Climate Change - Mitigation and Adaptation

Trishant Dev
Programme Officer, Climate Change, CSE

As the impacts of climate change become increasingly evident, the urgency to address this global challenge has never been more pressing. Mitigation and adaptation are the two complimentary strategies through which we can understand climate action, i.e., the effort being made in order to combat climate change.

Climate change mitigation involves limiting or preventing greenhouse gas (GHG) emissions and enhancing activities that remove these gases from the atmosphere, according to the Intergovernmental Panel on Climate Change (IPCC). The imperative to limit or prevent GHG emissions stems from the sobering fact that the world is currently veering off course in its pursuit of the emissions reduction essential to curbing global temperature rise to 1.5°C above pre-industrial levels. Researchers, industry practitioners, and policymakers are developing mitigation strategies across various sectors.

In the energy sector, for instance, the largest contributor to anthropogenic GHG emissions, efforts focus on rapidly phasing out fossil fuels, adopting renewable energy sources, and enhancing energy efficiency. Urban systems and transport strategies involve transitioning to low-carbon public transport, promoting electric vehicles, and implementing sustainable urban planning. Then, the industries need to improve energy efficiency and adopt cleaner production technologies. Agriculture and land-use mitigation efforts include sustainable farming practices, reducing deforestation, and promoting reforestation and afforestation. Then, the demand-side aspects emphasize reducing energy consumption and promoting sustainable lifestyles.

On the other hand, adaptation to climate change involves making adjustments in natural or human systems in response to actual or expected climate change and its impacts. This process aims to moderate harm or exploit beneficial opportunities arising from climate change. The need for adaptation is driven by the reality that certain impacts of climate change are now unavoidable due to past and present GHG emissions.

Timely adaptation actions can help communities build resilience against climate-related hazards, such as extreme weather events, sea level rise, and shifting agricultural conditions, safeguarding ecosystems, human health, and economic stability. Adaptation involves a range of strategies across various sectors. In agriculture, for instance, to ensure food security, crop diversification, improved irrigation techniques, and developing resilient crop varieties could help cope with changing precipitation patterns and extreme temperatures. Water resources management practices focusing on increasing storage capacities, and enhancing water use efficiency could address altered hydrological cycles.

In terms of human health, efforts could include strengthening healthcare systems to manage heat-related illnesses and diseases exacerbated by climate change. Ecosystems and biodiversity could be safeguarded through strategies such as establishing protected areas, creating ecological corridors, and restoring wetlands and mangroves to support biodiversity resilience. In urban areas, green infrastructure like parks could be prioritised in city planning to mitigate heat island effects and urban flooding risks. Infrastructure and the built environment could be made to adapt by retrofitting buildings to withstand extreme weather and upgrading drainage systems to manage increased precipitation. These adaptation measures are essential to reduce vulnerability and build resilience across different sectors and regions.

The need for mitigation and adaptation efforts has now become urgent with worsening climate impacts. The IPCC states that without rapid, deep and sustained mitigation and accelerated adaptation actions, losses and damages will continue to increase and will disproportionately affect the most vulnerable populations. The adaptation gap — the difference between estimated financing needs and costs of adapting to climate change and

finance flows in developing countries — is growing even as climate change continues to wreak havoc, said the 2023 Adaptation Gap Report. To this end, International cooperation, investment, finance, and technology transfer play important roles in supporting these efforts and, therefore, international forums like the UNFCCC COP process, and national efforts through policy targets (Nationally Determined Contributions, Low-Emission Development Strategies) become important.

Yet another point to consider while taking action is to understand the social, economic, and environmental consequences of implementing such measures. What happens to employment in the fossil fuel sector when the sector is phased out? It may necessitate what is called a 'just transition' or alternative livelihood opportunities for those who lose their livelihoods. Thus, balancing climate goals with social and economic equity also becomes important.

Global efforts to combat climate change must also recognize disparities in vulnerability and capacity among nations. Developing countries, facing multiple challenges, require support from developed nations to take effective action. Simultaneously, developed countries, having historically emitted more greenhouse gases and maintaining higher consumption levels, bear urgent responsibilities not only to mitigate their impact but also to assist others in their efforts. Thus, equity and Common But Differentiated Responsibilities (CBDR) guide international climate action and serve as the bedrock of climate justice globally.