Assessing the Impact of Climate Change on Agriculture and Food Security Among the 'Juang Tribe' in Kendujhar District, Odisha

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***Abstract*:** This study inspects the impact of climate change on agriculture and food security among the Juang tribe in Kendujhar district of Odisha. The Juang Tribe is recognised as a Particularly Vulnerable Tribal Group (PVTG) and habitually depends on agriculture, forest resources, and cyclical labour for its livelihood. However, in recent years, climate change has meaningfully impacted their agricultural practices, crop productivity, and overall livelihood safety. Irregular rainfall patterns, increasing temperatures, and recurrent droughts have created serious challenges for traditional agriculture systems in the region. The main aims of this study are to understand the tribal community in the Panasanasa village, which is occupied by the Juang tribe, and to study their socio-economic and agricultural conditions in the context of changing climatic situations. The study also aims to find the various types of agriculture practised by the Juang people, including maintenance farming, shifting farming, and small-scale crop production. Another important objective is to analyse the economic disorder of tribal households and to recognize how climate change has influenced their income sources, agricultural productivity, and livelihood constancy. Furthermore, the study seeks to assess the level of food security among the Juang community and to explore how environmental changes affect their access to appropriate and nutritious food. This study is descriptive and systematically based on the examination of research questions. The study depends on field-based observations, interviews, and the collection of primary data from Panasanasa Juang villages in Kendujhar district. The results are expected to provide insights into the relationships among climate change, agriculture, and food security among tribal communities, and to highlight the necessity for sustainable agricultural practices, climate variation strategies, and helpful government policies.

Keywords: *tribe, agriculture, climate change, food security*

I. INTRODUCTION

Climate change has occurred as one of the most demanding global challenges, excessively affecting vulnerable groups. Among those most impacted are indigenous and tribal populations who rely heavily on natural resources for their livelihoods. The Juang Tribe, be located in primarily in Kendujhar District, denotes one such community. Recognised as a Particularly Vulnerable Tribal Group (PVTG), the Juang people have conventionally depended on agriculture, forest resources, and seasonal wage labour for persistence.

However, in current years, changing climatic situations have disrupted their traditional ways of life. Erratic rainfall, rising temperatures, and increasing frequency of droughts have adversely affected agricultural productivity and food security. This thing examines the impact of climate change on agriculture and food security among the Juang tribe, focusing on their socio-economic situations and variation challenges.

II. Profile of the Juang Tribe:

The Juang tribe is one of the primogenital indigenous groups in Odisha. They mostly inhabit forested and hilly areas of Kendujhar district. Traditionally, the Juang people practice existence agriculture and maintain a close relationship with the forestry environment. Their livings are deeply intertwined with nature, making them highly sensitive to environmental deviations.

Despite about development involvements, the Juang community continues to face socio-economic challenges such as poverty, low literacy rates, limited access to healthcare, and insufficient setup. These vulnerabilities further intensify the impact of climate change on their lives.

III. Agricultural Practices of the Juang Community:

Agriculture forms the backbone of the Juang economy. Their farming practices are largely traditional and rain-fed. The major types of agriculture practised include:

- Subsistence Farming: Cultivation primarily for household consumption.
- Shifting Cultivation (Podu): A traditional method involving clearing forest land for temporary farming. (Mohapatra et al., 2023)
- Small-Scale Crop Production: Growing crops like millets, pulses, and local varieties of rice.

These agricultural systems are highly dependent on seasonal rainfall and natural soil fertility. The lack of modern irrigation facilities and advanced agricultural technologies makes their farming system vulnerable to climatic variations.

IV. Impact of Climate Change on Agriculture:

Climate change has meaningfully altered the agricultural landscape of the Juang area. The major influences include:

1. Irregular Rainfall Patterns

Rainfall has become impulsive, leading to overdue sowing and crop failure. Unpredictable monsoon cycles affect crop growth and reduce yields.

2. Rising Temperatures

Increasing temperatures have led to soil moisture loss, affecting crop productivity. Heat stress also impacts plant growth and reduces the quality of produce.

3. Frequent Droughts

Droughts have become more common, severely affecting rain-fed agriculture. Water scarcity reduces the possibility of multiple cropping and limits agricultural output.

4. Loss of Traditional Knowledge

Climate unpredictability has made traditional farming knowledge less reliable, leaving farmers in a state of uncertainty and risk.

V. Socio-Economic Impacts:

The effects of climate change on agriculture directly influence the socio-economic conditions of the Juang households:

- Decline in Income: Reduced agricultural productivity leads to lower household income.
- Increased Migration: Many tribal members migrate seasonally in search of wage labour.

- Debt and Financial Instability: Crop failures often push families into debt.
- Livelihood Insecurity: Dependence on uncertain agricultural output makes survival difficult.

VI. Food Security Challenges:

Food security is a major concern for the Juang community. Climate change affects all dimensions of food security:

- Availability: Reduced crop yields lead to food shortages.
- Access: Declining income limits the ability to purchase food.
- Utilisation: Nutritional intake is compromised due to a lack of diverse food.
- Stability: Frequent environmental shocks create long-term food insecurity.

As a result, many households face seasonal hunger and malnutrition.

VII. Research Methodology:

This study is descriptive and exploratory. It is based on:

- Field Observations: Direct interaction with the community.
- Interviews: Collection of qualitative data from tribal households.
- Primary Data Collection: Information gathered from Panasanasa villages in Kendujhar district.

The research focuses on understanding the lived experiences of the Juang people in the context of climate change.

VIII. Adaptation Strategies and Challenges:

The Juang community has attempted to adapt to changing climatic conditions in several ways:

- Diversification of crops
- Increased dependence on forest resources
- Seasonal migration for income

However, these strategies are often insufficient due to limited resources, lack of awareness, and inadequate institutional support.

IX. Policy Implications and Recommendations:

To address these challenges, the following measures are essential:

1. **Promotion of Climate-Resilient Agriculture**

   Introduction of drought-resistant crops and sustainable farming practices.

2. **Improved Irrigation Facilities**

   Development of small-scale irrigation systems to reduce dependence on rainfall.

3. **Strengthening Food Security Programs**

   Effective implementation of public distribution systems and nutrition schemes.

4. **Capacity Building and Awareness**

Training tribal farmers in modern and adaptive agricultural techniques.

5. **Government Support and Policy Intervention**

Inclusive policies that address the needs of PVTGs, such as the Juang tribe.

X. Conclusion:

Climate change poses a serious threat to the agricultural sustainability and food security of the Juang tribe in Kendujhar district. Their heavy reliance on natural resources and traditional farming practices makes them particularly vulnerable to environmental changes. The study highlights the urgent need for sustainable development strategies, climate adaptation measures, and targeted policy interventions to improve their livelihoods and ensure food security. Addressing these challenges requires a holistic approach that combines indigenous knowledge with modern scientific practices and strong institutional support. Only then can the resilience of the Juang community be strengthened in the face of a changing climate.

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