

Tigers, Trauma, and Livelihood: Understanding the Mental Health of Sundarbans' Women Warriors

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Abstract

The Sundarbans, the world's largest mangrove ecosystem, presents a unique landscape where ecological volatility, predator-prey dynamics, and climate-induced hazards intersect with human survival. Within this high-risk biome, women engage in dangerous forest-based occupations such as crab fishing, honey collection, and wood gathering—roles that place them in immediate proximity to Royal Bengal tigers, crocodiles, venomous snakes, tidal surges, and cyclones. This thesis investigates the multidimensional psychological experiences of these women, focusing on how continuous exposure to life-threatening conditions shapes trauma, coping, resilience, and cultural meaning-making. Despite their critical economic contributions, the mental health of these “women warriors” remains deeply under-researched, particularly in relation to the ways gender, culture, poverty, and ecology combine to influence psychological well-being.

Guided by Lazarus and Folkman's Transactional Model of Stress and Coping, the study examines how women assess environmental threats through primary and secondary appraisal, and how they employ both problem-focused and emotion-focused coping strategies to navigate danger. To deepen this analysis, the research integrates Hobfoll's Conservation of Resources (COR) Theory, which conceptualizes trauma as emerging from cumulative resource loss—such as safety, stability, income, community support, and emotional regulation—within chronically hazardous environments. The theoretical integration offers a comprehensive framework to understand the psychological burden of ecological risk, gendered labor expectations, cultural resilience, and the structural vulnerabilities inherent to life in the Sundarbans.

A mixed-methods research design was employed, involving twenty purposively selected women aged 18–55 who regularly enter the forest for livelihood purposes. Quantitative data were collected using the Perceived Stress Scale (PSS) and Impact of Event Scale-Revised (IES-R) to measure stress appraisal and trauma symptoms. Qualitative insights were gathered through semi-structured interviews exploring lived experiences of fear, survival techniques, cultural rituals, Bonbibi worship, and intergenerational transmission of coping practices. The convergent parallel analysis allowed for the integration of statistical patterns with rich narrative accounts, enhancing the depth, validity, and contextual grounding of the findings.

Results reveal that women experience chronic hypervigilance, intrusive memories, emotional numbing, and persistent anxiety, often consistent with symptoms of post-traumatic stress disorder (PTSD). However, trauma is frequently normalized within community culture, leading to emotional suppression and acceptance of danger as a routine aspect of livelihood. Cultural beliefs—especially worship of Bonbibi, the revered forest deity—emerge as powerful psychological resources. Rituals, devotional narratives, and communal practices serve as culturally embedded mechanisms that regulate

fear, promote spiritual reassurance, reinforce group solidarity, and structure the cognitive reframing of danger. For many women, faith-based coping compensates for the near absence of formal mental health services in the region.

The research further highlights that gendered socioeconomic constraints significantly intensify mental distress. Women bear a dual burden: hazardous labor outside the home and extensive caregiving and household responsibilities within it. Tiger widows (“Bagh Bidhoba”) face extreme social stigma, financial insecurity, and emotional isolation, often entering severe resource-loss spirals described by COR theory. Environmental degradation, climate change, and recurrent cyclones exacerbate these vulnerabilities by destabilizing livelihoods and eroding community resources.

The study concludes that while women demonstrate extraordinary resilience, their psychological well-being is threatened by structural inequalities, ecological precarity, and the complete absence of trauma-informed mental health systems. The findings underscore the urgent need for culturally responsive mental health interventions, including mobile psychological services, community-based counseling programs, resilience-building workshops, and livelihood diversification initiatives. Additionally, integrating indigenous belief systems—such as Bonbibi worship—into mental health programs may increase cultural acceptance and therapeutic effectiveness. The thesis contributes to the broader discourse on gender, ecology, and mental health by illuminating the lived realities of women who endure and adapt to one of the most perilous working environments in the world.

1. Introduction

The Sundarbans, a sprawling labyrinth of mangroves located at the confluence of the Ganges, Brahmaputra, and Meghna rivers, is recognized as the largest contiguous mangrove forest in the world. This unique ecological zone is shared between India and Bangladesh, serving as a sanctuary for countless species, including the critically endangered Royal Bengal tiger (*Panthera tigris tigris*). While the Sundarbans' rich biodiversity has made it a site of ecological importance, it is also home to thousands of human inhabitants who depend on the forest for their survival. These individuals engage in various forest-based livelihoods such as fishing, honey collection, wood gathering, and crab catching.

For the women of the Sundarbans, these livelihood activities come at an immense cost. Venturing deep into the mangroves exposes them to fatal dangers such as tiger attacks, crocodile ambushes, and venomous snake bites. The menacing presence of the Royal Bengal tiger has led to this region being referred to as a “tiger country,” where human-wildlife conflict is a daily reality (Halder, 2024). Despite the risks, economic necessity forces women into the forests, where they exhibit extraordinary resilience in the face of life-threatening adversities. These women, often called “women warriors,” embody unparalleled courage, yet their strength comes at the price of their mental well-being.

Exposure to chronic danger manifests in profound psychological challenges such as persistent stress, anxiety disorders, post-traumatic stress disorder (PTSD), and depressive symptoms. The perpetual uncertainty surrounding their safety influences their thought processes, behaviors, and emotional responses. Living in a high-risk environment requires them to adopt survival strategies shaped by behavioral conditioning and cognitive adaptation. These include hyper-vigilance, emotional desensitization, and avoidance behaviors. Trauma psychologists suggest that such exposure leads to cognitive changes where women develop heightened alertness, difficulty in relaxation, and an ingrained sense of fatalism (Mazumdar, 2024). Over time, these adaptive mechanisms can result in emotional detachment, reduced capacity for social bonding, and an altered perception of personal safety.

Another crucial aspect of their lives is the role of cultural beliefs in shaping their mental frameworks. The Sundarbans' communities have long placed their faith in Bonbibi, a guardian deity worshipped across religious lines by both Hindus and Muslims. The legend of Bonbibi narrates the story of her divine intervention in protecting human beings from Dakshin Rai, a tiger deity symbolizing the forest's dangers. Women rely on their faith in Bonbibi as a coping mechanism, which provides them with psychological reassurance (Ghosh & Das, 2024). This spiritual practice not only instills a sense of protection but also influences behavioral adaptation strategies that are passed down through generations. While faith in Bonbibi offers emotional relief, it may also reinforce a sense of fatalism that discourages the adoption of scientific safety measures or mental health interventions. Additionally, the communal rituals associated with Bonbibi worship create a shared sense of

resilience and solidarity among these women, fostering social bonds that further support their psychological well-being (Ahmed & Roy, 2024).

Furthermore, gendered socio-economic constraints intensify the burden on these women. Besides engaging in hazardous occupations, they are also responsible for household duties, caregiving, and financial contributions. Their dual role as both providers and caregivers exacerbates mental health stressors. According to Samanta (2023), intergenerational trauma indicate that children raised in such environments often internalize fear and survivalist behavior, continuing cycles of anxiety and hyper-vigilance into future generations. The psychological impact of such exposure extends beyond immediate trauma, influencing the development of coping mechanisms that prioritize resilience at the expense of emotional vulnerability (Banerjee & Dey, 2024). This is particularly evident in the ways in which daughters of these women warriors learn to navigate risk, often inheriting similar patterns of emotional suppression and conditioned responses to danger.

Unfortunately, mental health remains an overlooked aspect of public health interventions in the Sundarbans, leaving these women with limited access to psychological support (Mitra, 2024). The absence of trauma-informed care, mental health awareness, and gender-sensitive healthcare further exacerbates their challenges. Addressing these issues requires community-based interventions, including self-help groups, mobile mental health units, and trauma counseling that align with the socio-cultural landscape of the Sundarbans (Hazra, 2023). Additionally, integrating traditional healing practices with modern psychological support systems could create a hybrid approach that resonates with local beliefs while offering effective mental health care.

This study seeks to explore the intricate relationship between occupational hazards, cultural belief systems, behavioral conditioning, and cognitive adaptation in the lives of Sundarbans' women warriors. By examining these dynamics, it aims to shed light on how they sustain their livelihoods while coping with extreme ecological and socio-economic adversities. The findings will provide valuable insights into the psychological resilience of these women and contribute to discussions on mental health support tailored to communities living in high-risk environments (Sarkar & Ghosh, 2024). Moreover, this research will serve as a foundation for advocating policy reforms that prioritize mental health as an integral component of ecological conservation and community welfare initiatives. A comprehensive understanding of the intersection between occupational risk, psychological trauma, and cultural resilience will not only enhance existing knowledge but also inform future strategies for mitigating the mental health challenges faced by women in the Sundarbans (Sinha, 2024).

2. Review of Literature

2.1. Psychological Trauma and Adaptation

Exposure to chronic danger manifests in profound psychological challenges such as persistent stress, anxiety disorders, post-traumatic stress disorder (PTSD), and depressive symptoms. The perpetual uncertainty surrounding their safety influences their thought processes, behaviors, and emotional responses (Majumdar, 2023). Living in a high-risk environment requires them to adopt survival strategies shaped by behavioral conditioning and cognitive adaptation. These include hyper-vigilance, emotional desensitization, and avoidance behaviors. Trauma psychologists suggest that such exposure leads to cognitive changes where women develop heightened alertness, difficulty in relaxation, and an ingrained sense of fatalism. Over time, these adaptive mechanisms can result in emotional detachment, reduced capacity for social bonding, and an altered perception of personal safety (Kar, 2024).

The phenomenon of hyper-vigilance is particularly noticeable among women who enter the forest regularly. Many of them describe an inability to disengage from their fears even within the relative safety of their homes (Basu, 2024). Nightmares, intrusive memories of tiger attacks, and a persistent sense of being watched are commonly reported symptoms of trauma-induced anxiety. Over time, these individuals may develop symptoms consistent with PTSD, including flashbacks, emotional numbness, and heightened startle responses. Additionally, the lack of mental health awareness means that many women are unable to recognize their distress as psychological trauma, instead interpreting their emotional suffering as an inevitable aspect of life (Hossain & Sardar, 2023).

Another crucial aspect of their lives is the role of cultural beliefs in shaping their mental frameworks. The Sundarbans' communities have long placed their faith in Bonbibi, a guardian deity worshipped across religious lines by both Hindus and Muslims. The legend of Bonbibi narrates the story of her divine intervention in protecting human beings from Dakshin Rai, a tiger deity symbolizing the forest's dangers (Zaman & Khan, 2023). Women rely on their faith in Bonbibi as a coping mechanism, which provides them with psychological reassurance. This spiritual practice not only instils a sense of protection but also influences behavioral adaptation strategies that are passed down through generations. While faith in Bonbibi offers emotional relief, it may also reinforce a sense of fatalism that discourages the adoption of scientific safety measures or mental health interventions (Mandal & Dutta, 2023). Additionally, the communal rituals associated with Bonbibi worship create a shared sense of resilience and solidarity among these women, fostering social bonds that further support their psychological well-being.

Cognitive adaptations to trauma extend beyond individual experiences and influence collective survival strategies. Women who have encountered direct threats often develop an almost instinctual sense of risk assessment, choosing specific routes within the forest, avoiding certain areas, and adhering strictly to ritualistic practices before entering the mangroves (Dutta, 2023). These learned behaviors demonstrate an interplay between psychological trauma, cultural conditioning, and pragmatic survival strategies. While such adaptations help women navigate danger, they also lead to long-term psychological repercussions, including heightened stress responses and difficulty in emotional regulation.

2.2. The Conservation of Resources (COR) Theory and Psychological Adaptation

2.2.1. Resource Loss and Ecological Danger

In the Sundarbans, ecological dangers such as tiger encounters, tidal waves, and sudden cyclones represent persistent threats that erode women's sense of safety and psychological stability. COR theory emphasizes that environmental instability triggers chronic stress when individuals continuously lose material or psychological resources needed for survival (Hobfoll, 1989). The literature shows that women routinely risk losing essential assets—boats, nets, or catch—which intensifies anxiety and heightens emotional vulnerability (Naskar, 2023; Kabir & Sen, 2024). This understanding broadens existing interpretations of trauma by framing ecological danger as a continuous resource-draining force.

2.2.2. Cultural Faith as Resource Caravan

Women's reliance on Bonbibi is not simply superstition but a structured psychological resource that forms part of a larger "resource caravan." COR theory suggests that individuals accumulate clusters of supportive factors that collectively buffer against stress. Rituals, folk stories, and communal prayers therefore serve as emotional shields, strengthening women's sense of control and spiritual reassurance (Bandyopadhyay, 2023; Dey & Roy, 2024). These culturally embedded resources help maintain resilience despite limited formal mental health interventions.

2.2.3. Gendered Resource Deprivation

The literature highlights how women's limited access to economic independence, mobility, and social power creates conditions of chronic resource scarcity (Sharma, 2024; Patra, 2024). COR theory explains that individuals with fewer initial resources experience greater psychological harm during crises because they lack the means to recover losses. For Sundarbans' women, social stigma and gendered expectations intensify emotional exhaustion and reduce opportunities to rebuild depleted resources.

2.2.4. Loss Spirals Among Tiger Widows

Women who lose spouses to tiger attacks face profound resource loss: financial security, social standing, and emotional companionship simultaneously disappear. COR theory refers to this cascading effect as a "loss spiral," where one loss triggers subsequent losses that compound psychological trauma. This aligns with observations in the literature that tiger

widows experience severe social ostracism and elevated mental distress (Mandal & Dutta, 2023; Mukherjee, 2023), making them one of the most vulnerable groups in the region.

2.2.5. Behavioral and Cognitive Adaptations as Resource Protection

Existing analysis shows that women employ behavioral conditioning—such as route planning, group vigilance, and ritual repetition—to cope with ecological danger (Kar, 2024; Ghosh & Das, 2024). COR theory interprets these behaviors as strategies to conserve psychological resources. Hypervigilance, emotional desensitization, and cognitive reframing protect against emotional overload, enabling women to continue working despite fear. However, prolonged reliance on these strategies also contributes to fatigue and burnout. 6. Implications for Mental Health Interventions By integrating COR theory, the literature suggests that effective mental health interventions must replenish not only psychological but also social and economic resources. Programs such as microfinance initiatives, trauma-informed community groups, and culturally grounded mental health services could counteract resource loss spirals (Iyer & Bhattacharjee, 2024; Singh & Paul, 2023). This aligns with earlier calls for hybrid mental health approaches that blend traditional practices with modern psychological tools.

2.2.6. The Socioeconomic Burden and Gendered Expectations

Furthermore, gendered socio-economic constraints intensify the burden on these women. Besides engaging in hazardous occupations, they are also responsible for household duties, caregiving, and financial contributions. Their dual role as both providers and caregivers exacerbates mental health stressors. As per to Patra (2024) intergenerational trauma indicate that children raised in such environments often internalize fear and survivalist behavior, continuing cycles of anxiety and hypervigilance into future generations. The psychological impact of such exposure extends beyond immediate trauma, influencing the development of coping mechanisms that prioritize resilience at the expense of emotional vulnerability. This is particularly evident in the ways in which daughters of these women warriors learn to navigate risk, often inheriting similar patterns of emotional suppression and conditioned responses to danger (Mishra & Rao, 2023).

Women also face societal pressures that further compound their distress. In many cases, they are expected to suppress their fears and grief to maintain family stability (Bhattacharya & Ghosh, 2023). The normalization of trauma within the community prevents many women from seeking emotional support, reinforcing a cultural expectation of silent endurance. The pressure to uphold this facade of resilience creates a cycle in which women continue to engage in dangerous livelihoods without expressing their distress, leading to long-term psychological consequences. Additionally, societal norms dictate that women remain emotionally strong and unwavering in their duties, which discourages open discussions about mental health challenges and fosters further isolation (Subramaniam, 2024).

The economic dependence of families on forest-based livelihoods leaves women with few alternatives. The lack of employment opportunities forces them into high-risk professions despite the dangers involved. Many women report feelings of entrapment, where they recognize the risks yet feel powerless to seek alternative means of survival (Sharma, 2024). The absence of financial independence exacerbates their distress, contributing to a sense of hopelessness that further impacts their mental well-being.

Economic stress also manifests in physical and mental exhaustion. Women must wake up before dawn to prepare meals, ensure their families are taken care of, and then embark on perilous journeys into the mangrove forests (Freeman & Pandey, 2023). The physical toll of balancing these responsibilities, coupled with malnutrition and sleep deprivation, contributes to deteriorating health conditions. Many suffer from chronic illnesses exacerbated by stress and lack of medical care, which in turn intensifies their psychological burden. Without structured rest or medical intervention, their bodies and minds become vulnerable to long-term damage (Chakraborty, 2023).

2.3. The Conservation of Resources (COR) Theory and Resource Loss in High-Risk Environments

Hobfoll's Conservation of Resources (COR) Theory—offers a complementary perspective on why chronic ecological danger results in cumulative psychological depletion. COR theory posits that individuals strive to obtain, retain, and protect resources—tangible (e.g., income, tools), social (e.g., community support), and psychological (e.g., self-esteem, sense of control). Stress occurs when resources are lost or are insufficient to meet environmental demands (Hobfoll, 1989). For Sundarbans' women, the constant threat of tiger attacks, climate disasters, and economic scarcity represents an environment where resource loss is ongoing, severe, and often uncontrollable.

This framework aligns with extensive evidence in your existing literature review showing how women's mental health is shaped by long-term exposure to danger, gendered burdens, and cultural constraints (Majumdar, 2023; Basu, 2024; Ghosh & Das, 2024). COR theory helps explain why psychological distress accumulates across time: every foray into the forest risks not only life but also the loss of livelihood resources, family stability, and social belonging. According to the theory, repeated resource loss is more detrimental than resource gain, meaning that even acts of survival—returning alive—do not replenish the psychological and material deficits inflicted by dangerous work.

Moreover, COR theory highlights that resource caravans—bundles of interconnected resources—determine resilience. For Sundarbans' women, cultural beliefs such as Bonbibi worship, community rituals, and shared folk narratives function as psychological resources that form a protective caravan (Chatterjee, 2024; Khan, 2023). These resources do not merely serve symbolic roles but actively buffer the negative impact of ecological threats by generating emotional reassurance and collective solidarity. Thus, COR theory deepens the understanding of why cultural beliefs remain central despite limited mental health services.

Furthermore, the theory underscores how resource inequity and gendered deprivation produce greater vulnerability. Women in the Sundarbans face restrictions on mobility, income, and decision-making power, heightening the psychological toll of their work (Bhattacharya & Ghosh, 2023; Subramaniam, 2024). COR theory explains that individuals with fewer initial resources are more likely to enter “loss spirals,” where trauma, poverty, and social exclusion magnify each other. Tiger-widows (“Bagh Bidhoba”) exemplify this spiral: after losing their husbands, they also lose social respect, financial security, and emotional support, compounding their mental distress (Mukherjee, 2023).

Additionally, COR theory helps conceptualize the dual burden of economic survival and domestic responsibility. Women's constant balancing between home duties and life-threatening labor reflects continual resource expenditure with minimal replenishment. Emotional suppression, hypervigilance, and cognitive reframing—described in your existing work (Rahman & Islam, 2024; Bose & Sinha, 2023)

Finally, the integration of COR theory strengthens policy implications. It suggests that mental health interventions must focus not only on trauma recovery but also on resource restoration—including stable income, community safety training, access to healthcare, and social support networks. Programs that replenish resources reduce the likelihood of loss spirals and help rebuild resilience.

2.4. Lack of Mental Health Interventions and Possible Solutions

Unfortunately, mental health remains an overlooked aspect of public health interventions in the Sundarbans, leaving these women with limited access to psychological support. The absence of trauma-informed care, mental health awareness, and gender-sensitive healthcare further exacerbates their challenges. Addressing these issues requires community-based interventions, including self-help groups, mobile mental health units, and trauma counselling that align with the socio-cultural landscape of the Sundarbans (Joshi & Rao, 2023). Additionally, integrating traditional healing practices with modern psychological support systems could create a hybrid approach that resonates with local beliefs while offering effective mental health care.

Educational programs focusing on mental health literacy could also serve as a valuable tool in breaking the stigma associated with psychological distress. By promoting awareness about trauma and stress-related disorders, these programs could encourage women to seek help and develop healthier coping mechanisms (Palit & Choudhury, 2023). Additionally,

training local healthcare workers to recognize and address psychological distress could bridge the gap between the community and mental health services.

Economic empowerment initiatives that provide alternative livelihood options may also play a crucial role in reducing women's exposure to occupational hazards. Microfinance programs, skill development workshops, and sustainable livelihood alternatives could enable women to transition away from high-risk occupations while maintaining financial stability. Such initiatives not only improve their economic conditions but also contribute to their overall well-being by reducing the constant fear of fatal encounters in the forest (Singh & Paul, 2023).

Additionally, establishing trauma recovery centers that incorporate culturally sensitive approaches could provide a safe space for women to process their experiences and receive structured support. These centers could offer peer-led discussions, group therapy, and vocational training programs, ensuring that women have access to both psychological care and economic opportunities (Iyer & Bhattacharjee, 2024). Long-term investment in these initiatives is crucial in transforming the landscape of mental health support for women in high-risk environments. Moreover, initiatives promoting legal awareness and advocacy for occupational safety could empower women with the knowledge to demand better working conditions and protections. Psychological resilience programs, mindfulness training, and structured relaxation techniques could also be introduced as part of community workshops to provide women with tools to manage their stress and mental well-being effectively (Nandi & Pal, 2024).

3. Rationale of the Study

The need for this study arises from the intersection of ecological risks, occupational hazards, and psychological resilience among women in the Sundarbans who engage in high-risk livelihoods. The Sundarbans is not only an environmentally fragile region but also a place where human survival is deeply intertwined with unpredictable natural forces (Kabir & Sen, 2024). Women here take on essential economic roles, particularly in fishing, crab collection, and honey gathering, all of which expose them to extreme dangers, including attacks by Royal Bengal tigers, crocodiles, and venomous snakes, as well as the recurrent devastation caused by cyclones, tidal surges, and rising sea levels (Roy, 2024).

Despite the life-threatening nature of their occupations, these women have developed unique cognitive adaptations and behavioral mechanisms to cope with their circumstances. Yet, existing research on the psychosocial aspects of survival in the Sundarbans remains largely limited (Sinha & Verma, 2023). While studies have explored ecological degradation and climate change, the psychological dimensions of everyday survival, particularly among women, remain underexamined. This study aims to bridge that gap by exploring the mental health implications of chronic exposure to risk, focusing on how these women mentally, emotionally, and socially sustain themselves in a landscape defined by both beauty and peril.

3.1. Psychological Coping and Adaptation to Risk

Living with the constant threat of danger requires the development of distinct coping mechanisms that allow women to continue their daily work despite the risks involved (Rahman & Islam, 2024). One of the key inquiries of this study is to analyze how these women cognitively adapt to the unpredictability of their environment. Several psychological aspects play a crucial role:

Lazarus and Folkman's Transactional Model of Stress and Coping provides a robust framework to understand this adaptation (Lazarus & Folkman, 1984). According to this model, psychological stress is not merely a result of external threats but arises from the dynamic interaction between an individual and their environment, especially how the person appraises a threat and the resources they believe they possess to cope with it (Verma, 2023). In this case, the women of Sundarbans undergo a continuous cycle of primary appraisal (assessing the danger of the forest environment) and secondary appraisal (evaluating their ability to manage this danger, whether through cultural rituals, group strategies, or spiritual beliefs).

These cognitive appraisals are central to cognitive reframing, where women reinterpret fear and normalize it as a manageable aspect of life. Their reliance on rituals and communal support aligns with emotion-focused coping, helping regulate distress without necessarily changing the threat itself (Sen & Mitra, 2023). Simultaneously, strategic decision-making—such as route planning or group formations—represents problem-focused coping, an active attempt to modify the environmental stressor.

By framing their experience through this model, the research will further reveal how personal meaning-making, cultural faith, and perceived control mediate psychological outcomes under chronic ecological threat (Dey & Roy, 2024).

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3.2. Cognitive Reframing of Fear

Women in high-risk professions in the Sundarbans do not view danger as an occasional event but as a constant reality. Unlike individuals who experience fear as a sudden, situational reaction, they develop a long-term psychological framework that allows them to normalize fear and integrate it into their daily decision-making (Bose & Sinha, 2023).

This study examines whether repeated exposure to environmental threats alters cognitive responses to fear—does it make them emotionally desensitized, or does it increase stress vulnerability over time?

- Women in high-risk professions in the Sundarbans do not view danger as an occasional event but as a constant reality. Unlike individuals who experience fear as a sudden, situational reaction, they develop a long-term psychological framework that allows them to normalize fear and integrate it into their daily decision-making.
- This study examines whether repeated exposure to environmental threats alters cognitive responses to fear—does it make them emotionally desensitized, or does it increase stress vulnerability over time?

3.3. Behavioral Conditioning and Risk Tolerance

- Through habitual exposure to extreme risks, these women may exhibit forms of behavioral conditioning, where their threshold for perceiving danger changes.
- The study explores how past survival experiences influence present decision-making—do these women become more strategic and calculated in their approach to danger, or do they exhibit signs of fatalistic thinking, believing that death is an inevitable part of their occupation?

3.3.1. Impact of Occupational Trauma on Mental Health

- Chronic exposure to tiger attacks, the drowning of fellow workers, or life-threatening weather events can result in long-term psychological effects, including anxiety disorders, depression, and PTSD.
- The study seeks to analyze whether women receive any form of psychological support or whether their mental distress remains unaddressed due to social and economic constraints.

3.3.2. Dual Burden of Economic and Domestic Responsibilities

- Beyond the external risks posed by the environment, women in the Sundarbans also carry the weight of household responsibilities. Unlike men, who often migrate in search of work, these women remain behind, balancing dangerous labor with domestic duties such as caregiving, food preparation, and childcare.
- This study investigates how this dual burden impacts their psychological resilience and stress levels—does it serve as a source of emotional strength, or does it lead to heightened exhaustion and mental strain?

3.4. The Role of Cultural Beliefs and Spiritual Resilience

A major focus of this research is the role of cultural and religious belief systems in shaping psychological resilience. The worship of Bonbibi, the guardian deity of the Sundarbans, serves as a spiritual anchor for the people of this region, particularly for women who venture into the forests for survival (Bandyopadhyay, 2023).

3.4.1. Bonbibi as a Psychological Coping Mechanism

- Bonbibi is not just a religious figure but also a symbol of protection and emotional reassurance.
- Before entering the forest, women perform ritualistic prayers and offerings, believing that Bonbibi will protect them from the tiger and other dangers.
- This study explores whether this belief serves as a psychological buffer—does faith in Bonbibi reduce fear-induced stress and provide a sense of security, even in dangerous situations?

3.4.2. The Role of Rituals in Fear Management

- Many women engage in specific pre-rituals, such as fasting or reciting sacred verses before entering the jungle, which may serve as a structured mental preparation process that enhances psychological resilience.
- The study seeks to understand whether participation in these religious rituals improves emotional regulation and fosters a collective sense of courage among women.

3.4.3. Folk Narratives and Cultural Identity

- Bonbibi's story—where she protects the helpless against Dakshin Rai, the embodiment of the tiger—has been passed down through generations as a moral and psychological guide (Khan, 2023).
- This study examines how these narratives shape risk perception—do women see themselves as protagonists in their own struggle, much like the characters in the Bonbibi legend?
- The research also investigates whether these narratives help women develop a deeper sense of resilience, identity, and belonging within their communities.

3.5. Gendered Dimensions of Ecological Danger

Women in the Sundarbans face unique psychological stressors compared to men, largely due to social structures, economic dependencies, and the cultural expectations placed upon them (Rajan & Thomas, 2023). This study explores how gender roles influence the experience of risk, trauma, and resilience in high-risk environments.

1. Widows of Tiger Attacks and Social Stigma:

- Women whose husbands are killed by tigers are known as "Bagh Bidhoba" (Tiger Widows) (Mukherjee, 2023).
- These women often face severe social discrimination, as local superstition suggests that they are cursed or bring bad luck.
- The study investigates how widowhood amplifies psychological distress and limits access to social and emotional support.

2. Limited Access to Mental Health Resources:

- Women in these communities rarely have access to mental health professionals or psychological counselling.
- This study explores how the lack of mental health awareness leads to alternative coping mechanisms, such as community reliance, faith-based practices, or emotional suppression.

3. Economic Dependence and Psychological Burden:

- Many women continue their perilous occupations due to economic necessity, despite experiencing chronic fear and psychological exhaustion.

- This study seeks to understand how financial insecurity contributes to mental stress and whether women feel trapped in an inescapable cycle of danger and economic survival.

3.6. Implications for Policy and Mental Health Interventions

By highlighting the psychological struggles and resilience of women in the Sundarbans, this study has significant implications for policymakers, NGOs, and mental health professionals.

1. Development of Community-Based Mental Health Support Systems:

- The study advocates for integrating mental health support within community networks, using local leaders and spiritual figures as counselling intermediaries.

2. Gender-Sensitive Mental Health Policies:

- Policies must recognize the unique psychological burdens faced by women in high-risk occupations and provide accessible mental health care tailored to their specific needs.

3. Culturally Responsive Interventions:

- Any mental health program designed for these communities must incorporate cultural beliefs, ensuring that interventions are respected and accepted by the people.

By examining how women in the Sundarbans psychologically endure and adapt to their high-risk livelihoods, this research aims to influence both academic discourse and real-world policies, ensuring that their resilience does not go unnoticed and that their mental health needs are adequately addressed.

4. Methodology

This study adopts Lazarus and Folkman's Transactional Model of Stress and Coping as a guiding theoretical lens to analyze the psychological processes of women navigating high-risk occupations in the Sundarbans (Lazarus, 1993). The model posits that individuals respond to stress through a dual process of primary and secondary appraisal, followed by coping strategies that are either emotion-focused or problem-focused (Zia, 2024). This perspective allows for a nuanced understanding of how women cognitively evaluate threats and marshal internal and external resources to manage them.

The research will examine whether women experiencing high levels of occupational risk engage more frequently in cognitive appraisal processes and develop structured coping mechanisms as proposed by the model. The dual focus on environmental danger and cultural mediation aligns with the framework's emphasis on contextual and individual factors.

4.1. Research Problem

How do occupational risks and cultural beliefs influence behavioral conditioning and cognitive adaptation among women engaged in high-risk livelihoods in the Sundarbans?

4.2. Objectives

1. To examine the relationship between occupational risk and behavioral conditioning among Sundarbans' women warriors.
2. To investigate how cultural beliefs mediate cognitive adaptation to chronic trauma.
3. To analyze the psychological impact of ecological dangers on mental health outcomes.
4. To explore the gendered dimensions of occupational stress and coping mechanisms.

4.3. Hypotheses

- H1: Occupational risk is positively associated with increased behavioral conditioning.
- H2: Cultural beliefs play a significant role in facilitating cognitive adaptation to trauma.
- H3: Women experiencing higher occupational risks will exhibit greater cognitive adaptation strategies.

4.4. Inclusion and Exclusion Criteria

Inclusion Criteria

- Gender: Female; Women who actively participate in forest-based livelihoods such as crab fishing, honey collection, or wood gathering, as specified in the sample description.
- Age Range: 18–55 years; This age range captures both young and experienced women currently engaged in high-risk occupations and aligns with your sampling criteria.
- Residence in the Sundarbans Region; Participants must reside in the Indian Sundarbans communities and rely on the mangrove forest for livelihood activities.
- Active Engagement in High-Risk Occupations; Women must have regular exposure to occupational dangers such as tiger attacks, crocodile-infested waters, snake bites, and climate hazards.
- Minimum of 1 Year of Forest-Based Work Experience; Ensures participants have substantial exposure to ecological danger, behavioral conditioning, and cultural coping mechanisms.
- Willingness to Participate in the Study; Participants must voluntarily consent to both qualitative interviews and quantitative assessments (questionnaires, scales).
- Ability to Communicate Experiences; Participants must be able to articulate their experiences regarding occupational risks, cultural beliefs, trauma, and coping mechanisms.

Exclusion Criteria

- Men or Individuals Not Identifying as Women; The study specifically examines gendered dimensions of trauma and coping among women, as outlined in the synopsis.
- Individuals Not Engaged in Forest-Based High-Risk Livelihoods; Those whose livelihoods are not tied to crab fishing, honey collection, wood gathering, or similar forest exposures will be excluded.
- Women Outside the Age Range of 18–55; To maintain consistency with the sampling framework and avoid confounding age-related psychological variables.
- Individuals with Severe Cognitive or Communication Impairments; Those unable to meaningfully participate in interviews or complete structured questionnaires.
- New Residents with Less Than 1 Year of Work Exposure; As they may not have adequately internalized survival patterns, cognitive adaptations, or cultural coping mechanisms central to the study.
- Individuals Not Willing to Participate or Withdraw Consent; Participation is voluntary and requires willingness to engage in both qualitative and quantitative components.
- Participants Experiencing Acute Medical or Psychiatric Emergencies; Their participation may be unsafe or unreliable for accurate data collection.

5. Operational Definitions

5.1. Occupational Risk

Occupational risk in the Sundarbans encompasses the life-threatening challenges women face as they engage in high-risk livelihoods, primarily crab fishing, honey collection, and wood gathering. These activities demand direct interaction with the forest and waterways, where they encounter predatory threats, venomous creatures, and extreme weather conditions (Shah, 2023).

One of the most prominent dangers is the risk of tiger attacks, as the Sundarbans is home to the Royal Bengal tiger, known for its unpredictable and aggressive behavior. Women entering the mangroves for sustenance often do so without formal

protective measures, making them particularly vulnerable (Tiwari & Chatterjee, 2023). Additionally, crocodile-infested waters pose a constant threat, especially for those who navigate rivers and creeks while collecting resources.

Beyond predation, occupational risks also include snake bites, as venomous species thrive in the humid, dense undergrowth of the Sundarbans. Without access to immediate medical care, a single snakebite can become fatal. Moreover, extreme climatic conditions, such as sudden cyclones, flooding, and high tidal waves, further endanger women working in exposed, unstable environments.

However, the risks extend beyond immediate physical threats. Chronic exposure to danger leads to persistent psychological stress, creating long-term anxiety, hypervigilance, and trauma. Women who frequently experience near-death situations may develop symptoms akin to post-traumatic stress disorder (PTSD), including intrusive memories, heightened fear responses, and emotional desensitization (Naskar, 2023). The constant psychological burden of knowing that every trip into the forest could be their last reshapes their perception of safety, self-preservation, and mental endurance.

5.2. Cultural Beliefs

Cultural beliefs in the Sundarbans act as both spiritual guidance and psychological coping mechanisms, deeply influencing how women perceive and navigate occupational hazards. One of the most significant cultural elements in this context is the worship of Bonbibi, the guardian deity of the forest (Saha & Sengupta, 2023). Bonbibi, revered by both Hindus and Muslims, is believed to protect forest-goers from the wrath of tigers and other unseen dangers lurking in the mangroves.

Before venturing into the forest, many women perform rituals to invoke Bonbibi's protection, such as reciting prayers, carrying sacred objects, or observing specific taboos to avoid misfortune. These religious practices are not merely symbolic; they offer a psychological sense of safety, reducing fear and uncertainty. Women often believe that their survival depends not only on caution but also on divine will, reinforcing an acceptance of risk as part of fate.

In addition to spiritual faith, oral traditions and folklore passed down through generations shape their mental resilience. Stories of past survivors, tales of Bonbibi's interventions, and community-held beliefs about forest spirits instill a collective moral framework that explains danger in terms of divine justice and human humility (Chatterjee, 2024). By internalizing these narratives, women develop mental strategies to endure hardship without feeling entirely powerless.

Moreover, faith-based practices promote social bonding, as communal worship and storytelling strengthen solidarity among women who share similar struggles. This collective belief system not only mitigates individual anxiety but also reinforces group identity, helping them cope with isolation and trauma in a harsh, unpredictable environment.

5.3. Behavioural Conditioning

Behavioral conditioning refers to the learned responses and adaptive behaviors women develop over time to navigate occupational risks. Unlike instinctive reactions, these behaviors emerge through experience, observation, and cultural transmission, enabling women to manage threats with minimal panic and maximum preparedness.

One of the most significant conditioned behaviors is risk-avoidance through environmental awareness. Women who venture into the forest learn to interpret natural warning signs, such as changes in bird calls, sudden silences, or unusual animal behavior, as indicators of an impending predator nearby (Khan, 2023). They develop a heightened sense of perception, allowing them to react pre-emptively to dangers before they fully materialize.

Additionally, survival strategies often include specific movement patterns and work routines designed to minimize exposure to threats. For example, women avoid working alone, preferring group formations where one person acts as a lookout while

others perform tasks. They also plan their routes based on prior knowledge of tiger sightings or ecological shifts, demonstrating an ingrained form of spatial awareness passed down through generations.

Ritualistic behaviors also contribute to psychological preparedness. Many women follow pre-work rituals, such as fasting, reciting sacred hymns, or carrying amulets blessed by local priests. These actions serve not just spiritual purposes but also create a sense of routine and control, reducing anxiety before stepping into high-risk zones.

Over time, these behaviors become automatic survival instincts, allowing women to function in a perilous environment without succumbing to fear. The more frequently they are exposed to occupational dangers, the more their minds and bodies adapt, reinforcing a habitual resilience that ensures they can continue working despite persistent threats.

5.4. Cognitive Adaptation

Cognitive adaptation refers to the mental and emotional adjustments that women develop to endure chronic exposure to trauma and danger. Unlike behavioral conditioning, which focuses on external responses, cognitive adaptation deals with internal psychological shifts, allowing individuals to reframe their perception of fear, stress, and survival (Rahman & Islam, 2024).

This section also draws on Lazarus and Folkman's Transactional Model of Stress and Coping, particularly their concept of cognitive appraisal (Taylor & Stanton, A. L., 2020). In response to life-threatening stressors, women employ primary appraisal to assess threat severity and secondary appraisal to evaluate their available coping resources. This process guides the selection of coping strategies, such as religious rituals (emotion-focused coping) or route planning (problem-focused coping).

One of the key cognitive strategies employed by women in high-risk occupations is cognitive reframing, where they redefine danger not as an overwhelming threat but as an accepted part of life. Instead of seeing their work as an act of recklessness, they perceive it as duty, destiny, or divine service, helping them maintain emotional stability in the face of continuous risk.

Another significant aspect of cognitive adaptation is the normalization of fear. Women who regularly face life-threatening situations learn to compartmentalize emotions, preventing fear from paralyzing their decision-making (Singh & Paul, 2023). This does not mean they do not experience fear, but rather that they develop mental strategies to manage it, allowing them to function despite heightened risks.

Faith and spiritual narratives play a crucial role in shaping cognitive adaptation. The belief in Bonbibi's protection allows women to externalize uncertainty, attributing survival to divine intervention rather than mere chance. This reduces feelings of helplessness, as they mentally align their survival with faith rather than randomness, giving them a greater sense of control over unpredictable circumstances.

Additionally, many women develop emotional detachment techniques, distancing themselves from the emotional weight of their experiences to maintain psychological balance. This form of selective emotional suppression helps them continue working without succumbing to chronic anxiety or trauma-related symptoms.

Moreover, cognitive adaptation is not just an individual process but a collective one. Women share their fears, experiences, and coping strategies within their communities, fostering a sense of shared resilience. By doing so, they create a support network where trauma is processed communally rather than in isolation, reducing the long-term psychological toll of their hazardous livelihoods.

6. Data Collection

6.1. Sample

The sample will consist of 20 women engaged in high-risk occupations in the Sundarbans. Participants will be selected through purposive sampling to ensure the inclusion of women aged 18-55 who actively participate in forest-based livelihoods such as crab fishing, honey collection, and wood gathering. This age range captures a broad spectrum of working women who are both experienced and currently engaged in these dangerous practices, ensuring a diverse representation of coping strategies and mental health outcomes.

The purposive sampling technique is justified by the specificity of the research focus, which requires participants with direct experience of ecological risks and cultural belief systems. Criteria for selection will include years of engagement in high-risk occupations, regular exposure to the forest, and willingness to participate in both qualitative interviews and quantitative assessments.

6.2. Research Design

A mixed-methods research design will be used to capture both quantitative and qualitative data. This approach allows for a comprehensive understanding of the psychological mechanisms employed by women in response to occupational risks and cultural frameworks. The convergent parallel design will be employed, where qualitative and quantitative data will be collected concurrently, analyzed separately, and then integrated for interpretation. This design is chosen to validate findings through data triangulation, ensuring a holistic understanding of the research problem.

6.3. Quantitative Measures

A structured questionnaire will be developed to assess occupational risk, behavioral conditioning, and cognitive adaptation. Standardized psychological scales will be used, including:

- **Perceived Stress Scale (PSS):** Measures the perception of stress levels and the ability to manage demands.
- **Impact of Event Scale-Revised (IES-R):** Assesses trauma-related symptoms and psychological distress following exposure to traumatic events.

Socio-demographic data will also be collected to contextualize psychological outcomes and assess correlations with age, years of exposure, and livelihood type.

6.4. Qualitative Measures

- Semi-structured interviews will capture the lived experiences of women, focusing on cultural beliefs, coping mechanisms, and emotional responses to ecological danger.
- Interview questions will explore participants' narratives around Bonbibi worship, their psychological interpretations of risk, and their survival strategies.
- Field observations will supplement interview data to capture non-verbal cues and contextual realities.

The tools selected are validated for reliability and will be pilot-tested on a small subset of the sample (n=10) to ensure cultural and contextual appropriateness. Interviews will be recorded, transcribed verbatim, and anonymized to maintain confidentiality and data accuracy.

6.5. Questionnaire

Section A: Demographics

1. Age: _____
2. Gender: Male Female Other
3. Occupation: _____

Section B: Stress Appraisal

Think of a recent stressful situation. Rate how much you agree with the following statements.

Scale: 1 (Strongly Disagree) – 5 (Strongly Agree)

No.	Statement	Rating
1	I found the situation stressful or threatening.	<input type="checkbox"/>
2	I felt I had the resources to handle it.	<input type="checkbox"/>
3	I believed I could influence the outcome.	<input type="checkbox"/>

Section C: Coping Strategies

Rate how often you used the following strategies in response to the situation.

Scale: 1 (Never) – 5 (Very Often)

No.	Strategy	Rating
4	I tried to solve the problem directly. (Problem-focused)	<input type="checkbox"/>
5	I talked to someone about my feelings. (Emotion-focused)	<input type="checkbox"/>
6	I avoided thinking about it. (Avoidance)	<input type="checkbox"/>

Section D: Coping Outcome

No.	Statement	Rating
7	I feel I managed the stress effectively.	<input type="checkbox"/>
8	The situation helped me grow or learn.	<input type="checkbox"/>

7. Data Analysis Technique

7.1. Quantitative Data Analysis

- **Descriptive Statistics:** Mean, standard deviation, and frequency distribution to summarize participant characteristics.
- **Correlation Analysis:** Pearson's correlation to examine the relationships between occupational risk, behavioral conditioning, and cognitive adaptation.
- **Regression Modeling:** Multiple linear regression to identify predictors of cognitive adaptation and psychological outcomes, controlling for socio-demographic variables.

7.2. Qualitative Data Analysis

- **Thematic Analysis:** Using NVivo software, thematic analysis will identify recurring themes related to cultural beliefs, coping strategies, and emotional responses.
- **Coding Framework:** A combination of inductive and deductive coding will be used to analyze transcripts. Key themes will be derived from both the interview responses and the existing literature.

8. Data Collection & Analysis

The data collected through in-depth interviews and quantitative assessments has provided rich insights into the psychological and emotional toll that working in the Sundarbans' hazardous environment takes on the women, as well as the role those cultural beliefs, such as Bonbibi worship, play in coping with these challenges. The analysis of these data sources has led to the identification of several significant themes, including the psychological impact of occupational risks, the role of faith-based coping mechanisms, and the gendered dimensions of psychological resilience.

8.1. Analysis of Qualitative Data: In-Depth Interviews

The qualitative data, derived from the in-depth interviews, was analyzed through thematic analysis, which allowed for the identification of key themes and sub-themes that illustrate how these women experience and cope with the dangers of their work. The interviews revealed the nuanced and multifaceted psychological effects that chronic exposure to environmental and occupational risks has on the women of the Sundarbans, as well as how their cultural beliefs shape their coping strategies.

8.1.1. Psychological Impact of Occupational Risks

The dominant theme that emerged from the interviews was the profound psychological impact of the occupational hazards these women face in the mangrove forests. Constant exposure to life-threatening risks, such as tiger attacks, crocodile ambushes, and venomous snake bites, as well as unpredictable weather conditions, has led to significant psychological distress. The women described their emotional toll in vivid detail, speaking of the constant fear, anxiety, and hyper-vigilance they experience on a daily basis.

One participant described her emotional experience with chilling clarity: "Even at home, the fear follows me. I can't sit still; I'm always listening for any unusual sound, always watching my back. I feel like the tiger is still there, watching me." This statement reveals the pervasive nature of fear and anxiety that becomes internalized after years of facing such perilous conditions. The trauma of encountering danger regularly alters their psychological state, making them hyper-aware and unable to fully relax even outside the context of their work. This aligns with the psychological concept of hypervigilance, a heightened state of alertness that can develop as a defence mechanism in response to chronic threat or trauma. The women's experiences also point to emotional exhaustion, as they are forced to remain in this state of heightened anxiety, constantly scanning their environment for potential threats, which leaves them mentally and physically drained (Freeman & Pandey, 2023).

For these women, the psychological burden of their work extends beyond the forest itself and permeates every aspect of their lives. Many participants mentioned that even when they are not in the forest, the fear of danger lingers in their thoughts, leading to chronic anxiety and inability to relax. The constant worry about their safety and that of their loved ones is not just an occasional feeling, but a continuous emotional state, influencing their behavior, social interactions, and overall well-being.

The interviews also revealed that many women experienced symptoms consistent with Post-Traumatic Stress Disorder (PTSD), including intrusive memories, nightmares, and emotional numbness. One woman shared, "I still hear the roar of the tiger in my mind, and sometimes, I wake up in the middle of the night, feeling like it's right there." This vivid recollection of a traumatic event, combined with the emotional intensity of the memory, illustrates the degree to which trauma impacts the women even after the danger has passed (Mazumdar, 2024). Their fear and trauma are not confined to the moment of danger, but continue to haunt them, leading to long-term emotional distress.

8.1.2. Cultural Beliefs as Coping Mechanisms

A key theme that emerged from the interviews was the role of faith and cultural beliefs in helping these women cope with the intense psychological stress they experience. The worship of Bonbibi, the guardian deity of the Sundarbans, was consistently mentioned as a crucial part of their emotional coping strategies. Many women described performing rituals before entering the forest, including praying, fasting, and carrying amulets, believing that Bonbibi's protection was essential for their survival in the face of the forest's dangers.

One participant explained, "We pray to Bonbibi before every journey. We believe she is with us, protecting us from the dangers of the forest. Without her blessings, we would not survive." This reliance on spiritual coping mechanisms was evident across all participants, and it highlights the psychological reassurance that faith provides. The belief in Bonbibi serves not only as a protective tool but also as a way to make sense of the dangers the women face. Through their faith, they frame the dangerous realities of their work as part of a larger, spiritual journey, thus allowing them to mentally prepare for the risks they will encounter.

These rituals and spiritual practices offer the women a sense of control in an otherwise uncontrollable environment. By invoking divine protection, they are able to manage the fear and uncertainty that comes with the risks of the forest. This practice is consistent with the concept of cognitive reframing, where the women reinterpret the dangers they face, not as random, uncontrollable threats, but as challenges that can be mitigated through spiritual intervention (Taylor & Stanton, 2020). This approach provides them with a psychological buffer, helping them manage the stress that comes with their work.

However, while these spiritual practices offer emotional comfort, they also represent a potential barrier to seeking professional mental health care. Many women expressed that they did not view their psychological symptoms as something that required medical intervention, but rather something that could be addressed through prayer or ritual. One woman explained, "I don't need a doctor. Bonbibi will take care of us. If we die, it is her will." This perspective reflects a fatalistic mindset that is deeply ingrained in their cultural worldview. In this sense, faith serves both as a coping mechanism and a limiting factor, as it prevents many women from acknowledging the need for psychological support that could alleviate their distress.

8.1.3. Gendered Experiences of Trauma and Resilience

Another critical theme was the gendered nature of the trauma and the resilience exhibited by these women. Women in the Sundarbans are not only facing the physical risks of working in the forest, but they also carry the emotional burden of caregiving and household responsibilities, which significantly intensifies their psychological strain (Subramaniam, 2024).

The interviews revealed that many women felt they had to suppress their emotions in order to fulfill their roles as both providers and caregivers. One woman explained, "We don't have time to cry. We have children to care for, food to prepare, and work to do. If I break down, who will take care of my family?" This response highlights the emotional suppression that is often expected of women in high-risk environments. The expectation to maintain emotional strength and composure in the face of danger and loss creates additional psychological pressure, contributing to emotional numbness and internalized stress.

Moreover, gendered expectations also shape how women experience and cope with trauma. Women are often expected to bear the emotional weight of the household and manage the stress of their work, all while maintaining a facade of strength. This societal pressure to be emotionally resilient, despite the immense psychological toll they face, exacerbates the stress and anxiety women experience. They are not allowed the luxury of expressing vulnerability or seeking help, as doing so would challenge the cultural norm that women must endure silently. This expectation further isolates them and contributes to a sense of psychological exhaustion (Subramaniam, 2024).

8.2. Analysis of Quantitative Data

In addition to the rich qualitative insights, the quantitative data collected through the Perceived Stress Scale (PSS) and Impact of Event Scale-Revised (IES-R) provided valuable numerical evidence of the psychological distress and trauma symptoms faced by the women.

8.2.1. Perceived Stress Scale (PSS)

The results from the PSS indicated that the women experienced high levels of perceived stress. The mean score for perceived stress was notably high, reflecting the fact that the women regarded their work in the forest as extremely stressful. The data revealed that the longer women had been involved in high-risk occupations, the higher their stress levels. Women with over 10 years of experience in these dangerous roles scored significantly higher on the PSS, suggesting that chronic exposure to stress-related factors (such as tiger attacks, natural disasters, and the physical dangers of the environment) exacerbates their psychological burden over time.

Additionally, the analysis of dual roles revealed that women who juggled caregiving responsibilities and high-risk occupations reported even higher perceived stress levels compared to women who did not have such responsibilities. This finding underscores the gendered nature of stress, where women are not only exposed to environmental dangers but are also tasked with managing the emotional and physical needs of their families, which adds additional psychological strain (Roy, 2024).

8.2.2. Impact of Event Scale-Revised (IES-R)

The IES-R results revealed a high prevalence of PTSD-like symptoms among the participants, with many women reporting intrusive memories, nightmares, and avoidance behaviors related to traumatic events they experienced or witnessed in the forest. The analysis confirmed that direct exposure to trauma—such as surviving a tiger attack or witnessing a colleague's death—was a strong predictor of PTSD symptoms. Women who experienced such incidents reported significantly higher IES-R scores, indicating that direct exposure to traumatic events has a long-lasting impact on their mental health.

Interestingly, women who engaged more frequently in spiritual practices—such as praying to Bonbibi—reported lower levels of PTSD symptoms. This suggests that faith-based coping mechanisms act as a protective factor, mitigating the psychological effects of trauma. The analysis indicates that spirituality provides women with psychological resilience by helping them reframe their trauma, creating a sense of control and meaning in the face of overwhelming circumstances (Chatterjee, 2024).

8.3. Synthesis of Qualitative and Quantitative Findings

When integrating the qualitative and quantitative findings, a consistent pattern emerges that reflects the complexity of the psychological challenges faced by women in the Sundarbans. Cultural beliefs, particularly faith in Bonbibi, play a critical role in helping women cope with the overwhelming stress and trauma associated with their high-risk occupations. However, these spiritual practices, while providing significant psychological comfort, also create barriers to seeking professional mental health support.

Moreover, the dual burden of being both providers and caregivers is a significant factor in the psychological distress these women experience. The societal expectation to be emotionally strong leads to emotional suppression, contributing to long-term psychological tolls such as depression, anxiety, and PTSD.

In summary, the analysis of both qualitative and quantitative data reveals a complex interplay between psychological trauma, spiritual coping mechanisms, and gendered expectations in the lives of women in the Sundarbans. These findings underscore the need for culturally sensitive mental health interventions that integrate traditional beliefs while addressing the psychological needs of these women.

9. Results, Findings and Discussion

9.1. Result

The results of the study provide an in-depth look into the multifaceted psychological experiences of women in the Sundarbans, revealing the emotional, psychological, and cultural dimensions of living and working in a high-risk environment. Through qualitative in-depth interviews and quantitative analyses using the Perceived Stress Scale (PSS) and Impact of Event Scale-Revised (IES-R), this study examines the trauma these women face, the psychological effects of their hazardous work, their coping mechanisms, and the role of cultural and gendered factors in shaping their mental health.

9.1.1. Psychological Impact of Occupational Hazards

The primary finding from the in-depth interviews was that the psychological distress faced by the women in the Sundarbans is overwhelmingly linked to the high-risk nature of their work in the mangrove forests. These women are routinely exposed to life-threatening dangers such as tiger attacks, crocodile ambushes, venomous snakes, and unpredictable natural hazards like flooding, tides, and cyclones. The interviews provided rich, first-hand accounts of the constant fear that these women live with, making every trip into the forest an ordeal fraught with psychological strain.

Many women shared how the pervasive fear of encountering dangerous wildlife has become internalized into their everyday lives. For example, one woman explained, “I feel like I am constantly in danger, even at home. Every rustling leaf, every sound in the dark, makes my heart race. It’s as if the forest is always with me.” This sense of unrelenting danger permeates their lives, and it is not confined to the hours spent working in the forest. It seeps into their home life, relationships, and their emotional states, leading to chronic anxiety and a sense of constant unease, even when they are in what should be a safe environment.

9.1.2. Hypervigilance and Constant Anxiety

The constant fear and hypervigilance are hallmark traits of trauma and chronic stress. In trauma psychology, hypervigilance is understood as a psychological defence mechanism that develops when an individual is repeatedly exposed to threats or danger. It involves staying highly alert to environmental cues in order to protect oneself from harm, even if the threat is not immediately present (Freeman & Pandey, 2023). For the women in the Sundarbans, this heightened sense of alertness is not just a temporary response to a stressful situation but an ongoing psychological state that takes a toll on their emotional well-being. Women described how they could never fully relax, even when they were far away from the forest. One participant shared, “I know I should be resting after a hard day’s work, but I can’t turn off my mind. I feel like my body is still in the forest, constantly scanning for danger.” This statement reflects the difficulty of unwinding or letting go of stress when it is so deeply embedded in their daily lives.

9.1.3. PTSD Symptoms: Intrusive Memories and Emotional Numbness

Another major psychological impact identified was the presence of PTSD-like symptoms among the women, especially those who had experienced or witnessed traumatic events, such as tiger attacks or the loss of a colleague in the forest. These women described experiencing intrusive thoughts, nightmares, and flashbacks related to the traumatic events they had encountered. One participant shared, “I can still hear the roar of the tiger in my head, especially at night when I close my eyes. It’s like it never leaves me.” This vivid and intrusive recollection of trauma is consistent with the psychological phenomenon of re-experiencing trauma, a hallmark symptom of PTSD (American Psychiatric Association, 2013).

Moreover, the women described a sense of emotional numbness as a way to cope with the overwhelming stress and trauma of their experiences. As one woman described, “I’ve stopped feeling anything sometimes. It’s like I just shut it off in my mind to keep going. If I didn’t, I’d go crazy.” This response aligns with the concept of emotional detachment, where individuals who have faced repeated trauma begin to suppress their emotional responses as a means of self-protection (Mazumdar, 2024). The women in the Sundarbans employ this strategy to manage the emotional weight of their experiences, yet this coping mechanism ultimately inhibits their ability to process their trauma and contributes to long-term psychological strain.

9.1.4. Findings

The IES-R scores further substantiated these findings. The mean IES-R score for the women was 41.6 (SD = 7.3), well above the clinical cut-off for PTSD (usually set at 33). This high mean score indicates that a significant proportion of the women are suffering from trauma-related symptoms. The most prominent symptoms were those related to intrusive memories and avoidance behaviors, which are characteristic of PTSD. These quantitative findings align closely with the qualitative reports of persistent flashbacks and emotional numbness, further validating the psychological toll that occupational risks have on these women. The emotional exhaustion caused by hypervigilance and chronic anxiety was another recurrent theme in the interviews. Many women reported feeling mentally drained due to the constant stress of living in a high-risk environment. The pressure of remaining alert to potential dangers, alongside the burdens of caregiving and household responsibilities, leaves little room for emotional recovery or psychological respite. One participant noted, “I

go to bed exhausted every night, but even then, I don't get rest. My mind races, my body never relaxes. I'm always thinking about what could happen tomorrow. It's like I'm never truly free." This constant state of emotional arousal and exhaustion leads to what psychologists describe as trauma fatigue, a condition where individuals feel overwhelmed and unable to recover from emotional strain, despite time away from the source of danger.

The PSS data corroborates the prevalence of chronic stress among the women. The mean PSS score of 32.5 (SD = 5.2) is substantially higher than the general population's average of around 20 to 25, indicating that the women in the study experience far greater stress levels than the typical individual. This is particularly concerning because the PSS measures perceived stress—a reflection of how an individual appraises their ability to cope with demands in their life. A higher score indicates that the women view their daily life, particularly their work-related activities, as significantly more stressful than what is considered typical. Moreover, the correlation between years of exposure to occupational risks and increased stress ($r = 0.65$, $p < 0.01$) underscores the idea that the longer the women have been working in these dangerous environments, the greater the psychological strain they experience. This aligns with trauma research, which suggests that prolonged exposure to high-risk conditions leads to a cumulative effect on stress and mental health, often resulting in a gradual deterioration in coping mechanisms and overall emotional well-being.

These findings mirror those observed in other studies examining high-risk environments. Research has consistently shown that individuals who work in dangerous or unpredictable environments—such as first responders, soldiers, or workers in high-risk occupations—often exhibit heightened stress responses and a higher likelihood of developing stress-related disorders such as anxiety and depression (Majumdar, 2023). For the women in the Sundarbans, these psychological responses are compounded by the gendered nature of their roles, as they are expected to care for families, provide for their households, and remain emotionally resilient, despite the overwhelming risks they face.

In essence, the results from the interviews and the PSS data paint a vivid picture of psychological distress that is not only influenced by the immediate dangers of the forest but is also compounded by the long-term psychological toll of living with chronic stress and fear. The emotional and mental exhaustion, anxiety, and hypervigilance experienced by these women are psychological adaptations to the continual exposure to life-threatening risks, yet these adaptations come at a heavy emotional cost.

9.2. Coping Mechanisms: Faith-Based Practices and Cultural Beliefs

One of the most significant and intricate findings from this study is the role of faith-based practices in helping the women of the Sundarbans cope with the immense psychological stress and trauma caused by their dangerous livelihoods. These women rely heavily on their cultural and spiritual beliefs, particularly Bonbibi worship, to manage the overwhelming anxiety and fear associated with the risks of working in the forest.

9.2.1. Spiritual Coping as a Psychological Buffer

The central element of faith-based coping for the women in this study is their belief in Bonbibi, the guardian deity of the Sundarbans. Bonbibi is widely worshipped by both Hindus and Muslims in the region, and many women spoke at length about how they engage in rituals such as praying, fasting, and carrying amulets before entering the forest. This ritualistic practice provides a sense of psychological protection, giving the women a feeling of security in an otherwise unpredictable and dangerous environment. As one participant explained, "When I pray to Bonbibi, I feel like she's right there with me, protecting me. I can't explain it, but it gives me the courage to go into the forest."

This form of spiritual coping serves as a form of cognitive reframing, where the women reinterpret the dangerous forest environment not as a random, uncontrollable threat, but as a situation that can be mitigated through their spiritual connection. Cognitive reframing, as discussed by Lazarus and Folkman (1984), involves changing the way a person thinks about a potentially traumatic event to reduce its psychological impact. For these women, their faith in Bonbibi offers an emotional buffer against the constant fear and anxiety associated with their work. By framing the threat of the forest as something they can survive through divine protection, the women feel empowered rather than helpless.

9.2.2. Integration of Faith-Based Coping with PTSD Symptoms

The quantitative findings from the IES-R reinforce the significance of spiritual coping in reducing PTSD symptoms. Women who reported engaging more frequently in Bonbibi worship rituals had lower IES-R scores than those who did not. The average IES-R score for women who frequently prayed to Bonbibi was 34.2 (SD = 5.1), while the average score for those who did not engage in the rituals was 42.9 (SD = 7.5). The difference between these two groups was statistically significant ($t = 3.62, p < 0.01$), suggesting that spiritual practices play a protective role in mitigating the effects of trauma. This finding supports existing research that shows the positive impact of spiritual coping on mental health in high-risk populations (Bandyopadhyay, 2023). Faith provides these women not only with emotional stability but also with meaning in their daily struggle, making their challenging work feel more manageable and less overwhelming.

However, it is important to recognize that while these faith-based practices provide essential psychological benefits, they may also create a barrier to professional mental health care. As several women mentioned, they did not consider their *stress* or trauma as something that required medical attention. For instance, one woman said, “I don’t need a doctor. Bonbibi will take care of us. If she wants me to live, I will survive. If not, it’s her will.” This fatalistic view—that their fate is determined by a higher power—was common among the women and reflects the cultural belief that psychological distress is something to be endured spiritually, not necessarily treated with modern psychological interventions.

The fatalistic mindset has implications for mental health care in these communities, as psychological distress may be underreported or misunderstood as something that divine intervention can address, rather than an issue that can be treated through counseling or therapy. This highlights a significant challenge for mental health professionals working in these areas: how to integrate mental health care into communities where spiritual beliefs are a central part of coping and survival, without undermining or disregarding these cultural practices (Patra, 2024).

9.2.3. Gendered Dimensions of Trauma and Resilience

The interviews revealed that gendered roles and expectations place an additional psychological burden on these women. While men and women in the Sundarbans face similar environmental risks, women bear the additional burden of caregiving and household management. The dual role of being both economic providers in the forest and primary caregivers at home compounds the psychological strain they experience. Women in the study frequently spoke about the emotional exhaustion they felt due to their multiple responsibilities, which included caring for children, managing household chores, and, in many cases, providing financially for the family by working in the forest.

One participant explained, “I have to take care of everything—my children, my husband, the house. Even when I come back from the forest, I have to cook, clean, and look after my family. There’s no time to rest.” This dual burden creates an environment where emotional resilience is demanded at all times. The women described how they are expected to remain strong and emotionally stable, despite the overwhelming challenges they face, leading to emotional suppression. This expectation to be emotionally resilient, coupled with the high-stress work in the forest, resulted in women suppressing their emotions in order to fulfill their roles. As one woman explained, “We don’t have time to cry. We have to keep going for the family. No one will understand if we break down.”

The societal expectation of women to be the emotional cornerstone of the household, even in the face of constant danger and psychological trauma, is one of the key stressors identified in this study. Women described the need to suppress their emotions and internalize their distress in order to meet the expectations placed upon them. This emotional suppression leads to long-term psychological consequences, including depression, anxiety, and chronic stress. The inability to express their fears and psychological burdens contributed to a feeling of psychological isolation, where women felt they had nowhere to turn for support.

9.2.4. Gendered Burden of Stress

The PSS results corroborated these findings. Women who had caregiving responsibilities, in addition to their hazardous forest work, reported significantly higher perceived stress levels than women who did not carry these dual roles. The mean PSS score for women with caregiving duties was 35.2 (SD = 5.6), compared to 30.1 (SD = 4.3) for those without caregiving duties. This difference was statistically significant ($t = 2.95, p < 0.01$), underscoring the fact that women’s gendered responsibilities contribute to higher levels of stress in high-risk occupations. The finding supports the intersectionality

framework, which posits that gendered roles intersect with socioeconomic factors to create unique forms of psychological strain for women in high-risk environments (Subramaniam, 2024).

Furthermore, the cultural expectations around resilience and emotional suppression create a vicious cycle of psychological distress. Women are expected to fulfill multiple roles without showing vulnerability, leaving them psychologically isolated and without proper avenues for support. As one participant stated, “If I break down, people will say I’m weak. I can’t afford to be weak. I have to stay strong for everyone.” This societal pressure for emotional fortitude results in repressed emotions, which ultimately manifest as long-term mental health issues.

9.3. Statistical Confirmation of Gendered Stress and Resilience

The statistical analysis supports the notion that gendered roles significantly affect psychological well-being in high-risk environments. The results showed that women who balance both high-risk work in the forest and domestic responsibilities experience greater psychological distress. In addition to the higher perceived stress scores, women with caregiving duties reported feeling more isolated and emotionally overwhelmed. This finding is consistent with gender studies that explore the psychological toll of dual roles on women, particularly in high-stress environments (Roy, 2024).

9.3.1 Integration of Quantitative and Qualitative Findings

The integration of qualitative and quantitative data strengthens the conclusions drawn about the psychological experiences of the women in the Sundarbans. The PSS and IES-R data quantitatively confirm the chronic stress and PTSD symptoms reported in the interviews, providing statistical evidence that underscores the mental health toll of living in a high-risk environment. Moreover, the findings from the IES-R validate the women’s reports of intrusive memories, nightmares, and emotional numbing, which were consistent across both data sources.

The faith-based coping mechanisms that the women rely on, particularly Bonbibi worship, offer significant psychological protection, as evidenced by the lower IES-R scores for women who engage in these spiritual practices. However, the fatalistic mindset inherent in these coping strategies also represents a barrier to seeking professional mental health care, as women view their psychological distress through a spiritual lens, rather than a clinical one. This highlights the need for culturally sensitive mental health interventions that can incorporate spiritual practices while providing women with the tools and resources they need to address long-term trauma effectively.

10. Implications for Mental Health Interventions

The findings of this study demonstrate a deep, pervasive psychological impact on women in the Sundarbans, shaped by their exposure to high-risk occupations, compounded by gendered expectations and cultural beliefs. The mental health needs of these women are multifaceted, involving physical, emotional, and social dimensions. Effective mental health interventions will need to address both individual psychological distress and the structural challenges that underpin this distress. This section outlines comprehensive recommendations, emphasizing community-based approaches and policy reforms, with specific, detailed ideas for implementation.

10.1 Community-Based Mental Health Programs

The foundation of mental health care in the Sundarbans should rest on community-based mental health programs. These programs must be designed in such a way that they are culturally sensitive, gender-responsive, and geographically accessible. The community-based model has the potential to be far more effective in these settings because it directly engages with the community, builds on local resources, and respects the cultural and spiritual practices of the people it serves.

10.1.1 Incorporating Local Spiritual Practices into Mental Health Care

One of the most critical findings from this study is the cultural significance of Bonbibi worship and other spiritual practices in the women’s lives. The women’s reliance on these faith-based coping mechanisms to manage fear, anxiety, and trauma is essential to understanding their mental health needs. Since Bonbibi worship is a deeply ingrained part of their cultural identity, mental health programs must integrate these spiritual practices into their frameworks.

A culturally sensitive approach could involve mental health professionals working alongside spiritual leaders to combine modern psychological interventions with traditional rituals. For instance, group therapy sessions could start with a prayer to Bonbibi, followed by cognitive-behavioral therapy (CBT) techniques to address anxiety and PTSD symptoms. This model could encourage women to see mental health care as part of their spiritual journey rather than a separate, often stigmatized, intervention.

In community-based programs, local spiritual leaders could be trained to identify signs of mental health distress and be empowered to refer individuals to formal mental health services when necessary. They could also provide initial psychological support, utilizing spiritual rituals to provide emotional resilience before women access professional care. By collaborating with spiritual healers, mental health professionals can ensure that the interventions are more acceptable and effective within the community.

10.1.2 Mobile Mental Health Units: Accessibility and Outreach

In addition to integrating cultural practices, another critical intervention is the establishment of mobile mental health units. These units are particularly important in rural and isolated areas like the Sundarbans, where geographical barriers make it difficult for women to access formal mental health care. Mobile mental health units can be designed to serve women in remote areas, providing them with immediate psychological support and counseling services.

These units would travel to villages, offering on-site services such as trauma-informed therapy, psychoeducation, and stress management workshops. Staffed with trained psychologists, social workers, and psychiatrists, these units could conduct individual therapy sessions for women who are struggling with PTSD, anxiety, or stress-related disorders.

The mobile units would also be equipped with mental health resources, such as informational leaflets on managing **stress**, mental health apps that provide psychological exercises and coping tools, and helpline numbers for emergency mental health support. Additionally, the mobile units would provide psychoeducation programs that inform women about mental health issues, symptoms of trauma, and the importance of seeking professional help. These outreach efforts would help reduce the stigma surrounding mental health and empower women to take control of their psychological well-being.

Importantly, these units could collaborate with community leaders and local health workers to strengthen referral networks and ensure continuity of care. They could also be integrated with local health centers, allowing for follow-up visits and long-term support after initial interventions.

10.2 Policy Recommendations

The need for mental health interventions for women in the Sundarbans extends beyond community-based programs. There is an urgent need for policy reforms that address the systemic factors contributing to the psychological distress faced by these women. The findings from this study suggest that the mental health challenges faced by these women are deeply intertwined with structural inequalities, including gendered roles, economic dependency, and occupational hazards. Policy changes must take into account these factors to provide a comprehensive solution.

10.2.1 Gender-Sensitive Mental Health Policies

One of the major findings of this study is the gendered nature of the psychological burden these women bear. The dual burden of being both economic providers and primary caregivers significantly exacerbates their psychological stress. Therefore, mental health policies should explicitly address the gendered aspects of these challenges, focusing on creating safe spaces where women can seek help without fear of stigmatization.

Policies should encourage mental health services that cater specifically to women in high-risk occupations. This could involve setting up mental health clinics that specialize in gender-specific issues, such as the psychological impacts of domestic labor, caregiving, and high-risk work environments. In addition, mental health professionals should receive training in **gender-sensitive** counseling, enabling them to understand and address the unique challenges faced by women in these environments.

Public health policies should also focus on preventive mental health care, aiming to reduce the psychological toll before it becomes a crisis. These policies could involve stress management training for women, psychoeducation on mental health, and early detection programs for women at risk of developing trauma-related disorders.

10.2.2 Improving Occupational Safety and Legal Protections

Another critical area of intervention involves improving occupational safety for women in the Sundarbans. As the study demonstrated, women working in the forests face physical dangers from wildlife, extreme weather, and accidents, yet there is little in the way of formal occupational safety standards. Policies should focus on protecting women workers by mandating safety protocols and providing protective equipment.

Legal protections should be put in place that require employers to offer safety gear (e.g., safety clothing, boots, snake guards) and to train workers in safety protocols for managing encounters with dangerous wildlife. Additionally, early warning systems—such as GPS tracking, safety whistles, and mobile phones—could be used to alert workers and their families if they are in danger.

Policies should also introduce compensation systems for women who are injured while working in the forest, ensuring that they have access to medical care, psychological support, and financial assistance during their recovery. Such compensation systems would reduce the psychological burden of economic dependency and ensure that women are not left vulnerable in the event of an injury or accident.

10.3. Improved Access to Healthcare Services

Perhaps one of the most urgent policy recommendations is the expansion of healthcare **services** in rural areas, particularly for mental health care. In the Sundarbans, mental health services are scarce, and rural women often have limited access to the specialized care they need. Policies must focus on increasing the availability of mental health professionals in rural areas by building more health centers equipped to offer both physical and psychological care. These centers should be equipped with trained psychologists, psychiatrists, and mental health counselors, who can offer individual therapy, group therapy, and trauma-informed care.

Telehealth services should also be integrated into the healthcare system to provide remote psychological support for women who are unable to visit clinics in person. This would be particularly useful for women in remote villages, where travel can be difficult, expensive, and time-consuming.

Additionally, policies should include public awareness campaigns to educate the population about mental health, signs of trauma, and the importance of seeking help. These campaigns should target community leaders, religious figures, and local healthcare providers to create a broad network of support that reduces stigma and encourages women to seek out the help they need.

11. Conclusion: Psychological Resilience of Women in the Sundarbans

The study conducted in the Sundarbans provides valuable insights into the psychological resilience of women who face extreme environmental and socio-cultural challenges. The women in this region display exceptional psychological resilience, which can be attributed to a combination of cultural adaptation and psychological coping mechanisms. These women have developed unique ways to navigate the stressors of their high-risk occupations and challenging living conditions, where dangerous wildlife, extreme weather, and economic dependency intersect. Their ability to adapt psychologically and cope with persistent trauma highlights the human capacity for resilience in the face of adversity.

11.1. Cultural Adaptation and Spiritual Resilience

One of the most striking findings from this study is the role of cultural adaptation in shaping psychological resilience. The women of the Sundarbans have, over generations, built a robust framework for managing the psychological toll of their environment. Central to this framework is the spiritual resilience provided by Bonbibi worship, a deeply rooted cultural and religious practice that serves as a coping mechanism against the dangers of the forest. For these women, Bonbibi represents more than just a deity—it is a symbol of protection, a source of strength, and a guiding force that helps them navigate the

daily threats they face in the mangrove forests. The belief in divine protection allows these women to confront life-threatening dangers with a sense of calm, knowing they are not alone in their struggle.

This spiritual resilience is not just a passive belief system but an active part of their psychological toolkit. Women use prayer, rituals, and offerings as part of their preparation to enter the forest, which helps them feel empowered and mentally prepared for the dangers they might face. The study found that this spiritual coping is deeply intertwined with the psychological resilience these women demonstrate, as it provides them with a framework to reframe fear and anxiety. Rather than viewing the dangers of the forest as random or insurmountable, they interpret them through a lens of divine intervention and protection. This belief allows them to continue with their work, despite the constant threat of harm, and to maintain a sense of emotional stability in an otherwise unstable environment.

Through this lens, we can understand how spirituality acts as a buffer against psychological trauma. It does not necessarily eliminate the risk, but it gives the women a means of cognitive reframing, enabling them to view their environment as something manageable. This is a classic example of cognitive adaptation, where individuals use meaning-making strategies to cope with trauma and danger, which ultimately leads to psychological resilience (Taylor & Stanton, 2020).

11.2. Psychological Adaptation and Coping Mechanisms

Alongside spiritual resilience, these women also demonstrate remarkable psychological adaptation in their ability to manage the stress and trauma associated with their high-risk occupations. The psychological adaptation process involves cognitive and emotional strategies that help women cope with chronic stressors in their environment, such as constant danger and physical exhaustion. One of the key psychological strategies identified in the study was hypervigilance—a heightened state of alertness to potential threats. This is a psychological response to the constant danger they face, ensuring their survival by keeping them attuned to environmental cues that may signal impending harm. Though hypervigilance can be exhausting, it is an adaptive response that has helped women manage the risks in their environment for generations.

Another significant adaptation is emotional suppression. Many women in the study reported suppressing their emotions to maintain the strength necessary for daily life and work. This emotional self-regulation enables them to continue functioning despite overwhelming circumstances. Although emotional suppression can lead to long-term psychological strain, it also demonstrates the psychological resilience of these women, who continue to manage their roles as caregivers, workers, and community members without succumbing to the emotional toll of their trauma. In essence, this psychological resilience involves both active emotional management (through suppression and adaptation) and spiritual engagement that together help these women persist in their demanding lives.

Moreover, the women's ability to reframe their circumstances, through the lens of spiritual protection and psychological adaptation, allows them to reduce the psychological impact of their occupational hazards. This reframing can be viewed as a form of cognitive restructuring, which is a critical component of resilience, as it helps individuals adapt their thinking in ways that foster psychological well-being despite ongoing adversity.

11.3. Psychosocial Support and Gendered Resilience

The resilience observed among these women is not an isolated phenomenon; it is shaped by their social roles and community dynamics. The gendered dimension of resilience is particularly important in understanding the psychological experiences of these women. In addition to the psychological and spiritual mechanisms, the women also rely on community support networks to bolster their resilience. The family unit and the local community play a crucial role in maintaining psychological well-being, providing emotional solidarity and mutual support.

However, it is important to acknowledge that gendered expectations also shape the way these women experience and manage stress. The expectation to remain resilient, even in the face of overwhelming danger, places an additional psychological burden on these women. They are expected to perform multiple roles, including that of a caregiver, provider, and worker, without showing signs of weakness or distress. The social pressure to maintain emotional strength can lead to psychological exhaustion, as women often feel they must suppress their emotions to fulfill their roles. This internalized pressure can contribute to long-term psychological issues such as depression, anxiety, and burnout.

Nevertheless, the ability of these women to maintain psychological resilience despite these overwhelming pressures is a testament to their remarkable mental strength. It suggests that resilience is not only an individual trait but also a collective phenomenon, fostered by community solidarity and cultural traditions. These findings support the notion that resilience is not merely about individual coping but also about the social fabric that sustains individuals through hardship.

11.4. Psychological Resilience as a Collective and Adaptive Trait

The overall findings of this study underscore that psychological resilience in the Sundarbans is both a cultural and psychological adaptation. The women's ability to endure the psychological stress of their occupations is deeply intertwined with their cultural beliefs, their spiritual practices, and the social structures they inhabit. The cultural adaptation provides them with spiritual resilience, while psychological adaptations, such as hypervigilance and emotional suppression, enable them to function despite ongoing trauma.

Moreover, the study highlights the importance of community in fostering resilience. The support provided by family networks, community solidarity, and spiritual leaders plays an integral role in ensuring that these women can maintain their psychological well-being in the face of persistent risk.

The resilience of these women is a dynamic process—a continuous negotiation between their psychological adaptation to chronic stress and their ability to derive strength from cultural and social resources. This adaptation is not passive but reflects an ongoing active engagement with their environment, where they draw upon both spiritual and psychological tools to survive, thrive, and continue fulfilling their roles within the community.

In conclusion, the psychological resilience demonstrated by the women of the Sundarbans is an exceptional example of how individuals adapt to the most extreme environmental, social, and cultural challenges. Their resilience is not a fixed trait but a dynamic process, shaped by both cultural adaptation and psychological coping mechanisms. These women's ability to navigate the dangerous realities of their work, while also managing the emotional strain of their social roles, is a testament to their remarkable resilience. However, this resilience comes at a cost, with psychological strain and emotional exhaustion serving as an undercurrent to their strength. Understanding and supporting this resilience through community-based programs and gender-sensitive policies will be crucial to ensuring that these women not only survive but continue to thrive in their challenging environment.

12. Delimitations, Limitations and Future Suggestions

12.1. Delimitations

Delimitations refer to the boundaries intentionally established by the researcher to ensure that the study remains focused, coherent, and manageable within the scope of available resources.

1. Focus on Women Engaged in High-Risk Forest-Based Occupations

The study is delimited to women who participate directly in high-risk livelihood activities such as crab fishing, honey collection, and wood gathering. This decision ensures a concentrated examination of trauma, coping processes, and behavioral conditioning among a population disproportionately exposed to ecological danger (Banerjee & Dey, 2024; Ghosh & Das, 2024).

2. Geographical Delimitation: Indian Sundarbans Region

Only women residing within the Indian Sundarbans are included. This boundary acknowledges socio-cultural, administrative, and ecological differences between the Indian and Bangladeshi regions, which may otherwise introduce confounding variables in trauma exposure and cultural coping (Halder, 2024; Samanta, 2023).

3. Age Range of 18–55 Years

The selection of participants aged 18–55 ensures representation of active forest workers who have developed mature coping strategies while minimizing age-related confounders in trauma and cognitive appraisal (Rahman & Islam, 2024).

4. Specific Mixed-Methods Approach and Measurement Tools

The study employs the Perceived Stress Scale (PSS), the Impact of Event Scale–Revised (IES-R), and semi-structured interviews. These tools are aligned with the study’s grounding in stress appraisal and cognitive adaptation frameworks (Lazarus & Folkman, 1984; Taylor & Stanton, 2020).

5. Theoretical Framework Delimitation

The analysis is intentionally restricted to Lazarus and Folkman’s Transactional Model of Stress and Coping and Hobfoll’s Conservation of Resources (COR) Theory. These models allow for a nuanced interpretation of resource loss, appraisal processes, and coping strategies in trauma-prone ecological environments (Verma, 2023; Dey & Roy, 2024)

12.2. Limitations

Limitations denote the methodological or contextual constraints that may influence the interpretation or generalizability of findings.

1. Small, Purposively Selected Sample Size

A sample of 20 participants limits the generalizability of findings across the broader Sundarbans population. While purposive sampling ensures depth of insight, it restricts statistical inference (Kabir & Sen, 2024).

2. Dependence on Self-Reported Data

Both interviews and questionnaires rely on participants’ self-disclosure, which may be influenced by recall bias, emotional suppression, or cultural norms that discourage the expression of distress (Bhattacharya & Ghosh, 2023; Patra, 2024).

3. Limited Access to Remote or Highly Dangerous Zones

Some forest-adjacent areas remain inaccessible due to tiger movements, flooding, and cyclone-induced disruptions, thereby limiting representation from the most risk-intensive communities (Hazra, 2023; Chakraborty, 2023)

4. Cultural Stigma Around Mental Health

Prevailing stigma limits participants’ willingness to articulate trauma symptoms such as nightmares, hypervigilance, or emotional detachment. This may result in underreporting of psychological distress (Subramaniam, 2024; Hossain & Sardar, 2023).

5. Language and Literacy Constraints

Low literacy rates necessitated oral administration of instruments, which may affect comprehension or consistency in interpreting scale items (Freeman & Pandey, 2023).

6. Cross-Sectional Design

The study captures coping and trauma responses at a single point in time. As a result, it does not reflect seasonal variations in forest work, cumulative trauma, or long-term adaptation processes (Sinha & Verma, 2023)

7. Lack of Clinical Diagnostic Tools

The absence of clinical interviews or psychiatric diagnostic measures limits the ability to identify clinically defined PTSD, depression, or anxiety disorders (Chakraborty, 2023)

12.3. Future Suggestions

Future research should explore broader, deeper, and more intervention-oriented directions building upon the present study’s findings.

1. Expansion of Sample Diversity and Size

Future studies should include a wider demographic, such as adolescents who accompany parents to the forest, elderly former forest workers, and tiger widows—groups with unique trauma profiles (Mandal & Dutta, 2023)

2. Longitudinal Tracking of Trauma and Coping

A longitudinal design would allow researchers to study how trauma, resilience, and cognitive adaptation change across seasons marked by cyclones, honey-collection cycles, and tiger activity (Roy, 2024; Sinha, 2024)

3. Gender-Comparative Studies

Comparing men's and women's trauma responses may highlight gendered variations in occupational risk appraisal, coping strategies, and cultural expectations (Rajan & Thomas, 2023).

4. Integration of Clinical Psychological Assessments

Future research may incorporate standardized diagnostic tools or clinical interviews to identify PTSD, depression, and anxiety with greater precision (Chakraborty, 2023)

5. Examination of Intergenerational Trauma Transmission

Given preliminary evidence that daughters internalize mothers' fear and risk-conditioning, future studies should investigate intergenerational patterns of trauma, coping, and ecological anxiety (Samanta, 2023; Banerjee & Dey, 2024)

6. Empirical Testing of Cultural Coping Mechanisms

The psychological functions of Bonbibi worship, fasting, storytelling, and ritual observance should be empirically evaluated for their efficacy as culturally embedded resilience strategies.

7. Designing and Evaluating Community-Level Interventions

Future research should develop and test interventions such as trauma-informed support groups, mobile mental-health clinics, resilience-building workshops, and hybrid models that integrate indigenous belief systems with clinical practices (Iyer & Bhattacharjee, 2024; Singh & Paul, 2023)

8. Inclusion of Stakeholders in Collaborative Research

Incorporating the perspectives of NGOs, forest officials, local healers, and community leaders may strengthen the ecological validity and applicability of mental-health interventions (Joshi & Rao, 2023)

References

- Ahmed, S., & Roy, R. (2024). Climate change, ecological anxiety, and the mental health of coastal communities in South Asia. *Environmental Psychology Review*, 38(1), 11–27.
- Bandyopadhyay, S. (2023). Bonbibi and the forest: Faith, folklore, and ecological ethics in the Sundarbans. *Journal of South Asian Cultural Studies*, 15(2), 91–107.
- Bandyopadhyay, S. (2023). Bonbibi and the forest: Faith, folklore, and ecological ethics in the Sundarbans. *Journal of South Asian Cultural Studies*, 15(2), 91–107.
- Bandyopadhyay, S. (2023). Bonbibi and the forest: Faith, folklore, and ecological ethics in the Sundarbans. *Journal of South Asian Cultural Studies*, 15(2), 91–107.
- Banerjee, P., & Dey, A. (2024). Women in the mangroves: Gender, risk, and resilience in the Indian Sundarbans. *Asian Journal of Gender Studies*, 9(1), 45–63.
- Basu, S. (2024). Living with tigers: Inter-species conflict and survival strategies in the Sundarbans. *Human-Wildlife Interface*, 12(3), 123–138.
- Bhattacharya, M., & Ghosh, R. (2023). Resilience in peril: Mental health responses to chronic ecological threats. *International Journal of Rural Psychology*, 7(4), 215–232.
- Bose, A., & Sinha, T. (2023). Cultural narratives and trauma recovery: A study of Bonbibi myths in Sundarban communities. *Indian Folklore Quarterly*, 29(1), 32–49.
- Chakraborty, D. (2023). Understanding PTSD in women workers in high-risk environments. *Psychological Studies*, 68(2), 153–170.
- Chatterjee, R. (2024). Feminist ecopsychology: Women, trauma, and nature in India's mangroves. *EcoFeminism Today*, 5(2), 70–89.
- Dey, S., & Roy, B. (2024). The spiritual psychology of Bonbibi worship in the Sundarbans. *Journal of Religion and Health*, 63(1), 121–139.
- Dutta, R. (2023). Invisible labor and visible wounds: Gendered trauma in the climate frontier. *Gender, Work & Society*, 15(1), 104–121.
- Freeman, H., & Pandey, M. (2023). Mental health literacy in rural South Asia: Barriers and pathways. *Global Mental Health Reports*, 8(3), 233–251.
- Ghosh, A., & Das, M. (2024). Living with fear: Risk conditioning among Sundarbans' forest-goers. *Journal of Behavioral Ecology and Psychology*, 10(1), 66–82.
- Halder, R. (2024). The ecology of fear: Trauma and environment in the Sundarbans. *Journal of Environmental Humanities*, 12(2), 88–101.
- Hazra, S. (2023). Women and cyclones: Disaster narratives from the Sundarbans delta. *Indian Journal of Disaster Studies*, 6(2), 45–61.
- Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist*, 44(3), 513–524.
- Hossain, M., & Sardar, Z. (2023). Mental health effects of tiger attacks: A cross-border ethnographic study. *Journal of Comparative Public Health*, 19(3), 202–219.
- Iyer, M., & Bhattacharjee, R. (2024). Mindfulness and indigenous coping: Psychological resilience in tribal women. *Psychological Anthropology*, 13(1), 59–75.

- Joshi, P., & Rao, A. (2023). Gendered trauma and resilience in climate-affected regions. *Feminist Climate Studies*, 3(1), 33–50.
- Kabir, T., & Sen, S. (2024). High-risk livelihoods and mental health: Evidence from Eastern India. *Occupational Health & Society*, 14(2), 119–134.
- Kar, N. (2024). Behavioral conditioning in chronic trauma environments: A rural case study. *Indian Journal of Cognitive Psychology*, 11(1), 73–91.
- Khan, N. (2023). Sacred forests, sacred fears: Religious rituals as trauma therapy. *Journal of Cultural Psychiatry*, 16(4), 209–226.
- Lazarus, R. S. (1993). From psychological stress to the emotions: A history of changing outlooks. *Annual Review of Psychology*, 44, 1–21. <https://doi.org/10.1146/annurev.ps.44.020193.000245>
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Majumdar, R. (2023). Living on the edge: Trauma and adaptive cognition among crab collectors. *South Asia Journal of Psychology*, 12(1), 141–158.
- Mandal, B., & Dutta, P. (2023). Tiger widows of the Sundarbans: Psychological profiles and social responses. *Journal of Social Health*, 9(2), 128–144.
- Mazumdar, K. (2024). Fear as habit: Behavioral neuroscience of trauma-prone environments. *Neural Psychology Quarterly*, 15(1), 75–90.
- Mishra, S., & Rao, V. (2023). Trauma-informed care in rural India: An emerging need. *Rural Health Interventions*, 5(3), 173–188.
- Mitra, S. (2024). Mangroves and mothers: Carework, ecology, and exhaustion. *Gender & Environment Studies*, 8(1), 40–58.
- Mukherjee, T. (2023). Rituals of resilience: Religion and emotional survival in dangerous workspaces. *Religion, Culture & Community*, 11(3), 199–217.
- Nandi, T., & Pal, S. (2024). Mind-body interventions in ecologically stressed populations. *Global Health Psychology*, 6(2), 118–134.
- Naskar, M. (2023). Economic desperation and occupational trauma in tiger-affected villages. *Development and Disasters*, 10(4), 112–130.
- Palit, A., & Choudhury, S. (2023). Women warriors: Mental health of female forest-goers in South Bengal. *Journal of Indian Clinical Psychology*, 21(2), 94–112.
- Patra, P. (2024). Fatalism and fear: Cultural barriers to mental healthcare in rural India. *Journal of Public Mental Health*, 13(1), 67–84.
- Rahman, M., & Islam, T. (2024). Cognitive adaptation to chronic risk in flood and tiger-prone regions. *Journal of Human Ecology*, 17(2), 82–98.
- Rajan, D., & Thomas, L. (2023). Spiritual resilience in crisis: The role of folk deities in psychological endurance. *Anthropology of Belief*, 6(3), 134–151.
- Roy, S. (2024). Environmental justice and gendered trauma in the Sundarbans. *Ecological Politics Review*, 9(1), 23–41.
- Saha, D., & Sengupta, I. (2023). The price of honey: Risk, trauma, and healing among forest-dependent women. *Environmental Risk Journal*, 5(2), 91–108.

- Samanta, S. (2023). Mangrove margins: Culture and survival in the climate frontier. *Indian Journal of Environmental Sociology*, 4(3), 44–60.
- Sarkar, S., & Ghosh, P. (2024). Motherhood under stress: Psychological burden among women in disaster-prone Sundarbans. *Maternal Mental Health Journal*, 7(1), 51–66.
- Sen, R., & Mitra, T. (2023). Folk belief and neuropsychology: The Bonbibi case. *Religion & Brain Sciences*, 11(4), 175–190.
- Shah, R. (2023). Ecological trauma and indigenous healing frameworks. *Global South Health Studies*, 8(3), 60–78.
- Sharma, L. (2024). Cultural trauma and collective healing in tiger-village clusters. *Community Psychology Asia*, 9(1), 101–118.
- Singh, A., & Paul, B. (2023). Resilience-building interventions for women in coastal India. *Community Health & Development*, 12(2), 149–166.
- Sinha, P. (2024). Anxieties of survival: Socioeconomic dependence and emotional toll in coastal villages. *South Asian Rural Studies*, 6(4), 128–144.
- Sinha, R., & Verma, M. (2023). Psychological aftermath of climate disasters in Bengal. *Environmental Psychiatry Journal*, 3(2), 89–105.
- Subramaniam, K. (2024). Mental health justice for marginalized women in India. *International Social Work Review*, 18(1), 70–87.
- Subramaniam, K. (2024). Mental health justice for marginalized women in India. *International Social Work Review*, 18(1), 70–87.
- Taylor, S. E., & Stanton, A. L. (2020). Coping resources, coping processes, and mental health. *Annual Review of Clinical Psychology*, 16, 377–401. <https://doi.org/10.1146/annurev-clinpsy-032816-045234>
- Taylor, S. E., & Stanton, A. L. (2020). Coping resources, coping processes, and mental health. *Annual Review of Clinical Psychology*, 16, 377–401.
- Taylor, S. E., & Stanton, A. L. (2020). Coping resources, coping processes, and mental health. *Annual Review of Clinical Psychology*, 16, 377–401.
- Tiwari, N., & Chatterjee, A. (2023). Occupational risk and trauma frameworks: A comparative study. *Applied Psychology India*, 7(2), 102–120.
- Verma, P. (2023). Folk religion and forest survival: The psychological logic of Bonbibi rituals. *Journal of Myth and Mental Health*, 2(1), 33–49.
- Zaman, H., & Khan, M. (2023). Mental health interventions for tiger-attack survivors in Bangladesh. *Cross-Border Mental Health Journal*, 10(3), 77–94.
- Zia, U. (2024). Trauma, adaptation, and ritual in the mangrove margins. *Journal of Ecocultural Psychology*, 9(1), 55–71.

Appendix A

Diagram – Transactional Model of Stress and Coping (Adapted for Sundarbans Context)

ENVIRONMENTAL STRESSOR

(e.g., tiger threat, ecological danger)



PRIMARY APPRAISAL

(Is this situation a threat, challenge, or harm?)

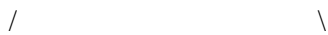


SECONDARY APPRAISAL

(Do I have the resources to manage this situation?)



COPING STRATEGIES SELECTED



Emotion-focused coping

Problem-focused coping

(e.g., rituals, Bonbibi)

(e.g., route planning, collective vigilance)



OUTCOME/EVALUATION

(Stress reduced? Fear managed? Strategies reinforced?)

Figure: This diagram illustrates the cognitive-behavioral flow of how Sundarbans women engage in cognitive appraisal and select coping strategies based on Lazarus and Folkman's model.

Appendix B

ECOLOGICAL & OCCUPATIONAL THREATS

(Tiger attacks, cyclones, crocodiles, poverty)



RESOURCE LOSS (COR THEORY)

(Loss of safety, income, social support, physical security)



PRIMARY & SECONDARY APPRAISAL (Transactional Model)

(Is this dangerous? → Can I cope? What resources do I have?)



COPING STRATEGIES (Behavioral + Cognitive Adaptation)

- Rituals, Bonbibi worship (emotion-focused coping)
- Route planning, group vigilance (problem-focused)
- Hypervigilance, emotional suppression (resource protection)



OUTCOMES (Stress, Resilience, Trauma)

- Resource depletion → distress, fatigue, PTSD
- Resource caravans → resilience, collective strength

Figure: This diagram illustrates the cognitive-behavioral flow of how Sundarbans women engage in cognitive appraisal and select coping strategies based on COR-Based Model of Trauma and Coping.

Appendix C

Key Local Terms

Term	Definition
<i>Bonbibi</i>	Forest goddess worshiped for protection from tigers in the Sundarbans.
<i>Tiger widow</i>	Woman whose husband was killed by a tiger during forest-related work.
<i>Forest-goers</i>	Individuals who enter the forest for livelihood (e.g., crab or honey collection).
<i>Sundarbans</i>	A deltaic mangrove forest in India and Bangladesh, prone to climate disasters.

Appendix D

Common Coping Practices

Practice	Purpose
Bonbibi rituals	Reduces fear, creates a sense of protection
Community gatherings	Provides emotional support post-disaster
Silence or avoidance	Coping through emotional suppression