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Climate Change and its Ripples on Agriculture-based Self Help Groups (SHGs) in Arid Regions: A Case Study of Channi Mansar Village of Jammu and Kashmir, India

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Abstract

This paper examines the impact of climate change on agriculture-based self-help groups (SHGs) in Channi Mansar village, Udhampur District, India. SHGs, which primarily rely on agriculture for income, are affected by extreme weather events and region-specific disasters. The research aims to understand the degree of climate change awareness among SHG members and their adaptability to these changes. The study uses qualitative research methods, including in-depth interviews with SHG members, to gather qualitative data. The findings will help the research ecosystem investigate further in this region and help governments formulate sustainable policies for the welfare of the people in the region.

Keywords

Climate change, Self Help Group (SHG), Livelihood, Arid region.

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1. Introduction

Climate change, a phenomenon demonstrably linked to human activities, has emerged as a major global concern over the past few decades (Intergovernmental Panel on Climate Change, 2021). Defined by the United Nations Framework Convention on Climate Change (UNFCCC, 1992) as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods", it encompasses a range of environmental consequences including sea-level rise, floods, variations in rainfall patterns, and global warming. These consequences have far-reaching social, economic, and political impacts, demanding immediate and effective actions.

India, with over 54.6% of its population reliant on agriculture and allied sectors according to the Ministry of Agriculture, Government of India (2023), is particularly vulnerable to the disruptions caused by climate change. The nation's agricultural practices heavily depend on the monsoon cycle, and any alterations to this pattern can significantly disrupt crop yields. Furthermore, extreme weather events like El Niño and La Niña, exacerbate the challenges faced by Indian agriculture (Indian Institute of Tropical Meteorology,)

The agricultural sector in India is a complex ecosystem, comprising small-scale and large-scale farmers. In recent years, cooperative farming, pioneered by Self Help Groups (SHGs), has emerged as a promising approach for collective agricultural production (National Bank for Agriculture and Rural Development, 2021). However, the looming threat of climate change necessitates a collective effort to ensure the resilience and sustainability of Indian agriculture.

2. Review of Literature

Self-Help Groups (SHGs) have emerged as a powerful tool for promoting self-employment, poverty reduction, and women's empowerment in India. This paper explores the concept of SHGs, its history in India, and role in supporting rural livelihoods, particularly in agriculture. The paper also highlights the challenges posed by climate change to agricultural based SHGs and emphasizes the need for capacity building to ensure resilience and sustainability of communities.

Self-Help Groups (SHGs) are voluntary associations of individuals from similar socioeconomic backgrounds who come together for collective action to achieve common goals. These groups are characterized by self-governance and peer management, fostering a sense of ownership and empowerment among members (Mhatre et al., 2013). They operate on the principle of "self-help" to promote financial inclusion, self-employment, and poverty reduction, particularly among women and marginalized communities (National Bank for Agriculture and Rural Development (NABARD, 2020). The concept originated with the formation of Alcoholics Anonymous in the United States in 1935 (Bill Wilson and Bob Smith, 2023).

2.1 SHGs in India

In India, SHGs have become a cornerstone of rural development, with a focus on empowering women and marginalized groups. The first SHG in India, MYRADA, was established in Maharashtra in 1975 (2023). Since then, several government initiatives like Kudumbashree in Kerala and national programs like the National Rural Livelihood Mission (NRLM) have actively promoted SHG formation (Government of Kerala).

SHGs are typically registered under the Societies Registration Act, 1860, and function as microfinance institutions, providing access to credit and financial resources to their members (Reserve Bank of India, 2019). They also offer training programs on various topics like financial management, entrepreneurship, and health (NABARD, 2020).

2.2 SHGs and Agriculture

A significant number of SHGs in India focus on agriculture and allied activities like animal husbandry, poultry farming, and dairy (2023). NABARD plays a crucial role in supporting these agricultural

SHGs by providing financial assistance, capacity building programs, and promoting sustainable farming practices (NABARD, 2020).

However, climate change poses a significant threat to the livelihoods of agricultural SHGs. Changes in temperature and precipitation patterns, soil degradation, and increased pest and disease outbreaks can severely impact agricultural productivity (Intergovernmental Panel on Climate Change (IPCC, 2022).

Jammu & Kashmir, with its diverse topography, is particularly vulnerable to climate change due to variations in weather conditions across the region (Department of Agriculture & Farmers Welfare, J&K). This climatic variability can disrupt agricultural operations and negatively impact the functioning of SHGs engaged in agriculture in Channi Mansar.

SHGs have demonstrably contributed to women's empowerment, poverty reduction, and rural development in India. However, climate change necessitates a focus on building the resilience of agricultural SHGs. Grassroots-level studies are needed to understand their existing knowledge and coping mechanisms regarding climate change. This will inform targeted interventions to enhance their capacity to adapt and thrive in a changing climate.

3. Methods, Material & Data Collection

The study was an attempt to investigate the awareness and community level adaptation mechanism in terms of climate change among the SHG members. The study was initiated by analyzing the level of awareness of SHG members on climate change followed by finding out the socio-economic implications of climate change on the working of SHGs. Research has also explored the adaptation or coping mechanism adopted by the SHGs to overcome the implications of climate change. Study has also analyzed the impact of climate change on crop production, yield, and cropped area. The research used the qualitative method of research method by adopting descriptive research design in order to obtain a comprehensive and in-depth understanding of the proposed objectives. Fourteen (14) samples were taken from the members of registered agricultural-based SHGs who are registered under the concerned authority, that is NABARD in the Channi Mansar block of Udhampur district of Jammu region. Research has opted for simple random sampling under probability sampling technique, as the lists of SHG members were available in the records. Two respondents were chosen from each ward out of the total

seven wards, yielding a total of 14 samples, to ensure geographic representation from each ward in the proposed research area. All SHGs who were agricultural-based and registered under NABARD in the proposed area were part of the inclusion criteria for the study and those SHGs that were not registered and not agricultural-based were excluded. The researcher used a semi-structured interview schedule. It contains both open-ended and closed-ended questions. The qualitative data collected through the interview guide was analyzed and presented as case studies.

4. Ethical Considerations

- ▶ Informed consent was obtained from all participants, including assent from respondents.
- ▶ Anonymity and confidentiality were maintained throughout the study to protect the identity and privacy of participants.
- ▶ The study adhered to ethical guidelines, ensuring the well-being of the participants and the integrity of the research process.

5. Profile of the Research Area

Channi Mansar is a village located in the Udhampur district of Jammu and Kashmir, India. Predominantly hilly with rain-fed agriculture as the primary source of income, the village fosters a number of SHGs focused on agricultural activities. These SHGs contribute significantly to the local economy. However, Channi Mansar's geographical location within J&K makes it particularly vulnerable to the impacts of climate change. The region experiences diverse weather patterns, and fluctuations in temperature and precipitation can disrupt agricultural practices as it comes under arid regions. Studying the experiences of Channi Mansar's SHGs grappling with these climatic variations can provide valuable insights into the challenges faced by agricultural livelihoods in a changing climate.

6. Discussion

6.1 Awareness Level on Climate Change

People were well aware about the visible changes happening around them due to climate change by experiencing droughts, rainfall change, extreme heat in summer, chilling cold in winter, changes in rainfall patterns etc. They are also ready to admit the

anthropogenic reasons and destructive potential of climate change in the future. Issues of climate change and related consequences are in the local level discussions, especially in the public spheres and peer groups. This highlights the severity of climate change effects at the community level. Sources of information on global climate phenomena are mainly from television and radio, newspapers, and magazines. This means that the mass media can be an effective tool in spreading information about climate change to the public at large. They are also advocating for the need for governmental interventions to implement policies and regulations to reduce greenhouse gas emissions and transition to more secure forms of energy, which are not dangerous to the planet. Discussions among them are pointing to the need for individual level and collective actions like reducing energy consumption, using public transportation, and supporting sustainable practices in many fields. People have started observing the climate-based changes from the last decade only by highlighting the incidents of increased water scarcity during summers, droughts, unpredictable flash floods, unbearable winters, and landslides. Few respondents have opined that climate change made both positive changes and negative changes depending on the circumstances. The respondents have backed the statement with some points that rainfall pattern has changed nowadays, and it is providing water in the summer. The respondent also pointed to the negative changes like extreme heat and extreme cold in both seasons. The negative changes have the potential to create an awful situation in the coming years. These changes in the patterns of rainfall are the reason for implications in the agriculture sector, food security, and water availability, and they affect the livelihoods of millions of people. Discussion on climate change has also been reflected in the peer meetings, that too among women, showing that the issue is being handled and discussed among the women communities. Some members are unsure whether the climate change adjustments are advantageous or disadvantageous, this uncertainty implies a lack of knowledge or comprehension regarding climate change, as well as its possible effects on the environment and people's quality of life. They exhibit openness to implementing and adopting new practices, such as the use of organic fertilizers and drip irrigation systems, and realize that changes in temperature and rainfall patterns are having an impact on their way of life. It is observed that few of them are not adopting preventative actions, such as utilizing safety medications or wearing protective gear, to safeguard themselves against the

negative effects of climate change. This emphasizes the necessity of spreading knowledge about the potential effects of climate change and the significance of adaptation methods. The public's understanding of climate change has substantially expanded in recent years due to the widespread discussion of this worldwide phenomenon. People have also identified pollution as a sign of a changing climate. This demonstrates the people's comprehension of how pollution affects climate change. Through gatherings and interactions with neighbors, they have learned about climate change and related implications among people. This demonstrates the importance of community civic deliberations to raise public understanding of the effects of climate change. The people have not significantly altered their farming methods, but they have cut back on irrigation water consumption as a result of shifting rainfall patterns. In order to cope with the intense heat in the summer, they have also avoided working at midday, which has reduced both quantity and quality of production. This emphasizes the value of using community-based strategies to educate people about climate change's effects and the necessity of taking adaptation measures to deal with shifting climatic trends. Majority of them are not having insurance against natural disasters, which is problematic, given the rise in disasters brought on by climate change. Overall, the responses indicate that there is a general awareness and concern about climate change among the participants. The answers show that people are aware of climate change and its anthropogenic and other related factors. So, it establishes that the respondent will be more proactive towards initiating the potential solutions or mitigation measures that could be implemented to address climate change at their levels.

6.2 Socio-Economic Implications

The problems caused by climate change on health are a growing concern and increasing household financial burden. Children's skin problems and skin allergies are the result of air pollution in the area. Health issues like skin problems and sunburn result in an increase in health expenditure especially for the expenses for buying creams and ointments frequently affecting family budget. This highlights the financial burden that climate imposed on the people. This further increases the out-of-pocket expenditure of the individual and it will badly affect the people who have limited resources. Also their work efficiency and productivity will reduce due to health concerns which will further add to financial burden.

Changes in the job nature and change in working time due to the extreme summer heat can have an impact on work schedules and productivity, especially in sectors like outdoor labor and agriculture work as well as mental health of people. Changes in climate affected the irrigation pattern of crops mainly due to water scarcity in the area. This emphasizes the impact that climate change can have on the agriculture sector, which is normally vulnerable to changes in weather events and patterns and the availability of water. Due to the effects of climate change people have started to change irrigation patterns and fertilizing techniques to adapt to the situation. Climate change can also have an impact on soil health, which could exacerbate the effects of using less effective fertilizers. The decrease in income from the crops will result in many socio-economic implications for the farmers and their families like poverty, a lack of access to food, and a shift in population from rural to urban regions. An important observation made among the people was that they were not relying on modern medical facilities and rather they were using traditional medicine. This suggests that the impacts of climate change on healthcare may be reduced by alternative practices like traditional medicine. People also started worrying about the shortage of laborers and increased labor cost as they are using them only in the summer seasons. These changes in farming practices and their associated costs may have a significant impact on small-scale farmers, who may not have the resources to adapt to climate change. In turn, this could lead to a decrease in agricultural productivity and food security. That will affect not only the households and SHGs but also the whole community. In general, the changes in climate can decrease agricultural productivity, increase production costs, and lower overall income. This will impact the livelihoods of farmers and their families, particularly in low-income or resource families or communities. Although, climate change has numerous socio-economic impacts, including the impacts on human health, working times, agricultural productivity, job nature changes and reduction in income. It is necessary to take measures to reduce the impacts in many sectors to ensure sustainable economic development and an increase in livelihoods alternatives.

Changes in fertilizing patterns due to climate change signals that they have adopted the new farming practices to cope up with the changing climate. This may reduce the risks of climate change. But the excessive use of fertilizers will lead to the degradation of soil and decrease the fertility of the soil. The rising temperatures negatively

impact agriculture, especially for crops that need lower temperatures to grow. In summary, the response from the respondent shows how significantly climate change has affected many facets of life. The impacts of changing weather patterns on agriculture, livelihoods, and human health are detrimental. This emphasizes the requirement for quick action to lessen the effects of climate change, such as lowering greenhouse gas emissions and supporting sustainable lifestyles.

The study demonstrates how the respondent's health, agriculture, and income have been influenced by climate change. To lessen the effects of climate change, which are pervasive, immediate action is required. Communities need more help, education, and awareness in order to adapt to the changing environment. Therefore, any adverse impact on agriculture can lead to poverty, hunger and malnutrition. Climate change can lead to changes in precipitation, temperature and extreme weather events, resulting in reduced yields, increased crop damage and water scarcity. They can also affect food supplies and increase their scarcity, leading to inflation and poverty. In addition, the effects of climate change can have indirect effects on other areas of life, such as immigration, conflict and social cohesion. For example, when people are forced to migrate due to the adverse effects of climate change, this can lead to resource and social strains.

6.3 Resilience to the Climate Change

People are taking certain steps for protection from the harmful effects of climate change like they are using anti-UV sleeves and sunscreen creams. It is a positive step as the increased temperature and heat can lead to skin problems. They also made changes to their irrigation pattern, like the usage of drip sets, mulching (Palwar), and using wastewater from the bathrooms. These changes applied by the respondent in the agriculture sector will help to conserve water and it will reduce the impacts of drought, which is becoming more common due to the changes in climate. It is a good example of adaptation to the changing climate, as it allows the farmers to continue to do the farming of crops even if there is water scarcity. People are also changing their job timing to avoid working in the hottest part of the day. This will be a sensible measure to avoid heat stroke and other heat-related problems, which can be dangerous. Making shading in the workplace, taking breaks, and adequate hydration are the

Respondents are using traditional medicine or Desi Dawai to protect against the harms of climate change. It is suggesting that

alternative healthcare practices can play a vital role in the adaptation to climate change. Changes in the usage of fertilizers and seed varieties are being adopted. They adopted an SMC-8 variety of seed for defending the issues of drought. They have also adopted the Nitrogen, Phosphorus and Potassium (NPK) variety of fertilizer for the SMC-8 seed. These changes could be important in adapting to the droughts and increasing productivity in drought times also. No insurance coverage was taken by the majority of them against the harms of climate change or natural disasters. It highlights the vulnerability of the respondent towards natural disasters and financial risks. This underscores the need for policies and programs that provide financial protection and support for households affected by climate change-induced disasters. The use of Drip sets, received from NABARD indicates that respondents are aware of the latest technological advances that help solve their irrigation problems. The Drip set is an efficient watering system that delivers water directly to the roots of your plants, minimizing water waste and ensuring your plants receive the amount of water they need. This demonstrates the resourcefulness and innovation of respondents in adopting new methodologies and technologies to address the challenges posed by climate change. They started changing the nature of their employment by avoiding working at midday during the summer, employing help during periods of excessive heat, and altering their wearing habits. In order to prevent health problems brought on by climate change, the respondent also takes preventative medications.

In the case of agriculture they altered their irrigation practices by using less water, which may be a reaction to the water shortage brought on by climate change. In addition, they have used strategies like NABARD watershed projects to solve irrigation issues. Some of them are conserving water resources by using wastewater from the kitchen and bathroom and less water for irrigation. This technique can be especially helpful in areas with a shortage of water, where droughts are occurring more frequently and with greater intensity as a result of climate change. However, it is crucial to make sure that waste water is used safely and does not contaminate crops, creating health risks.

7. Results and Additional Insights from the Study

Key findings of this study are as follows:

- ▶ **Limited Knowledge of Long-Term Impact** : Although SHG members are aware of the symptoms of climate change, some

of them are unaware of its long-term effects. This suggests that there is a need to increase knowledge about the possible effects on their communities, way of life, and general well-being.

- ▶ **Lack of Knowledge about Climate-Resilient Agricultural Methods** : The members lack knowledge about innovative agricultural methods and strategies that could aid in their defense and adaptation to the negative effects of climate change. Their inability to use sustainable and climate-resilient agricultural techniques may impede their ability to do so, which may have an impact on their agricultural production and food security.
- ▶ **Lack of Knowledge about Climate Insurance Programs** : The members know little about insurance programs created especially to lower the risks connected with climate change. Such programs can offer financial security and assistance in the event of climate-related losses or disasters, assisting SHG members in recovering and reestablishing their livelihoods more speedily.
- ▶ **The Utilization of Traditional Medicine** : It appears that SHG members are turning to traditional medicine to treat health problems brought on by climate change. Their preference for traditional medicine may be influenced by cultural norms, accessibility, or cost. This research emphasizes how crucial it is to comprehend and incorporate traditional knowledge with contemporary healthcare systems in order to improve community resilience in the face of health-related difficulties related to the environment.
- ▶ **Lack of Knowledge about Climate-related Illnesses** : The SHG members are aware of climate change and its symptoms, to sum up. However, they lack knowledge of the long-term effects, strategies for farming that are climate resilient, awareness of insurance plans that address climate change, and a dependence on conventional treatment to treat climate-related illnesses. These results highlight the importance of empowering SHGs with resources and support so they can respond to the effects of climate change in an efficient manner.

8. Recommendations

- ▶ **Enhancing Education and Awareness** : Create focused educational initiatives and awareness campaigns to better

inform SHG members about the long-term effects of climate change. Workshops, training sessions, and the distribution of informational materials explaining the potential effects of climate change on their communities, way of life, and health can accomplish this.

- ▶ **Encouragement of Climate-Resilient Farming Methods :** Promote knowledge-sharing platforms and capacity-building programs to educate SHG members on innovative farming techniques and methods that increase climate change resistance. This may entail advocating for environmentally friendly farming practices that lessen vulnerability to climate-related risks, such as conservation agriculture, crop diversification, agroforestry, and water management approaches.
- ▶ **Raising Awareness about Climate Insurance :** Work with relevant parties, such as government organizations, non-governmental organizations, and insurance companies, to inform SHG members about insurance plans that are particularly created to lessen the risks associated with climate change. Conduct training workshops and informational sessions to outline the advantages, requirements, and application procedures for gaining access to climate insurance products. This will enable SHG members to safeguard their livelihoods from climate-related risks.
- ▶ **Bringing together both Traditional and Contemporary Methods :** Recognize and appreciate the SHG members' use of traditional medicine to treat health issues related to climate change. To blend conventional wisdom with evidence-based practices, encourage communication and cooperation between traditional healers and contemporary healthcare professionals. This integration can improve community resilience and provide all-inclusive healthcare options for problems related to the health of the climate.
- ▶ **Strengthening access to Resources :** Promote easier access to resources like financial aid, technical advancements, and climate information services. In order to offer SHG members with current and pertinent information, technology, and financing possibilities that enable them to successfully execute climate-resilient plans, this may entail forming relationships with local authorities, research institutes, and funding organizations.

► **Facilitating Networks, Collaborations and Partnerships :**

Facilitate the formation of networks and collaborations between SHGs, community-based organizations, governmental institutions, and nonprofit organizations. These partnerships can encourage information sharing, resource sharing, and group effort in tackling the problems caused by climate change. Encourage the creation of peer-learning groups so that SHG members can exchange knowledge, best practices, and insights into climate change adaptation.

9. Conclusion and Future Directions

The study's three main goals were to gauge SHG members' awareness of climate change, comprehend the socioeconomic effects of climate change on SHG members, and estimate their climate resilience. The majority of SHG members are aware of climate change, according to the data gathered from them. They get this information from a variety of sources, including their peers, periodicals, newspapers, radio, and television. SHG members are aware of the effects of climate change, which include intense summer and winter heat, high summer and winter temperatures, and erratic rainfall. However, it was noted that some SHG members believe that climate change will benefit their community. This impression results from ignorance of the full consequences and long-term effects of climate change. On the other hand, other SHG members are fully aware of how climate change is harming the ecosystem. They are aware that these negative alterations will have far-reaching effects in the future. Importantly, every member acknowledges that humans are to blame for climate change, proving that they are aware of the precise causes. They explicitly blame climate change for the temperature rise. The study reveals the various levels of knowledge about climate change and diverse perspectives on its effects among SHG members. There is a need to create mass-level awareness among agriculture-based communities about climate change and related impacts in order to build climate-smart communities. The use of indigenous knowledge, skills and practices needs to be encouraged as well as the utilization of nature-based solutions. This will enhance their capacities to deal with changing climate and related uncertainties, thus enhancing their well-being.

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