Chapter 7
Smart Sustainability Leveraging Technology to Safeguard Social Stability, Food Security, and Mental Health in a Changing Climate

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ABSTRACT

In the face of escalating threats to human health, food security, and ecological sustainability due to climate change, particularly in marginalized and vulnerable communities globally, urgent actions are imperative. This chapter addresses the pressing need for initiatives that mitigate adverse climatic impacts and align with Sustainable Development Goals (SDGs), with a specific focus on food and health outcomes. Recognizing the intricate and multidimensional impact of climate change on these vital aspects of human well-being, there is a growing call for an integrated, science-based approach. The proposed approach advocates for a harmonious marriage of scientific knowledge and local wisdom to address access inequities through agroecology, thereby mitigating the impact of climate change on development-constrained communities. The overarching goal is to pave the way for healthier, more sustainable, and equitable food systems.

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INTRODUCTION

In an era marked by the profound repercussions of climate change, the interconnected threats to human health, food security, and ecological sustainability have become increasingly urgent. The ramifications of this global phenomenon are particularly pronounced in marginalized and vulnerable communities worldwide, where concerted efforts are imperative to navigate the adverse impacts and align with the Sustainable Development Goals (SDGs), especially in the realms of food and health. The multifaceted challenges posed by climate change demand an integrated, science-based approach that transcends traditional disciplinary boundaries. This paper aims to address this imperative by examining the transdisciplinary practice of agroecology—a holistic and sustainable agricultural paradigm that intricately connects science, on-the-ground practices, and policy. Through a comprehensive analysis of agroecology, this study explores its potential as a pivotal instrument for climate action, particularly in building climate-resilient communities through the establishment of sustainable and equitable food systems. The synthesis of scientific knowledge and local wisdom within the agroecological framework emerges as a promising avenue to mitigate the disproportionate impacts of climate change on vulnerable populations, fostering not only healthier communities but also contributing to the restoration of ecosystems essential for global environmental balance. This introduction sets the stage for an in-depth exploration of the transformative potential of agroecology, advocating for its integration into broader strategic initiatives for climate change adaptation and mitigation within the realms of science and policy.

BACKGROUND STUDY

The global shift toward achieving net-zero emissions necessitates substantial transformations at societal and industrial levels. Governments and corporations are increasingly turning to technological innovations as a key avenue to meet ambitious net-zero targets (Miller, 2020). Within this context, digital technologies emerge as promising tools to address complex societal challenges associated with climate change (George, Merrill, & Schillebeeckx, 2021). A report from the World Economic Forum (WEF), co-authored with PwC and titled "Harnessing Technology for the Global Goals," underscores the significant role that digital technology can play in enhancing resilience to global warming-related hazards, reducing emissions, and empowering humanity to realize net-zero objectives. The report specifically highlights the potential for digital technologies, including Artificial Intelligence (AI), to automate and improve the efficiency of industrial, manufacturing, and agricultural

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