

### Key Points

- Women farmers play a crucial role in South Asia's agricultural sector and contribute significantly, despite facing numerous challenges.
- The intersection of climate change, gender, and health can have disproportionate impacts on women's well-being.
- Communicable and non-communicable diseases, occupational hazards, and mental health issues are exacerbated by climate change, affecting women's health, productivity, and livelihoods.
- Policies to address these issues should incorporate gender-sensitive approaches in climate adaptation strategies, encompassing disaster preparedness, healthcare access, occupational safety, nutrition security, and mental health support.
- Prioritizing women farmers' health and well-being is essential for building resilient agricultural systems and achieving sustainable development in South Asia.

# Addressing the Impact of Climate Change on Women Farmers' Health in South Asia

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## 1. Introduction

Over 50% of global food is produced by female farmers, with women comprising 43% globally and nearly half of the agricultural labor force in developing nations (Akter et al., 2017). In South Asia, women (57%) are more prominently involved in agriculture compared to men (37.5%) (Figure 1). However, they are often overlooked as primary stakeholders for several reasons. Traditional gender roles and norms often limit women's access to land ownership, resources, and decision-making power (Balayar and Mazur, 2021). Additionally, discriminatory practices and a lack of recognition for women's agricultural contributions contribute to their underrepresentation in formal farm institutions and policymaking processes (Satyavathi et al., 2010). Economic disparities and unequal access to education and extension services further marginalize women in agricultural development initiatives, perpetuating their exclusion as key stakeholders in this sector (Petesch and Badstue, 2020).

Still, there is a growing trend of women's involvement in farming activities in South Asian countries (Figure 2) driven by several socioeconomic dynamics. Younger men in South Asian countries are now increasingly looking for opportunities in cities or abroad for better employment prospects as a result of agrarian distress. This is creating a void in rural agricultural communities and contributing to the feminization of agriculture (Southard and Randell 2022). As a result, women, who traditionally played supportive roles in farming, are now stepping into new, more active roles in agricultural production to sustain their livelihoods and, at the same time, are bound to take on increased household responsibilities (Spangler and Christie 2020). Evidence suggests that if women were granted equal access as men to productive resources, they could potentially enhance farm yields by 20%–30%, which could result in a 2.5%–4% rise in total agricultural output in developing nations, consequently reducing global hunger levels by 12%–17% (UNFCCC 2023).

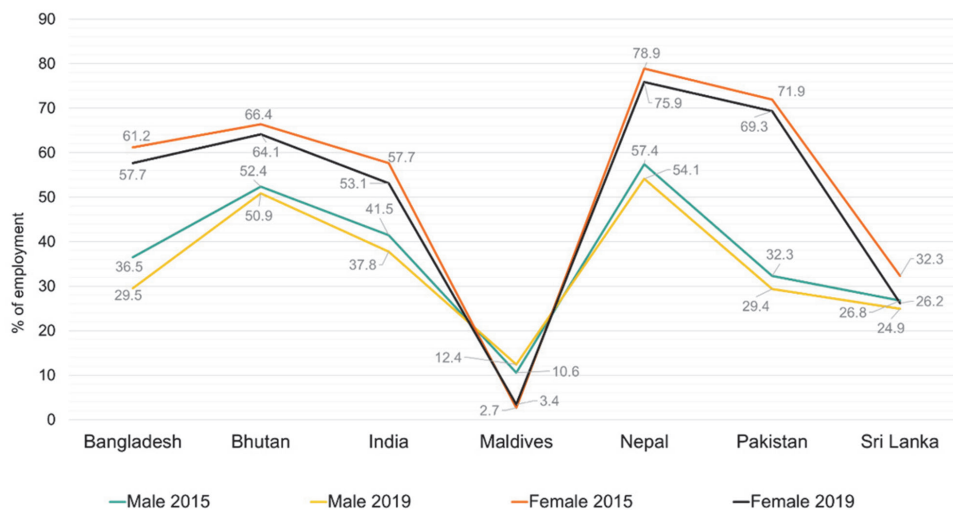
However, alongside these shifts, women farmers in South Asia are facing various challenges posed by climate change, which can have significant impacts on their health and well-being (Datta et al. 2022). Rising temperatures, erratic rainfall patterns,

**Figure 1: Percentage of Male and Female Employment by Sector, 2019**



Source: World Bank, World Development Indicators (<https://wdi.worldbank.org/table/2.3>).

**Figure 2: Percentage of Male and Female Employment in the Agricultural Sector of South Asian Countries**



Source: World Bank, World Development Indicators (<https://wdi.worldbank.org/table/2.3>).

and extreme weather events, such as cyclones, floods, and droughts, are becoming more frequent and intense, affecting crop yields and agricultural productivity (Aryal et al. 2020). Southard and Randell (2022) indicate that women in South Asia are more likely to work in agriculture at higher temperatures and drier- or wetter-than-normal rainfall, especially less-educated and married women due to the out-migration of men. Consequently, women may be more

affected by these climate-related challenges than their counterparts since they are frequently in charge of chores, including agricultural production, livestock management, and water collecting, along with household caregiving. Ensuring safe working environments and prioritizing the well-being of female farmers are therefore essential prerequisites for maintaining agricultural production and attaining several of the Sustainable Development Goals

(SDGs)—especially, SDG 2: Zero Hunger, SDG 3: Good Health and Well-being, SDG 5: Gender Equality, and SDG 8: Decent Work and Economic Growth.

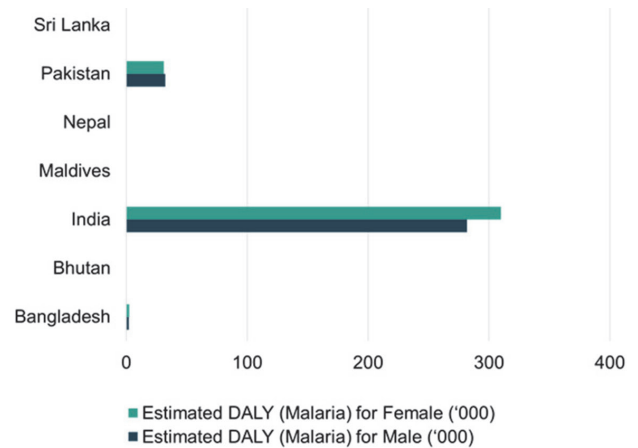
In light of the abovementioned challenges, this policy brief examines the intersection of climate change, gender, and health in the context of the agricultural sector of South Asia, highlighting the urgent need for targeted interventions to enhance adaptive capacity, access to healthcare services, and nutritional support for women farmers. By prioritizing the health and well-being of women farmers, planners and policy makers can foster resilient agricultural systems and promote sustainable development in the region. The following sections discuss the impact of climate change on women farmers' health via four avenues, viz. (i) communicable diseases, (ii) non-communicable diseases, (iii) occupational health, and (iv) mental health and psychosocial well-being, followed by appropriate policy recommendations.

## 2. Communicable Diseases: Risks and Impacts on Women Farmers

The heightened risks of communicable diseases in South Asia, exacerbated by climate-related factors, such as shifting weather patterns, water scarcity, and the prevalence of vector-borne diseases, pose significant challenges to the health and well-being of women farmers and are worsened by unequal access to important livelihood capitals (Aryal et al. 2020). Increasing temperatures contribute to the proliferation of climate-sensitive vector-borne diseases such as malaria, dengue, chikungunya, and Japanese encephalitis (Dhimal et al. 2021). Global Health Estimates (2019) shows that women in most South Asian countries are becoming more affected by malaria than men, and India recorded the highest number of such cases (Figure 3). Furthermore, projected changes to temperature and precipitation patterns in South Asia, particularly in areas that were previously thought to be non-endemic for these communicable diseases, would also be conducive to the spread of these diseases (Dhimal et al. 2021).

All these put women farmers at risk as they engage in both domestic and farm tasks, often in close proximity to standing water (Sorensen et al. 2018). Moreover, water-related diseases like diarrheal disease and typhoid fever stem from contaminated water sources due to floods or poor sanitation, which further threaten their health. Diarrheal disease-related impacts are higher among women in most South Asian countries, especially India (Figure 4).

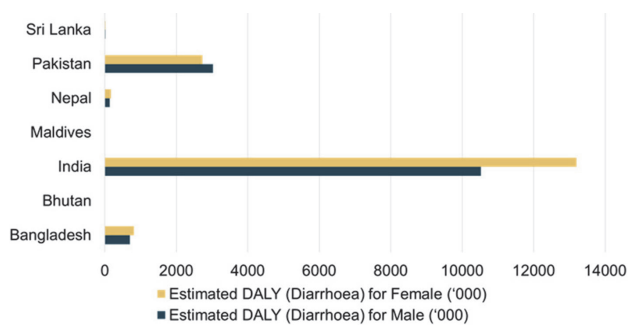
**Figure 3: Prevalence of Malaria in South Asian Countries, 2019**



Note: DALY denotes disability-adjusted life year. One DALY represents the loss of the equivalent of 1 year of full health.

Source: World Health Organization.

**Figure 4: Prevalence of Diarrhoea in South Asian Countries, 2019**



Note: DALY denotes disability-adjusted life year. One DALY represents the loss of the equivalent of 1 year of full health.

Source: World Health Organization.

Jerin et al. (2023) found that women who are mostly involved in agricultural activities in northern Bangladesh suffered disproportionately during catastrophic floods, with 81% experiencing communicable diseases like diarrhea, cholera, and eye conjunctivitis, compared to over half of men. Unequal access to medical facilities and transportation exacerbated the gender disparity, as women faced challenges reaching hospitals due to long distances and high costs. Limited control over income-earning resources left women particularly vulnerable, highlighting the intersection of flood impacts and unequal economic resources in rural Bangladesh.

Additionally, livestock-related diseases such as anthrax or brucellosis can also affect women farmers, who are often involved in livestock management activities (Ahmed et al. 2010; Iqbal et al. 2020). Awareness of zoonotic pathogens is often reported to be low among women farmers in South Asia, which leads to high-risk practices and the spread of zoonotic diseases (Kelly et al. 2018).

Beyond the immediate health impacts, communicable diseases also have profound impacts on women's productivity, income, and overall livelihoods. For instance, outbreaks of waterborne diseases like cholera or diarrhea can lead to prolonged illness, hindering women's ability to work in the fields and generate income for their families (Datta et al. 2023). Moreover, the increased burden of caring for sick family members can place further strain on women's time and workloads.

### 3. Non-Communicable Diseases: Emerging Threats for Women Farmers

Non-communicable diseases (NCDs) represent a significant health burden globally, and emerging evidence suggests that climate change may exacerbate the prevalence and impact of these diseases, particularly among vulnerable populations, such as women in agricultural households (Sorensen et al. 2018).

Climate change can disrupt agricultural systems, leading to changes in crop yields, nutrient availability, and food security (Table 1). Women farmers, particularly in low-income settings, may face challenges in accessing diverse and nutritious foods, increasing their risk of micronutrient deficiencies and leading to several other diseases (Acharya and Das 2020). In times of crisis, such as the aftermath of the severe cyclones Sidr and Aila

in Bangladesh, many women starved because they fed their children and other family members before taking care of themselves and suffered physically (Kabir et al. 2016). Malnutrition often leads to anemia, and the prevalence of anemia among pregnant women in South Asian countries is often more than the global average (37%) (Figure 5a).

Currently, the maternal mortality rate in Nepal (174 per 100,000 live births) is the highest in South Asia (Figure 5b), followed by Pakistan (154 per 100,000 live births), and Bangladesh (123 per 100,000 live births). The impacts of climate change could further exacerbate the situation if suitable policy actions are not taken. Extreme weather events, such as floods and cyclones, often disrupt access to essential healthcare services for women, exacerbating the health risks in affected regions (Datta et al. 2023). In particular, limited access to maternal healthcare facilities during floods can increase the likelihood of pregnancy complications and maternal mortality.

Patel et al. (2019) highlight that following climate-related disasters, issues with water availability and/or quality lead to poor hygiene and urinary tract infections among women. The scarcity of menstrual hygiene products during and after extreme events also exposes women to urinary tract infections, highlighting the intersection between environmental disasters and women's health, including the risk of NCDs, such as renal disorders and reproductive health complications (Iqbal et al. 2022).

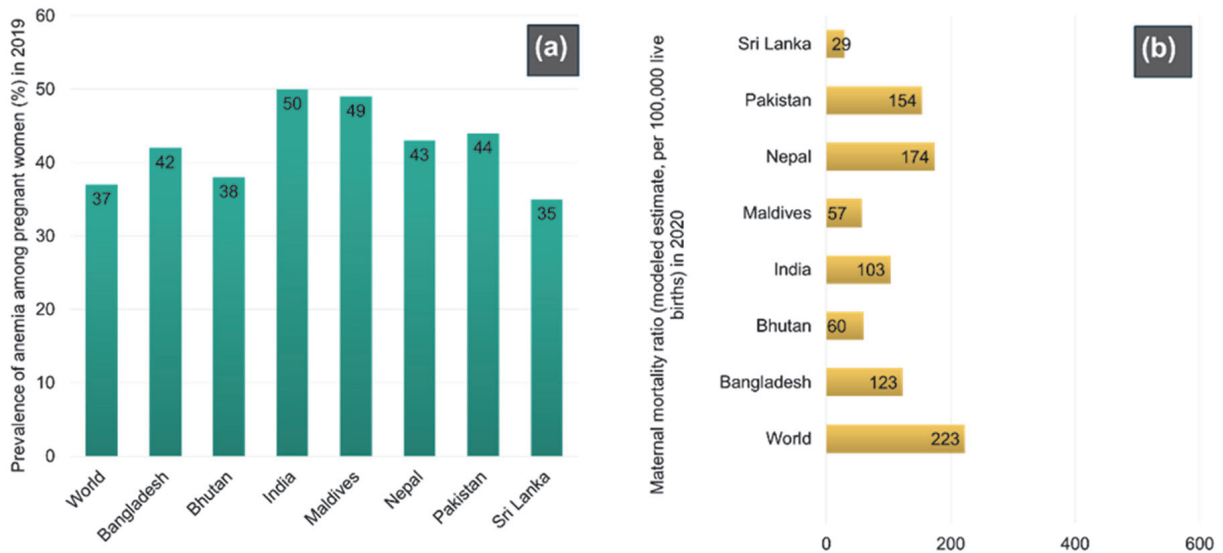
### 4. Women Farmers' Occupational Health Challenges

Climate change leads to unpredictable weather patterns, including prolonged droughts, intense heatwaves, heavy rainfall, and floods. Women farmers are often on the front lines, working in fields exposed to these

**Table 1: Health Vulnerabilities among Women Farmers in South Asia under Climate Change**

Exposure Pathway	Country	Women Farmers' Health Vulnerabilities	Reference
Erratic rainfall	India	In climate-vulnerable districts, there is a higher prevalence of anemia among women aged 15–49, alongside increased household malnutrition burdens, particularly affecting women.	Acharya and Das (2020)
Drought	India	Drought results in decreased or inconsistent food intake among women, consequently causing malnutrition.	Kodavalla et al. (2015)
Floods	Pakistan	In flood-affected regions, numerous pregnant women lack access to maternal healthcare services, while menstrual hygiene products are also scarce. This scarcity exposes them to the perilous threat of urinary tract infections.	Iqbal et al. (2022)

**Figure 5. (a) Prevalence of Anemia among Pregnant Women; (b) Maternal Mortality Ratio in South Asia and the World Average**



Source: World Health Organization.

extreme conditions for extended periods. Climate change alters the distribution and behavior of pests and diseases, impacting crop yields and quality (Datta et al. 2022). Women farmers who are actively engaged in planting, weeding, and harvesting are more vulnerable to vector-borne diseases and allergic reactions from increased exposure to the pesticides and agrochemicals used to combat these pests (Table 2). Changes in precipitation patterns and melting glaciers lead to water scarcity in many regions (Datta et al. 2023). Women, who are often responsible for fetching water for household and agricultural use, face increased burdens when water sources become depleted or contaminated (The Hindu 2022; FES 2023). Moreover, long walks to distant water sources not only consume time but also pose risks of musculoskeletal injuries and accidents (Yadav and Lal 2018).

## 5. Mental Health and Psychosocial Well-Being of Women Farmers

Climate change exacerbates uncertainty in agricultural production, leading to heightened anxiety among farmers (Datta et al. 2022). Erratic weather patterns, unpredictable rainfall, and extreme events like floods or droughts disrupt farming schedules and crop yields, leaving women uncertain about their livelihoods and

financial security (Patel et al. 2020). The constant worry about the next harvest or coping with losses can lead to chronic stress and anxiety, which could be high among women farmers due to increased responsibilities and unequal access to resources. Global Health Estimates (2019) reveals that women in South Asian countries are more prone to anxiety attacks than men, and the cases are high in India (Figure 6).

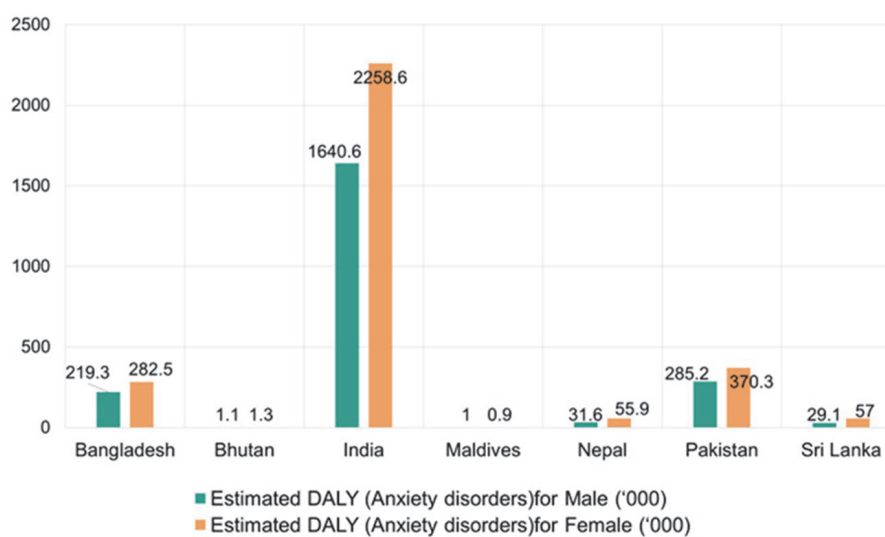
Climate change-induced disasters such as floods or hurricanes can lead to displacement and social isolation for farmers (Datta et al. 2023). Disrupted community networks, loss of social support systems, and relocation to unfamiliar environments often contribute to feelings of loneliness and isolation. Moreover, women may have to take on additional caregiving responsibilities for children or elderly family members, further limiting their opportunities for social interaction and support (Patel et al. 2020).

In the aftermath of climate-related disasters, women farmers are often at increased risk of gender-based violence, including domestic violence, sexual assault, and exploitation (Ahmad 2012). Displacement, loss of income, and the breakdown of social norms and structures create conditions conducive to abuse and exploitation, exacerbating women's mental health challenges and trauma. Fisher (2010) indicates that the prevalence

**Table 2: Occupational Health Challenges of Women Farmers under Climate Change**

Exposure Pathway	Country	Women Farmers' Health Vulnerabilities	Reference
Drought and heat waves	India	The heightened occurrence of extreme events intensifies the workload for women, particularly in tasks like fetching water and collecting fuelwood. Carrying heavy loads on their heads or backs results in significant backaches and spinal injuries.	Yadav and Lal (2018)
Increasing temperatures	Pakistan	Poorer women from landless or smallholding households are heavily involved in agricultural tasks like sowing and harvesting, while men handle land preparation and irrigation. These women also work as daily wage laborers for cotton picking, facing challenges such as sunburn and heatstroke, especially during scorching summers when temperatures reach 49°C.	Qaisrani and Batool (2021)
Rising temperatures and reduced rainfall	Pakistan	Rising temperatures and reduced rainfall increase crop pest attacks, prompting heightened pesticide use. In regions like Dera Ghazi Khan and Faisalabad, predominantly women and young girls, particularly pregnant cotton pickers, face skin allergies from pesticide residues during cotton picking due to inadequate safety measures.	Abbasi et al. (2021)
Rising temperatures and reduced rainfall	India	Exposure to pesticides in the workplace during pregnancy could potentially lead to placental insufficiency and restricted fetal growth among female workers in tea gardens.	Kumar et al. (2021)
Temperature warming, increases in extreme events, storm surges and sea-level rise	India and Bangladesh	Women engage in daily fishing to earn a livelihood by selling the prawns and small fish they catch, requiring them to stand in waist-deep water for approximately 6 hours each day. Exposure to saline water leads to infections in their reproductive organs, resulting in irregular menstrual cycles, vaginal infections, recurring urinary tract infections, and miscarriages among these women.	The Hindu (2022); FES (2023)

**Figure 6: Anxiety Disorders among Males and Females in South Asia, 2019**



Note: DALY denotes disability-adjusted life year. One DALY represents the loss of the equivalent of 1 year of full health.

Source: World Health Organization.

**Table 3: Climate Change and Women Farmers’ Mental Health and Psychosocial Well-Being in South Asia**

Exposure Pathway	Country	Women Farmers’ Health Vulnerabilities	Reference
Cyclones, storm surges, sea-level rise, and increased salinity	Bangladesh	Salinity in coastal areas contributes to permanent skin diseases in girls, leading to child marriage as parents fear rejection of their daughters with darkened skin tones. The cycle continues as husbands leave affected wives for younger brides, leaving them with children and added burdens.	FES (2023)
Floods and crop failures	India	The departure of men from rural areas exacerbates pressure on women and triggers various social tensions, impacting their mental well-being. This disadvantage is particularly evident during floods and crop failures, with many women resorting to medication for hypertension.	Singh (2018); Aiswarya et al. (2023)
Increased temperature, droughts	India	Climate-related risks led to decreased agricultural output, prompting various responses such as increased labor participation among women, earlier-than-expected marriages, and a rise in school dropouts.	Guérin et al. (2013)
Crop failures	Bangladesh	Financial transactions, particularly when involving borrowing from men outside the family, are often viewed with suspicion and can lead to accusations of immorality. Additionally, women frequently face sexual harassment from male lenders, creating a dilemma between financial need and preserving their reputation.	FES (2023)

of violence against women escalates during climatic disasters in Sri Lanka, exacerbated by pre-existing levels of gender disparity. Table 3 illustrates several instances where the combination of climate-related occurrences and gender-related social factors heightened the challenges faced by women in terms of mental health and psychosocial well-being in South Asian nations.

## 6. Policy Recommendations

Different governments in South Asian nations have implemented diverse climate change adaptation strategies. These include Bangladesh’s Climate Change Strategy and Action Plan (BCCSAP), Bhutan’s National Adaptation Programme of Action, India’s National Action Plan on Climate Change (NAPCC), Maldives’ National Adaptation Programme of Action (NAPA), Nepal’s Local Adaptation Plans for Action (LAPAs), and Pakistan’s Climate Change Act of 2017. However, according to some studies (Singh et al. 2021; Patel et al. 2020), these policies often lack a gender-sensitive approach.

Governments should ensure that climate change adaptation and mitigation strategies explicitly incorporate gender considerations. This involves recognizing and addressing the unique vulnerabilities of women farmers, such as limited access to resources, decision-making power, and institutional support.

Gender-sensitive climate policies should prioritize the participation of women in decision-making processes and allocate resources equitably to support their adaptive capacity. The following recommendations are proposed for the South Asian region to prioritize gender as the central climate change agenda within the agricultural sector.

- (i) **Gender-responsive disaster preparedness:** Integrate gender considerations into disaster risk reduction efforts, ensuring women’s participation in planning and response mechanisms, equitable access to shelters, and protection from gender-based violence. Enhancements in sanitation infrastructure are imperative, including the provision of mobile toilet facilities during disasters equipped with menstrual hygiene products and safe disposal arrangements. Sufficient security measures must be implemented at shelters to safeguard women from violence and sexual harassment following natural disasters.
- (ii) **Improving access to healthcare services:** Efforts should be made to improve women farmers’ access to essential healthcare services, particularly in rural and remote areas where access is limited. This includes strengthening healthcare infrastructure, training healthcare

workers to address the specific health needs of women farmers, and providing mobile healthcare clinics to reach underserved populations. Additionally, initiatives to raise awareness about preventive healthcare measures and facilitate early diagnosis and treatment of diseases are crucial.

- (iii) **Enhancing occupational health and safety:** Measures should be taken to improve occupational health and safety for women farmers, considering the unique challenges they face due to climate change. This includes providing training on safe agricultural practices, ensuring access to personal protective equipment, and implementing policies to reduce exposure to pesticides and other hazardous substances.

- (iv) **Promoting nutrition security:** Given the increased risk of malnutrition and food insecurity among women farmers, targeted interventions should focus on improving access to diverse and nutritious foods. This can be achieved through implementing food security programs and nutritional interventions to ensure access to diverse, nutrient-rich foods, including support for kitchen gardens and livestock rearing.

- (v) **Supporting mental health and psychosocial well-being:** Recognizing the psychological impact of climate change on women farmers, efforts should be made to support their mental health and psychosocial well-being. This includes providing psychosocial support services, counseling, and mental health awareness programs to help women cope with the stress, anxiety, and trauma associated with climate-related disasters.



## References

- Abbasi, S.S., Anwar, M.Z., Habib, N. and Khan, Q., 2021. Vulnerabilities and resilience of local women towards climate change in the Indus basin. In *Engendering Climate Change* (pp. 85–105). Routledge India.
- Acharya, A. and Das, A.K., 2020. District-level analysis of climate vulnerability and household nutrition status among rural communities in Odisha, India. *International Journal of Population Studies*, 6(1), pp. 41–55.
- Ahmed, B.N., Sultana, Y., Fatema, D.S.M., Ara, K., Begum, N., Mostanzid, S.M. and Jubayer, S., 2010. Anthrax: an emerging zoonotic disease in Bangladesh. *Bangladesh J Med Microbiol*, 4(1), pp. 46–50.
- Ahmad, N., 2012. Gender and climate change in Bangladesh: The role of institutions in reducing gender gaps in adaptation program.
- Aiswarya, T.P., Parayil, C., Bonny, B.P., Nameer, P.O., Prema, A. and Sreya, P.S., 2023. Gendered vulnerabilities in small-scale agricultural households of Southern India. *International Journal of Disaster Risk Reduction*, 84, p. 103475.
- Akter, S., Rutsaert, P., Luis, J., Htwe, N.M., San, S.S., Raharjo, B. and Pustika, A., 2017. Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food policy*, 69, pp. 270–279.
- Aryal, J.P., Sapkota, T.B., Khurana, R., Khatri-Chhetri, A., Rahut, D.B. and Jat, M.L., 2020. Climate change and agriculture in South Asia: Adaptation options in smallholder production systems. *Environment, Development and Sustainability*, 22(6), pp. 5045–5075.
- Balayar, R. and Mazur, R., 2021. Women's decision-making roles in vegetable production, marketing and income utilization in Nepal's hills communities. *World Development Perspectives*, 21, p. 100298.
- Croppenstedt, A., Goldstein, M. and Rosas, N., 2013. Gender and agriculture: Inefficiencies, segregation, and low productivity traps. *The World Bank Research Observer*, 28(1), pp. 79–109.
- Datta, P. and Behera, B., 2022. Climate change and Indian agriculture: A systematic review of farmers' perception, adaptation, and transformation. *Environmental Challenges*, 8, p. 100543.
- Datta, P., Behera, B. and Rahut, D.B., 2023. Climate change and water-related threats in the Indian Sundarbans: food security and management implications. *International Journal of Water Resources Development*, pp.1–22.
- Dhimal, M., Kramer, I.M., Phuyal, P., Budhathoki, S.S., Hartke, J., Ahrens, B., Kuch, U., Groneberg, D.A., Nepal, S., Liu, Q.Y. and Huang, C.R., 2021. Climate change and its association with the expansion of vectors and vector-borne diseases in the Hindu Kush Himalayan region: a systematic synthesis of the literature. *Advances in Climate Change Research*, 12(3), pp. 421–429.
- FES, 2023. <https://asia.fes.de/news/bangladesh-coastal-women#:~:text=%22In%20the%20case%20of%20women,%5Bvaginal%20infection%5D%20are%20increasing.>
- Fisher, S., 2010. Violence against women and natural disasters: findings from post-tsunami Sri Lanka. *Violence against women*, 16(8), pp. 902–918.
- Global Health Estimates 2019: Disease burden by Cause, Age, Sex, by Country and by Region, 2000–2019. Geneva, World Health Organization; 2020.
- Guérin, I., Roesch, M., Venkatasubramanian, G. and Kumar, K.S., 2013. The Social Meaning of Over-Indebtedness and Creditworthiness in the Context of Poor Rural South Indian Households (Tamil Nadu) 1. In *Microfinance, Debt and Over-Indebtedness* (pp. 125–150). Routledge.
- Iqbal, M., Fatmi, Z. and Khan, M.A., 2020. Brucellosis in Pakistan: a neglected zoonotic disease. *JPMA. The Journal of the Pakistan Medical Association*, 70(9), p.1625.
- Iqbal, M., Rabbani, A., Haq, F. and Bhimani, S., 2022. The floods of 2022: Economic and health crisis hits Pakistan. *Annals of Medicine and Surgery*, 84.
- Jerin, T., Azad, M.A.K. and Khan, M.N., 2023. Climate change-triggered vulnerability assessment of the flood-prone communities in Bangladesh: A gender perspective. *International journal of disaster risk reduction*, 95, p.103851.
- Kelly, T.R., Bunn, D.A., Joshi, N.P., Grooms, D., Devkota, D., Devkota, N.R., Paudel, L.N., Roug, A., Wolking, D.J. and Mazet, J.A., 2018. Awareness and practices relating to zoonotic diseases among smallholder farmers in Nepal. *EcoHealth*, 15, pp. 656–669.
- Kodavalla, V., Kokku, S.B., Nimmathota, A., Kodavanti, M.R., Ch, G.R., Kumar, S., Manchala, R., Avula, L. and Brahmam, G.N.V., 2015. Impact of Chronic Drought on Nutritional Status of the Community in Drought-affected areas in India. *Indian Journal of Community Health*, 27(4), pp. 478–484.
- Kumar, S.N., Vaibhav, K., Bastia, B., Singh, V., Ahluwalia, M., Agrawal, U., Borgohain, D., Raisuddin, S. and Jain, A.K., 2021. Occupational exposure to pesticides in female tea garden workers and adverse birth outcomes. *Journal of Biochemical and Molecular Toxicology*, 35(3), p.e22677.
- Lambrecht, I.B., 2016. "As a husband I will love, lead, and provide." Gendered access to land in Ghana. *World Development*, 88, pp. 188–200.
- Patel, S.K., Agrawal, G., Mathew, B., Patel, S., Mohanty, B. and Singh, A., 2020. Climate change and women in South Asia: a review and future policy implications. *World Journal of Science, Technology and Sustainable Development*, 17(2), pp. 145–166.

- Petes, P. and Badstue, L., 2020. Gender norms and poverty dynamics in 32 villages of South Asia. *International Journal of Community Well-Being*, 3(3), pp. 289–310.
- Qaisrani, A. and Batool, S., 2021. Vulnerabilities of rural women to climate extremes: A case of semi-arid districts in Pakistan. In *Engendering climate change* (pp. 19–37). Routledge India.
- Satyavathi, C.T., Bharadwaj, C. and Brahmanand, P.S., 2010. Role of farm women in agriculture: Lessons learned. *Gender, Technology and Development*, 14(3), pp. 441–449.
- Singh, C., Solomon, D. and Rao, N., 2021. How does climate change adaptation policy in India consider gender? An analysis of 28 state action plans. *Climate Policy*, 21(7), pp. 958–975.
- Singh, R., 2018. Impact of male out-migration on women left behind: A study of two villages in Uttar Pradesh. *Remittances Review*, 3(1), pp. 75–92.
- Southard, E.M. and Randell, H., 2022. Climate Change, Agrarian Distress, and the Feminization of Agriculture in South Asia. *Rural sociology*, 87(3), pp. 873–900.
- Spangler, K. and Christie, M.E., 2020. Renegotiating gender roles and cultivation practices in the Nepali mid-hills: unpacking the feminization of agriculture. *Agriculture and Human Values*, 37(2), pp.415–432.
- The Hindu, 2022. <https://www.thehindu.com/sci-tech/energy-and-environment/climate-change-salinity-and-menstrual-health-problems-sundarbans-women-battle-triple-whammy/article65905757.ece>.
- UNFCCC, 2023. Five Reasons Why Climate Action Needs Women., <https://unfccc.int/news/five-reasons-why-climate-action-needs-women>.
- Yadav, S.S. and Lal, R., 2018. Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia. *Journal of Arid Environments*, 149, pp. 4–17.

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