The Hidden Toll of Drought: Exploring Gender-Based Violence in Drought-Affected Regions of India

Apoorva Nambiar[1], Garima Jain[2], Pratyush Tripathy[3], Kaushalendra Kumar[1]

[1]International Institute for Population Sciences; [2]Arizona State University; [3]University of California, Santa Barbara

Introduction

The intersection of climate change and gender-based violence (GBV) is an emerging area of concern, particularly in vulnerable regions like India, where environmental stressors such as drought exacerbate existing societal inequalities. This study delves into the connection between drought conditions and the increased likelihood of physical violence against women. Using a combination of meteorological and health survey data, we aim to explore how drought impacts the well-being of women in India, highlighting critical socio-demographic factors that influence this relationship. By focusing on this issue, we aim to offer insights into how climate change, through droughts, may intensify the vulnerability of women to domestic violence.

Data and Methods

This study is based on two primary data sources. First, rainfall data from the Indian Meteorological Department (1980-2016) were analyzed at a district level to classify drought conditions. Second, data from the National Family Health Survey (NFHS) 2015-2016 provided detailed information about women's experiences with physical violence. The outcome variable was the occurrence of physical, sexual, and emotional violence. Control variables included socio-demographic factors such as religion, education, wealth, age, and urban versus rural residence. Drought exposure was categorized into three levels: no drought, mild drought (rainfall between the 10th and 30th percentiles), and severe drought (rainfall below the 10th percentile).

Results

The analysis reveals a significant correlation between drought conditions and the prevalence of physical violence against women in India. By examining the data from the National Family Health Survey (2015-2016) and rainfall records from the Indian Meteorological Department (1980-2016), we identified clear patterns of increased violence in regions affected by drought. The study focuses on three primary drought categories: no drought, mild drought (rainfall between the 10th and 30th percentiles), and severe drought (rainfall below the 10th percentile).

1. Overall Impact of Drought on Physical Violence

The odds of women experiencing physical violence were found to be significantly higher in drought-affected regions. In areas that experienced severe drought, women were 1.25 times more likely to report incidents of violence compared to those in regions with no drought. Similarly, in areas with mild drought, the odds of experiencing violence were 1.22 times higher. These findings demonstrate that as drought severity increases, so does the vulnerability of women to domestic violence.

2. Temporal Influence of Drought

The temporal aspect of drought exposure was also critical in understanding its impact on violence. The data indicate that the timing of drought plays a asubstantial role in exacerbating violence. Women who experienced mild or severe drought conditions two years before the survey showed the most significant increase in violence rates. The odds of experiencing violence were 1.22 and 1.25 times higher, respectively, for those exposed to drought two years prior, suggesting a delayed but sustained effect of environmental stressors on household dynamics. Interestingly, the effect of drought in the third year prior to the survey was less pronounced, indicating that the closer the drought occurrence to the time of the survey, the stronger its impact on domestic violence.

3. Socio-economic Disparities

The study also highlights stark socio-economic disparities in the relationship between drought and violence. Women from poorer households reported significantly higher instances of physical violence during and after droughts compared to their wealthier counterparts. For instance, in areas affected by severe drought, poor women were more than twice as likely to experience violence than women from wealthier households. This disparity can be attributed to the heightened economic vulnerability of poorer households, where drought-induced crop failures and financial instability intensify domestic tensions, leading to an increase in violent behaviors.

4. Urban vs. Rural Divide

The rural-urban divide further underscores the uneven impact of drought on women's safety. Women living in rural areas, where livelihoods are more closely tied to agriculture and rainfall patterns, were disproportionately affected by physical violence during drought conditions. In contrast, women in urban areas, though still affected, faced lower odds of violence compared to their rural counterparts. For example, in regions with mild drought, rural women had 1.19 times higher odds of facing violence, while urban women experienced a lesser increase in risk. This rural-urban divide points to the critical role that rural economies and traditional gender roles play in exacerbating the vulnerability of women during environmental crises.

5. Cumulative Effects of Drought

Another key finding is the cumulative effect of repeated drought exposure. Women who experienced multiple years of drought were more likely to report violence compared to those in regions that experienced sporadic or single-year droughts. The cumulative stress from consecutive years of environmental hardship, combined with declining economic resources, appears to have a compounding effect on the rates of violence within households.

Figure 1 illustrates the relationship between the severity of drought and the percentage of women reporting physical violence over three consecutive years. The graph reveals that the percentage of women reporting violence increases with both the intensity of drought and the passage of time following the drought event.

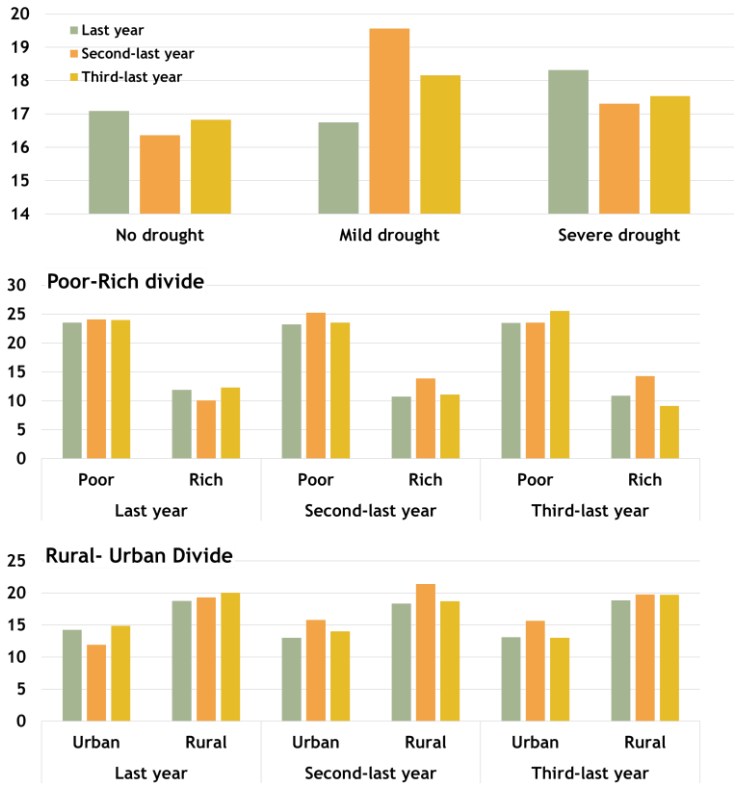

Table 1 provides a detailed breakdown of the logistic regression results, showing the odds ratios for women experiencing violence across various drought conditions, socio-economic categories, and time frames. The table confirms that women in both mild and severe drought conditions are at greater risk of violence, particularly in rural and poor households.

Physical Violence	Model 1 (y1)	Model 2 (y1+y2)	Model 3 (y2+y3)	Model 4 (y1+y2+y3)
Drought in last Year				
No drought (Ref)				
Mild drought	0.98 (0.91-1.05)	0.98 (0.89-1.07)		0.98 (0.91-1.05)
Severe drought	1.06 (0.97-1.16)	1.13 (1-1.28)		1.05 (0.96-1.14)
In Second last Year				
No drought (Ref)				
Mild drought		1.22***(1.11-1.34)	1.22***(1.12-1.32)	1.17***(1.09-1.26)
Severe drought		1.25**(1.07-1.46)	1.21**(1.07-1.37)	1.16**(1.05-1.28)
In Third last Year				
No drought (Ref)				
Mild drought			1.01 (0.9-1.12)	1.02 (0.94-1.11)
Severe drought			1.1 (0.91-1.34)	0.95 (0.84-1.06)

	Urban	Rural	Poor	Rich
Drought in Last Year				
No drought (Ref)				
Mild drought	0.88 (0.74-1.04)	1.02 (0.95-1.1)	1.03 (0.94-1.14)	0.85*(0.75-0.97)
Severe drought	1.05 (0.87-1.28)	1.04 (0.95-1.15)	1.01 (0.9-1.14)	1.08 (0.9-1.29)
In Second-last Year				
No drought (Ref)				
Mild drought	1.1 (0.95-1.28)	1.19***(1.1-1.29)	1.12*(1.02-1.24)	1.23**(1.07-1.42)
Severe drought	1.21 (0.98-1.48)	1.13*(1.01-1.27)	1.09 (0.95-1.26)	1.26*(1.05-1.52)
In Third-last Year				
No drought (Ref)				
Mild drought	0.98 (0.82-1.17)	1.04 (0.95-1.14)	0.97 (0.87-1.08)	1.11 (0.95-1.31)
Severe drought	0.88 (0.67-1.17)	0.98 (0.88-1.1)	1.1 (0.94-1.29)	0.85 (0.69-1.05)

Discussion

The findings underscore the urgent need for targeted interventions that address both environmental and gender-based vulnerabilities. The study suggests that the economic strain caused by drought, such as crop failures, increases stress within households, leading to a rise in domestic violence. Women in rural and impoverished areas are particularly susceptible due to limited access to resources and social support systems.

This research fills a critical gap in the literature on climate change and GBV, offering evidence that environmental factors can directly exacerbate gender inequality. Policymakers must consider the intersection of environmental and social vulnerabilities when crafting strategies to combat violence against women.

Conclusions and Policy Implications

This study calls for comprehensive strategies that address the dual challenges of environmental degradation and gender-based violence. Policy interventions must focus on improving the resilience of vulnerable women in drought-prone areas by promoting economic empowerment and access to social services. Furthermore, global strategies to mitigate climate change should incorporate a gender lens, recognizing the disproportionate impact that environmental crises have on women. Our findings also suggest that international development organizations should prioritize drought-stricken regions for GBV interventions. By addressing both the environmental and social drivers of violence, we can work towards creating a more equitable and resilient society for all.