



# Climate Change, Food Security, and Scheduled Caste Women's Livelihoods: A Field-Based Study of Rajnagar Block, Birbhum, West Bengal

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## Abstract

This study examines the livelihoods, food security and climate related impacts on Scheduled Caste women in the Rajnagar Block of Birbhum district, West Bengal. The research is based on a field-based case study approach, where primary data were collected through face-to-face interviews with 100 Scheduled Caste women. The findings reveal that climate change has significantly affected the livelihoods, income stability and access to basic needs such as education, sanitation among these women. As a result, their overall socio-economic condition has become increasingly uncertain and vulnerable. However, some women are trying to cope with these challenges by adopting strategies such as seasonal migration, participation in self-help groups and crop diversification. This study highlights that climate change is not only an environmental issue, but also a serious social and economic concern, with its impact particularly severe on marginalized groups like Scheduled Caste women. Therefore, the study emphasizes the urgent need for effective policies, institutional support and targeted interventions to enhance the resilience and wellbeing of this vulnerable population.

**Keywords:** Scheduled Caste women, livelihoods, food security, climate change



**Introduction:** Climate change has had a significant impact on agricultural production and food security across the world. Countries with tropical climates, such as India, are facing higher level of risk. Climate change is severely affecting agricultural production and food systems in developing countries (FAO, 2018). In India, Scheduled Caste women living in rural areas and working in the informal sector are particularly vulnerable. Marginalized and vulnerable populations, particularly women, are at greater risk from climate change (UNDP, 2020). They are experiencing problem such as unemployment, reduced agricultural productivity, food insecurity, seasonal unemployment and an increased incidence of various diseases due to climate change. These challenges also act as barriers to the overall development of the country. Rising temperatures and extreme weather events are negatively impacting rural livelihoods and food security (IPCC, 2022). The situation is further worsened by the lack of own land ownership, limited access to resources, and inadequate basis facilities such as education. Sustainable agriculture and adaptation strategies are crucial for ensuring food security (World Bank, 2021). These factor make their livelihood make there more insecure and difficult. In this context, the present study conducts a field-based analysis of the relationship between the livelihoods, food security, and climate change among Scheduled Castes women in the Rajnagar Block of Birbhum District.

**About the Study Area:** Birbhum district of West Bengal, popularly known as Rarh Bengal, lies between 23°32'30" N to 24°35'00" N and 87°05'25" E to 88°01'40" E longitude. Although agriculture forms the backbone of the district's economy, the availability of cultivable land is not uniform across all areas. Rajnagar Block located in the western part of the district, characterized by challenging physical environment. The people of this Block largely dependent on agricultural resources, and lack of employment opportunities. These conditions make their livelihood highly uncertain and vulnerable. In this Block, Scheduled Caste women constitute a significant proportion of the population, accounting for approximately 48.7 percent (census, 2011). This highlights the importance of focusing on their socio economic conditions in the context of environmental and developmental challenges.

### Map of the Study Area: Rajnagar Block in Birbhum District, West Bengal, India

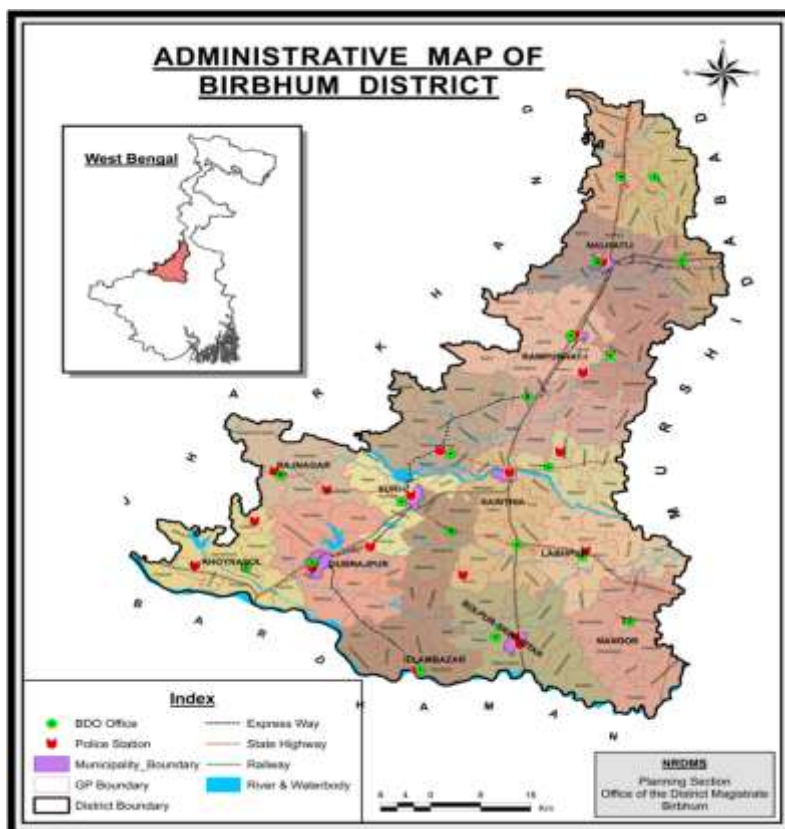


Figure 1: Administrative Map showing Blocks and Infrastructure of Birbhum District, West Bengal.

Source: Rathindra Krishi Vigyan Kendra, n.d.



## Literature Review:

Kumar, S., et al. (2023) This study shows that climate change has been identified as the primary cause. As a result of climate change, food supply is becoming unstable and agricultural production is declining, most notably in arid and semi-arid regions, thereby damaging crops.

Das, A., et al. (2025) This study analyses the negative impacts of rising temperatures, erratic rainfall and extreme weather events. It highlights the long-term risks to food security.

Chakrabarty, M. (2016) The report details the effects of climate change on the three core components of food security—availability, access and utilization.

Basu, J. P. (2014) This study places special emphasis on agroforestry in addressing climate change and enhancing rural livelihoods and incomes.

Porter, J. R., et al. (2014) This IPCC report analyses the impacts of global climate change on food production, agricultural systems, and food security.

Springer Nature. (2019) This article discusses the risks of climate change to food production, supply systems, and nutrition, as well as strategies for mitigation.

**Research Problem:** Researcher across the world, as well as in India have expressed different view on climate change. However, widely accepted concern is that the impacts of climate change are likely to create serious challenges for food security and informal livelihood, especially among marginalized communities. In this context, the present study examine how climate change has affected the food security, informal work and resource utilization of Scheduled Caste women. These women are particularly vulnerable due to their socio economic condition and dependence on climate sensitive livelihood. The major research question of this study are as follows-

1. What impact has climate change had on the food security of Scheduled Caste women in the Rajnagar Block?
2. To what extent is the food security at risk due to these changes?
3. What types of strategies are being adopted by Scheduled Caste women to sustain their livelihoods and ensure food security?

The primary objective of this study is to find answers to these questions and understand the broader implications of climate change on this vulnerable group.

**Objectives:** The objectives of this study are:

1. To examine the impacts of climate change on Scheduled Caste women in the Rajnagar Block.
2. To identify the livelihood strategies adopted by Scheduled Caste women and assess their food security condition.
3. To suggest suitable recommendations for improving the food security and livelihood of Scheduled Caste women.

**Methodology:** This study is field based and follows case study approach. The main objective is to collect and analyse first-hand information on the livelihoods, food security and the impacts of climate change on Scheduled Caste women in the Rajnagar Block of Birbhum district.



**Research Design:** this study adopted both descriptive and analytical research designs. The case study method allows an in depth understanding of the lives of Scheduled Caste women in the Rajnagar Block. It helps to explore their real life livelihoods conditions, social and economic status, food security issues, and their experience of climate change and adaptation strategies.

**Source of Data:** Both primary and secondary data have been used in this study. Primary data were collected through face-to-face interviews and field observation. Secondary data were obtained from census, books, journals, newspapers.

**Sample Selection:** The respondents were selected based on the following criteria.

1. They belong to Scheduled Caste women community.
2. They are engaged in the informal sector, especially as agricultural labourers or involved in agricultural activists.
3. They have some awareness of climate change and its impacts.

**Sample size:** A total of 100 Scheduled Caste women were selected as respondents. These respondents were chosen from different villages of the Rajnagar Block to ensure representation of diverse social and economic backgrounds.

**Methods of data collection:** A structured questionnaire was used to collect the required data for this study.

**Sampling Method:** The purposive sampling method was applied for selecting the respondents.

**Data Collection Time Period:** The study collected data from January 4 to January 18, 2026, from selected respondents in the study area.

**Methods of Data Analysis:** The collected data were analysed using the percentage method and presented in tabular form for clarity and interpretation.

**Ethical Considerations:** The study followed important ethical principal:

1. Informed Consent was obtained from all respondents.
2. The privacy and confidentiality of respondents was strictly maintained.
3. The collected data were used only for research purposes.

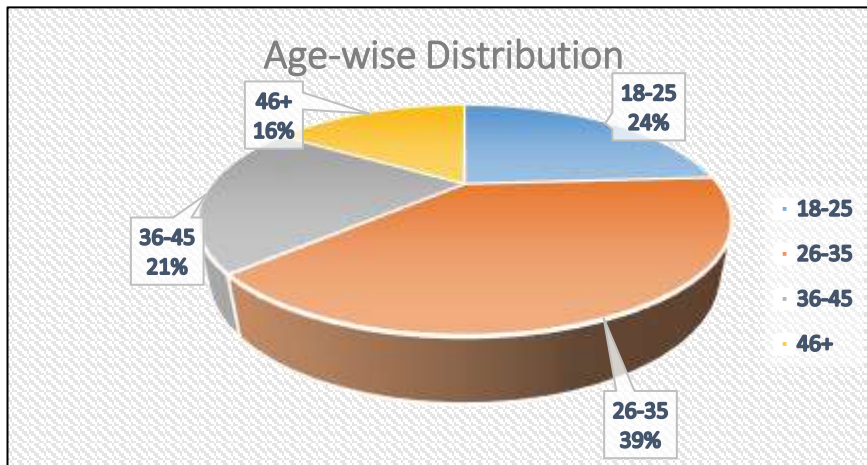
**Analysis and Discussion:** The collected data were analyzed and interpreted to understand the research finding:

**Table I: Age-wise Distribution**

Age Group (Years)	Frequency	Percentage
18-25	24	24
26-35	39	39
36-45	21	21
46+	16	16
Total	100	100%



Sources: Field Survey conducted in Rajnagar Block, Birbhum

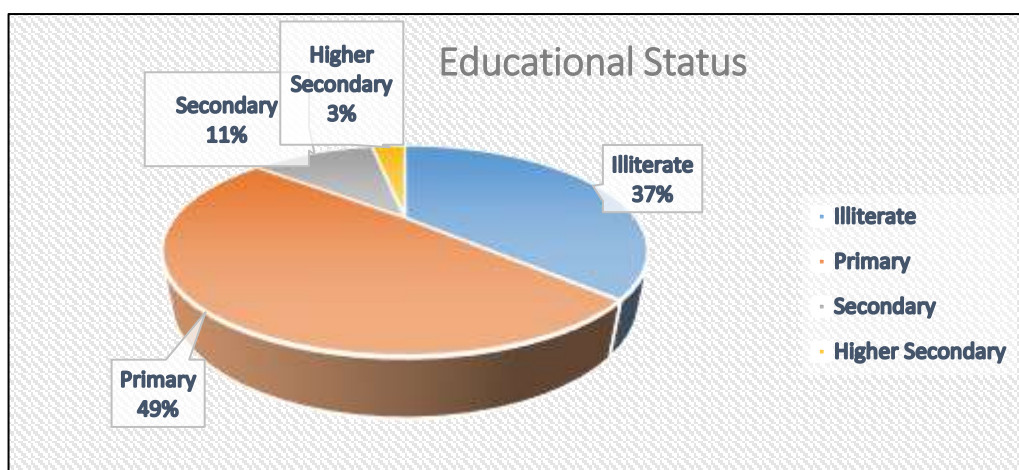


**Interpretation:** According to the research data, about 39 percentage of women in the age group of 25–35 years are economically active and engaged in income-earning activities. However, despite their active participation in work, they face difficulties in resources generation due to a lack of employment opportunity in the local area.

**Table II: Educational Status**

Education Level	Frequency	Percentage
Illiterate	37	37
Primary	49	49
Secondary	11	11
Higher Secondary	03	03
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum

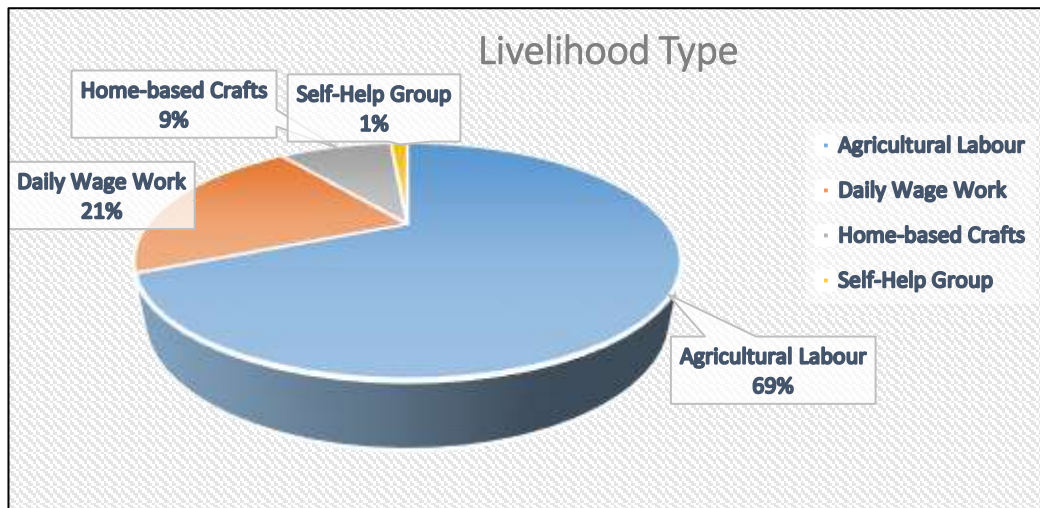


**Interpretation:** The data show that, 37 percentage of Scheduled Caste women in the Rajnagar Block are illiterate. This limits their ability to acquire knowledge of modern agricultural techniques, climate adaption strategies, and access to various opportunities and facilities, thereby restricting the overall development.

**Table III: Main Livelihood Activities**

Livelihood Type	Frequency	Percentage
Agricultural Labour	61	61
Daily Wage Work	19	19
Home-based Crafts	08	08
Self-Help Group	12	12
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum



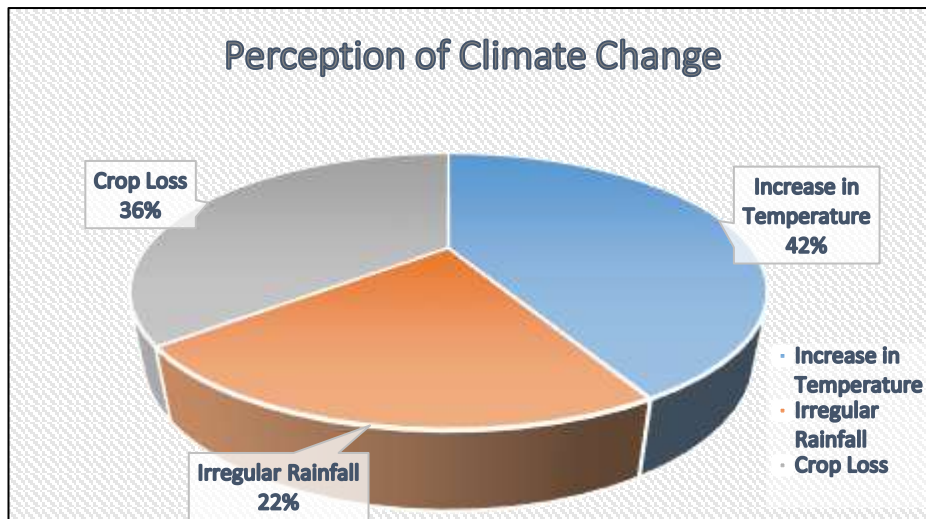
**Interpretation:** According to the research data, in Rajnagar Block a 61 percentage of Scheduled Caste women dependent on agricultural labour for their livelihood. Their work is mostly in seasonal and temporary in nature, resulting in low and unstable incomes. However, participation in Self Help Groups has helped some women to increase their earnings, which supports their household expenses.

**Table IV: Perception of Climate Change**

Response	Frequency	Percentage
Increase in Temperature	42	42
Irregular Rainfall	22	22
Crop Loss	36	36
Total	100	100%



Sources: Field Survey conducted in Rajnagar Block, Birbhum

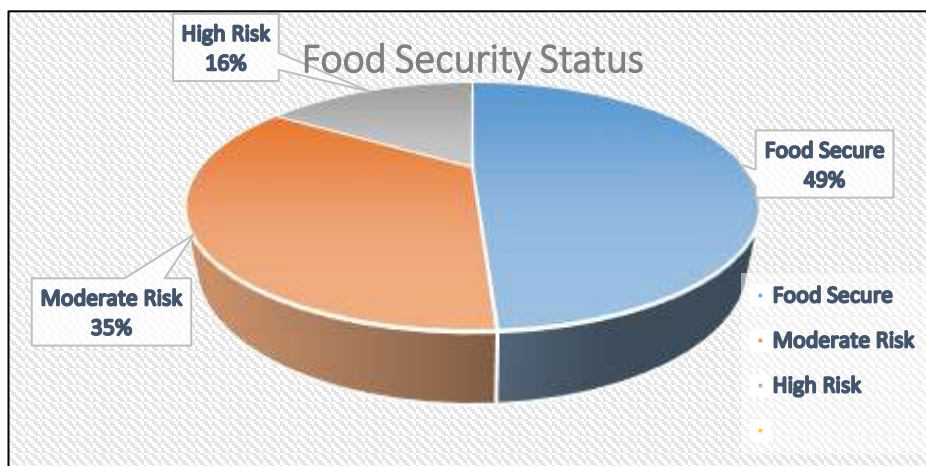


**Interpretation:** In terms of awareness of climate change, about 42 percentage of women are aware of issues such as rising temperatures and irregular rainfall. However, there is clear lack of understanding regarding effective adaptation strategies.

**Table V: Food Security Status**

Status	Frequency	Percentage
Food Secure	49	49
Moderate Risk	35	35
High Risk	16	16
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum



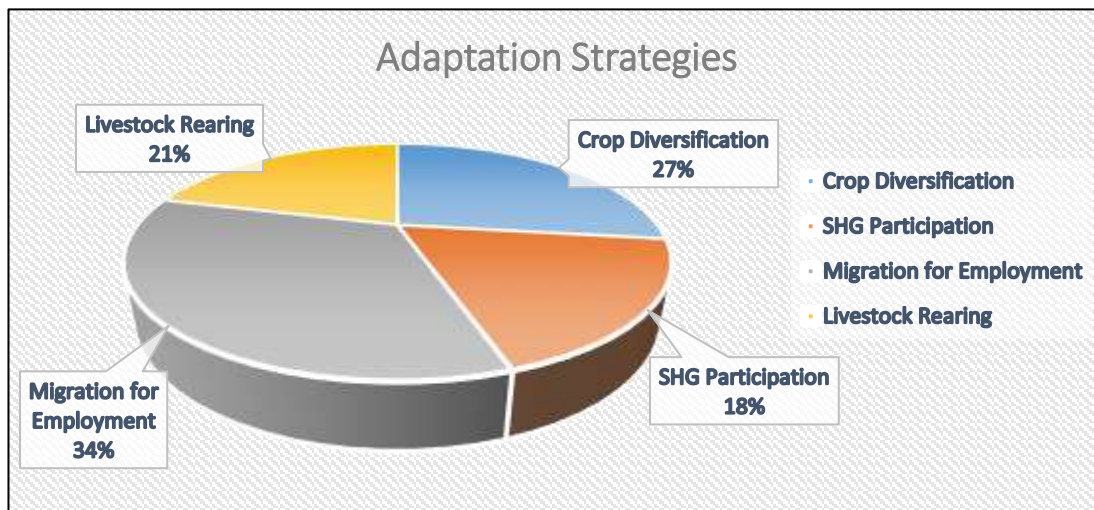
**Interpretation:** Climate change has emerged as a major factor affecting of food security. The data indicate that 49 percentage of women face food security, meaning many households are unable to meet their basis food requirements.



**Table VI: Adaptation Strategies**

Strategy	Frequency	Percentage
Crop Diversification	27	27
SHG Participation	18	18
Migration for Employment	34	34
Livestock Rearing	21	21
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum

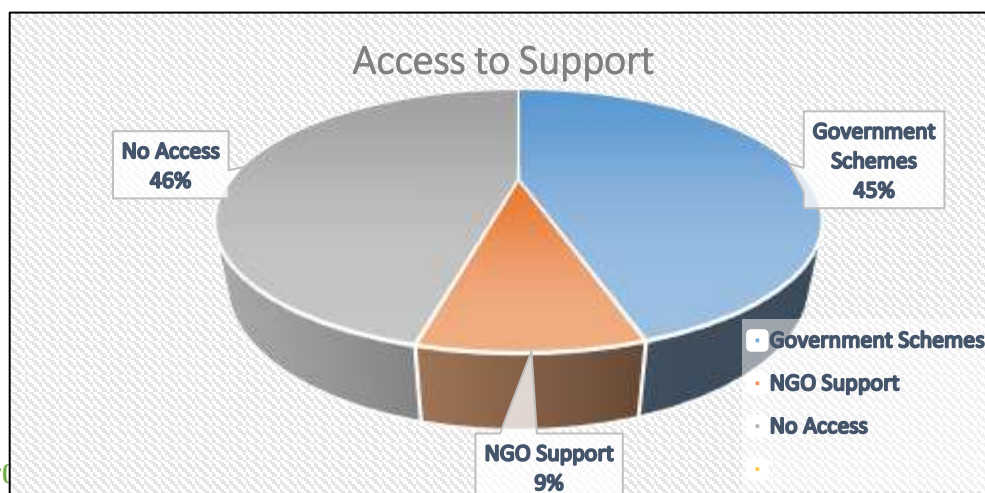


**Interpretation:** To cope with these challenges, about 27 percent of women have adopted Crop Diversification strategies, while 34 percent engage in seasonal migration. In addition, 18 percent participate in SHG activities, and 21 percent are involved in livestock rearing and vegetable cultivation to meet their household needs.

**Table VII: Access to Support**

Support Type	Frequency	Percentage
Government Schemes	45	45
NGO Support	09	09
No Access	46	46
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum



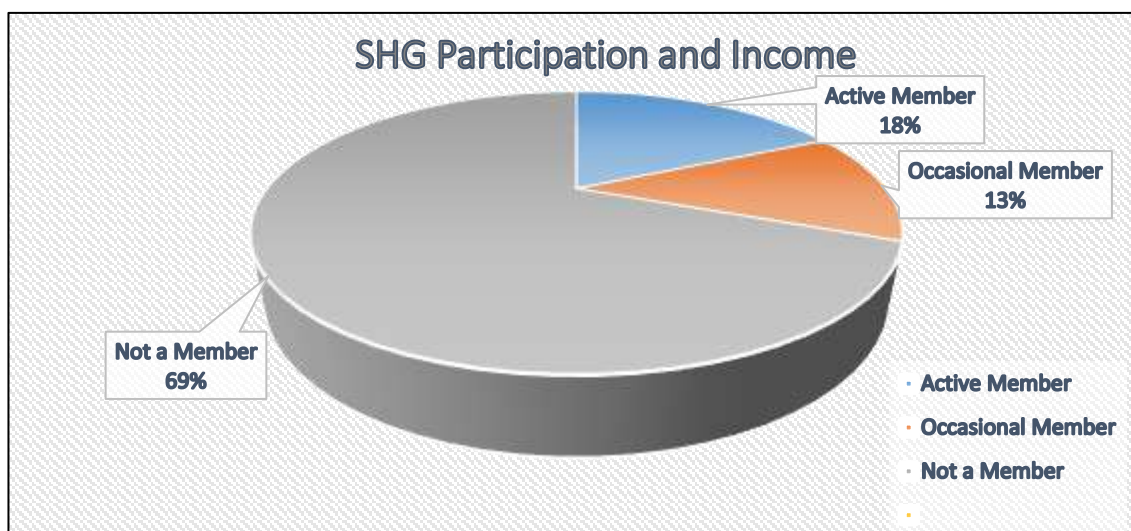


**Interpretation:** The data reveal that 20 percentage of Scheduled Caste women are deprived of benefit from government schemes. This lack of access is a major issue that negatively affects their quality of life. Moreover, many women are also excluded from opportunities provided by NGOs.

**Table VIII: SHG Participation and Income**

Participation Level	Frequency	Percentage
Active Member	18	
Occasional Member	13	
Not a Member	69	
Total	100	100%

Sources: Field Survey conducted in Rajnagar Block, Birbhum



**Interpretation:** Self Help Group plays an important role in women empowerment rural areas. However, the study show that, 69 percentage of Scheduled Caste women are not enrolled in SHGs, this limit their income opportunities and contributes to gender-based inequality in economic empowerment.

**Recommendation:** Practical suggestions are given to improve the current situation.

- 1. Raising Awareness:** There is a strong need to increase awareness among rural women about the impacts of climate change and the importance of adopting strategies.
- 2. Agricultural Technology and Training:** efforts should be made to restore areas affected by climate change. Scheduled caste women should be provide with improved agricultural technology, drought-resistant seeds, and proper training so that can better adapt to changing climate condition.
- 3. Creation of alternative income opportunities:** Alternative sources of income should be promoted with a focus on climate resilience, activates such as livestock farming, small-scale businesses, handicrafts can help women diversify their income and reduce dependence on agriculture.
- 4. Strengthening Self-help Groups:** The role and functioning of self-help groups should be further strengthened to enhance the financial self-reliance of Scheduled Castes women. This will also contribute to improving their food security and overall socio economic condition.



**Conclusion Remarks:** In conclusion, this study examines the livelihoods, food security and impacts of climate change on Scheduled Castes women in the Rajnagar Block of Birbhum District. The finding reveals that climate change has directly affected agricultural production, leading to irregular output and frequent crop failures. This growing uncertainty in agriculture has negatively influenced the income level and food security of Scheduled Caste women. The situation is further intensified by limited cultivable land in the Rajnagar Block and the fact that most Scheduled Caste women are engaged as agricultural labourers and in irregular, low income activities. As a result their livelihoods become highly vulnerable to climate change. However, women are generating income through participation in self-help groups, handicraft industry and seasonal migration, which helps sustain their household economic. Therefore, there is a need for effective policies and institutional support to promote the development of Scheduled Caste women.

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