presently developed countries were achieving GDP levels of 6,7,8,9% per annum, they were doing so by using ample amount of fossil fuels like coal, oil, and natural gas. As a country develops the contribution to GDP from agricultural decline and that of manufacturing and services start increasing, resulting in increasing amount of energy. Fossil fuels as a source of

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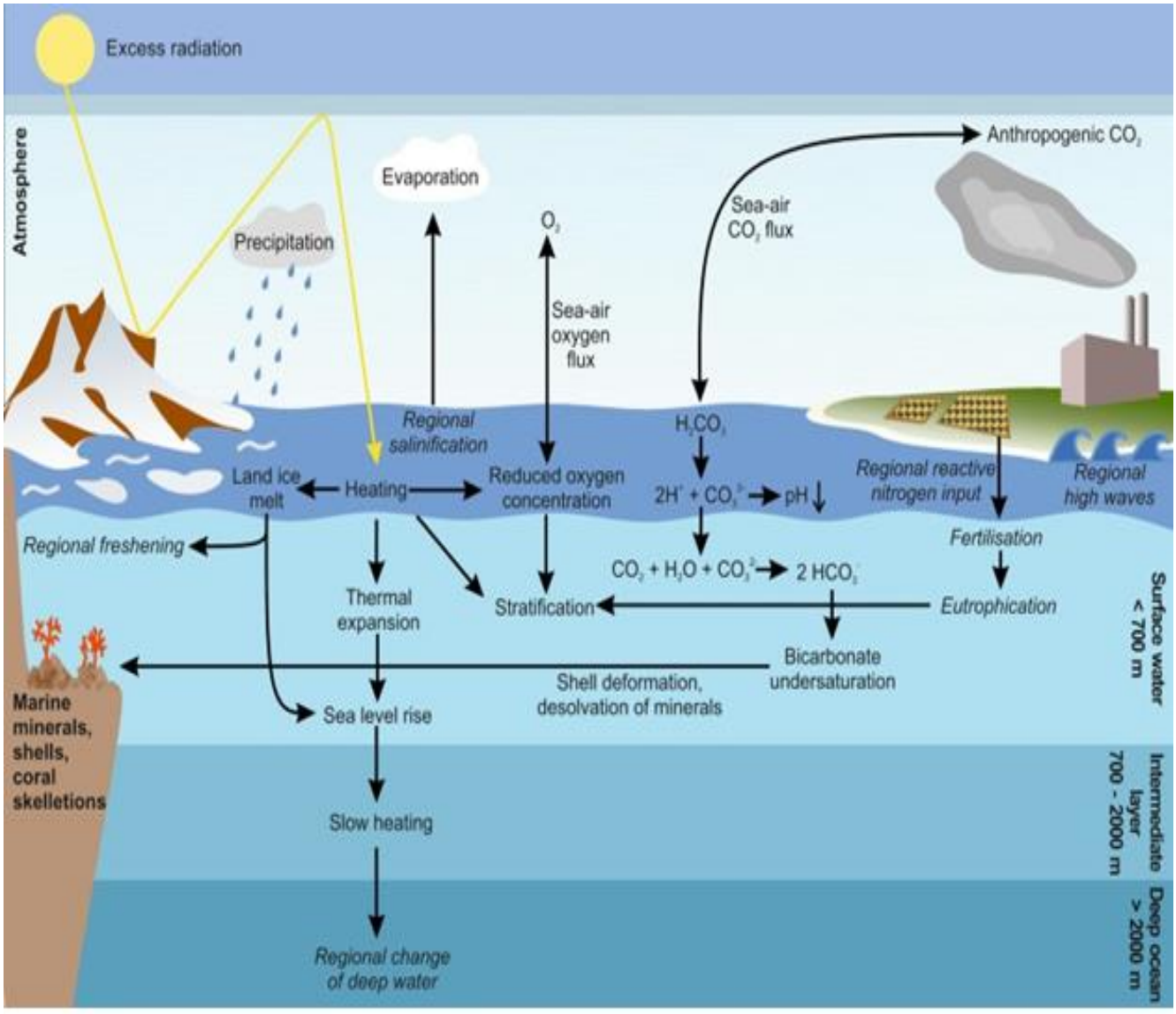
energy were freely available for the earlier industrialised nations. This led to environmental disasters that the world is facing today. The result of these has been extinction of a number of species as well as the growth of unwanted plants, diseases, and pests due to the high variation in temperature.

Figure 8.1: Impact of climate change on water bodies



Source: https://en.wikipedia.org/wiki/Effects_of_climate_change_on_oceans

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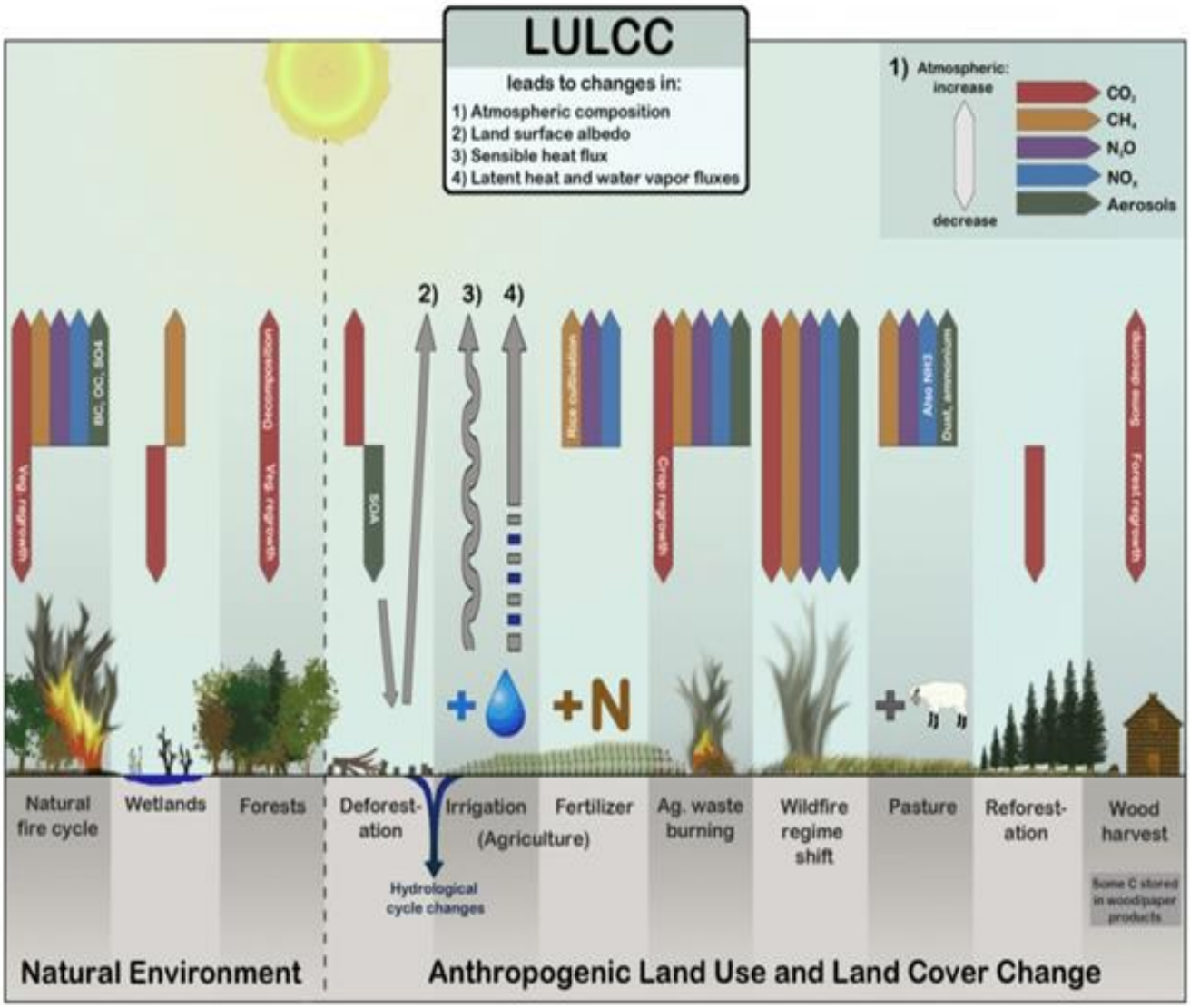
Figure 8.2: Impact of climate change on the land



Source: researchgate.net

3.2- Gross Domestic Product (GDP)

At the time that the countries were developing, the main aim was to increase theoutput from the manufacturing sector at whatever cost. This meant large consumption of fossil fuels and an adverse impact on climate. None of these countries realised, or they conveniently chose to ignore at that time this adverseimpact.

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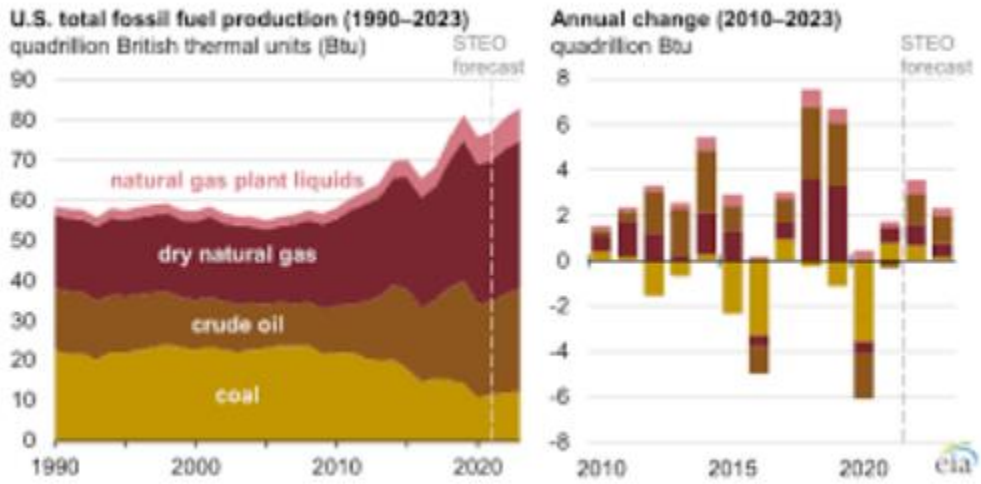
Figure 9: Indications of the continuous dependence on fossil fuels



Source: eia.gov

In spite of the adverse climatic influence on the continuous use of fossil fuels advanced economies like America are still dependant on fossil fuels to increase their GDP. The cost benefit analysis of using alternative sources of fuel seem to be heavily loaded against using alternative fuels. The cost of developing and as well as using them is extremely high and thus not always a viable alternative. This is thecase for a developed economy and becomes even worse in the case of emerging market economies.

4. Emerging Economies

Emerging economies have additional responsibilities:

1) Increasing and sustaining high GDP levels.

2) Battling adverse impact of climate change.

Such economies have to achieve high capita levels of income such that there is reduction in poverty levels, increasing employment, adequate health, education, and improvement in standard of living. The government of such economies have to implement policy measures which can achieve all the above goals. These at times seems difficult given the fact that we are in an era of globalisation and liberalisation, where any recessional fear in any part of the world impacts every country. Given these two factors the up-hill task of achieving sustainable high GDP growth rate becomes even more difficult.

In countries like India the aim is primarily to use the labour surplus in increasing the growth of

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the economy. This means that they should be employed in labour intensive sectors which serve the purpose of increasing employment, reducing poverty, and increasing standards of living. As the economy progresses on the pathof development the contribution of the agricultural sector to GDP declines and that of the manufacturing and the services sector increase. In India the contributors of the agricultural sector to GDP have decreased but the number of workers dependent on the agricultural sector are still in the range of about 45%. Essentiallyindicating that half the work force is still dependant for their living on the agricultural sector. It also indicates that the manufacturing sector development is more of a capital-intensive nature. This defeats the purpose of using excess labour supply.

India is fortunate to be at a stage where it has a 'demographic dividend' (This is anindependent workforce in the age group 15 to 59 years who can be gainfully employed and add to increasing the GDP of the economy. The below 15 years andabove 59 years are dependant population i.e.; they are not going to add to increase GDP but are going to be dependant either on the government or on their families). China effectively used its excess labour to increase its GDP by adopting labour intensive technology. It has around the 1980's followed a policy of one child norm leading to a situation today where its dependant population is greater than its independent population. India on the other hand is in a fortunate position of 'demographic dividend', which it should use as China did to increase its level ofdevelopment.

4.1- Environment

The impact of climate change on environment normally leads to lower agricultural yield, lower incomes in the agricultural sector. As 44% of the population is dependent on the agricultural sector the adverse impact of climate change on this sector leads to detrimental impact on the people dependant on it. Increased droughts and floods have led to higher vulnerability of this sector. Poverty and inequality are the main issues in recent times for emerging market economies but due to the increasing detrimental impact of climate change it has become as big an issue as poverty and inequality.

Changes in temperature could reduce crop yields which does not bear well for economies facing food insecurities. The ironical fact is that agriculture forestry and land use change are in fact responsible for 25% of greenhouse gas emissions (GHG).

The burning issue for developing economies is that they no longer have the bandwidth as it was the case for developed economies, to develop first in a highcarbon intensive way and then clean up and decarbonise later. Developing economies need to slow down the impact on climate and all the processes and procedures would have to be more inclusive and sustainable. The policies that these countries have to put in place have to include low carbon, environment and

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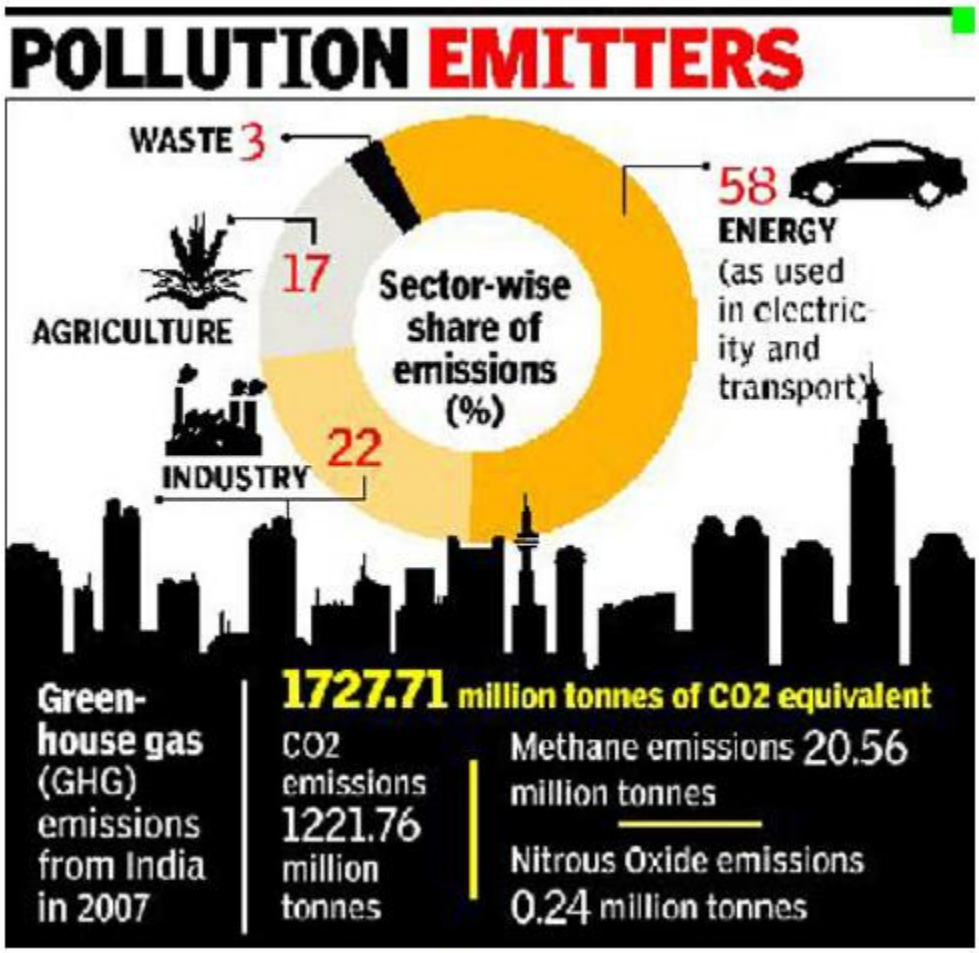
ecologically-friendly processes.

Figure 10: India GHG (Greenhouse Gas) Emissions



Source: https://images.app.goo.gl/c9g8cQGgQCJtgrA38

4.2- Gross Domestic Product (GDP)

It has been predicted that climate change can reduce India's GDP by 2.6% in the year 2100. This is when the global temperature is projected to increase at 1.5% peryear. If it increases then the substantial impact on GDP will be worse. India is blessed with a lot of natural resources like forests and solar but has limited capital and technology. For it grow, it needs to increase the resources that it does not adequately have. For that GHG emissions and carbon imprints are likely to increase. As the economy starts growing the demand for fuel and petroleum will simultaneously start rising. The dependency on fossil fuels is enormous which further adversely

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impacts climate. The usage of fossil fuels is an easier and cheaper alternative which is an important factor in increasing GDP levels. For India to move to the more sustainable, environment-friendly alternative to fossil fuels is an extremely expensive and nonviable alternative. At all points in time, there will be acontinuous trade-of between cheaper environment harming resources vis-a-vis the more expensive sustainable technology.

5. Suggested solutions to reduce carbon footprints

Climate change and its impact is being felt all over the world. The adverse effect of the consequences is so intense that they seem to be a sense of urgency to address these issues. This is both for developing and developed economies. The idea is to adopt sustainable practices which will create long-term impact throughout the world. This really means that every individual, every country has to find a collective solution and follow it judiciously. The new norm is going to be adoptingpractices that are ‘zero carbon emission’.

Figure 11: Zero carbon emission

Source: https://www.istockphoto.com/photo/achieve-zero-co2-emission-gm1154356567-313883574

5.1 - Developed Economies

Developed economies have already achieved their major economic goals with respect to GDP, inflation, employment, and inequality. At the time that they were developing, their main emphasis was on fossil fuels which resulted in a huge emission of GHGs. The level of these emissions did not lead to major temperature variations or extreme unexpected weather conditions. To follow and control GHG requires all economies to adopt practices which are environment friendly as well ascost effective.

The sudden adverse impact of changes in climate are being felt all over the world essentially

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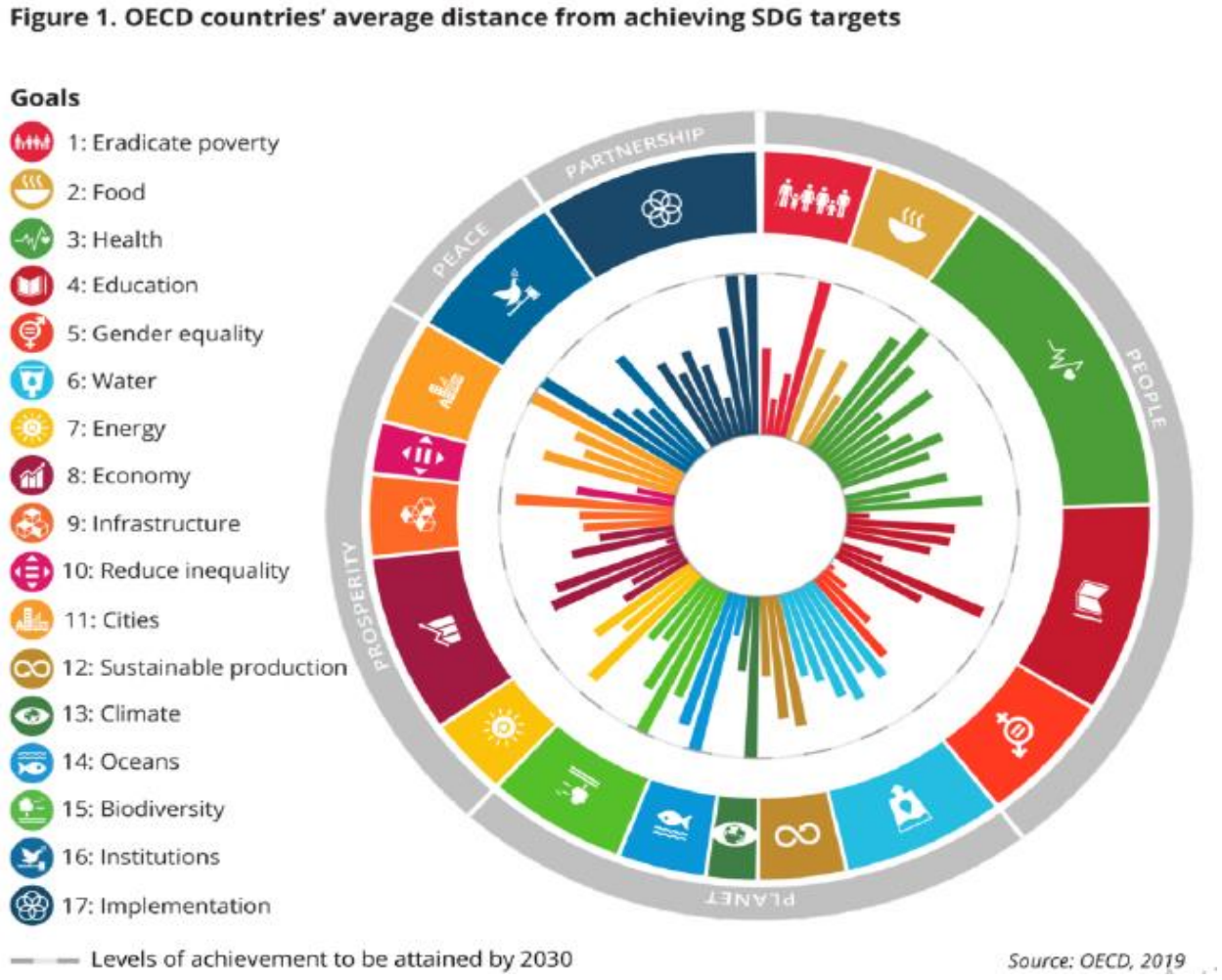
through the latter half of the twentieth century. This phenomenon has led to the urgency within the world to look for alternative production processes which generate profit and are ecologically friendly.

Developed economies have the additional onus of adopting practices which are more rigorous than developing economies as they have the capital as well as the know-how. These countries cannot expect that the same rules to control carbon emissions can be adopted for both developing and developed economies.

Figure 12: Practices adopted by developed economies to reduce GHG emissions



Source: https://sdg-action.org/how-to-create-economic-growth-without-carbon- emissions-and-environmental-damage%EF%BF%BC/

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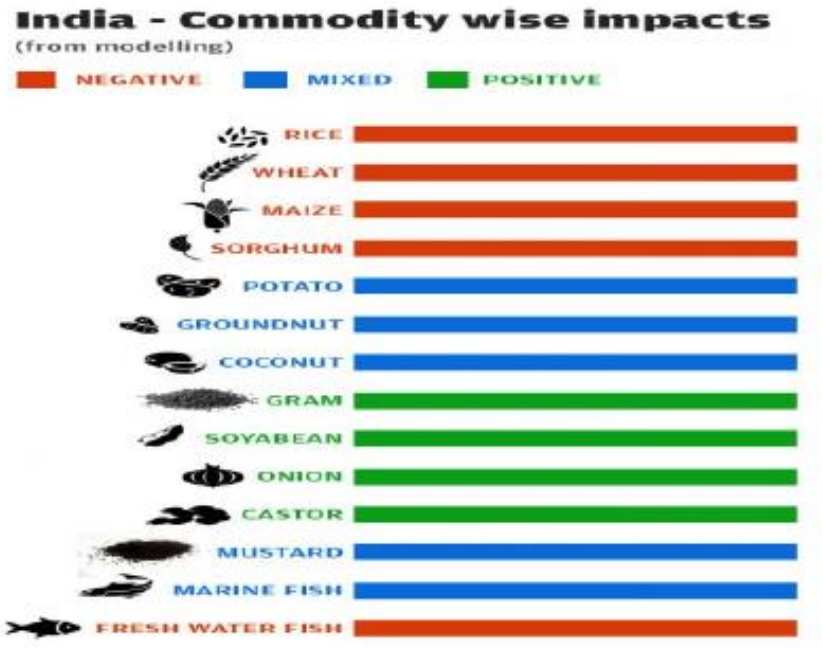
5.2 - Developing Economies

As approximately 40% of the workforce is dependent on the agricultural sector, an impact of variations in temperature are likely to result in lower yields as well as lower productivity of the soil. This in turn will adversely impact the income earned from this sector. The fact remains that in spite of India being at the developing stage, the over-dependence on fossil fuels will in fact harm the economy ratherthan increasing its growth prospects.

The continuous increase in worldwide carbon imprints have a severe impact on the growth potential of economies which have a large portion of its workforce dependant on the agricultural sector.

If the productivity of the agricultural sector does not grow there will definitely be a lag on the GDP growth of an economy like India. For India to achieve a sustainable GDP growth of 9% per annum, agriculture has to grow at 3% to 4% perannum. For this to be achieved, the government needs to follow judicious policies to counter the negative impact of climate change with respect to extreme temperatures and vulnerability to draughts and floods.

Figure 13: The impact of climate change on India's agricultural sector



Source: https://www.downtoearth.org.in/news/agriculture/climate-change-causes- about-1-5-per-cent-loss-in-india-s-gdp-57883

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6. Conclusion

Climate change has become a disaster for the world. Both developed and developing economies have changed their course of policies in moving towards saving the environment and reducing carbon imprints. The question that arises is not only to add to the existing set of carbon imprints but to actively follow policymeasures which will reduce it.

The world is at a stage where the sudden increase and decrease in temperatures have not only affected the productivity of the agricultural sector but has also impacted the lives of the citizens of a country. Most of the people are in severe danger due to the extremities in temperature. This could be in the form of deathsdue to heatstroke, floods, draughts, and severe cold conditions.

Thus, the world economy irrespective of their state of development or whether they have an abundance of fossil fuels have woken up to the fact that there has to be a collective decision in reduction of carbon footprints to save the people of the planet.

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