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A REVIEW OF CLIMATE CHANGE IMPACTS, ADAPTATION, AND MITIGATION IN SOUTH ASIA

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ABSTRACT

Climate change is a critical global issue, challenging and threatening various sectors in different ways. South Asia is one of the front-line regions to the impacts of climate change. According to the World Bank estimates, in 2021, around 1.9 billion people were in South Asia, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. Therefore, this review aims to assess the impacts of climate change and the existing mitigation and adaptation measures with effectiveness across the South Asian region. We reviewed published reports, journal articles, policy documents, and other grey literature for this study. The findings of this study revealed that total greenhouse gas emissions in South Asia increased from 2.11 TgCO₂ in 2000 to 4.16 TgCO₂ equivalent in 2019, with an annual rate of change of 5.11%. In total greenhouse gas emissions in 2019, approximately 70% was captured by carbon emissions from 51% in 2000. Among these eight nations, India was the leading greenhouse gas emitter, followed by Pakistan and Bangladesh. South Asia is highly vulnerable to cyclones, floods, erosion, sea level rise, and other natural disasters. Agricultural production is a crucial source of income. Food insecurity was growing due to decreased agricultural yield due to global warming. Not only the agriculture sector, it severely affects other sectors such as health, coastal and marine, energy, water resources, forests, and other ecosystems. The economic cost associated with climate change on a long-term basis is showing an increase by the end of this century. A higher percentage of financial losses can be expected in India. The impacts of climate change can further aggravate water insecurity, the spread of diseases, and biodiversity loss. India, Bangladesh, and the Maldives' average annual Gross Domestic Product (GDP) growth (%) was nearly equal. However, the CO₂ emissions of Bangladesh, Pakistan, and Maldives were 30, 12, and 1,516 times less than India's, respectively. Noticeably, we found that climate finance and CO₂ emissions were strongly and positively correlated, $r(6) = .92$, $p < .05$. Similarly, a positive correlation was observed between the average loss due to climate hazards and climate finance, $r(6) = .96$, $p < .01$. Therefore, South Asia is witnessing severe effects of climate change, hurting several economic sectors and creating serious obstacles to the area's sustainable development. To lessen these effects and increase resilience to adapt to the changing climate, prompt action is needed in the form of low-carbon development plans, climate-smart agriculture, climate-resilient strategies, nature-based solutions, sustainable forest and ecosystems management, and strict policies and governance.

Keywords: adaptation, climate change, impacts, mitigation, South Asia