



The Effects Of Climate Change On Rural Women: A Study In South Tripura

“We are the first generation to feel the effect of climate change and the last generation who can do something about it.”

Barack Obama, Former US President

1Arnab Pal, 2Dr. Lipika Roy

1Research Scholar in The Department of Liberal Arts, 2Assistant Professor in The Department of Liberal Arts

Tripura University

Abstract - The Effects of Climate Change on Rural Women: A Study in South Tripura This study investigates the gendered impacts of climate change on rural women in South Tripura, focusing on the Chittamara Gram Panchayat. Utilizing a mixed-methods approach combining structured surveys, semi-structured interviews, and focus group discussions, the research explores how climate variability intensifies pre-existing social, economic, and health vulnerabilities among women. Key findings reveal that rural women, who are primary caregivers and agricultural laborers, face heightened challenges due to erratic rainfall, crop failures, water scarcity, and increased labor burdens. These factors severely affect their livelihoods, physical health, and mental well-being, particularly in the face of disasters such as the August 2024 Muhuri River flood. Over 90% of respondents reported worsening food security and health conditions, with many citing increased anxiety, depression, and limited access to healthcare. Although some women participate in grassroots adaptation efforts using indigenous knowledge--such as drought-resistant crops and water-saving practices--their efforts are constrained by systemic issues including limited land ownership, poor access to education, lack of credit, and exclusion from decision-making. Only 28.18% of surveyed women felt their voices were heard in climate policy formulation, while nearly 94% were unaware of gender-sensitive government programs. This disconnect highlights a critical policy gap. The study advocates for the development of inclusive, gender-responsive climate policies that recognize the vital roles women play in sustaining household economies and managing natural resources. Recommendations include improving access to health and education services, targeted capacity building, financial support for climate-resilient livelihoods, and increased female representation in policymaking. Empowering rural women is identified as not only a matter of equity but also a strategic imperative for sustainable climate adaptation in India's vulnerable regions.

keywords - Climate change, Gender inequality, Rural women, Livelihood vulnerability, Health impacts, South Tripura, Adaptation strategies, Policy inclusion

Introduction

Climate change, which is characterized by long-term changes in temperature, precipitation patterns, and the frequency of extreme weather events, is one of the most pressing issues of the twenty-first century. Globally, these environmental disruptions are becoming worse due to human activities such as industrialization, deforestation, and the burning of fossil fuels (Swaminathan, 2012). The relationship between ecological fragility and socioeconomic marginalization is microscopically represented in northeastern India, particularly in the state of Tripura. South Tripura is especially susceptible to climate-related shocks that disproportionately affect disadvantaged groups, especially rural women, because of its primarily rural and agrarian nature. Recent climate changes in South Tripura demonstrate the severity of this issue. The region has been impacted by several adverse weather conditions, such as erratic monsoons, rising temperatures, and severe flooding. The August 2024 flood, which resulted from the Muhuri River overflowing following exceptionally heavy rains, is one such instance. The flood flooded large areas, damaged critical infrastructure, and forced thousands of people to relocate. Due to their reliance on natural resources, their participation in subsistence farming, and their restricted access to institutional assistance, women have been disproportionately impacted by these disasters. The research clearly shows that climate change acts as a "threat multiplier," escalating existing inequalities, especially those based on gender (Lahiri-Dutt, 2023; Roy, 2022). The primary caregivers, water gatherers, and family food producers in rural Tripura are women. Rain-fed agriculture, which is their main source of income, is growing less reliable due to shifting rainfall patterns and warming monsoon temperatures. Similar conditions have been noted in Northeastern states of India, including Manipur, Mizoram, and Sikkim, where crop yields of rice, maize, and potatoes have declined due to these climate changes (Feroze, 2014; Feroze, 2020). Tripura's traditional agricultural practices are under increasing pressure due to declining water supplies, degraded soil, and decreased forest availability. These agricultural challenges are made worse by the increasing water stress in rural Tripura. Long dry spells and erratic rains have increased the time and effort required for water collection, a task typically done by women. These issues limit their access to educational and income-generating opportunities in addition to impairing their physical and productivity (Lahiri-Dutt, 2023). Floods can also contaminate water supplies, raising the possibility of waterborne diseases like cholera and dysentery, which are especially dangerous for women and children. Despite these vulnerabilities, rural women are not defenseless victims of climate change. In South Tripura, women are actively engaged in adaptation strategies based on indigenous knowledge. These include diversifying agriculture, using drought-resistant seed varieties, and reviving traditional water-saving methods. Similar trends have been observed in rural India, where residents are utilizing indigenous crops and environmentally friendly farming methods to preserve food security despite environmental change (Ghosh-Jerath, 2021). Such grassroots resilience reflects the agency and adaptability of women in the face of increasing environmental stress. However, the effectiveness and scalability of these initiatives are still limited by institutional and structural barriers. Many rural women in Tripura lack access to loans, land ownership, climate-resilient technology, and agricultural extension services. Limited mobility and gender-biased societal norms further hinder their ability to participate in

climate change decision-making (Roy, 2022; Lahiri-Dutt, 2023). In the absence of systemic changes, these constraints make it difficult to develop inclusive and sustainable adaption plans. The gap between the development of policies and the actual conditions on the ground is especially apparent. Although inclusion and region-specific interventions are prioritized in the National Action Plan on Climate Change (NAPCC) and other national adaptation programs, gender is often overlooked in their implementation. According to adaptation programs like Maharashtra's Birs Munda Krishi Kranti Yojana, for example, benefits tend to concentrate among wealthier, male landowners, excluding disadvantaged groups like women (Pritchard, 2023). Such a mistake could exacerbate inequality and undermine efforts to strengthen resilience in Tripura.

Another significant aspect that is commonly overlooked is how climate change affects the health of rural women. Increased exposure to extreme heat, tainted water and a rise in the prevalence of disease pose major risks to one's physical and mental well-being. These are exacerbated by a lack of healthcare facilities and support systems that are tailored to women's particular needs (Chakrabarty, 2023; Hussain, 2024). Lack of access to wholesome food, clean water, and sanitary facilities exacerbates mental health conditions like depression and anxiety, reproductive issues, and malnutrition, especially after natural disasters. The effects of climate change on gender in Northeast India, and particularly in South Tripura, remain largely unexplored. Most of the existing literature focuses on the impacts in urban areas or provides general assessments without adequately addressing the ways that socioeconomic constraints and climate variability impact rural women in particular (Elmhirst, 2015; Agarwal, 2010). Singh et al. (2021) and Sultana (2014) have underlined the significance of gender-disaggregated, localized research in the creation of effective adaptation programs. Furthermore, research on crucial subjects like policy gaps, diverse health outcomes, and the role of informal support networks is still lacking (Tschakert & Dietrich, 2010; Bhattacharya & Dey, 2019). This study aims to bridge this research gap by providing a thorough, gender-focused analysis of the impacts of climate change in South Tripura. It specifically examines how climate variability affects and responds to the livelihoods, health, and institutional engagement of rural women. This study emphasizes the critical need for gender-responsive climate policies that support equitable development, strengthen community resilience, and empower women in India's climate-vulnerable areas. It is driven by three primary goals: evaluating the inclusiveness of local climate policies, analyzing health effects, and assessing livelihood impacts specific to gender.

Research Methodology:-

This study employs a mixed-methods research methodology to thoroughly examine the gender-specific effects of climate change on rural women in South Tripura, with a focus on the Chittamara Gram Panchayat. Combining quantitative and qualitative methods allows for a thorough exploration of the relationship between gendered vulnerabilities and climatic variability in a context that is ecologically vulnerable and socioeconomically marginalized (Creswell & Plano Clark, 2017; Aguilar et al., 2015). Chittamara Gram Panchayat, located in the Dakshin Bharat Chandra Nagar Block of the Belonia Constituency in the South Tripura district, is the study area. This rural area has a population of 1,214

people living in 284 houses, and its sex ratio—roughly 1,009 women for every 1,000 men—is higher than the national average. The overall literacy rate is 67.71%, with 75.17% of men and 60.3% of women being literate. The demographic distribution consists of 422 members of Unreserved (UR) groups, 785 members of Scheduled Tribes (ST), and 7 members of Scheduled Castes (SC). Bengali and Kokborok are the most common languages in the linguistically and culturally diverse village. Although educational institutions such as Brindaban Royaja Para High School serve the community, infrastructure problems persist. Importantly, one of the ecological stresses that characterize Chittamara is the presence of 13 brick Industries that employ roughly 2,500 migrant workers from Bihar and Jharkhand. These industries worsen environmental conditions and significantly increase local greenhouse gas emissions, which puts additional strain on natural resources and increases the region's susceptibility to climate change. Rural women who are 18 years of age or older are the subject of the study, particularly those who work in small business ownership, agriculture, domestic work, and livestock rearing. These women are essential resource managers in their homes and communities. Their daily activities, which range from producing food to gathering fuel and water, make them especially susceptible to the detrimental effects of climatic variability and ecological changes (Agarwal, 2010; Elmhirst, 2015). Social and economic constraints, such as limited access to land, credit, education, and extension services, make it more difficult for them to adapt appropriately to environmental stresses (Kabeer, 2018; Tschakert & Dietrich, 2010). To ensure representativeness and lessen selection bias, a random sample approach was employed in compliance with recognized quantitative research protocols (Creswell & Creswell, 2018). A comprehensive household list in the Chittamara Gram Panchayat was used to select a total of 110 female respondents. The sample procedure was stratified to account for differences in job functions, age, socioeconomic status, and tribe membership. Consequently, the sample was ensured to be diverse and comprehensive, encompassing a wide range of perspectives and life experiences (Fink, 2013; Kumar, 2014). To properly capture the breadth and complexity of climate impacts on rural women, the study used a variety of data collection methods. To gather quantitative data, structured questionnaires were given to each of the 110 respondents. These surveys were designed to collect standardized data on key variables, including socio-demographic characteristics, attitudes and knowledge about climate change, changes in farming practices, health impacts, and participation in local or regional climate projects (IPCC, 2014). The quantitative data provided a thorough statistical evaluation of the adaptation responses and climate-related vulnerabilities of the study population. In addition to the quantitative approach, qualitative methodologies were employed to gain a better understanding of the social, cultural, and emotional aspects of climate vulnerability that are challenging to measure (Leavy, 2017). Semi-structured interviews were conducted with a targeted sample of women who had been significantly affected by recent natural disasters, as well as local health professionals and community leaders. These interviews allowed for open-ended, narrative responses and yielded rich qualitative data on a variety of topics, including coping strategies, the impact on mental health, access to institutional assistance, and opinions on both governmental and non-governmental initiatives (Tschakert & Dietrich, 2010; Scoones, 2009). The sometimes invisible difficulties faced by rural women as they adapt to a changing climate were illuminated through firsthand

stories. Focus Group Discussions (FGDs) further improved the qualitative aspect of the study. These sessions were conducted with groups of rural women to encourage group discussion and reflection on shared experiences related to water scarcity, agricultural challenges, shifting gender roles, and regional adaptation strategies (Katz & Salkind, 2019). Focus group discussions (FGDs), a crucial platform for exchanging knowledge within communities, allowed researchers to identify patterns and differences in climate resilience across communities. The group format also allowed for the observation of the power relations and social dynamics that influence women's access to resources and decision-making spaces (O'Brien et al., 2010; Agarwal, 2010). The best example of methodological triangulation, a technique that enhances the validity and reliability of research findings by enabling cross-verification across multiple data sources and analytical frameworks, is the combination of focus group discussions (FGDs), semi-structured interviews, and structured surveys (Denzin, 2012). Quantitative data were analyzed using cross-tabulations and descriptive statistics to identify significant patterns and relationships, while qualitative data were thematically coded to extract basic themes related to vulnerability, adaptability, and institutional response. This dual-track approach allowed for a comprehensive understanding of the statistical trends and human experiences that underpin climate change impacts in the study area (Patton, 2015; Elmhirst, 2015). Ethical considerations were closely followed during the investigation. Participants provided their informed consent while maintaining their privacy. The voluntary nature of participation was emphasized, and data were only used for academic and policy-related purposes. To sum up, the methodological framework of this study offers a sound and contextually aware approach to examining the ways in which climate change impacts women in rural South Tripura. Through the integration of various approaches and points of view, the research identifies significant weaknesses while also highlighting the resilience and adaptation strategies of rural women. This comprehensive approach lays the groundwork for evidence-based, gender-responsive climate policies that are grounded in the real-world experiences of women in climate-vulnerable regions of India.

Major Findings:-

Voices from the Fields: Rural Women's Experiences of Climate Change in South Tripura

In the quiet, rural community of Chittamara Gram Panchayat in South Tripura, rural women's daily lives are being altered by the pressing reality of climate change. Based on the results of a field study involving 110 participants, this narrative offers a human-centered explanation of how gendered vulnerabilities are being exacerbated by environmental change. The demographic profile of the respondents shows that more than half (49.09%) are between the ages of 36 and 45, a group that is heavily involved in household and financial responsibilities. They are the primary breadwinners and caregivers, which is supported by the shocking 93.63% of them who are married. Their primary source of income is farming, with 46.36% of them engaged in agricultural work, 34.54% in domestic duties, and 10% in animal husbandry. However, their access to knowledge and adaptation options is limited because of their low educational levels, with half (50.90%) having only completed basic school and 20.90 having no formal education. All respondents (100%) reported measurable changes in weather patterns over the past five years, citing

higher temperatures and more erratic rainfall. In addition to disrupting agricultural cycles, these changes have resulted in actual economic pressure. 76.36% of families experienced lower incomes as a result of 32.72% of lower yields and more than one-third (37.27%) of rising labor costs. Access to vital natural resources, such as water and firewood, has also diminished, according to 43.63% of respondents, which puts additional strain on women. Every participant (100%) voiced concern about food insecurity, pointing to difficulties maintaining the family's food supply due to weather-related disruptions. Health impacts are equally severe; all respondents blamed climate change for rising rates of respiratory issues, heatstroke, and waterborne illnesses. Mental health issues are also common; 100% of respondents said that rural women suffer from stress, anxiety, and depression, which is often exacerbated by their inability to work in extremely hot weather (90.90%). Despite these challenges, a significant portion of respondents (83.63%) seek medical care, and others resort to preventative strategies like staying indoors during heat waves. It is encouraging that 66.36% of people are aware of and have participated in climate adaptation activities. Nonetheless, 71.81% feel excluded from decision-making processes, and 61.81% identify a lack of policy support and knowledge as the primary barriers. Despite differing opinions on current policies—52.72% think they are effective, while 45.45% think they are only marginally so—there is strong support for reform. Nearly half (45.45%) say that more access to climate education is necessary, and 55.55% stress the need for gender-specific training and capacity-building initiatives. These stories demonstrate how urgently rural India needs gender-responsive, inclusive, and informed climate action.

Conclusion:-

This study explores the multifaceted impacts of climate change on rural women in South Tripura, highlighting the intimate links between environmental problems and gender inequality, socioeconomic vulnerability, and ineffective government support. The findings demonstrate that rural women are disproportionately affected by climate-related hardships, particularly when it comes to their access to essential resources, means of subsistence, and health. Unpredictable weather patterns have significantly impacted the primary occupation of the majority of respondents, farming, resulting in an increase in crop failures, decreased yields, and increased labor costs. These setbacks put women under additional stress as they balance caregiving and household responsibilities, in addition to jeopardizing food security and income. Climate change has also had a major impact on access to essential natural resources like firewood and water; prolonged droughts and frequent flooding have made resource gathering riskier and more difficult. Because they are the primary caregivers and water collectors in their homes, rural women are more susceptible to health issues like respiratory ailments, waterborne infections, and heat-related disorders. The physical effects of climate change are made worse by emotional stress, anxiety, and depression, but access to both mental and physical healthcare is still limited. These health-related vulnerabilities underscore the critical need for readily available, gender-responsive healthcare services. The survey indicates that there are significant differences in the awareness and application of policies. Just 28.18% of women think their opinions are taken into consideration when preparing for climate change, and a startling 93.63% of women are unsure if current government policies are gender-sensitive.

These disconnect between policymaking and local reality underscores the lack of effective gender inclusion in climate plans. Lack of adequate financial resources, inadequate education, and unreliable information dissemination methods further impair rural women's ability to adapt to climate issues. These structural barriers exacerbate pre-existing gender inequality and restrict women's participation in climate resilience programs. Given these results, the study strongly recommends the adoption of enhanced gender-sensitive climate policies that actively involve rural women in the decision-making process. These policies must take into account the roles that women play in agriculture, water management, and household care. Expanding access to climate-related education, knowledge, and capacity-building programs is essential to equipping women with the skills they need to adapt, particularly in the fields of sustainable agriculture, health, and disaster preparedness. In order to give rural women access to specialized mental and physical health care, healthcare systems must also be improved. Financial aid and subsidies should be provided to enable women to adopt climate-resilient farming practices and pursue alternative livelihoods. To adequately address their unique concerns, it is equally important to increase the representation of women in local, regional, and national policy-making. Collaboration with global organizations that place a high priority on gender equality and climate resilience is also crucial to filling knowledge gaps and advancing more inclusive and effective adaptation plans. The study generally encourages gender-sensitive, locally grounded, targeted, and inclusive methods. Without rural women having access to adequate support networks and being actively involved in climate planning, efforts to improve climate change resilience will not be fully achieved. Empowering rural women is not only a social justice issue, but it is also a vital strategic requirement for sustainable and equitable climate adaptation.

Bibliography:-

- Agarwal, B. (2010). *Gender and green governance: The political economy of women's participation in forestry reform in South Asia*. Oxford University Press.
- Aguilar, L., Rojas, W., & Carrillo, C. (2015). *Gender and climate change: An overview of research and initiatives*. United Nations Development Programme.
- Bhattacharya, R., & Dey, S. (2019). *Gender, environment, and development: A South Asian perspective*. Cambridge University Press.
- Chakrabarty, D. (2023). *Climate change and rural livelihoods in India: The nexus of food security and development*. Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th Ed.). Sage Publications.
- Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.
- Denzin, N. K. (2012). *The research act: A theoretical introduction to sociological methods* (4th ed.). Aldine Transaction.

- Elmhirst, R. (2015). *Translocal political ecologies: Gender and the environment in Southeast Asia*. Palgrave Macmillan.
- Feroze, S. (2014). *Climate change and its impact on rain-fed agriculture in Northeast India*. Springer.
- Feroze, S. (2020). *The vulnerabilities of rural agriculture to climate change in Northeast India*. Springer.
- Fink, A. (2013). *How to conduct surveys: A step-by-step guide* (5th ed.). Sage Publications.
- Ghosh-Jerath, S. (2021). *Women's roles in agricultural adaptation: A case study from India*. *Climate Change and Development*, 23(4), 392-406.
- Hussain, S. (2024). *Air pollution, climate change, and public health in India*. *Journal of Environmental Health*, 50(2), 128-142.
- IPCC. (2014). *Climate change 2014: Impacts, adaptation, and vulnerability*. Cambridge University Press.
- Kabeer, N. (2018). *Gender, livelihoods, and sustainability in South Asia: Exploring intersections*. Oxford University Press.
- Katz, J., & Salkind, N. J. (2019). *Methods in social research* (5th ed.). Sage Publications.
- Kuki, S. (2023). *Climate vulnerability in the Northeast: The role of women in adaptation practices*. *Northeast Journal of Environmental Science*, 12(1), 1-19.
- Kumar, R. (2014). *Research methodology: A step-by-step guide for beginners* (4th ed.). Sage Publications.
- Lahiri-Dutt, K. (2023). *Women, work, and climate change: A study of rural women in South Asia*. *Journal of Gender and Development*, 30(1), 55-67.
- Leavy, P. (2017). *Research design: Quantitative, qualitative, mixed methods, arts-based, and community-based participatory research approaches*. The Guilford Press.
- Nair, P. (2019). *Gender and climate change in South Asia: A review of literature*. *International Journal of Environmental Studies*, 75(2), 101-115.
- O'Brien, K., Sygna, L., & Haugen, M. (2010). *Social aspects of climate change adaptation: Understanding and integrating local perspectives*. Earthscan.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). Sage Publications.
- Pritchard, T. (2023). *Climate adaptation and social stratification: Lessons from India*. *Environment and Development Economics*, 28(1), 14-30.
- Roy, P. (2022). *Climate change and the rural poor: The gendered impacts in South Asia*. Springer.
- Scoones, I. (2009). *Livelihoods perspectives and rural development*. *Journal of Development Studies*, 45(1), 1-30.
- Singh, D., Verma, R., & Rani, A. (2021). *Gendered impacts of climate change in rural India: The case of the Chittamara Gram Panchayat, Tripura*. *South Asian Studies*, 39(2), 82-101.

- Sultana, F. (2014). *Gender and water governance: The impact of climate change on rural women*. Environmental Sociology, 2(3), 176-189.
- Swaminathan, M. S. (2012). *The impact of climate change on agriculture and food security*. National Institute of Rural Development.
- Tschakert, P., & Dietrich, K. A. (2010). *Anticipatory learning for climate change adaptation in rural communities*. Environmental Science & Policy, 13(4), 283-297.
- Census India. (2011). CHITTAMARA VILLAGE, RAJNAGAR, SOUTH TRIPURA. Census2011.co.in. Retrieved May 6, 2025, from <https://www.census2011.co.in/data/village/272279-chittamara-tripura.html>
- Wikipedia contributors. (2025, May 6). CHITTAMARA, BELONIA. Wikipedia. https://en.wikipedia.org/wiki/Chittamara%2C_Belonia

