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Financial and Environmental Stressors among Rural Female Farmers in Parbhani District, Maharashtra

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ABSTRACT: Rural women sustain farm production while also carrying substantial household and caregiving responsibilities, yet their work-related mental stress remains insufficiently documented. This study examined the socio-economic, financial and environmental sources of stress among rural female farmers in Parbhani taluka of Maharashtra. 150 women were selected from Pingli, Pokharni, Daithana, Indewadi and Sanpuri villages, with 30 respondents drawn from each village through stratified random sampling. Stress responses summarized using frequencies, percentages, means and standard deviations. Most respondents were married (92.67 %), lived in nuclear families (76.67 %), earned less than ₹1 lakh annually (69.33 %), and cultivated or worked on marginal and small holdings. More than half worked mainly as farm labourers, while only 8 % reported a decision-making role. Financial stress was most pronounced for insufficient regular cash flow (3.66 ± 1.236), concern about keeping the farm in the family (3.60 ± 1.259), debt (3.52 ± 1.403), and the need to take off-farm employment (3.49 ± 1.289). Environmental stress was highest for prolonged adverse weather (3.53 ± 1.354), hazardous chemical use (3.45 ± 1.213), delayed farm operations due to weather (3.38 ± 1.133), and pest- and disease-related production losses (3.36 ± 1.064). The findings show that women's stress is shaped by the interaction of economic insecurity, climate exposure, demanding work and restricted control over farm decisions. Gender-responsive credit, climate-resilient production support, safer technologies, drudgery reduction and accessible community-based mental-health services are therefore required.

INTRODUCTION

Farming is an occupation in which livelihood, family identity and exposure to uncertainty are closely connected. Farmers routinely deal with unstable prices, debt, heavy workloads, crop and livestock losses, changing policies and weather-related disruption; together, these pressures can undermine mental well-being (Daghagh Yazd *et al.*, 2019; Brennan *et al.*, 2022). Women experience many of the same risks, but their burden is often intensified by unpaid domestic work, caregiving and limited recognition as farmers (Price & Evans, 2009; Wheeler & Nye, 2025). Evidence from rural India shows that demanding work is associated with psychological distress among women, while education can soften some of this relationship (Fahey *et al.*, 2016; Richardson *et al.*, 2017). Farm women are not a uniform group: stress varies with household position, health, control over resources, type of farm work and access to social support (Carruth & Logan, 2002; Doss *et al.*, 2018; Nichols & Davis, 2024). This makes local evidence essential for designing interventions that reflect women's actual responsibilities rather than treating farm households as gender-neutral units.

The issue is especially relevant in Marathwada, where rain-fed farming, recurrent drought and water scarcity make production and income highly uncertain (Mishra *et al.*, 2023). Women frequently contribute labour without equivalent control over land, credit, technology or marketing decisions, and the physical demands of repetitive agricultural work add another layer of strain (Jost *et al.*, 2016; Vyas, 2012). Studies from Maharashtra also point to debt, livelihood disruption and barriers to mental-health support as persistent concerns (Kulkarni *et al.*, 2021; Iyer *et al.*, 2023; Swami *et al.*, 2020). Against this background, the study assessed the profile of rural female farmers in Parbhani taluka and identified the financial, economic, crop-production and environmental situations that generated the greatest stress. The analysis was intended to provide an evidence base for practical support through agricultural extension, women's groups, rural health services and climate-resilience programmes.

MATERIALS AND METHODS

Study area and design

The investigation was conducted in Parbhani taluka of Parbhani district, Maharashtra, in the Marathwada region. The area was selected purposively because agriculture is a major livelihood and women participate extensively in crop production and allied work.

Sampling and respondents

Five villages *namey*, Pingli, Pokharni, Daithana, Indewadi and Sanpuri were included. A stratified random sampling procedure was used to select 30 rural female farmers from each village, giving a total sample of 150 women in early and middle adulthood.

Instrument and data collection

A structured interview schedule was prepared in line with the study objectives. It recorded socio-personal, socio-economic and farm characteristics and included statements covering financial and economic stress as well as crop-production and environmental stress. Respondents indicated the intensity of stress on a five-point scale ranging from very low to very high. Personal interviews were used so that the questions could be explained consistently and responses could be recorded directly.

Data analysis

The completed schedules were checked, coded and tabulated. Frequencies and percentages described the respondents' characteristics and response categories. Item-level stress was summarized using the arithmetic mean and standard deviation; a larger mean represented greater perceived stress. Because the design was cross-sectional and descriptive, the results indicate patterns and associations in the study population rather than causal effects.

RESULTS AND DISCUSSION

Respondent profile

The sample reflected women managing multiple and sometimes competing responsibilities. Most were 31–40 years old (57.33%), married (92.67%) and living in nuclear families (76.67%). Nearly seven in ten households earned below ₹1 lakh annually, and 64% of respondents had no education beyond the primary level. Land access was limited: 48% worked marginal holdings and 33.33% small holdings, while 6% were landless. More than half described their farm role mainly as labour, compared with only 8% who reported decision-making alone. These patterns matter because high work demands combined with low control and limited resources can heighten psychological strain (Richardson *et al.*, 2017; Wheeler & Nye, 2025).

Table 1. Selected socio-economic and farm characteristics of respondents (n = 150)

Characteristic	Frequency	Percentage
Age: 18–30 years	64	42.67
Age: 31–40 years	86	57.33
Married	139	92.67
Widowed	11	7.33

Characteristic	Frequency	Percentage
Nuclear family	115	76.67
Joint/extended family	35	23.33
Annual income < ₹1 lakh	104	69.33
Annual income ₹1–3 lakh	43	28.67
Annual income ₹3–5 lakh	3	2.00
Illiterate	22	14.67
Primary education	74	49.33
Secondary or higher education	54	36.00
Landless	9	6.00
Marginal holding (≤ 1 ha)	72	48.00
Small holding (1.01–2 ha)	50	33.33
Medium holding (2.01–4 ha)	10	6.67
Farm labour role	79	52.67
Both labour and decision-making	59	39.33
Decision-making role	12	8.00
Works 6–10 hours/day	110	73.33
Chronic illness reported	36	24.00
SHG/community participation	124	82.67

Note. Percentages for selected categories were calculated from the reported frequencies using $n = 150$.

The time burden was also substantial: 73.33% worked six to ten hours per day, 73.33 % reported childcare and 44.67 % elder-care responsibilities. Workload (68.67 %), heat stress (51.33 %) and climate change (46.00 %) were the most frequently identified broad stressors. This overlap of productive and care work is consistent with evidence that household inequality and combined rural and domestic work are linked with poorer physical and mental health among women (Eek & Axmon, 2015; Cezar-Vaz *et al.*, 2015). Although 82.67 % participated in self-help groups or community organizations, only 16.67% reported high decision-making power, suggesting that social participation did not always translate into authority within the farm household.

Financial and economic stress

Daily liquidity and the continuity of the family farm were the most prominent economic concerns. Insufficient regular cash flow recorded the highest mean in this domain (3.66 ± 1.236), followed by worry about keeping the farm in the family (3.60 ± 1.259), owing money (3.52 ± 1.403) and taking an off-farm job to meet expenses (3.49 ± 1.289). Notably, 61% of respondents reported high or very high stress about owing money, while 56.9% reported very high or high stress because regular cash flow was insufficient. These results show that stress was not limited to the total amount of debt; it also arose from the everyday uncertainty of meeting household and farm obligations.

Table 2. Financial and economic stress reported by rural female farmers (n = 150)

Stress situation	Very low	Low	Medium	High	Very high	Mean $\pm$ SD
Sudden and significant increase in debt load	(5.3) 8	(23.2) 35	(25.8) 39	(38.4) 58	(6.6) 10	3.18 $\pm$ 1.037
Insufficient regular cash flow to meet financial obligations or daily necessities	(6.6) 10	(11.3) 17	(24.5) 37	(23.8) 36	(33.1) 50	3.66 $\pm$ 1.236
Low commodity prices	(9.3) 14	(17.2) 26	(21.2) 32	(33.8) 51	(17.9) 27	3.34 $\pm$ 1.225
Meeting with loan officer for additional loan	(16.6) 25	(15.9) 24	(22.5) 34	(24.5) 37	(19.9) 30	3.15 $\pm$ 1.365
Purchase of major machinery, facility or livestock	(13.2) 20	(14.6) 22	(22.5) 34	(20.5) 31	(28.5) 43	3.37 $\pm$ 1.383
Taking an off-farm job to meet expenses	(6.6) 10	(19.9) 30	(21.2) 32	(21.9) 33	(29.8) 45	3.49 $\pm$ 1.289
Rising expenses	(11.3) 17	(23.8) 36	(17.9) 27	(25.8) 39	(20.5) 31	3.21 $\pm$ 1.322
Concerns about continued financial viability of the farm	(8.6) 13	(15.2) 23	(24.5) 37	(36.4) 55	(14.6) 22	3.33 $\pm$ 1.162
Having a loan request turned down	(11.3) 17	(15.9) 24	(19.2) 29	(27.8) 42	(25.2) 38	3.40 $\pm$ 1.326
Government free trade policies	(7.3) 11	(21.9) 33	(35.1) 53	(23.8) 36	(11.3) 17	3.10 $\pm$ 1.098
Government cheap food policies	(6.6) 10	(29.1) 44	(26) 39	(25.8) 41	(10.6) 16	3.05 $\pm$ 1.119
Deciding when to sell	(16.6) 25	(17.9) 27	(27.8) 42	(29.1) 44	(7.9) 12	2.94 $\pm$ 1.211
Worrying about market conditions	(7.3) 11	(17.3) 26	(28.5) 43	(33.8) 51	(12.6) 19	3.27 $\pm$ 1.117
Worrying about owing money	(14.6) 22	(10.6) 16	(13.2) 20	(30.5) 46	(30.5) 46	3.52 $\pm$ 1.403
Worrying about keeping the farm in the family	(6.6) 10	(16.6) 25	(16.6) 25	(29.8) 45	(29.8) 45	3.60 $\pm$ 1.259

Note. Entries in the five response columns are percentage (frequency), as presented in the source data.

The pattern agrees with research linking agrarian distress to low and unstable farm income, debt, poor output prices and restricted access to formal credit (Reddy *et al.*, 2020; Swami *et al.*, 2020; Saini & Hussain, 2025). Loan rejection (3.40 $\pm$ 1.326) and major capital purchases (3.37 $\pm$ 1.383) were also highly stressful, indicating that women faced pressure both when credit was unavailable and when investment was required. Similar constraints have been reported among women farmers in Maharashtra, where inadequate income and outstanding obligations can force distress sales and narrow livelihood choices (Kulkarni *et al.*, 2021).

Market uncertainty remained important but was somewhat less intense than household cash-flow and debt concerns. Worry about market conditions averaged 3.27 ± 1.117 , whereas deciding when to sell had the lowest financial-domain mean (2.94 ± 1.211). This distinction suggests that women may experience the market mainly through uncertainty about prices and household consequences, rather than through control over the timing of sales—a plausible reflection of their limited decision-making role.

Production and environmental stress

Environmental exposure was a second major source of strain. Prolonged adverse weather produced the highest mean score (3.53 ± 1.354), with 59% of women reporting high or very high stress. Hazardous chemical use followed (3.45 ± 1.213), while weather-related delays in planting or harvesting (3.38 ± 1.133) and production loss from pests and diseases (3.36 ± 1.064) were also prominent. The findings are consistent with Marathwada's vulnerability to rainfall variability, drought and crop loss (Mishra *et al.*, 2023; PoCRA, 2024).

Table 4. Crop-production and environmental stress reported by rural female farmers (n = 150)

Stress situation	Very low	Low	Medium	High	Very high	Mean $\pm$ SD
Significant production loss due to pests and disease	(2.6) 4	(20.5) 31	(30.5) 46	(29.8) 45	(15.9) 24	3.36 ± 1.064
Delay in planting or harvesting due to weather	(6.6) 10	(16.6) 25	(23.8) 36	(37.1) 56	(15.2) 23	3.38 ± 1.133
Prolonged bad weather	(11.3) 17	(13.9) 21	(15.2) 23	(28.5) 43	(30.5) 46	3.53 ± 1.354
Problems with weeds and insects	(7.3) 11	(19.2) 29	(24.5) 37	(33.8) 51	(14.6) 22	3.29 ± 1.156
Crop loss due to weather	(12.6) 19	(17.9) 27	(19.2) 29	(28.5) 43	(21.2) 32	3.28 ± 1.327
Breeding or reproductive difficulties with livestock	(41.1) 62	(12.6) 19	(25.2) 38	(13.2) 20	(7.3) 11	2.33 ± 1.329
Illness during planting and harvesting	(10.6) 16	(18.5) 28	(31.8) 48	(21.9) 33	(16.6) 25	3.15 ± 1.219
Use of hazardous chemicals on the farm	(7.9) 12	(15.9) 24	(19.9) 30	(35.1) 53	(20.5) 31	3.45 ± 1.213

Note. Entries in the five response columns are percentage (frequency), as presented in the source data.

Stress associated with weeds and insects (3.29 ± 1.156) and weather-related crop loss (3.28 ± 1.327) further demonstrates how production risks become psychological risks when farm income and family welfare depend on a successful season. In contrast, livestock breeding or reproductive difficulties had the lowest mean (2.33 ± 1.329), probably because crop farming was nearly universal in the sample whereas comparatively few respondents reported livestock or allied enterprises. The relatively high score for chemical exposure is important because women often perform labour-intensive tasks without adequate protective equipment or control over input decisions; safer practices and practical training should therefore be treated as both occupational-health and mental-health measures (Patil, 2022; Vyas, 2012).

Practical implications

The results call for an integrated response rather than a stand-alone awareness campaign. Agricultural support should improve reliable access to institutional credit, timely market information, crop insurance and climate-resilient practices. Extension programmes should reach women directly, recognize them as producers and decision-makers, and promote drudgery-reducing tools and safe handling of farm chemicals. Self-help groups can provide a familiar platform for financial counselling, peer support, stress identification and referral, but services should protect privacy and use locally acceptable language. Farmer-

centred mental-health initiatives are more likely to be used when they are co-designed with agricultural communities and delivered through trusted rural networks (Hagen *et al.*, 2022; King *et al.*, 2023).

CONCLUSION

Mental stress among the rural female farmers studied was rooted in the combined pressure of insecure income, debt, uncertain weather, crop-production risks, heavy workloads and restricted decision-making. The strongest financial concerns involved day-to-day cash flow, continuity of the family farm, debt and dependence on off-farm work. Prolonged adverse weather, hazardous chemical use, delayed farm operations and pest- and disease-related losses dominated the environmental domain. The findings make clear that women's mental well-being cannot be separated from their economic position and working conditions. Policies should therefore combine gender-responsive credit and market support with climate-resilient agriculture, safer and less laborious technologies, stronger decision-making rights and accessible community-based mental-health care.

REFERENCES

- [1] Brennan, M., Hennessy, T., Meredith, D., & Dillon, E. (2022). Workload and money: Determining and evaluating sources of stress for farmers in Ireland. *Journal of Agromedicine*, 27(2), 132–142.
- [2] Carruth, A. K., & Logan, C. A. (2002). Depressive symptoms in farm women: Effects of health status and farming lifestyle characteristics, behaviors, and beliefs. *Journal of Community Health*, 27(1), 483.
- [3] Cezar-Vaz, M. R., Bonow, C. A., & da Silva, M. R. S. (2015). Mental and physical symptoms of female rural workers: Relation between household and rural work. *International Journal of Environmental Research and Public Health*, 12(9), 11037–11049. <https://doi.org/10.3390/ijerph120911037>
- [4] Daghigh Yazd, S., Wheeler, S. A., & Zuo, A. (2019). Key risk factors affecting farmers' mental health: A systematic review. *International Journal of Environmental Research and Public Health*, 16(23), 4849. <https://doi.org/10.3390/ijerph16234849>
- [5] Doss, C., Meinzen-Dick, R., Quisumbing, A., & Theis, S. (2018). Women in agriculture: Four myths. *Global Food Security*, 16, 69–74.
- [6] Eek, F., & Axmon, A. (2015). Gender inequality at home is associated with poorer health for women. *Scandinavian Journal of Public Health*, 43, 176–182.
- [7] Fahey, N., Soni, A., Allison, J., Vankar, J., Prabhakaran, A., Moore Simas, T. A., Byatt, N., Phatak, A., O'Keefe, E., & Nimbalkar, S. (2016). Education mitigates the relationship of stress and mental disorders among rural Indian women. *Annals of Global Health*, 82(5), 779–787. <https://doi.org/10.1016/j.aogh.2016.04.001>
- [8] Hagen, B. N. M., Sawatzky, A., Harper, S. L., O'Sullivan, T. L., & Jones-Bitton, A. (2022). 'Farmers aren't into the emotions and things, right?': A qualitative exploration of motivations and barriers for mental health help-seeking among Canadian farmers. *Journal of Agromedicine*, 27(2), 113–123. <https://doi.org/10.1080/1059924X.2021.1893884>
- [9] Iyer, K., Gupta, P., Sapre, S., Pawar, T., Gala, P., Kapoor, H., Kalahasthi, R., Ticku, A., Kulkarni, S., & Iyer, P. (2023). Mental health resources, barriers, and intervention needs among women in rural Maharashtra, India: A qualitative study. *Cambridge Prisms: Global Mental Health*, 10, e93, 1–7. <https://doi.org/10.1017/gmh.2023.78>
- [10] Jost, C., Kyazze, F., Naab, J., Neelormi, S., Kinyangi, J., & Zougmore, R. (2016). Understanding gender dimensions of agriculture and climate change in smallholder farming communities. *Climate and Development*, 8(2), 133–144.
- [11] Kerlinger, F. N. (1973). Foundations of behavioral research (2nd ed.). Holt, Rinehart and Winston.
- [12] King, E., Lamont, K., Wendelboe-Nelson, C., Williams, C., Stark, C., van Woerden, H. C., & Maxwell, M. (2023). Engaging the agricultural community in the development of mental health interventions: A qualitative research study. *BMC Psychiatry*, 23, 399. <https://doi.org/10.1186/s12888-023-04806-9>
- [13] Kulkarni, S., Bhat, S., Harshe, P., & Satpute, S. (2021). Locked out of livelihoods: Impact of COVID-19 on single women farmers in Maharashtra, India. *Economia Politica*, 39(1), 185–202. <https://doi.org/10.1007/s40888-021-00240-w>
- [14] Mishra, V., Shah, H. L., & Thakur, P. (2023). Drought characteristics and agricultural impacts in Marathwada, India. *Climate Services*, 29, 100336. <https://doi.org/10.1016/j.cliser.2023.100336>
- [15] Nichols, C. E., & Davis, J. (2024). The Women Farmer Stress Inventory: Examining women farmer stress in the United States Corn Belt. *The Journal of Rural Health*, 40(3), 457–466. <https://doi.org/10.1111/jrh.12808>
- [16] Patil, S. (2022). Climate-smart agriculture and family farming in Marathwada, India. Food and Agriculture Organization of the United Nations.

- [17] PoCRA. (2024). Monitoring and evaluation report: Project on Climate Resilient Agriculture (PoCRA). Government of Maharashtra, Department of Agriculture. <https://mahapocra.gov.in/>
- [18] Price, L., & Evans, N. (2009). From stress to distress: Conceptualizing the British family farming patriarchal way of life. *Journal of Rural Studies*, 25(1), 1–11. <https://doi.org/10.1016/j.jrurstud.2008.03.008>
- [19] Reddy, A. A., Raju, S. S., & Bose, A. (2020). Farmers' income, indebtedness and agrarian distress in India. *The Microfinance Review*, 12(1), 20–38.
- [20] Richardson, R. A., Nandi, A., Jaswal, S., & Harper, S. (2017). Are work demands associated with mental distress? Evidence from women in rural India. *Social Psychiatry and Psychiatric Epidemiology*, 52(12), 1501–1511. <https://doi.org/10.1007/s00127-017-1448-z>
- [21] Saini, S., & Hussain, S. (2025). Beyond loan waivers: Empirical evidence from Punjab, Maharashtra, and Uttar Pradesh on farmer distress and coping mechanisms. *Agricultural Economics Research Review*, 38(1), 47–60. <https://doi.org/10.1177/09713441251389414>
- [22] Swami, D., Dave, P., & Parthasarathy, D. (2020). Understanding farmers' suicidal ideation: A structural equation modeling study in Maharashtra, India. *Climatic Change*, 163, 2175–2200. <https://doi.org/10.1007/s10584-020-02935-8>
- [23] Vyas, R. (2012). Mitigation of musculoskeletal problems and body discomfort of agricultural workers through educational intervention. *Work*, 41, 2398–2404.
- [24] Wheeler, R., & Nye, C. (2025). The health and well-being of women in farming: A systematic scoping review. *Journal of Agromedicine*, 30(1), 132–152. <https://doi.org/10.1080/1059924X.2024.2407385>