**Climate Change Through a Gendered Lens: Intra-Household Perception and Adaptation Strategies in South Kashmir**

**Abstract**

Gender and climate change is emerging as one of most sensitive issues in recent times. Existing studies have demonstrated gender divide in critical dimensions such as climate change perceptions, climate change concern, adaptation and mitigation strategies. This study aims at a more nuanced gender analysis at intra-household level in South Kashmir, India, to examine how males and females within a same household perceive climate change risks and possible adaptation and mitigation options to negotiate such a serious issue. The results revealed significant gender variations in climate change perception in the study area. While males have more or less perceived it as long terms fluctuations in temperature and rainfall component, a higher proportion of females(appx.35%) perceive climate change as specific climatic events such as floods, droughts, hailstorm activity, cloud bursts and crop failure on account of their vulnerability and susceptibility to such natural disasters. The findings were more supplemented by indices used in the study which confirmed that females tend to be more concerned about the negative impacts of climate change and also possess more accurate scientific knowledge than do men. Both quantitative and qualitative analysis revealed that gender differences also exist in adaptation and mitigation strategies. Women are likely to uptake sustainable measures and smart-agricultural practices such as crop diversification, agroforestry, improving irrigational facilities, opting for high value crops, soil conservation and so on. Contrary to it, males strongly prefer diversification of income options and shifting to less climatic sensitive sectors of economy as part of the coping strategy to climate change effects. Besides, the findings also demonstrate the link between gender variations in climate change and social roles that males and females perform in a social set up. The study recommended future research to prioritize more refined measures of gender and understand gender variations of climate change under varying socio-economic and demographic contexts to improve outcomes under accelerating climate change threat.

**Key Words:** Climate change, Gender variation, Hailstorm, Intra-household, Natural disasters.

**1. Introduction**

Climate change stands out as one of the most pressing issues of the 21st century, posing serious threats to both environmental and societal systems worldwide (Cohen and Waddell, 2009; Kjellstrom et al., 2016). According to the Intergovernmental Panel on Climate Change (IPCC), global land and ocean surface temperatures increased by about 0.95°C between 1880 and 2012 (Hansen et al., 2010; Gonzalez et al., 2018). The impacts of climate change are felt globally. However, these impacts are not experienced evenly on account of existing economic, social, political, and cultural inequality among individuals. This affects them in their ability to adequately respond to any natural and human disasters. One of the most important area of inequality is that of a gender which is a focus of this research work. Understanding gender is very important because men and women tend to have different experiences in relation to climate change based on the inequalities which are socially constructed gender roles in the society (Bjornberg and Hansson, 2013) ;(Rohr,2007). Thus, men and women are experiencing the impacts of climate change differently due to ever persisting gender inequalities around the world which largely determine their ability to adapt (GGCA, 2016).

 Gender serves as a lens through which one could easily comprehend the experiences associated with climate change (GGCA report, 2016).Significance of gender dynamics in climate change can be recognised from the fact that all the parties in the UNFCCC (2001) have acknowledged the involvement of women and men equally in climate change mitigation programmes (Aguilar et al., 2015).This issue at various international forums has led to social scientists and environmentalists investigate gender dynamics in scientific knowledge and environmental concern. Largely independent of these efforts is a burgeoning multi-disciplinary literature examining public opinion on climate change, an important science-based environmental issue rife with political conflict and moral concern. Climate change is the most expansive environmental problem facing humanity and arguably is the most serious environmental challenge of modern world. As such climate change is theoretically and empirically interesting case for examining gender dynamics. The scientific basis and severity of this problem urge integration of insights from previous work in academia (Dunlap and McCright). Various researches have revealed that how differences in the ways men and women experience science and math education facilitate gender inequality within the domain of science (Dankelman, 2011.

 The interaction between climate change and gender has received special attention in recent past, especially on the issue of vulnerability and susceptibility of women (GACC,2016). Initial studies of environmental concern typically found no gender differences in environmental attitudes and support for environmental policies (Xiao and McCright,2015). However, studies since 1970,s report the emergence of the different pattern. Women express more concern than do men about local environmental problems, especially those posing health and safety risks to community members (Davidson and Freudenberg,1996; Greenbaum,1995; Mohia,1992). Gender differences persist, though to a lesser extent, when the focus is general environmental concern and non-local problems with no identifiable health and safety risk. Especially when measures of general environmental concern explicitly tap risk perceptions, women consistently express more concern than do men (McCright and Sundström,2013). The relevance of gender in climate change studies analyses the different ways in which men and women contribute to the climate change, the different impact that climate change has on men and women, the different ways the men and women respond to and are able to cope with climate change (Strapko et al.,2016).

 The impacts of climate change worsens pre-existing social inequalities especially for women who are more vulnerable because of limited access to resources and their livelihood largely depends upon agriculture and natural resources, which are highly susceptible to climatic variability (UN watch,2011; Alston, 2013). To lessen the adverse impacts of climate change, local farming community have adjusted to the harsh weather conditions and have already developed coping strategies over time. The coping strategies developed on the gender basis reflected the deep social roles and capabilities that men and women possess in a society and understanding such roles remain vital for conceptualising gender behaviour (Niggi et al.,2017). It has been widely acknowledged that the effects of climate change and variability are not gender neutral. Further, there is a far-reaching literature and adaptation to climate change in the domain of developing countries (Grothmann and Patt,2005; Deressa et al., 2009; Parez et al.,2014). Nonetheless these studies often miss out more nuanced gender aspects, or their empirical approach only permits comparing male and female households. Therefore, there is limited empirical evidence at the intra household levels influences the adaptive capacities men and women. Substantial empirical evidences indicate that gender disparity exists in excessive to resources, information and access to agricultural inputs (Fao, 2011; Peterman et al .,2014).

 The novelty of this research lies in its intra-household gender-based analysis of climate change perceptions, knowledge, concern, and adaptation strategies in South Kashmir, a dimension rarely explored in existing literature. Unlike previous studies that often treat households as homogenous units or merely compare male- and female-headed households, this study uniquely captures individual-level responses from both males and females within the same household. By doing so, it reveals nuanced gender dynamics that significantly shape how climate change is perceived and addressed at the grassroots level. The study’s **innovative approach**—collecting paired data from 170 male-female respondents using both qualitative and quantitative tools—enables a comprehensive understanding of how gendered roles, access to resources, and socio-cultural positioning affect perceptions and adaptive capacities. Furthermore, the construction of indices such as the **Climate Change Knowledge Index** and **Concern Index,** along with detailed breakdowns of adaptation and mitigation strategies, enhances the analytical depth of the research. The findings, which show that women not only perceive climate change more acutely through event-based experiences but also demonstrate higher concern and readiness for sustainable adaptation strategies, challenge conventional assumptions about gender and environmental knowledge. This study, therefore, offers **fresh empirical evidence** and methodological insight, contributing significantly to the emerging discourse on gender and climate justice under climate change in Himalayan regions.

**2.Study Area:**

The present study has been conducted in South Kashmir, a sub-region of the Union Territory of Jammu and Kashmir, comprising four districts: Anantnag, Kulgam, Pulwama, and Shopian. These districts are located in the southern part of the Kashmir Valley, which lies between the Pir Panjal Range in the south and the Zabarwan Range in the north. Geographically, the South Kashmir region extends approximately between 33.2°N to 34.0°N latitude and 74.5°E to 75.5°E longitude. Topographically, the region exhibits a diverse terrain ranging from low-lying river plains to rugged mountainous landscapes. The northern parts of these districts are composed of fertile alluvial plains, while the southern and eastern fringes gradually merge into the undulating Pahalgam and Shopian highlands, part of the outer Himalayas. The elevation varies from approximately 1,500 meters to over 3,000 meters above sea level, making the region ideal for mixed cropping, temperate horticulture, and pasture-based livestock rearing The drainage system of South Kashmir is primarily controlled by the Jhelum River, a major tributary of the Indus. Originating from Verinag Spring in Anantnag district, the Jhelum flows north-westward through all four districts, forming a critical hydrological and agricultural lifeline for the region. Its key tributaries include the Brengi, Lidder, Rambiara, and Veshaw rivers. The Lidder River, draining the Pahalgam valley, is one of the most significant glacial-fed tributaries and plays a vital role in irrigation, tourism, and hydroelectricity (Romshoo et al., 2015). Demographically, these districts represent a significant portion of the valley’s rural population. According to the Census of India 2011, the combined population of these four districts is approximately 2.3 million, with Anantnag being the most populous. The region is predominantly rural and agrarian, with livelihoods centered around horticulture, paddy cultivation, and livestock farming. Apple production, in particular, is a major economic activity in Shopian and Kulgam districts. Pulwama is well known for saffron cultivation, especially in the Pampore belt, while Anantnag also serves as a regional tourism hub due to destinations like Pahalgam and Verinag. In recent decades, South Kashmir has emerged as one of the most ecologically and socio-politically sensitive zones in the Kashmir Valley. Its climatic variability, altitude-specific agriculture, and rural socio-economic structure make it an ideal region for studying climate change perception and adaptation dynamics (Shafiq et al., 2019; Parrey et al., 2024).

  **Fig.1.Study area map.**

**2.Methodological framework**

The study was conducted in the four districts of Kashmir valley, J&K, India. The conceptual framework of this research enterprise was to understand gender differentiated responses to climate change perceptions and their impacts in the region. Data for the study was collected in the southern districts of Kashmir valley i.e. Anantnag, Kulgam, Shopian, and Pulwama. The study included 38 villages and data was collected between April and July 2023, for which both qualitative and quantitative methods were employed in the study. The survey completely focussed on individual and intra-household level data, which was collected by interviewing males and females of a same household at different timings. Overall, 170 pairs of males and females were interviewed, resulting in 340 respondents in total. The questionnaire was carefully designed to capture gender differentiated data on various dimensions of climate change such as perception, knowledge, concern, adaptation strategies and seriousness of the issue. The questionnaire was pre-tested and therefore, revised before the actual survey was administered in the study area. Prior knowledge of villages and respondents were collected with the help of local leaders to ensure wider representation and diverse views of women and men. Descriptive statistics such as mean, percentage, standard deviation and likert scale were extensively used to analyse the dichotomous data. To enhance and integrate qualitative and quantitative analysis, deductive approach was applied to derive inferences

**Table 1: Climate change knowledge and concern index by gender (N=340)**

|  |  |  |  |
| --- | --- | --- | --- |
| Variables |  Coding  | Mean | SD |
| Perception and understanding climatic change | 0(if the response is other than undesired change in climatic variables )to 1(if the response is undesired change in climatic variables) | 0.32 | 0.47 |
| Occurrence of climate change | 0(if response happens to be not yet begun)to 1(in case of already happening) | 0.69 | 0.46 |
| Cause of climate change | 0(human induced)to 1(if caused by both natural and anthropogenic causes) | 0.63 | 0.48 |
| Adaptation and mitigation | 0(in case the effects can’t be tackled through adaptation and mitigation)to 1(in case response is otherwise) | 0.58 | 0.49 |
| Climate change knowledge index | summative index (0-4)=what they meant by term climate change + cause of climate change + adaptation and mitigation regarding climate change + occurrence of climate change  | 1.90 |  |
| Concerned about impacts of climate change  | 0(in case of not concerned) to 3(in case highly concerned) | 2.05 | 0.94 |
| Magnitude of climate change threat | 0(in case of no threat at all) to 3 (in case of serious threat) | 2.09 | 0.88 |
| Seriousness of climate change | 0(in case of hype/myth) to 3(in case of problem is underestimated and needs to be addressed) | 2.16 | 0.90 |
| Climate change concern index | summative index(0-9) =concerned about impacts of climate change + magnitude of threat+ seriousness of climate change | 6.29  |  |

Understanding perception of climate change involved asking males and females how they perceive the term climate change. The descriptive statistics, coding, mean and standard deviation of the variables are presented in the **table 1**. Various options were given in the questionnaire to which respondents have to either agree or disagree. As such, the study applied mean perception index which was assessed using a two-point rating scale, from 1= if the respondent agree to 0=if the respondent disagrees. Climate change knowledge index was calculated by developing summative index comprising of various variables of climate change. Such variables include respondent’s knowledge regarding the term climate change, its occurrence, cause, and effectiveness of adaptation and mitigation measures to such problem. Similarly, climate change concern index was worked out by summing the mean values of three basic qualitative statements that were used in the study. This included whether people are concerned about the climate change, what is the magnitude of climate change threat and lastly whether people are serious about the issue. An effort was also made to document self-reported adaptations and mitigation strategies that both males and females have either implemented or recommended in response to climate change in various sectors of economy.

 **3.Results and discussion**

**3.1. Gender perceptions on specific climatic events/variables**

The gender-based perception regarding the specific climatic events in the study area are presented in **table 2**. Both males and females within the same household have perceived changes in climatic events. The results show similar findings regarding all these specific events with majority supporting a particular trend. However, in terms of percentage there are obvious gender-based differences in almost all the climatic variables recorded. The majority of women **(85.29%)** have perceived that the temperature in the region has increased since 1990, s while this view is only supported by slightly more than **(68%)** of men in the study area.

|  |
| --- |
| **Table 2. % of respondents indicating level of degree to which they have experienced specific climatic events in the study area since 1990, s** |
| **Variables** | **Increase** | **Decrease** | **Unchanged** | **Can’t Say** |
|  | Male | Female | Male | Female | Male | Female | Male | Female |
| Temperature  | 68.24 | 85.29 | 6.47 | 5.29 | 16.47 | 6.47 | 8.82 | 2.94 |
| Rainfall  | 40.59 | 43.53 | 35.88 | 33.53 | 10.59 | 8.82 | 12.94 | 14.12 |
| Snowfall | 0.00 | 1.18 | 90.00 | 86.47 | 2.94 | 2.94 | 7.06 | 9.41 |
| Change in seasonality\* | 77.00 | 81.80 | 23.00 | 18.20 | …… | …… | …… | …… |
| Flood | 30.00 | 32.35 | 26.47 | 31.18 | 18.24 | 16.47 | 25.29 | 20.00 |
| Cloud bursts | 27.06 | 25.29 | 17.06 | 18.24 | 12.35 | 9.41 | 43.53 | 47.06 |
| Hailstorms | 57.06 | 79.41 | 4.71 | 1.76 | 5.29 | 8.24 | 32.94 | 10.59 |
| Drought  | 24.12 | 31.18 | 20.59 | 15.29 | 21.76 | 13.53 | 33.53 | 41.76 |
| \*refers that the change in seasonality was recorded in yes/no options rather than increase/decrease options  |

The similar findings were recorded with respect to hailstorm activity in the region with females again on the overwhelming side (see table 2). the results may be justified on account of women being involved more than men in domestic activities and other areas such as agriculture where climate change signals are more felt and thus easily perceived. It may be pointed out that higher percentage of both men and women have self-reported that temperature and hailstorm activity in the region has increased tremendously while on the other hand, a drastic decrease in snowfall has been witnessed in the same time period. These findings uphold with that of many empirical studies conducted in recent times such as and-who concluded that there is statically significant increasing trend for mean temperature in the region in the studied period. Substantial agreement **(78%)** was observed among both men and women regarding the change in seasonality for weather events such as early or delayed rains, unseasonal flooding, late snowfalls, unusual cloudbursts and thunder storms. It is worth noting here that inferences for rest of the climatic events can’t be drawn since there is not a significant agreement among the respondents regarding the general trend of these variables.

**3.2 Gender and climate change perception**

The key comparisons on the basis of gender are explicitly displayed on **table 3**. The perception regarding the climate change was assessed using the qualitative statement i.e. “what do you mean by the term climate change”.

**Figure 2: Proportion of respondents by gender what they mean by term climate change (n=340)**

Multiple options were given to each respondent to which he/she has to agree upon based on his/her perceived understanding of term climate change (see graph 1), men perceived a greater understanding of the issue than females with a margin of **(9%)** which is overwhelming though not significant when taken holistically. The possible explanations may be attributed to higher education level among males and other socio-economic characteristics that tend to favour males significantly. It is noteworthy to mention here that majority of women in the study area perceive climate change as specific climatic events such as floods, cloud bursts, droughts, hailstorms and crop failures which have frequently occurred in the region since 1990,s.contrary to it, a fair percentage of men perceive it as long term fluctuations in climatic variables such as temperature and precipitation (see figure 1).women being largely engaged in domestic activities including agriculture consistently believe phenomena’s disrupting their activities as climate change.

**Table 3: Climate change perception, knowledge and concern by gender (pooled sample 2018)**

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| --- |
| Perception or Belief item/index Women Men  Perceived understanding **Perceived understanding of climate change 0.28 0.37** Climate change knowledge% of respondents who believe climate change is both natural and  anthropogenic induced process 0.57 0.69% of respondents who believe the effects of climate change can be tackled through adaptation and mitigation strategies. 0.75 0.52% of respondents who believe climate change is happening 0.76 0.63**Climate change knowledge index 0.69 0.61** Climate change concern% of respondents who are concerned about the effects of climate change (least to highly concerned) 2.27 1.82% of respondents who consider climate change as a threat (least to serious threat) 2.27 1.86% of respondents who believe it is a serious issue (overestimated to underestimated) 2.54 1.79**Climate change concern index 2.36 1.82**  |

 **3.3. Climate change knowledge index and gender**

Coming to the climate change knowledge index, females possess more scientifically accurate knowledge than do men **(see table 3).** These findings are opposite to what has been found in scientific and environmental knowledge in the past. Research enterprises on gender and climate change by (Hayes ,2001; Arcury,1987) are some of the typical examples on this issue. The gender divides in climate change knowledge in recent times have remained consistent and despite being not overwhelming it is statistically significant (Dunlap and McCright,2008). The higher mean value of **(0.75)** indicate that women are very much optimistic about the adaptation and mitigation strategies to minimize the adverse impacts of climate change. This is also proven in the adaptation and mitigation section where women are recommended the effective agricultural and environmental practices to cope up with this problem. The gender variations were also witnessed in comprehended the causes of climate change. The high value of **(0.69)** in case of men, because of their relatively higher level of knowledge, demonstrates their understanding about the primary causes of climate change. These findings are somewhat similar with the results of (Aaron and McCright.,2010) who also empirically proves it with moderate certainty.

**3.4. Climate change and concern.**

The gender differences in terms of climate change concern strongly exhibit that women are more worried about the climate change than do men. We see in the bottom section of table 3 that in all the three items presented, women have significant mean score **(2.36)** than men **(1.82)** in seriousness, threat and concern indices. The possible explanation is that women, being more dependent on natural resources, are affected more by climate change since it reduces the availability of such resources significantly (UN Women Watch, 2011). The gender discrepancy in climate change concern is also due to the fact that vulnerability of disasters for women is increased because of her low economic status and social security. The gender differences are thus deeply rooted in the positional occupancy of the women in the society (GGCA report, 2016).

**3.5. Gender perceptions regarding adaptation and mitigation strategies**

Adaptation and mitigation practices that have been prioritized separately by males and females are presented in **table 4**. There is almost similarity among males and females in the adoption of certain adaptation and mitigation strategies to combat climate change. These options include sustainable use of resources, improving infrastructural facilities, shift to high value crops and implement climate change resilient policies in the region. However, there is no similarity among men and women in the domain of most agricultural-related practices. The descriptive analysis reveal that women support crop rotation **(43.25%),** agroforestry **(61.8%),** water harvesting **(45.25%),** irrigation **(33.6%),** and focus on development and use of local resources **(56.9%)** as part of coping strategies. The empowering of weaker sections of society has also been highly prioritized by women which is the need of the hour since adaptations could become only effective when hindrances and inequalities among the members of community are eliminated to bring every individual on same footings in terms of his/her ability to adjust the impacts of climate change. The qualitative analysis indicates that males mainly recommend measures such as crop diversification and diversifying income sources.

**Table 4. Percentage of respondent by gender agreeing use of adaptation and mitigation strategies to cope with climate change in the study area.**



A substantial difference was recorded in access to climate change information as highest negative difference of **(24.57)** observed on gender-based analysis. It seems that males have more realised the significance of access to climate change information than their counter parts. However, it may be pointed out that women are ready to uptake any possible adaptation strategies to cope with negative implications of climate change if provided information by female extension officers (GACC, 2016). Furthermore, males are also interested in diversifying different sectors of economy to develop more earning options and at the same time engage in those sectors of the economy which tends to be less climate sensitive.

**4.Conclusion and suggestions**

Based on the findings of the study, it can be concluded that gender plays a crucial and multi-dimensional role in shaping perceptions, knowledge, concern, and adaptive strategies related to climate change in South Kashmir. The research reveals distinct gendered patterns that emerge from the intra-household analysis, challenging the assumption of homogeneous experiences within households. Women, despite facing structural disadvantages such as limited access to resources, education, and institutional support, exhibit a higher level of concern and more nuanced perception of climate change, particularly in terms of its immediate manifestations such as floods, droughts, hailstorms, and crop failures. This may be attributed to their daily engagement with nature-based livelihoods, domestic responsibilities, and proximity to natural resources, making them more sensitive and vulnerable to environmental changes. In contrast, men tend to frame climate change more as long-term fluctuations in temperature and rainfall patterns, likely due to their access to more formal sources of information, education, and broader social interactions. The study also found that women exhibit greater scientific knowledge of climate change than previously assumed, with higher mean scores on knowledge indices compared to men. This is a notable departure from traditional studies that often associate men with greater access to scientific and environmental knowledge. Women’s deeper concern about the seriousness of climate change and its long-term threat may also reflect their higher dependency on agriculture and ecosystem services, making climate-induced disruptions more impactful for them. Their heightened awareness is further reflected in their strong inclination toward sustainable agricultural practices such as crop rotation, agroforestry, irrigation improvement, and water harvesting. These practices, in addition to being environment-friendly, also reflect women's indigenous knowledge systems and adaptive resilience accumulated over time. In contrast, men preferred diversification of income and shifting to less climate-sensitive economic sectors, indicating a strategy more aligned with economic transition and risk avoidance than environmental sustainability. The study also highlights a concerning gender gap in access to climate change-related information, with males enjoying significantly greater exposure to information sources than females. However, the willingness of women to adopt mitigation and adaptation strategies, if guided and informed properly—particularly through female extension officers—points to a latent potential that could be unlocked with gender-responsive policy interventions. It becomes evident that while women possess the capacity and willingness to engage in adaptive practices, socio-cultural barriers and limited outreach hinder their effective participation in climate change planning and action. The study underscores the need for targeted interventions that recognize and strengthen the role of women in climate adaptation, not just as passive victims but as active agents of change. Importantly, the research reinforces the idea that climate change is not gender-neutral. The unequal social roles, responsibilities, and power structures that define gender relations also shape how climate change is experienced and responded to. Therefore, policy approaches must move beyond simplistic male-female household head dichotomies and embrace intra-household analyses to understand the nuances of gendered vulnerability and resilience. Future climate policy in the region must integrate gender-sensitive planning that ensures equitable access to resources, climate information, education, and support systems for both men and women. Empowering women through capacity-building programs, inclusive agricultural extension services, and increased representation in climate governance structures will not only enhance community resilience but also lead to more inclusive and effective climate action. Overall, this study provides strong empirical evidence that addressing gender disparities in climate change perception, knowledge, and adaptation is essential for building equitable and sustainable climate resilience in the vulnerable regions of the Kashmir Himalayas.

 Based on the findings of the study, several key suggestions emerge to strengthen gender-responsive climate action in the South Kashmir region. First and foremost, there is a critical need to bridge the information and awareness gap between men and women regarding climate change. While women demonstrated higher concern and a strong inclination towards sustainable agricultural practices, the data also revealed their limited access to climate-related information. Therefore, establishing gender-sensitive communication channels, especially through female extension officers and grassroots-level female-led organizations, can significantly enhance women's participation in climate adaptation strategies. Second, climate resilience policies must incorporate the unique roles and vulnerabilities of women, particularly in the agricultural sector, where women are primary actors. Policy frameworks should promote women’s access to agricultural inputs, credit, training, and technology that are otherwise skewed towards male counterparts. Third, targeted capacity-building programs that focus on improving women’s adaptive capabilities—such as water harvesting, agroforestry, and local resource development—can help harness their potential in mitigating the impacts of climate change. Additionally, male-preferred strategies such as income diversification and transitioning to less climate-sensitive economic sectors also need to be encouraged through tailored skill-building and livelihood support initiatives. Fourth, the gender gap in climate change knowledge suggests the necessity for more inclusive education programs that go beyond formal schooling to include community-based learning, awareness campaigns, and participatory workshops. These initiatives should be context-specific and culturally sensitive to the unique socio-economic realities of South Kashmir. Moreover, since women are more affected due to their lower social positioning, policy and institutional mechanisms must aim to empower women by removing structural barriers to resources and decision-making. Finally, future climate policies should be formulated through participatory approaches that involve both men and women equally, ensuring that local knowledge and gender-specific needs are adequately reflected. This study underlines the importance of shifting from generic adaptation frameworks to more inclusive, gender-sensitive models that not only address the immediate threats of climate change but also advance long-term gender equality in vulnerable regions such as South Kashmir.

**DECLARATION**

**Data Availability**

Data will be made available upon reasonable request

**Ethical approval**

All ethical standards were taken care of during the study

**Consent for Publication**

This manuscript is nowhere else under consideration for publication

**COMPETING INTERESTS DISCLAIMER:**

Authors have declared that they have no known competing financial interests OR non-financial interests OR personal relationships that could have appeared to influence the work reported in this paper.

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