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Women's Invisible Labor and Emotional Stress in Coastal Households

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ABSTRACT

In Bangladesh, where women are the primary providers of domestic, caregiving and livelihood support yet challenged by climate vulnerability in coastal areas, women's invisible labor has historically been a fundamentally important but largely unseen feature for household and community well-being. To explore the interplay between women's invisible labor and emotional stress, and with an eye on the coastal household vulnerability context. The specific objective was to measure and analyze the effect of coastal household vulnerability on this relationship. The study was quantitative, cross-sectional in nature, where data were collected from 400 women of selected coastal districts of Bangladesh by a structured questionnaire using a five-point Likert scale. The sample size calculated based on Cochran's formula, and the collected data were analyzed by SPSS using descriptive statistics, reliability analysis, correlation analysis and multiple regression analysis. Women showed remarkably high invisible labor, especially over unpaid household work followed by care and livelihood-support activities. High prevalence rates of emotional stress characterized a slightly different pattern: emotional exhaust, financial distress, family responsibilities and lack of recognition. Research has also shown that cyclones, salinity intrusion, water scarcity, and disruptions to livelihoods due to climate change add significantly to the unpaid work burden of women while also contributing heavily to their emotional labor. The study found that invisible labor, emotional distress and coastal household vulnerability were significantly linked together while it also recommended the implementation of policies addressing gender-responsiveness, provision of psychosocial support services and climate-responsive resilient development programs to strengthen women's well-being as well as household resilience in Bangladesh's coastal areas.

INTRODUCTION

Despite the important role of women's labor in sustaining households, communities and local economies, much of the work they do remains unrecognized and invisible (Akter *et al.*, 2024). Invisible labor is unpaid work that often goes unnoticed, including household tasks, caring for family members, cooking, collecting water and fuel, providing emotional support and care as well as managing family wellbeing (Naveed Raja & Digal, 2024). However, while they are often crucial for the functioning of households and the reproduction of society as a whole, they rarely enter into economic statistics or labor market evaluations and development planning. As a result, women often take on more than their share of responsibilities without adequate credit, pay or assistance (Vageeshan & Kamalakar, 2025). Invisible labor is a particularly pertinent issue in developing countries, where traditional gender expectations continue to shape the way work is divided in the home. Women are assumed to do domestic work and provide care while also contributing to agricultural production and income-generating activities in many rural and other marginalized communities (George & Shaji, 2024). This dual burden usually leads to longer working hours, loss of opportunities for education and employment, and physical and psychological strain. Several prior studies have shown that the unequal allocation of unpaid labor

leads to gender discrimination, as well as adverse effects on women's health, mental wellbeing and socioeconomic empowerment (Chowdhury, 2025). Invisible labor is most acutely heavy in the coastal regions of Bangladesh, where cyclones, flooding, storm surges and salinity intrusion make household duties even worse. Women, women also are putting in extra work gathering safe drinking water, caring for family members, managing household resources and supporting post disaster recovery leading to additional emotional stress (Gharbaoui *et al.*, 2025). Being responsible for these tasks over a longer period may have a negative impact on their mental health, quality of life and resilience.

While earlier studies had looked at the issues of gender roles and climate vulnerability in Bangladesh, very few quantitative pieces have analyzed invisible labor and emotional stress among women belonging to coastal households. Accordingly, this research sheds light on how much invisible labor women undertake, examines their emotional stress and explores whether the vulnerability of coastal households plays a role in this relationship. The results will provide empirical support for policymakers and practitioners in developing gender-sensitive solutions that acknowledge the critical role women play, unpaid contributions to psychology across coastal communities in Bangladesh.

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LITERATURE REVIEW

Invisible labor is the unpaid, unrecognized and often devalued work important to continuity of families and communities (Lavee & Kaplan, 2022). This involves the essential work of cooking, cleaning, childcare, eldercare, emotional support and gathering water and fuel (domestic work) as well as household management. Feminist scholars have long pointed out that the mainstream economy does not recognize unpaid domestic work, no matter how much it contributes to social and economic development (Ben-David *et al.*, 2026). The notions of invisible labor came from critiques to the traditional ways of analyzing the labor force, in which attention is mostly given to paid work ignoring most of the features of reproductive and caregiving activities that are still carried out by women (Delgado, 2023). This supports evidence from across the developing world that women do on average much more unpaid work within the household and in caring for others than men. In rural parts of the country, women also tend to divide their time between household chores as well as work in agriculture and informal economic activities, leaving them with a double burden of work (Pathak, 2022). These responsibilities are so deep-rooted in culture and gender stereotypes, that women get seen as care givers and household managers. As a consequence, the majority of women's work still continues to be invisible in formal economic statistics and policy debates (Grace, 2022). A weak public service and infrastructure environment in rural and impoverished areas exacerbate the disproportionate burden of invisible labor shouldered by women across Bangladesh (Amar *et al.*, 2022). Women are often involved in food preparation, childcare, livestock herding and management, collection of resources for domestic work as well as support in agricultural production (Afifah *et al.*, 2025). Though helpful in the measure of many economic contributions women provide, these activities tend to be seen as natural extensions of women's familial roles rather than productive labor for which they are recognized and compensated. If such work is carried on in areas of public life, their invisibility upholds gender inequality and continues to deny women economic empowerment (Taye & Tesfaye, 2024).

Emotional stress is a psychological pressure, having many responsibilities, various challenges that an individual cannot cope with (Ovsiannikova *et al.*, 2024). It includes anxiety, frustration, exhaustion, worry and emotional weight. Stress influenced by personal as well as environmental factors has a pronounced effect on mental health, physical health and quality of life (Islam *et al.*, 2025). Stressors unique to women, specifically related to being wives and mothers. Many studies stated that balancing housekeeping, childcare, income-generating work and social responsibilities places a heavy emotional burden (Bondarchuk *et al.*, 2023). Expectations to do multiple jobs at once will lead many women to chronic stress, fatigue and psychological distress. Long-lasting emotional strain can lead to depression, anxiety disorder,

sleep problems and also reduced life satisfaction (Córdova *et al.*, 2023).

The growing importance of workload for public health and social science. There is evidence that too much unpaid work means less time for rest, leisure and self-care, which in turn leads to greater exposure of psychological stress (Turpin *et al.*, 2021). Additionally, the denial of recognition for women can worsen frustrations and emotional exhaustion. In situations where household responsibilities are unevenly divided, women often take on the additional emotional weight of maintaining family needs experienced a detrimental effect on their mental health (Astale *et al.*, 2023). Environmental and socio-economic tensions can potentially add to the levels of stress in remote locations (Roy *et al.*, 2026). Having less access to healthcare, education, transportation and jobs increases both uncertainty and emotional strain (Klebanova *et al.*, 2024). Bangladesh's coastal areas are highly prone to climate-induced hazards such as the same cyclone, storm surge, and flooding and salinity intrusion through flood-affected stagnant waters in addition to river bank erosion (Rabbani, 2022). Such environmental issues affect livelihoods, house hold assets and access to safe water, health care, and other basic services. Same with women who are always called to carry responsibilities in the family, or household management and other services like caregiving and post-disaster recovery (Tewari, 2025). Thus, climate vulnerability exacerbates both the amount of women's unpaid care work and emotional distress. Past research has shown that women in climate-vulnerable coastal areas suffer heavy work burdens and have less time for rest and income-generating activities (Ashrafuzzaman *et al.*, 2023).

The literature recognizes the robust positive association between invisible labor by women and emotional strain Based on the Role Strain Theory, individual experience psychological stress when concurrent roles exceed their resources and coping capacity. Emotional exhaustion and anxiety is higher among women juggling household chores with caregiving duties, livelihood activities, and humanitarian work during disasters (Chen *et al.*, 2019). Empirical studies have found that burden of unpaid domestic and care work is correlated with more stress, poor mental health, and lower life satisfaction (Halimuzzaman, 2025). Disasters, largely related to climate change, occur frequently in comparison to inland regions and it is women who bear the brunt of running the households (Saha *et al.*, 2025). But quantitative evidence exploring this connection in the context of coastal Bangladesh still is few. This study explores the indirect relationship between women's invisible labor and emotional stress with a view that coastal household vulnerability context matters.

The study showed that long journeys to markets, schools, health care facilities and water supply increase daily burdens whilst likely causing both physical fatigue and psychological stress. Thus, household vulnerability is an important contextual factor that may mediate the association between invisible labor and emotional stress.

Based on the literature review the research questions are:

- How serious is the problem of household invisibility of women in the coastal Bangladesh?
 - How much emotional stress do women live in the household of coastal Bangladesh?
 - What private costs in terms of emotional stress are women with invisible labour households sustaining in the coastal Bangladesh?
 - What is the role of the coastal household vulnerability context in women's emotional stress?
 - How do the vulnerability context of coastal households influence women's invisible labor and emotional stress?
- To answer the above questions, the following research objectives are determined:
- To investigate the invisible work done by women in households in the coastal Bangladesh.
 - To assess Nature and magnitude of emotional distress faced by women in the coastal Bangladesh.
 - To investigate the impact of invisible labor performed by women on emotional stress among women in the coastal Bangladesh.
 - To assess the role of coastal household vulnerability context on women stress inherent.
 - To investigate the role of the coastal household vulnerability context in shaping the relationship between women's invisible labor and emotional stress

METHODS AND MATERIALS

The current study used a cross-sectional quantitative research design to explore relations between women's invisible labor and emotional stress among coastal households in Bangladesh. Using a structured questionnaire with sections on demographics information, women's invisible labor; emotional stress and coastal household vulnerability context, primary data were collected from women in selected coastal districts. A five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) was used for each construct item. The target population was adult women currently engaged in household management and caregiving work. The study determined the sample size using Cochran's formula for infinite population:

Where n = sample size, Z = standard normal variate for 95% confidence level (1.96), p = estimated proportion of the population with the attribute being measured

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{E^2}$$

(p was presumed to be 0.5 since no prior information needed to be used) and E is margin of error (0.05) (Cochran, 1942). On the basis of these parameters, a sample size of 384 respondents was calculated as minimum. In order to make the results more reliable and cover for non-response, 400 questionnaires were distributed by purposive sampling from various selected coastal communities with all questionnaires analyzed being completed. The geographical data were extracted using KoBoToolbox, a mobile data collection platform

based on face-to-face interviews. The data was collected, coded and analyzed using the version 26 of SPSS. The relationship between the study variables was examined through descriptive statistics, reliability analysis Pearson correlation and multiple regression analysis. Informed consent was obtained from all respondents, and voluntary participation, anonymity, confidentiality and that data were used for academic research purpose only was ensured to keep up ethical principles during the study.

RESULTS AND DISCUSSIONS

This section reports the findings of our study conducted on invisible labor and emotional stress among households in coastal Bangladesh. The study started with respondent demographics, then follow with descriptive statistics of the important variables in this study. The analysis included reliability, correlation and regression analyses of women's invisible labor, emotional stress and coastal household vulnerability context. The results are discussed in context of the study aims and literature to illuminate how unpaid, and often invisible work supports women's wellbeing in the geographical and socio-economic context of the coastal Bangladesh.

Demographic Information

Demographic characteristic of the respondent gives useful background information about socioeconomic characteristics of women residing in coastal areas of Bangladesh (Noori, 2022). Four hundred women completed the survey. Respondents had different demographic trends when it came to age, marital status, education, occupation, household income, district of residence and household size. These characteristics are significant, as they affect the burden of household duties for women and ownership of resources, leaving them open to emotional stress. The distribution of respondents is outlined in Table 1.

Table 1 summarizes the demographic characteristics of the study sample of 400 respondents indicating that the majority of respondent ranged from 26–35 years old (37.0%) followed by 36–45 years age group (26.5%). Women in these age groups are typically tasked with household tasks, childcare, elder care and participation in activities to generate incomes. This makes them a more likely candidate of that emotional labor and the burdens that come with invisible work. The lower percentage of respondents aged >45 (16.0%) suggests that most of the work force in household management among coastal communities are younger to middle age women. Most (73.5%) of the participants had a spouse at the time of assessments, while 12.0% were single without a partner; 9.0% were widowed and 5.5% were divorced or separated. The large proportion of married women also indicates that, in the family-centric social structure found near coastlines in Bangladesh, they are generally the main domestic workers, caregivers and support earners. This burden is sky-high during environmental and economic crises, putting those women in challenge marriages at

Table 1: Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Age	18–25 years	82	20.5
	26–35 years	148	37.0
	36–45 years	106	26.5
	Above 45 years	64	16.0
Marital Status	Single	48	12.0
	Married	294	73.5
	Widowed	36	9.0
	Divorced/Separated	22	5.5
Education	No Formal Education	88	22.0
	Primary	126	31.5
	Secondary	108	27.0
	Higher Secondary	50	12.5
	Graduate and Above	28	7.0
Occupation	Homemaker	170	42.5
	Agriculture/Fishing	110	27.5
	Small Business	42	10.5
	Service	30	7.5
	Day Laborer	28	7.0
	Others	20	5.0
Monthly Household Income (BDT)	Below 15,000	150	37.5
	15,001–25,000	140	35.0
	25,001–35,000	72	18.0
	Above 35,000	38	9.5
Coastal District	Khulna	70	17.5
	Satkhira	62	15.5
	Bagerhat	56	14.0
	Barguna	58	14.5
	Patuakhali	54	13.5
	Bhola	52	13.0
	Cox's Bazar	48	12.0
Household Size	1–4 Members	110	27.5
	5–6 Members	186	46.5
	More than 6 Members	104	26.0

the highest risk for work-related stress. The educational profile indicated that 31.5% of the respondents finished primary education, 27.0% was secondary educated and 22.0 had no formal education. Barely 19.5% had completed higher secondary or above. This distribution is suggestive of low levels of female education in coastal communities. Less education may reduce job prospects, push women into forgoing paid work in favor of unpaid domestic tasks, and restrict their access to information and support services that could enhance household resilience as well as women's well-being.

In terms of occupation, 42.5% were homemakers and 27.5% worked in agriculture or fisheries based activities. Wage work consisted of small businesses (10.5%), service occupations (7.5%), day labor (7.0%) and other income-generating activities (5.0%). Many women described themselves as homemakers, but they

also played an important role in agriculture, fisheries, household enterprises and strategies for disaster recovery. The findings illustrate that the productive and economic contributions of women go beyond unpaid domestic work, yet the majority remains invisible. The income distribution was such that 37.5% of the households earned below BDT 15,000 per month and another set of 35.0% borrowers were in the group where monthly household income ranged between BDT 15,001 and BDT 25,000. As a result, almost three out of four respondents came from households that barely scraped by. Where households cannot outsource domestic tasks or pay for key services, financial constraints may augment reliance on women's unpaid labor. Since lives are often disrupted in climate-sensitive, coastal areas by disasters, economic difficulties add further emotional stress. Respondents were selected from seven leading coastal districts where

Khulna had the highest share (17.5) followed by Satkhira with 15.5 percent, Barguna with 14.5 per cent, Bagerhat with 14.0 percent, Patuakhali 13.5 percent, Bhola 13.0 percent and Cox's Bazar accounting for the least number of respondents (12.0 per cent). The balanced distribution of the sample across districts improves representation and reflects variation in women's experiences in Bangladesh's coastal regions. These districts are also clockwork for cyclones, tidal surges flooding and salinity intrusion which marks them very relevant places for the study of invisible emotional labor by women. Household size is another indicator of family responsibilities respondents may have. Nearly one-half (46.5%) of the respondents lived in four to six members households, and 26.0% belonged had family with more than six members. If the household is bigger, it usually means that you will need more time to devote on cooking, cleaning, caregiving and managing a household. With the increase in household size, unpaid work carried out by women and their caregiving tasks also increases which may lead to an increased risk of emotional burden.

Across all of the demographic data, it was apparent that mostly married middle-aged women had been surveyed

for this study and these women on average have lower educational attainment as well as household income who mainly live in climate-change vulnerable coastal districts (Atiqur Rahman Sunny, 2020). The majority of women were housewives or worked in agriculture and fishing while simultaneously performing great amounts of unpaid domestic and caregiving duties. These demographic characteristics provide a suitable background to explore the relationship of invisibilised women's labor and emotional stress in coastal households of Bangladesh, and demonstrate the sociocultural milieu which underpins women's lives on a day to day basis.

Women's Invisible Labor

Ten statements about unpaid domestic work, responsibility for caregiving activities, support for livelihoods and household management were used to measure women's unrecognized labor. The respondents were asked to evaluate each statement on a five-point Likert scale from 1 (Strongly Disagree) – 5 (Strongly Agree). In households of women in the Bangladesh Hill Tracts, higher mean scores suggested greater prevalence of invisible labor.

Table 2 presents the results that show a high overall

Table 2: Descriptive Statistics of Women's Invisible Labor (N = 400)

Statement	Mean	SD	Rank
I spend many hours each day performing unpaid household work.	4.38	0.71	2
I am responsible for most household chores in my family.	4.42	0.69	1
I regularly care for children, elderly family members, or sick relatives without compensation.	4.21	0.83	6
I participate in agricultural or livelihood activities in addition to household work.	4.19	0.86	7
I often sacrifice my personal needs to fulfill family responsibilities.	4.30	0.74	4
My unpaid work is essential for the functioning of my household.	4.34	0.72	3
My contribution to family well-being is often overlooked.	4.08	0.88	9
I have little time for rest because of my daily responsibilities.	4.24	0.79	5
Family members depend heavily on me for daily household management.	4.17	0.82	8
The amount of unpaid work I perform has increased over time.	4.02	0.91	10
Overall Mean of Women's Invisible Labor	4.24	0.80	-

mean average score ($M = 4.24$, $SD = 0.80$) indicating a considerable burden of invisible labor experienced by women in the Bangladesh Hill Tracts. The results indicate that unpaid household responsibilities, caregiving work and work related to making money were part of the everyday lives of women. The general agreement over all statements indicates the persistence of invisible labor within existing household structures as well as the role of gender in this community. Out of all items we measured, the statement: "I do most (not all) household work in my family" had the highest mean score ($M = 4.42$, $SD=0.69$). It suggests that women still remained the principal managers of domestic duties in respect to

cooking, cleaning, washing and organizing the home. The outcome mirrors entrenched gender stereotypes in many rural and indigenous communities, which assign domestic chores almost exclusively to women. International Labour Organization (2018) also gives indication for these similar findings where it noted that the type of unpaid household work performed by men is much less than women in both wealthy and developing countries. The second highest mean score was for the statement I spend many hours every day doing unpaid housework ($M = 4.38$, $SD = 0.71$) with a high rating of engaged (43%). This result shows that, even in a highly unequal society like the one in which I studied women were putting many hours into

domestic work. More detailed information on paid work, the problem is that they concentrate and kidnap the worker's time with unpaid labor, thus depriving them of opportunities for education, leisure, income generation and personal development. According to existing evidence, women worldwide perform around three times more hours of unpaid care and domestic work than men (UN Women, 2023), resulting in persistent gender gap in paid and unpaid labor contributions. Similarly, respondents also strongly agreed with the statement "My non-paid work is necessary for my household to run" which received a high mean score ($M = 4.34$, $SD = 0.72$). Despite the fact that women put in enormous efforts to ensure household survival and sustainability, such unpaid work was generally not measured by modern economic indicators. Results are consistent with feminist economic thinking which argues unpaid labor is a crucial form of work for families and communities, but that it often remains invisible – not counted in the national accounts (Ferrant *et al.*, 2014). Respondents also agreed that they frequently compromised personal needs for family commitments ($M = 4.30$, $SD = 0.74$). This result is indicative that relatively often, women put household welfare over their own health, education and ambition. The combination of these sacrifices can lead to physical fatigue and emotional distress, especially in low-resource settings like that of the Hill Tracts. In fact, cultural expectations and caregiving roles bring many women to prioritize family responsibilities over their own well-being (FAO, 2023). The item regarding limited time for sleeping because of daily obligations resulted in a similarly high mean score ($M = 4.24$, $SD = 0.79$). This finding suggests that the workload borne by women often went beyond traditional working hours. Family workload in the Hill Tracts comprises not just routine domestic tasks but also agricultural labor, resource collection and community obligations thus increasing the quantity of work carried out on a daily basis. These responsibilities could limit opportunities for recovery and increase exposure to stress-related outcomes, given their high demands. At or near the top of invisible labor was care taking responsibilities. Respondents reported substantial involvement in caring for children, elderly family members and sick relatives ($M = 4.21$, $SD = 0.83$). Household maintenance: a function that is essential to the household but largely goes unnoticed, Care work, these results reaffirm earlier studies showing that caregiving activities represent one of the most ubiquitous unpaid work by women globally (ILO, 2018). You are also able to participate in agricultural and livelihood activities along working in the household ($M = 4.19$, $SD = 0.86$). Women in productive activities are often referred to as homemakers, and their economic contributions do not therefore get recognized. Community science and rural development evidence made similar observations around the previously unseen contributions women play in keeping household economies afloat (FAO, 2023). While all items rated relatively well, contributions left

unacknowledged ($M = 4.08$, $SD = 0.88$) and rising unpaid work over time ($M = 4.02$, $SD = 0.91$) should also be given consideration. These results imply a widespread lack of support around recognition while increasing work volume among many women. These misconceptions may lead to a sense of contempt and emotional burden, which are highly correlated with mental health.

The overall findings highlighted that women's invisible work was the salient aspect of household life in the coastal Bangladesh. Pulling together domestic work, caring responsibilities, the role in agriculture or unpaid experiments on premises for agricultural purposes and household management created this very massive but unrecognized and unpaid burden. These observations are similar to previous international and regional studies on unpaid work revealing the unequal share of unpaid work carried by women (Ashrafuzzaman *et al.*, 2023). The prevalent forms of invisible labor detected here offers a solid basis to study the impact of invisible labor on women's emotional distress in subsequent analyses.

Emotional Stress

The emotional stress was measured using 10 statements on impacts of home-based care and domestic work, financial stress, emotional exhaustion/stress due to caregiving, and lack of social support. Each item was rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher mean scores were found for emotional stress among women residing in coastal households of Bangladesh. Table 3 depicts the descriptive statistics.

Table 3 draws the descriptive statistics of emotional distress among women living in coastal households in Bangladesh Descriptively the mean of 4.23 ($SD = 0.79$) suggests that emotional distress was high among respondents in general. Such consistently high mean scores among all ten statements point to emotional strain being experienced by women across the board, driven primarily through unpaid household labor, care work and financial precarity compounded by climate vulnerability in coastal communities.

The mean score for the statement "I feel emotionally drained when doing household chores and caring for others" was 4.38 ($SD = 0.69$) which is the highest among all states. This finding is consistent with the argument that the additional burden of performing domestic work and caregiving before, during, and after the pandemic had a huge impact on their psychological well-being In coastal households women often play a significant role in child and elder care, meal preparation, water collection and household management even as they contribute to family livelihoods. These expectations often rise during climate-related catastrophes such as cyclones, flooding and storm surges when women have less time to rest and recover. The result corroborates previous findings that longer hours in caregiving and unpaid homes are important predictors of emotional exhaustion and mental fatigue among women.

The item with the second-highest mean score and a

Table 3: Descriptive Statistics of Emotional Stress

Statement	Mean	SD	Rank
I frequently feel overwhelmed by my daily responsibilities.	4.31	0.74	3
I experience emotional exhaustion due to household and caregiving duties.	4.38	0.69	1
I often feel stressed about meeting the needs of my family.	4.34	0.72	2
My daily responsibilities negatively affect my mental well-being.	4.21	0.81	6
I feel anxious when I cannot complete all my household tasks.	4.14	0.85	8
Lack of appreciation for my work causes emotional distress.	4.23	0.79	5
I worry about the economic security of my household.	4.28	0.76	4
I feel pressure to manage household problems on my own.	4.19	0.83	7
I rarely receive emotional support when I feel stressed.	4.08	0.88	10
My emotional well-being would improve if my work received greater recognition.	4.11	0.86	9
Overall Mean Emotional Stress	4.23	0.79	

relatively large standard deviation was “I often worry about being there for my family” ($M = 4.34$, $SD = 0.72$). This finding is an indicator of the extent to which women feel responsible for household welfare in terms of limited access to financial resources and environmental resources. Bangladesh coastal communities are repeatedly affected by climate change, including salinity intrusion & flooding as well as natural shocks: these place burdens on women’s role in food security, support for family members and household stability. Thus, worrying about the welfare of family became one of major emotional stressors.

Participants similarly strongly agreed that they were often overwhelmed by everyday life demands ($M = 4.31$, $SD = 0.74$). This suggests that women engaged in multiple duties as normal, handling domestic work, caregiving, and asset & resources management along with income-supporting tasks. When the burden of these duties adds up, it can surpass a person’s physical and emotional limits leading to mental stress. This is consistent with Role Strain Theory, a concept that postulates stress arises when people are forced to fulfill several taxing roles with little resources available (i.e., time of the day) and social-support.

$M = 4.28$, $SD = 0.76$: I am worried about the economic security of my household (4th highest mean score). In most coastal communities, households depend on laboring in agriculture, fishing, aquaculture and wage labor: this revenue means that financial insecurity remains an overarching concern as livelihoods are vulnerable to climate shocks. Women often take on more unpaid work like domestic chores when household incomes suffer after natural disasters, which raises their both workload and emotional burden. The result shows that economic uncertainty is fiercely related to female psychological health.

Respondents also indicated that the lack of appreciation for their work affected them emotionally ($M = 4.23$, $SD = 0.79$). Women are engaged in multiple activities crucial to keeping a household alive, but these efforts are perceived as routine family labor rather than valuable work. This lack of recognition makes one feel less about themselves

and lead to higher frustration and emotional weariness. This result highlights the phenomenon of invisible labour when contributions that are key to family and household welfare still remain socially and economically unrecognized.

Result: The mean score of, “My everyday activities affect my mental health negatively” was 4.21 ($SD = 0.81$), reflecting that respondents felt strongly about their household responsibilities directly affecting them mentally. Constant interaction on mentally and physically arduous jobs with little to no time for leisure or self-care can lead chronic stress, anxiety, as well as low quality of life. This is particularly precarious for women in coastal areas, as environmental stressors often disrupt their daily routines and increase caregiving demand.

The same pattern emerged with the pressure to take care of household problems themselves ($M = 4.19$, $SD = 0.83$) and anxiety when they cannot do household tasks ($M=4.14$, $SD=0.85$), as respondents tended to agree on those statements too. These results suggest that most women viewed themselves as the chief manager of household affairs, and often tackling family problems by themselves without adequate support. These expectations may heighten psychological stress and lead to emotional exhaustion, especially in households experiencing financial difficulties or broader climate-related disruptions.

Even the items “My emotional well-being would be better if my work was more appreciated.” ($M = 4.11$, $SD = 0.86$) and “I do not get much emotional support when I am feeling stressed.” ($M = 4.08$, $SD = 0.88$)—ranked lower—were all above 4.00 on average with high levels of agreement. Their results reveal that the women wanted more reciprocation from family members for their voluntary efforts, as well as more empathy and emotional support. More recognition and equal division of household work may lessen emotional burden and enhance women’s mental health.

In general, results show that emotional fatigue was extremely common among women in coastal households of Bangladesh. Emerging as the top reasons for stress were emotional exhaustion, concern for family welfare,

household responsibilities holding too much workload, financial insecurity and no acknowledgment. The findings show that these challenges are worsened by climate vulnerability which increases women's unpaid work during or after environmental disasters (Carrasco & O'Brien, 2023). This information is particularly pertinent for informing policies focused on equitable-sharing of household responsibility and greater social support, gender-responsive climate adaptation strategies aiming to promote women's mental health and overall well-being.

Coastal Household Vulnerability Context

Ten items measured the Coastal Household Vulnerability

Context, specifically how respondents perceived the impact of climate hazards and environmental challenges on their household obligations and daily lives. The narrative identifies the adverse effects of cyclone, storm surge and tidal waves, floods, salinity intrusion/soil erosion or water scarcity, loss of livelihood (which encompasses but is not limited to natural destruction), disaster recovery on unpaid labor and women welfare. The design of each statement was rated by 1 (Strongly Disagree) to 5 (Strongly Agree) in a five-point Likert scale. The higher mean scores indicate that household vulnerability is perceived to be greater in the coastal areas Bangladesh. Table 4 shows the descriptive statistics.

Table 4: Descriptive Statistics of Coastal Household Vulnerability Context

Statement	Mean	SD	Rank
Climate-related disasters such as cyclones and storm surges increase my household workload.	4.39	0.70	2
Salinity intrusion makes it more difficult to manage household activities.	4.28	0.76	5
Collecting safe drinking water requires significant time and effort.	4.42	0.68	1
Environmental changes have increased the amount of unpaid work I perform.	4.35	0.73	3
Loss of livelihood opportunities due to climate-related events increases my household responsibilities.	4.22	0.81	7
Natural disasters place additional caregiving burdens on women in my household.	4.31	0.75	4
Household recovery after cyclones or floods depends heavily on women's unpaid labor.	4.26	0.79	6
Living in a climate-vulnerable coastal area creates additional stress in managing household responsibilities.	4.20	0.82	8
Economic uncertainty caused by environmental challenges increases my emotional burden.	4.18	0.84	9
Climate-related challenges negatively affect my overall quality of life.	4.15	0.86	10
Overall Mean Coastal Household Vulnerability Context	4.28	0.77	-

In Table 4 the descriptive statistics for the Coastal Household Vulnerability Context. The overall mean of 4.28 (SD = 0.77) shows that the women perceived a high level of household vulnerability based on climate change and environmental risk due to changes in their coastal areas in Bangladesh. The high mean scores of all statements indicate that climate change and natural hazards caused significant impacts on women activities in their daily tasks, homely chores, and their emotional wellbeing.

The mean score for the statement "It needs time to get aqueous safe drinking water" was obtained (M = 4.42, SD = 0.68) which was maximum among all statements. Such findings echo one of the most significant challenges confronting women in Bangladesh's coastal population. Salinity intrusion into the surface and in-ground water sources has led to reduced safe drinking water availability, causing women to trudge out over long distances to secure freshwater for household consumption. As water collection is typically the responsibility of women, lack of access to potable water largely increases their unpaid labor burden and decreases time available for education, income activities, rest and personal care.

The mean score ranked second highest, climate-related disasters such as cyclones and storm surges increase the household workload (M=4.39; SD = 0.70). Cyclones, tidal surges and flooding in coastal Bangladesh regularly

destroy homes, disrupt livelihoods and exacerbate domestic burdens. Women are frequently tasked with safeguarding household resources, childcare and caregiving, storage of emergency food stocks as well as household recovery post-disasters. These duties can greatly increase a woman's unrecognized work during times of disaster and add to the additional burden, both physically and mentally.

In addition, respondents were also in firm agreement regarding environmental changes contributing to increasing the amount of unpaid work done (M = 4.35, SD = 0.73). Climate-induced natural resource loss such as soil salinization, farmland abandonment, housing and property destruction forcing changes in household livelihoods and reliance on the unwaged work of women laborers (Prado de Nicolás *et al.*, 2023). Women often try to fill this gap caused by the declining household resources through extra work out of home (especially water supply from distant sources, food preparation with limited inputs and supporting agricultural measures as well as local administration on adaptation strategies). The results highlight how environmental change has become a key factor driving the invisible labor of women in coastal communities.

The item "Natural disasters impose even greater care responsibilities on women in my household" had a mean score of 4.31 (SD = 0.75). Women are often the ones who

care for injured family members, children, older adults and individuals with disabilities during and after a natural disaster. They are also responsible for coordinating temporary shelter arrangements, food preparation, hygiene, and household recovery while dealing with some of their own emotional and physical issues. This finding shows that more intensive caregiving occur in disasters and it increases unpaid work of women.

At the same time salinity intrusion was recognized as among the most daunting challenge, with “Salinity intrusion complicates our overall management of livelihoods” rated with a mean 4.28 (SD = 0.76). Drinking water, sanitation is troubled, agriculture and food preparation becomes much less approachable due to salinity affecting these lines of a general household management. Women have to spend more time and energy in obtaining freshwater and adjusting everyday household activities due to climate change. This finding demonstrates a pathway by which indirect climate-related environmental changes add to the invisible labor of women.

Respondents also agreed that household recovery after cyclones or floods is reliant on women’s unpaid labor (M = 4.26, SD = 0.79). Reconstruction involves far more than physical recovery of damaged infrastructure; it includes household activity patterns, family member care practices, food supply and distribution activities, and any restoration of community networks. Women are still central to these recovery processes, yet often financially uncompensated and without formal recognition of their efforts. Disaster recovery is therefore a key area that can increase the unpaid burden on women.

The item Loss of sources of livelihood due to climate change events adds burden to my work at home received a mean score of 4.22 (SD = 0.81). Disruptions in agriculture, fisheries, and wage employment due to climate-related phenomena decrease household income and lead women to take on more domestic tasks and livelihood-supporting burdens. This suggests a continued rapport between economic vulnerability and invisible labor, as many women find themselves engaged in more unpaid work on the home front under worsening household economic conditions to sustain family wellbeing.

In the same vein, respondents passed on additional stress in dealing with household duties infused by living in a coastal area vulnerable to climate change (M = 4.20, SD = 0.82) and that environmental uncertainty caused economic instability, which burdens them emotionally (M = 4.18; SD = 0.84). The results indicate climate vulnerability has an increasing workload on women’s labour but also contributes to their psychological ill-being. Repeated exposure to the risks and unknowns posed by climatic changes may drive greater anxieties about home safety, household income and livelihoods in the future.

Consensus also emerged on the item ranked lowest, ‘Issues related to climate change have a negative influence on my general well-being’ (M = 4.15, SD = 0.86; Broad agreement). This finding indicates that women were aware of the chronic impact environmental risks had on

their physical, emotional, social and economic health. As climate-related adversities have a habitual nature, this might deter resilience and induce long-term vulnerability among coastal households.

Even so, these findings illustrate that the Coastal Household Vulnerability Context was rated as one of the largest influences on women’s everyday lives in coastal Bangladesh. This exacerbates women’s unpaid household burdens and contributes to emotional trauma due to: water scarcity; cyclones; salinity intrusion, loss of means of subsistence for vulnerable women-headed families, and demands surrounding recovery from disasters (Pourzand & Noy, 2022). One possible explanation for the high overall mean score could be that climate vulnerability continues to be a significant contextual factor affecting labor (invisibility) and psychological well-being. These findings also imply that concrete policy measures are needed in Bangladesh’s coastal areas to target women’s emotional stress through strengthened climate resilience, more access to safe water and basic services, gender-responsive disaster risk reduction and adaptation policies, as well as recognition of unpaid labor.

Findings

- The characteristics of the participants were mostly 26–35-year-old married women with a low to moderate level of education and economic status, which are similar to the socioeconomic status of coastal households in Bangladesh.

- One largely unseen aspect of women in coastal households was the involvement and time they devoted to unpaid household chores, caregiving duties, and economic engagement activities.

- The study revealed high levels of episode emotional stress among the women, with emotional exhaustion and family responsibilities being the mission (family and social roles) and concern for financial management mainly reported during episodes, while unrecognized work did not follow.

- Climate vulnerability context in coastal households increased non-paid work of women with factors like cyclones, salinity intrusion, water scarcity and destruction/harm to livelihoods.

- The results suggest that the association between women invisible labor, their emotional stress and coastal household vulnerability is tightly interwoven with implications of gender responsive policies and climate adaptation at large particularly for women’s well-being in coastal Bangladesh.

Recommendations

- Creation of the more formal recognition of the invisible work carried out by women through gender sensitive development and social protection policies, integrating unpaid care and domestic work in government agencies and development organizations.

- A focus on community-based programs that train the gender equitable sharing of unpaid household and

caregiving work within families to minimize the burden of both care work and emotional labor borne by women.

- Access to mental health counseling, psychosocial support services and community awareness programs must be initiated in coastal regions for the treatment of the mental and emotional well-being of women.

- Investments are required in improving access to safe drinking water, climate-resilient infrastructure, disaster preparedness and livelihood diversification to lessen the burden of coastal environmental hazard risk.

- Policymakers need to implement gender-sensitive policy for climate adaptation and disaster risk reduction that engages women as active participants in planning and decision-making processes, also acknowledging the indispensable roles they play in ensuring household resilience and community recovery.

CONCLUSION

This study explored women's invisible labor in relation to emotional stress in coastal households in Bangladesh taking into accounts the effects of the coastal household vulnerability context. The results showed that although women play a decisive role in ensuring household well-being, they perform a huge volume of unpaid domestic and care work, as well as other livelihood-related tasks, which receive little formal recognition. Women, according to the study, suffer from high emotional fatigue chiefly due to heavy workloads intertwined with financial uncertainties and caregiving responsibilities while their contributions go largely unrecognized. Moreover, climate extremes (cyclones), salinity intrusion, water scarcity and livelihood disruption exacerbated both operational burden and emotional wellbeing among women. The interrelatedness of gender inequality, unpaid labor and climate vulnerability in coastal communities is emphasized by these findings. Thus, the conclusion can be drawn that bringing women's invisible labor to the forefront, institutionalizing psychosocial support, strengthening climate-resilient infrastructure and basic services as well as integrating gender-responsive climate adaptation policies with social protection measures are critical for women's wellbeing, household resilience and sustainable development in deltaic Bangladesh.

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