Chapter 2
Climate Change Mitigation and Resilience Strategies:
A Nexus Between Governance and Sustainable Development

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ABSTRACT

The critical intersection of climate change mitigation and resilience strategies with governance and sustainable development. It argues that effective climate action requires a holistic approach that integrates robust governance frameworks with sustainable development goals. The chapter examines the role of governance, from international agreements like the Paris Agreement to national policies and local community initiatives, in driving these strategies. It highlights how good governance, characterized by transparency, accountability, and inclusivity, is essential for the successful implementation of climate policies. Furthermore, the chapter delves into how sustainable development, which balances economic growth, social equity, and environmental protection, provides a crucial framework for climate action. The chapter also concludes that governance, mitigation, resilience, and sustainable development are not viewed as separate issues but as interconnected elements of a unified strategy for a sustainable and climate-secure future.

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INTRODUCTION

Climate change represents one of the most profound and pressing challenges confronting humanity in the twenty-first century, acting as both a catalyst and a magnifier of environmental, economic, social, and political vulnerabilities, thereby making it impossible to address in isolation from the frameworks of governance and sustainable development. Since the problem and its solutions are deeply interwoven with policy coherence, institutional capacity, societal participation, and technological innovation, and as global average temperatures continue to rise due to the anthropogenic greenhouse gas emissions primarily carbon dioxide, methane, and nitrous oxide from fossil fuel combustion, deforestation, industrial processes, and agricultural activities (Alibašić, 2018). The cascading impacts such as melting polar ice caps, sea level rise, intensified tropical cyclones, prolonged droughts, shifting precipitation patterns, biodiversity loss, ocean acidification, and the destabilization of food and water systems are not merely environmental concerns but existential threats to human well-being and planetary stability (Al-Romeedy & Singh, 2026). Prompting urgent calls for transformative approaches that combine mitigation efforts to reduce or prevent the emission of greenhouse gases with resilience strategies that strengthen the capacity of communities, economies, and ecosystems to anticipate, absorb, adapt to, and recover from climate-related shocks, all within the broader agenda of sustainable development as envisioned by the United Nations Sustainable Development Goals (SDGs), particularly SDG 13 on climate action, SDG 7 on affordable and clean energy, SDG 11 on sustainable cities and communities, and SDG 15 on life on land, where governance acts as the central mechanism to orchestrate the balance between environmental protection, economic growth, and social equity (Al Romeedy et al., 2025). The effective climate governance entails multilevel coordination global treaties like the Paris Agreement, national policy frameworks, subnational climate action plans, and local community initiatives while also requiring transparency, accountability, inclusiveness, and adaptive capacity to respond to new scientific evidence and socio-economic realities (Ashipala & Singh, 2025). In this nexus, mitigation strategies include transitioning to renewable energy sources such as solar, wind, hydropower, and geothermal to decarbonize electricity generation; improving energy efficiency in buildings, transportation, and industry through advanced materials, smart technologies, and circular economy practices; promoting sustainable land use and forest conservation to enhance carbon sinks; investing in carbon capture, utilization, and storage (CCUS) technologies (Bahadur et al., 2013). Reforming the agricultural practices to reduce methane emissions from livestock and nitrous oxide emissions from fertilizers through precision farming, regenerative agriculture, and alternative protein sources that phasing out fossil fuel subsidies and implementing carbon pricing mechanisms

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