IMPACT OF GLOBAL WARMING ON SUSTAINABLE PRODUCTIVITY

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Introduction

The World Commission on Environment & Development (WCED) in their report "Our Common Future" defined sustainable development as, "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The seventeen Sustainable Development Goals (SDGs) constitute the blueprint prepared by the United Nations for ensuring the sustainable development of the planet. SDGs hold hope of a better future for all mankind for their all-round development. The goals address the global challenges of poverty, illiteracy, inequality, climate change, environmental degradation and promise peace, justice and social dignity for all. The primary objective of sustainable development is to balance the social, economic, and environmental aspects of development. The economy must follow the vision as enshrined in the objectives of the United Nations for a responsible and ethical process of development.

The sustainable development agenda comprising the seventeen sustainable development goals have been accepted by all nations. Every nation has to evolve strategies to align its development paradigms to the emerging framework of sustainable development agenda with a target date of 2030.Issues and challenges of sustainable development are having impacts on the economies all over the world in the twenty first century.

SDG Midpoint Review

The goals are to be achieved by the world community within a period of 15 years (2015-2030). The midpoint of time given for achievement of the SDGs has arrived in the year 2023. The Global Sustainable Development Report 2023 commented on the progress on the 2030 Agenda. It is disturbing to note that the report summarised the achievements of the SDGs around the world as "stagnation in the face of multiple crises". COVID 19 pandemic, Ukraine-Russia war and global warming are the major causes of the reversal of the gains achieved in the earlier years. The gravest challenge to save the planet comes from unprecedented climate change. If climate change and its basic cause the global warming are not attended to urgently , all development goals will be nullified. In this context, the Sustainable Development Goal on climate action has assumed topmost priority for the global community.

Goal 13: Climate action

The objective of this goal 13 is "To take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy."

Global warming

Three factors mainly responsible for alarming levels of climate change are excessive emission of greenhouse gases, abnormal increase in carbon footprints and rise in global temperature. Burning fossil fuels, cutting down forests, intensive agriculture, excessive use of fertilisers, and livestock farming are some of the factors adversely affecting the climate and the earth's temperature. These activities add enormous amounts of greenhouse gases to those naturally occurring in the atmosphere, increasing the adverse effects of greenhouse gases and global warming.

The main driver of climate change is the greenhouse effect. Some gases in the Earth's atmosphere act like the glass in a greenhouse, trapping the sun's heat and stopping it from leaking back into space and causing global warming. Many of these greenhouse gases occur naturally, but human activities are increasing the concentrations of some of them in the atmosphere like carbon dioxide, methane, nitrous oxide and fluorinated gases.CO2 produced by human activities is the largest contributor to global warming. By 2020, its concentration in the atmosphere had risen to 48% above its pre-industrial level (before 1750). Natural causes, such as changes in solar radiation or volcanic activities are also estimated

to have contributed to global warming

Climate change will cause large, permanent economic losses around the world in the long run, unless timely and sufficient adaptation and mitigating actions take place. It takes time for the full warming impact of atmospheric greenhouse gasses (GHGs) to materialise. Even if the transition to a net-zero carbon economy were to accelerate, the global average temperature would continue rising, potentially bringing with it an increased frequency and magnitude of natural hazards such as windstorms, floods and droughts.

How do rising temperatures affect productivity?

It is well known that productivity at manufacturing plants may fall when temperatures persistently exceed beyond 25oC.Surveys have shown that every degree rise above 20oC can reduce productivity by as much as 4 percent. That means a rise of just 5 degrees can cut the output by 20 percent!

The level of thermal comfort would decrease. It would become more difficult to perform physical and cognitive tasks. This would lead to decrease in the labour productivity both in outdoor and indoor activities. Temperature has been found to affect income via agriculture as well as industrial and manufacturing activities. It would increase demand for energy and other neutralising facilities.

Projections suggest that, in 2030, 2.2 per cent of total working hours worldwide will be lost due to high temperatures - a productivity loss equivalent to 80 million full-time jobs.

When the working environment is too hot, people work far less efficiently. Morale plunges, and accidents and absenteeism rise. Cooling the factory shop floor is essential to keep productivity levels high and for the wellbeing of the people working in this environment. However, conventional cooling systems are not a viable solution as they are expensive. The solution is to harness the cooling power of water. New technologies such as evaporative cooling offers cost-effective solutions for production facilities.

Global warming may have three types of risks for sustaining productivity. The physical risks arising out of the long-run changes in average temperatures and sea levels are referred to as chronic risks, while the impact of natural hazards such as droughts, wildfires and storms are referred to as acute risks. In addition, the path to carbon neutrality and its enabling policies and regulations might also disrupt economic performance, in what is referred to as transition risks. Their impact will be on the factors responsible for labour productivity.

Paris agreement on climate change

An international treaty on climate change was adopted in 2015.The Agreement was negotiated by 196 parties at the 2015 United Nations Climate Change Conference near Paris. As of November 2021, 193 members of the United Nations Framework Convention on Climate Change (UNFCCC) are parties to the agreement. The Paris Agreement's long-term goal is to keep the rise in mean global temperature to well below 2 °C (3.6 °F) above pre-industrial levels, and preferably limit the increase to 1.5 °C (2.7 °F). Emissions should be reduced as soon as possible to reach net-zero by the middle of the 21st century. The international community has recognised the need to keep warming well below 2°C and pursue efforts to limit it to 1.5°C.

"Climate Change Inaction Costly"

The business case for net zero economies is crystal clear. Leadership vision will also focus on sustainability. Highlighting this inevitable transformation, Mr Alan Jope, Global Chief Executive Officer, Unilever warned that the estimated disruptions caused by rising temperatures will cost companies US$1.3 trillion by 2026, and result in the loss of 80mn jobs. "Now the cost of inaction is far higher than cost of acting. Hence, to achieve superior financial performances, there is a need to build sustainable business," he added. The CEO of the multinational consumer goods giant made the remarks while speaking at an event organized by FICCI on 20 September 2022 at New Delhi.

Sustainable development for Productivity

Productivity is a measure of how well a society transforms work and other resources into products and services that improve people's lives. Historically, productivity has trended upwards over time: more goods and services have been produced for the same level of input of resources, allowing living standards to rise. According to Gerd Müller, Director General of UNIDO "Sustainable industrial development can deliver a world without hunger, using sustainable energy for productive activities, and creating jobs, particularly for young people." In the past four years, the world has been hit by numerous shocks including the COVID-19 pandemic, a rising number of armed conflicts and several natural catastrophes, induced by climate change. The simultaneous impact of these shocks has been recognized as a global poly crisis .

Climate change is already having impacts on economic performance, including on GDP, labour relations and productivity. It will have even greater impacts in the future. It is crucial to explore productivity measures that are associated with the physical and natural processes linked to climate change. This includes the scientific use of fossil fuels and other materials for production, the efficiency of energy use, the carbon intensity of economies, and the productivity of natural resources including land, forests, and water resources. Improving productivity in the use of materials, energy and natural resources is central to achieving sustainable development goals, and the target of net zero. There is need for a new era of modern industrial policies, which encompass four crucial elements. First, modern industrial policies should be guided by the SDGs. Second, industrial policies should be future-ready and, right from their inception, consider the megatrends reshaping the world. Third, modern industrial policies should promote collaboration. Finally, such policies should be regionally coordinated to mitigate tensions and unlock the full potential for cooperation among neighbours.

Policy action should aim at meeting net zero while supporting productivity and wellbeing. The main policy challenge is how to design climate change policies to meet the global objective of net zero while also supporting productivity and wellbeing. To meet this challenge, governments will need to shape markets for low-carbon products and services, e.g., through regulation and standards, and give direction for technological change to accelerate low-carbon innovation and foster the uptake and diffusion of low-carbon technologies. Innovation policies are particularly important, as they can help bring down the cost of climate policy action, and simultaneously support productivity growth.

Revisiting Triple bottom line

John Elkington, British management consultant and sustainability Guru, coined the phrase "triple bottom line" in 1994 for measuring performance of a business corporation in the context of sustainable development. He proposed that a company should be managed in a way that not only makes money for the shareholders, but also improves people's lives and the well-being of the planet. John Elkington advanced a sustainable model of development based upon the triple bottom line (TBL) approach. The TBL concept maintains that companies should commit to focusing as much on social and environmental concerns as they do on profits. TBL theory posits that instead of one bottom line, there should be three: profit, people, and planet. TBL seeks to assess a corporation's level of commitment to corporate social responsibility and its impact on the environment over time. Whereas profit is the traditional measure of net corporate profit in the profit and loss (P&L) account, "people" measures how socially responsible an organization has been during the period. Similarly, "planet" measures how environmentally responsible a firm has been. Organizations must adopt TBL frameworks and be accountable to all stakeholders- not just shareholders.

The three pillars of sustainable development, namely profit, planet, and people correspond to the economic, ecological, and social aspects of development. The process of development should be sustainable by balancing the economic, social and environment aspects. It is interesting to note that John Elkington is now having second thoughts about his own TBL theory. "To truly shift the needle, however, we need a new wave of TBL innovation and deployment". He feels that the sustainability frameworks will not be enough, as long as they lack the suitable pace and scale needed to stop us all "overshooting our planetary boundaries." (John Elkington, 2018). All nations have to strive harder in a more

committed manner to prevent "overshooting our planetary boundaries ". In the context of ecological disbalance due to global warming, the needs of the planet and nature must receive higher priority over the reckless pursuit of profit for economic growth.

There is a new perspective emerging in the context of global warming. Instead of balancing the three aspects of economy, society and environment, the economy tends to dominate over environment. Decisions are often taken for faster and higher economic growth at the expense of environment. It is high time the environment enjoys priority over economy. It is necessary for preservation of nature and prevention of global warming not exceeding the tipping point, which is the point of no return for the environment.

Climate Action: COP Conferences

The UN Conference on the Environment and Development was held in Rio de Janeiro in 1992. It resulted in the UN Framework Convention on Climate Change ("UNFCCC"). The Committee of Parties (COP) was created as the supreme decision-making body of the Convention comprising all States that are Parties to the Convention. COP reviews the implementation of the objectives of the Convention.

Last three COP conferences at Glasgow (2021), Sharm El-Sheikh (2022) and Dubai (2023) were landmark events in the process of meaningful global action on climate protection for sustainable development. COP 26 at Glasgow (26th session of COP) brought significant outcomes in the global fight against climate change. COP 26 in Glasgow marked a step forward in global efforts to address climate change, including a material increase in ambitions to reduce emissions across the world, finalization of rules on reporting emissions and international carbon trading, and the launch of a range of new initiatives and sector deals. COP 27 at Sharm El-Sheikh closed with a breakthrough agreement to provide loss and damage funding for vulnerable countries hit hard by floods, droughts and other climate disasters. This was widely lauded as a historic decision.

COP 28 at Dubai saw major initiatives by the global community. According to an estimate by the International Energy Agency, full delivery of the energy-related pledges made at COP 28 would result in global greenhouse gas (GHG) emissions in 2030 being about four metric gigatons less than would be expected without them. COP28 delivered historic negotiated outcomes to operationalize Loss and Damage, securing $792 million of early pledges, providing a framework for the Global Goal on Adaptation (GGA), and institutionalizing the role of the Youth Climate Champion to mainstream youth inclusion at future COPs.

Road Ahead

Based upon the above analysis is suggested for sustainable productivity in the context of global warming:

1. Innovative technologies to maintain levels productivity around the world

2. Innovation policies are particularly important, as they can help bring down the cost of climate policy action, and simultaneously support productivity growth. Policy action should aim at meeting net zero while supporting productivity and wellbeing.

3. Redefine role of environment vis-à-vis economy and accord higher priority to environment

4. Financial support by rich countries to poor countries. The SDG Summit 2023 recognised the urgent need for a significant increase in financing for sustainable development, to the tune of at least $500 billion per year, to be delivered through a combination of concessional and non-concessional finance in a mutually reinforcing way combined with the necessary reforms in the international financial architecture.

5. India should advance date of net zero emission to 2050 or even earlier, despite the problems of massive

development needs of the vast population

6. Public Policy of India should be to minimize greenhouse gases by rationalizing energy production, agricultural process, transportation and other sectors

7. Effective climate laws to ensure climate-neutral status by 2050 for all countries.

8. Reducing emissions is not enough. To achieve our climate ambitions, we will also need to capture, utilise and store carbon.

9. Land can serve as both a carbon sink, absorbing CO2 from the atmosphere, and a carbon source, releasing Co2 through activities such as deforestation. Sustainable land management practices, including afforestation and protection of existing carbon stocks, have great potential for carbon sequestration. Moreover, carbon can be stored in the long term in durable products made of sustainably sourced wood.

10. Climate change is also causing losses in agricultural production and reducing suitable areas for crop cultivation. These challenges are putting the livelihoods of those dependent on the sector in danger.

Conclusion

Industries and firms have to adapt to new regulations and invest in sustainable practices and technologies. It is apprehended that there may be some short-term productivity setbacks as marginal costs increase and demand decreases. However, the long-term outlook is more favourable. Shifting towards a greener economy could temporarily decrease overall labour productivity but is important for mitigating climate change.

Stricter environmental protection is beneficial for productivity growth. The impact of climate policies on resource reallocation across sectors is likely negative, as the more carbon-intensive sectors are currently more productive than the sectors that are expected to grow due to the green transition.

In conclusion, while shifting towards a greener economy can lead to temporary declines in labour productivity in the shorter term, it could yield several long-term productivity benefits.

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