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CLIMATE CHANGE, POVERTY AND HEALTH OUTCOMES IN VULNERABLE COMMUNITIES: A NARRATIVE REVIEW

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Abstract
Climate change poses significant threats to vulnerable communities, worsening poverty and negatively impacting health outcomes.

This narrative review examines the intersection of climate change, poverty, and health outcomes in these communities. By synthesizing peer-reviewed literature and other reputable sources, this paper highlights the complex relationships and feedback loops between these factors.

The findings indicate that climate change disproportionately affects impoverished communities, leading to a range of adverse health outcomes. Additionally, poverty limits the ability of these communities to adapt to climate change, creating a vicious cycle of vulnerability.

The review concludes with recommendations for policy interventions and strategies to mitigate these impacts.

Keywords: Climate Change, Health Outcome, Vulnerable Community

Introduction

Climate change represents one of the most critical global challenges of our era. The Intergovernmental Panel on Climate Change (IPCC) has provided compelling evidence that human activities, particularly the emission of greenhouse gases like carbon dioxide and methane, are driving significant changes in the Earth's climate (Ivanov, 2022). These changes manifest in various forms, including altered weather patterns, rising sea levels, and increased frequency and intensity of extreme weather events. Vulnerable communities, especially those in developing nations, face the greatest risks due to their limited capacity to adapt and mitigate the impacts of climate change (Leichenko & Silva, 2014).

The complex relationship between climate change and poverty further exacerbates the challenges faced by these communities. Poverty limits access to resources necessary for adaptation, such as improved infrastructure, healthcare, and education. Additionally, the economic constraints faced by poor communities make it difficult to recover from climate-related disasters, perpetuating cycles of vulnerability and disadvantage (Füssel,

2012). This intersection of climate change and poverty is particularly evident in the health outcomes of vulnerable populations, who often experience the most severe consequences of environmental changes (Khine & Langkulsen, 2022).

Climate Change and Its Impacts

The IPCC's Fifth Assessment Report outlines several critical impacts of climate change, including increased frequency and intensity of extreme weather events, rising sea levels, and shifting precipitation patterns (Ivanov, 2022**)**. These changes have profound implications for both natural and human systems. For instance, alterations in temperature and precipitation can lead to reduced agricultural productivity, threatening food security in many regions. Coastal communities face heightened risks of flooding and erosion due to rising sea levels, while changes in water availability can affect both drinking water supplies and agricultural irrigation (Gentle & Maraseni, 2012).

Moreover, climate change exacerbates existing health issues and creates new challenges. Increased temperatures can lead to heat stress and worsen respiratory and cardiovascular diseases. Changes in weather patterns can influence the spread of infectious diseases, such as malaria and dengue fever, by altering the habitats of vectors like mosquitoes (Berrang-Ford et al., 2012). Additionally, extreme weather events can cause injuries, displacement, and mental health problems, compounding the difficulties faced by vulnerable populations (Prudent, Houghton & Luber, 2016).

Poverty and Vulnerability

Poverty significantly influences a community's vulnerability to climate change. According to the World Bank, approximately 9.2% of the global population lived on less than $1.90 a day in 2021 (World Bank Group, 2023). These individuals are often the least equipped to cope with the impacts of climate change due to limited financial resources, inadequate access to healthcare, and insufficient social safety nets. Poor communities frequently depend on climate-sensitive sectors such as agriculture, fisheries, and forestry for their livelihoods, making them particularly susceptible to the adverse effects of environmental changes (Gentle & Maraseni, 2012).

The socio-economic characteristics of poor communities further compound their vulnerability. Factors such as inadequate housing, limited access to clean water and sanitation, and lack of education and information hinder their ability to prepare for and respond to climate-related hazards (Haines et al., 2006). Social inequalities, including gender and ethnic disparities, exacerbate the impacts of climate change on specific groups within these communities. For example, women and children are often more vulnerable to the effects of climate change due to their roles in society and unequal access to resources.
Climate Change Health Outcomes in Vulnerable Communities.

The health impacts of climate change are diverse and multifaceted, affecting physical, mental, and social well-being. In vulnerable communities, these impacts are magnified due to pre-existing health disparities and limited access to healthcare services. Climate change exacerbates malnutrition, especially in regions where food security is already

tenuous. Changes in agricultural productivity and food availability can lead to higher food prices, making it difficult for poor households to afford nutritious food (Costello et al., 2009).

In addition to malnutrition, climate change worsens the burden of infectious diseases. Warmer temperatures and altered precipitation patterns create favorable conditions for the proliferation of disease vectors. For instance, the spread of malaria and dengue fever is expected to increase in many parts of the world as mosquito habitats expand. Furthermore, extreme weather events such as floods and hurricanes can lead to outbreaks of waterborne diseases like cholera and dysentery, particularly in areas with inadequate sanitation infrastructure (Gage et al., 2008).

Mental health is another critical aspect of the health impacts of climate change. The stress and trauma associated with climate-related disasters, displacement, and loss of livelihoods can lead to a range of mental health issues, including anxiety, depression, and post-traumatic stress disorder (PTSD). These mental health challenges are often overlooked in the context of climate change but are essential components of overall well-being (McMichael & Lindgren, 2011).

Objective of the Review

This narrative review explored the intersection of climate change, poverty, and health outcomes in vulnerable communities. By synthesizing existing literature, this paper provided a comprehensive understanding of how these factors interact and influence each other. The review identified key pathways through which climate change affects health outcomes in poor communities and examined the role of poverty in shaping vulnerability and resilience. Additionally, the review highlighted gaps in the current knowledge and suggest areas for future research.

Research Questions

i. Do extreme weather events (e.g., hurricanes, floods, droughts) impact the health and livelihoods of vulnerable communities?
ii. Does climate change affect agricultural productivity and, consequently, food security and malnutrition in impoverished regions?
iii. Is there a relationship between altered precipitation patterns, water scarcity, and public health outcomes in climate-vulnerable areas?
iv. Do economic constraints and social inequalities influence a community's ability to adapt to climate-related risks?
v. Are mental health effects associated with climate-induced disasters in vulnerable populations?

Method

The narrative review employed a comprehensive literature search to identify peer-reviewed articles, reports, and policy documents that address the intersection of climate change, poverty, and health outcomes. The search was conducted across multiple databases, including PubMed, Web of Science, and Google Scholar, using keywords such as "climate change," "poverty," "health outcomes," and "vulnerable community."

Inclusion criteria for the selected literature included studies published within the last two decades, focusing on empirical research, reviews, and policy analyses. The review also considered grey literature, including reports from international organizations such as the World Health Organization (WHO) and the World Bank Group, to capture a broad range of perspectives and recommendations.

The selected literature was reviewed to extract relevant data and insights on the health impacts of climate change, the vulnerabilities of public health systems, and the strategies for enhancing resilience. Key themes and findings were synthesized to provide a comprehensive overview of the current state of knowledge and to identify gaps and opportunities for future research and policy development.

Results

The result highlights how climate change acts as a threat multiplier, worsening existing socioeconomic disparities and undermining the resilience of populations already at risk. It identified that extreme weather events, deteriorating agricultural productivity, and declining water availability are key drivers of worsening health outcomes, including increased incidences of infectious diseases, malnutrition, and mental health disorders. It also showed that the interplay of economic constraints and social inequalities, particularly among women, children, and marginalized groups, further intensified vulnerability to climate-related health risks.

Climate Change Impacts

McGuigan et al. (2002) demonstrate that extreme weather events, such as hurricanes, floods, droughts, and heatwaves, disproportionately affect vulnerable communities. These events cause substantial economic losses, displacement, and long-term disruption of livelihoods, particularly among impoverished populations (McGuigan et al., 2002). Recent analyses, including The Lancet Countdown reports, further indicate that rising global temperatures have amplified the intensity and frequency of these events, thereby increasing morbidity, mortality, and mental health burdens (Ben Clarke et al., 2022; Vince, 2025).

Climate change adversely influences agricultural productivity, a critical source of income and food security in poor communities. Altered temperature and precipitation patterns contribute to frequent crop failures, reduced yields, and surging food prices, thereby intensifying poverty and malnutrition (Alderman, Turner, & Tong, 2012). Study by the World Bank Group (2023) shows that diminished productivity has direct consequences on rural economies, leading to increased food insecurity and long-term developmental challenges.

Changes in precipitation regimes, coupled with higher evaporation rates under warming conditions, significantly impact water availability (Frumkin et al., 2008). Studies also reveal that water scarcity, worsened by climate change, poses major challenges for drinking water, sanitation, and agricultural irrigation in vulnerable regions (Frumkin et al., 2008). Additional field studies in arid regions of Africa and Asia report that erratic rainfall and prolonged droughts further strain local water resources, contributing to the spread of waterborne diseases and heightened health risks (Sandosham, 2025).

Poverty and Vulnerability

Poverty limits the capacity of communities to invest in adaptive measures, such as improved infrastructure, early warning systems, and resilient agricultural practices, which, in turn perpetuates their vulnerability to climate shocks (Costello et al., 2009). For example, low-income households in both urban and rural settings often lack the financial means to retrofit homes or adopt new technologies that mitigate risks from extreme weather events (Vince, 2025). Social inequalities, particularly those related to gender, age, and ethnicity, also play a crucial role in determining the impact of climate change. Women, children, and marginalized ethnic groups frequently face higher exposure to climate hazards due to reduced access to resources and limited involvement in decision-making processes (Confalonieri et al., 2007). Recent findings from Sandosham (2025) underscore that women constitute nearly half of the global agricultural workforce yet are often sidelined in adaptation strategies, which further diminishes community resilience.

Inadequate health infrastructure in impoverished areas further compounds the adverse effects of climate change. Limited access to healthcare services and emergency response systems results in higher morbidity and mortality during climate-induced disasters (Confalonieri et al., 2007). For instance, in regions like northern Colombia, indigenous migrants report significant disruptions in health service access following recurrent flooding and drought events (Grattan, 2025).

Health Outcomes

Climate change is altering vector habitats, leading to increased incidences of infectious diseases such as malaria, dengue fever, and other vector-borne illnesses (Patz & Kovats, 2002). Warmer temperatures and unpredictable rainfall create favorable conditions for disease vectors, thus intensifying public health challenges in vulnerable regions (WHO, 2022). Declines in agricultural productivity and rising food prices also contribute to malnutrition, particularly among children in low-income communities. According to the World Bank Group (2023), malnutrition worsens existing health issues, creating a vicious cycle of poor health and poverty. This is further corroborated by recent reports from Neville (2024), which detail warnings by Bill Gates on the rising global malnutrition crisis driven by climate change.

The mental health impacts of climate change are increasingly recognized, with studies documenting increased rates of anxiety, depression, and post-traumatic stress disorder (PTSD) among those affected by extreme weather events (Kjellstrom, 2009). The stress and trauma associated with displacement and loss of livelihoods further worsen these mental health outcomes (Grattan, 2025; Vince, 2025). Conceptual developments such as ecoanxiety and ecological grief highlight the evolving nature of climate-related mental health challenges (Clayton et al., 2017).

Discussions

Climate change, poverty, and health outcomes are deeply interconnected, with each factor influencing and worsening the others. The findings underscore the need for integrated approaches to address these issues, recognizing the complex feedback loops that perpetuate vulnerability. The result indicated that extreme weather events, such as floods and droughts, have profound impacts on vulnerable communities by destroying homes, displacing populations, and disrupting livelihoods. These events often lead to significant economic losses, which are particularly devastating for poor communities with limited

financial resources and insurance coverage (Asia-Pacific SDG Partnership Report, 2024). Agricultural productivity is significantly affected by climate change, which in turn aggravates food insecurity and malnutrition in vulnerable populations. The decline in crop yields due to changing weather patterns and increased frequency of extreme events contributes to higher food prices and reduced access to nutritious food, particularly for impoverished households. The review also highlighted that climate change worsens the spread of infectious diseases by creating favorable conditions for vectors such as mosquitoes. Warmer temperatures and altered precipitation patterns expand the habitats of these vectors, leading to increased incidences of diseases like malaria and dengue fever in regions that were previously unaffected (Leichenko & Silva, 2014).

Mental health impacts are another critical finding of this review. The stress and trauma associated with climate-related disasters, displacement, and loss of livelihoods contribute to a range of mental health issues, including anxiety, depression, and PTSD. These mental health challenges are often overlooked in the context of climate change but are essential components of overall well-being (Kjellstrom, 2009).

Policy Implications

Adaptation and Mitigation:
Policies must prioritize adaptation and mitigation strategies that are inclusive and consider the specific needs of vulnerable communities. This includes investing in resilient infrastructure, improving access to healthcare and education, and supporting sustainable agricultural practices. For instance, implementing early warning systems for extreme weather events can help communities prepare and respond more effectively (GFDRR & The World Bank, 2015).

Social Protection:
Strengthening social protection systems can enhance the resilience of poor communities to climate change. Social safety nets, such as cash transfers and insurance schemes, can provide critical support during and after climate-related disasters. These measures can help buffer the economic impacts of climate change and enable communities to recover more quickly.

Community Engagement:
Engaging communities in decision-making processes is essential for developing effective and context-specific interventions. Empowering local communities to participate in climate action can enhance the relevance and sustainability of adaptation and mitigation efforts. Community-based approaches ensure that interventions are tailored to the specific needs and conditions of the affected populations.

Research Gaps and Future Directions
The review identifies several gaps in the current literature, including a need for more research on the mental health impacts of climate change and the role of social inequalities in shaping vulnerability. Future research should also explore the effectiveness of various policy interventions and adaptive strategies in different contexts. Specifically, there is a need for longitudinal studies to understand the long-term impacts of climate change on health outcomes and to evaluate the effectiveness of adaptation measures over time.

Conclusion

This narrative review highlights the complex interplay between climate change, poverty, and health outcomes in vulnerable communities. The evidence indicates that climate change disproportionately affects poor communities, leading to a range of adverse health outcomes and perpetuating cycles of vulnerability (Prudent, Houghton & Luber, 2016). Key findings include the significant impacts of extreme weather events on economic stability and livelihoods, the exacerbation of food insecurity and malnutrition, the increased spread of infectious diseases, and the critical mental health challenges posed by climate-related stress and trauma.

Recommendations

Policy Interventions:

1. There is need to develop and implement inclusive adaptation and mitigation strategies that address the specific needs of vulnerable communities. This includes investing in resilient infrastructure, healthcare services, and sustainable agricultural practices.
2. It is important to strengthen social protection systems to enhance community resilience to climate change. Social safety nets, such as cash transfers and insurance schemes, can provide critical support during and after climate-related disasters.
3. It is also important to invest in healthcare infrastructure and services to better cope with climate-induced health challenges. This includes improving access to healthcare in remote and underserved areas and enhancing the capacity of healthcare systems to respond to climate-related health issues.

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