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IMPACT OF CLIMATE CHANGE ON HEALTH IN RURAL INDIA: A COMMUNITY BASED STUDY

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ABSTRACT

Climate change is a growing global concern, especially in low-resource settings such as rural India. This community-based cross-sectional study investigates how climate variability affects public health in rural areas, using both qualitative and quantitative methodologies. A total of 400 respondents from rural India were surveyed using structured questionnaires, interviews, and focus group discussions. The findings highlight increased prevalence of heat-related illnesses, respiratory and vector-borne diseases, nutritional deficiencies, and mental health issues. Limited healthcare access and poor infrastructure exacerbate these issues. The study concludes with recommendations for climate-resilient health systems, targeted policy reforms, and local awareness programs to mitigate future risks.

Keywords: Climate change, rural health, heatstroke, vector-borne diseases, adaptation, India, community-based study

1. Introduction

1.1 Background

Climate change significantly influences public health, especially in vulnerable populations lacking infrastructural resilience. Rural India, where the majority of the population depends on agriculture, faces direct impacts of shifting climatic patterns, including rising temperatures, erratic rainfall, and extreme weather events. These changes exacerbate the burden of vector-borne, respiratory, and waterborne diseases and strain limited health services.

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1.2 Rationale

Existing literature primarily focuses on urban and global perspectives, overlooking localized experiences. There is a critical need for grassroots-level data on climate-sensitive health issues in rural areas to inform adaptive policies.

1.3 Significant of the study

This study holds strong relevance in multiple domains:

- **Public Health Planning**: It identifies specific climate-sensitive diseases affecting rural populations, enabling targeted health interventions.
- **Policy Development**: Findings will support policymakers in crafting inclusive, localized climate-health action plans that reflect ground realities.
- **Community Empowerment**: By engaging rural communities directly, the study promotes awareness, knowledge-sharing, and grassroots resilience.
- **Academic Contribution**: It fills a critical research gap by generating empirical data from rural India, contributing to the broader discourse on climate and health.
- **Healthcare System Strengthening**: Insights from this study can help in designing climate-resilient healthcare models suitable for rural infrastructure.

Ultimately, this research aims to strengthen the link between climate science and public health response in rural India, ensuring that the most vulnerable populations are not left behind in climate adaptation and health planning.

1.4 Objectives

- Assess awareness of climate change among rural communities.
- Measure prevalence of climate-sensitive diseases.
- Analyse socio-demographic vulnerabilities.
- Evaluate healthcare access and adaptation strategies.
- Formulate recommendations for rural health resilience.

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2. Methodology

2.1 Study Design

A **community-based, cross-sectional, mixed-methods** approach was adopted. Both quantitative surveys and qualitative interviews were conducted.

2.2 Sampling

A total of **400 respondents** were selected via **multi-stage stratified random sampling** from rural Madhya Pradesh.

2.3 Data Collection Tools

- Pre-tested questionnaire (socio-demographic data, awareness, health issues, coping strategies)
- Focus Group Discussions (FGDs)
- Key Informant Interviews (KIIs)
- Field observation checklist

2.4 Ethical Considerations

Informed consent was obtained. The study was approved by the institutional ethics committee of SAM Global University.

2.5 Data Analysis

Quantitative data were analysed using SPSS. Qualitative responses were transcribed and thematically coded.

3. Results

3.1 Demographics

- 52% aged 30–50 years; 58% female.
- 67% engaged in agriculture.

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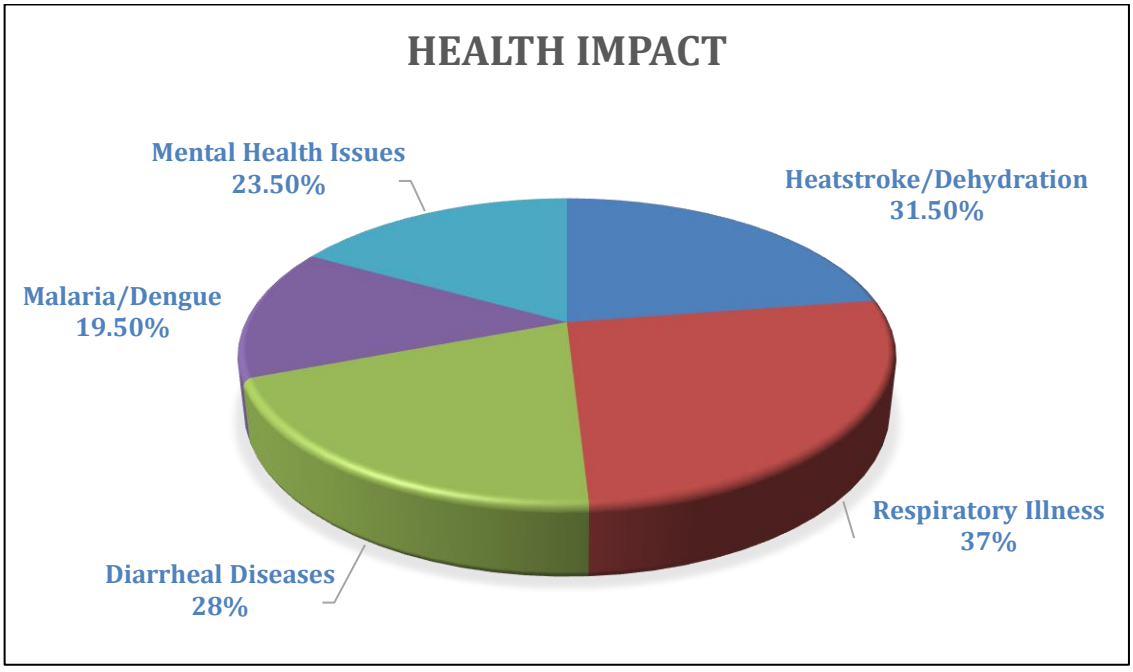
- 75% had only primary or no formal education.

3.2 Climate Awareness

- 83% observed changes in climate (heatwaves, rainfall).
- Only 31% had heard the term “climate change.”

3.3 Health Impacts

Health Condition	Affected (%)
Heatstroke/Dehydration	31.5%
Respiratory Illness	37%
Diarrheal Diseases	28%
Malaria/Dengue	19.5%
Mental Health Issues	23.5%



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- Increased vector-borne disease incidence post-monsoon.
- High diarrheal cases after floods due to unsafe water.

3.4 Vulnerable Groups

- Elderly (41.3%), children (36.5%), and low-income families (45.7%) were more affected.
- Women faced dual burdens of caregiving and climate stress.

3.5 Access to Healthcare

- 51% accessed public health facilities; 7% did not seek treatment.
- Distance and staff shortages were major barriers.

3.6 Adaptation Strategies

- 43% shifted crop patterns; 21.4% migrated seasonally.
- 56.2% relied on home remedies; only 12.5% attended awareness programs.

3.7 Hypotheses Testing

- H1 (climate-health link), H2 (vulnerable groups), H4 (infrastructure), H5 (mental health) were **accepted**.
- H3 (awareness reduces burden) was **partially accepted** (p=0.07).

4. Discussion

The study validates growing concern that climate change has direct and indirect health implications for rural populations. Community perceptions, while experience-based, lack scientific understanding. Poor healthcare infrastructure, combined with inadequate preparedness and weak institutional response, worsens outcomes.

Mental health, a neglected aspect in most rural health assessments, surfaced prominently due to livelihood loss and environmental stress.

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Comparative analysis aligns with WHO, IPCC, and Indian government reports on climate-health risks.

5. Conclusion

Climate change is reshaping the health landscape of rural India. The intersection of environmental stressors, weak health infrastructure, and socioeconomic vulnerabilities demands urgent multisectoral intervention. Without targeted policy and community engagement, the rural health burden will intensify.

6. Recommendations

Policy Level

- Integrate climate-health risk into district health plans.
- Strengthen the National Health Mission with climate-focused modules.

Healthcare System

- Train frontline workers (ASHAs, ANMs) on climate-related diseases.
- Improve rural health infrastructure and mobile health access.

Community Action

- Launch local awareness campaigns in vernacular languages.
- Promote water sanitation, nutrition, and climate-resilient agriculture.

Future Research

- Conduct longitudinal studies on health trends.
- Explore gendered and psychological impacts of climate variability.

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