Chapter 1
Understanding Climate Change and Organizational Responsibility

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ABSTRACT

Climate change, driven by human activities, poses severe environmental, economic, and social challenges. This chapter examines its impacts, including rising temperatures, ecosystem disruption, and threats to food security and health, with vulnerable populations disproportionately affected. It explores the role of industries in greenhouse gas emissions and the potential for sustainable practices like renewable energy and circular economies. The chapter critiques greenwashing and emphasizes the need for stricter regulations and corporate accountability. Key policies, such as the European Green Deal and U.S. Inflation Reduction Act, are highlighted as critical steps toward climate resilience. The chapter concludes with a call for global collaboration to mitigate climate change and ensure a sustainable future.

1. INTRODUCTION

Global climate change refers to the extensive and long-term fluctuations in the earth's weather and temperatures. Earth's climate, while naturally fluctuating throughout its existence, is of particular interest currently due to its exceptional rate and unique causation solely caused by human forces, especially after the Industrial

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Revolution. The Intergovernmental Panel on Climate Change (IPCC) defines the climate change as "*a change in the state of the climate that can be detected by changes in the mean and/or variability of its properties and that persists for an extended period, typically decades or more"* (IPCC, 2014).

The scientific consensus is that anthropogenic climate change does exist. It is claimed that 97% of all publishing climate scientists agree that human-caused global warming is the main reason for global warming (Cook et al., 2013). This is also highlighted by the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA), which have provided detailed information of evidence for anthropogenic climate change (NASA, 2021; NOAA, 2022).

Key climate change signals are rising global surface temperatures, melting ice sheets and glaciers, sea-level increase, and enhanced frequency of extreme weather events. The global mean surface temperature has increased by about 1.18°C over the late 19th century, with most of the warming happening in the last four decades, as recorded by NASA (NASA, 2021). Arctic sea ice coverage has lost approximately 12.2% every decade since 1979, reflecting the fast melting of polar ice (NASA, n.d.).

2. THE IMPACT OF CLIMATE CHANGE ON ECOSYSTEMS AND HUMAN LIFE

Climate change affects societies and natural ecosystems profoundly. Species redistribution, altered reproduction, and increased vulnerability to invasive species and disease are happening to ecosystems. For instance, many terrestrial species have experienced poleward or elevation shifts in response to higher temperatures, seeking suitable habitats (Parmesan & Yohe, 2003). These alterations disrupt ecological webs since new species interactions occur, sometimes causing competition or extinction (Putra et al., 2025).

Marine ecosystems are also threatened; coral reefs, home to a significant percentage of marine biodiversity, are experiencing widespread bleaching due to rising sea temperatures. A recent report detailed mass coral bleaching in Western Australia's Ningaloo Reef, with large expanses of reefs facing mortality within the coming weeks (The Guardian, 2025). Ocean acidification, which is caused by increased CO_2, is weakening coral skeletons and shellfish exoskeletons, impacting ocean biodiversity and undermining food webs (Putra et al., 2025). Moreover, climate change is modifying ocean zooplankton communities, which are the foundation for most oceanic food webs (Putra et al., 2025).

The human population is also vulnerable to climate change impacts. Increased and intensified extreme weather conditions, such as hurricanes, floods, and heat