

SCHOLARLY TRENDS IN WOMEN FARMERS' MENTAL HEALTH AND DEPRESSION: ALIGNMENT WITH SDG GOOD HEALTH AND WELLBEING

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Abstract

Mental health and depression among women in agriculture remain critically underexplored despite their alignment with Sustainable Development Goal 3 on good health and well-being. This study adopts a feminist political ecology framework to examine how gendered power structures, environmental pressures, and unpaid labor intersect to shape the mental well-being of female farmers. A bibliometric analysis of 202 scholarly documents published between 2015 and 2024 was conducted using data from the Web of Science, analyzed through Biblioshiny and Microsoft Excel. Results show a rise in research output following the COVID-19 pandemic, with key themes including “women workers,” “occupational stress,” “empowerment,” and “gender roles.” Most studies are focused on regions such as Africa, India, and Bangladesh, where women play vital roles in agriculture. However, research partnerships remain limited within these regions, with most publications driven by institutions in high-income countries. The analysis highlights the gender bias in mental health research and calls for more inclusive, locally informed, and gender-sensitive approaches. This study urges policymakers to increase funding, strengthen regional collaboration, and integrate mental well-being into agricultural and rural development programs. By framing mental health as both a public health and gender equity issue, this work contributes to rethinking well-being in farming systems.

Keywords: Bibliometric Analysis; mental well-being; agriculture; health and safety; women

JEL: H51, I12, Q12

Introduction

Agriculture is one of the world's most essential sectors, providing food, employment, and economic stability for billions of people (Viana et al., 2022). It contributes approximately 4.3% to the global economy and accounts for over 20% of GDP in many African countries (FAO, 2024b; Giller, 2020). The sector also employs 26.2% of the global workforce, particularly in developing economies (FAO, 2024a). Despite its importance, farming is sometimes carried out under hazardous conditions that harm both physical and mental health. Farmers face several stressors, including agrochemicals, long work hours, repetitive labor, and financial uncertainty, which can result in musculoskeletal diseases, chronic pain, weariness, and psychological discomfort (Barneo-Alcántara et al., 2021; Donohoe et al., 2024; Steen et al., 2023).

However, farmers worldwide are facing a mostly unacknowledged mental health epidemic. Every year, an estimated 800,000 individuals commit suicide, one every 40 seconds (Shuchman, 2014; WHO, 2019), a trend that is not limited to the farming community. According to research, farmers have higher rates of depression, anxiety, stress, and burnout, which are influenced by economic insecurity, climate change, and unsafe working conditions (Rudolphi et al., 2020; Talukder et al., 2021; Yazd et al., 2019). Despite this, mental health in agriculture is understudied, particularly from a gender-sensitive perspective.

Suicide data show a substantial gender disparity. In the United States, male farmers are 3.5 times more likely to commit suicide than the overall public (Rosalie & Carolyn, n.d.). Between 2003 and

2017, there were 1,575 male farmer suicides compared to just 77 among female farmers, complicating efforts to measure women's suicide rates reliably (Miller & Rudolphi, 2022; Norrod et al., 2023). Globally, similar patterns persist. In India, approximately 400,000 farmers committed suicide between 1995 and 2021, translating to 48 farmers every day, 85% of whom were men (Kannuri & Jadhav, 2021). In Hungary, suicide remains a national concern, with 1,159 male suicides (32.6 per 100,000) versus 434 female suicides (8.3 per 100,000) in 2023 (Hungarian Suicide Report, 2023). These figures highlight a recurring and worldwide gendered trend in suicide rates, particularly in agricultural settings where males are subject to particular socioeconomic and cultural constraints that may increase their risk.

While men's mental health is often highlighted due to higher suicide rates, women in agriculture face a quieter but equally serious crisis (Galvez-Sánchez et al., 2025). Although female suicide rates are lower, women suffer disproportionately from chronic, non-fatal psychological issues. Their emotional strain is often compounded by overlapping responsibilities in farm labor and domestic care, duties that frequently go unrecognized in public health strategies (Conway & O'Mullane, 2025; Wheeler & Nye, 2025a). Studies give compelling evidence for this discrepancy. In Brazil, a survey of 450 farmers discovered that 12.4% had suicidal thoughts, with women having much greater levels of depression and anxiety than men (de Oliveira Santos et al., 2022). In Japan, research on 273 dairy farmers revealed that female farmers were more likely to be depressed as compared to male dairy farmers (Sato et al., 2020). Similarly, a systematic review addressing mental health among farmers indicated that women in farming frequently combine off-farm employment, household tasks, and family care, which contributes to emotional fatigue over time (Wheeler & Nye, 2025).

Role of Women in Agriculture and Mental Health

Women are critical to global agriculture, participating along the value chain, from agricultural production and animal care to food preservation, marketing, and community service. According to the Food and Agriculture Organization, women account for at least 28.5% of the world's agricultural labor, with percentages exceeding 50% in Sub-Saharan Africa and Southeast Asia (FAO, n.d.-b). Despite their critical roles, female farmers face long-standing structural inequities, such as limited access to land, loans, extension services, and leadership opportunities (FAO, 2003). These difficulties reduce economic independence and increase susceptibility to psychosocial stress.

Traditional gender norms worsen the mental health burden by assigning women to both agricultural labor and unpaid household caregiving (Seedat & Rondon, 2021; Stewart et al., 2021). In many rural communities, women are expected to do childcare, cooking, cleaning, and eldercare in addition to farm work. This overlapping task causes longer working hours, physical exhaustion, and mental stress. In places like Africa, customary rules frequently limit women's land rights and inheritance, strengthening reliance on male relatives and limiting access to agricultural supplies, loans, and education (Behr et al., 2023; O'Sullivan, 2017).

Broader economic pressures heighten these issues. With Africa's poverty rate at 30% and unemployment at 7% (International Labor Organization, 2022), many women are forced to engage in informal income-generating activities such as selling vegetables at local markets or working on nearby farms while also managing home obligations. Their sensitivity to depression, anxiety, and fatigue is made worse by a lack of access to mental health services and support networks. However, these chronic mental health issues are rarely documented in national health records and are rarely prioritised in wellness programs (Pedersen et al., 2022).

Global health initiatives, including the United Nations Sustainable Development Goal 3 (Target 3.4), emphasize mental health promotion and the reduction of non-communicable diseases (WHO, 2023). Yet the specific needs of women in agriculture are rarely incorporated into national mental health strategies. Due to the higher visibility of male suicide and workplace fatalities in statistical records, public health interventions tend to prioritize men, leaving women's psychological struggles underrepresented in research, data collection, and policy responses (The Women in Global Mental Health Research Group & Rose-Clarke, 2023).

This study draws on Feminist Political Ecology (FPE), a framework that explores how gender, power, and environmental stressors intersect to shape the lived experiences of marginalized communities, especially women in agriculture (Elmhirst, 2015; Sundberg, 2017). It highlights the invisibility of unpaid labor, unequal access to resources, and the emotional toll of these inequalities, key concerns in understanding the mental health of female farmers. This study hypothesizes that women's mental health in agriculture is systematically underrepresented in scholarly literature and, where addressed, is often framed within androcentric or generalized health paradigms that fail to account for gendered labor burdens and structural. Through a gender-sensitive bibliometric analysis, this study confronts the androcentric bias in mental health research and draws attention to how socio-environmental stressors shaped by neoliberal and patriarchal systems uniquely affect women farmers. In doing so, it not only fills a critical gap in research but also calls for more just, inclusive, and intersectional approaches to rural mental health.

This study seeks to raise awareness of women's mental health in agriculture and to inform more inclusive research and policy discourse. It aims to engage governments, NGOs, private and public sector actors, and the academic community in understanding both the current landscape and the actions needed to support the mental well-being of women farmers by addressing the following specific questions:

1. What are the trends in scientific publications on mental health and depression among female farmers?
2. Which journals, articles, and countries have contributed to this body of research?
3. What are the key themes and trending topics in this field?

Materials and Methods

This study was conducted through bibliometric analysis (Donthu et al., 2021). This analysis method has gained popularity for analyzing data from a large database. The study reviewed articles from Web of Science database. For analysis, the study employed Biblioshiny through R version 4.3.3 software and Microsoft Excel. The following keyword combination was used to source the articles: Keyword combination: TS=(((("Agricultur*") AND ("Farm*") AND ("mental health") AND ("depression") AND ("stressors") AND ("gender roles") AND ("suicide") AND ("occupational stress") AND ("agricultural workload") AND ("labor burden") AND ("emotional wellbeing") AND ("women") OR ("women workers"))))

The review process followed a structured approach guided by the PRISMA model (Page et al., 2021), as illustrated in Figure 1. Inclusion and exclusion criteria were applied systematically to ensure rigor. Only original articles, reviews, and book chapters published between 2015 and 2024 were considered, limited to English-language publications aligned with the Sustainable Development Goal on Good Health and Well-being. A Feminist Political Ecology lens informed both the keyword selection and the interpretation of results, ensuring that structural inequalities and gendered experiences were central to the analysis.

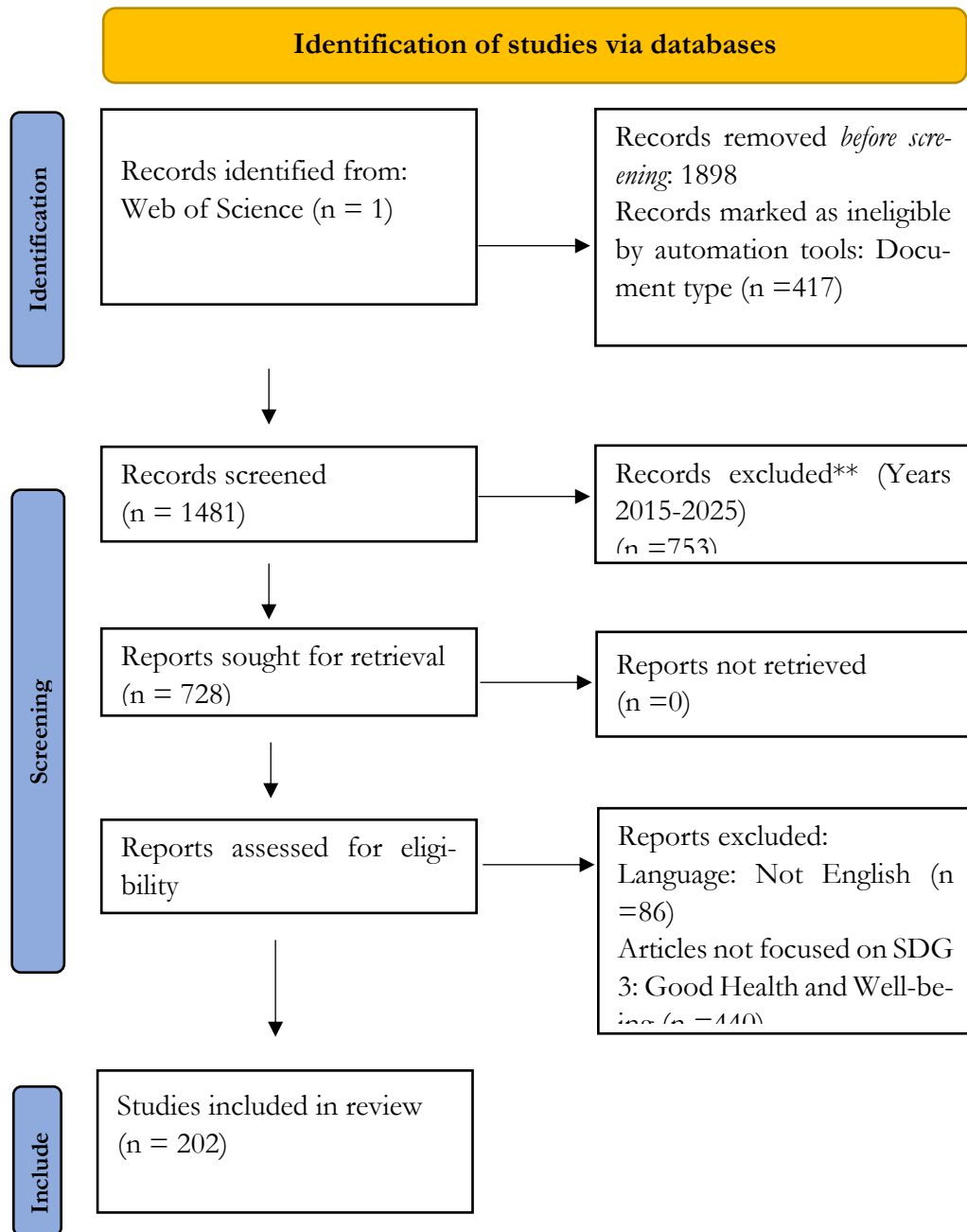


Figure 1: Research Process (PRISMA Model)
Source: Authors own compilation using PRISMA Framework

Finding and Results

Table 1 shows the general information about the research data that was used for bibliometric analysis

Table 1: General information about the Data

Timespan	2015:2024
Sources (Journals, Books, etc)	161
Documents	202
Annual Growth Rate %	4.04
Document Average Age	5.03
Average citations per doc	8.564
References	8707
DOCUMENT CONTENTS	
Keywords Plus (ID)	530
Author's Keywords (DE)	758
AUTHORS	
Authors	746
Authors of single-authored docs	48
AUTHORS COLLABORATION	
Single-authored docs	48
Co-Authors per Doc	3.95
International co-authorships %	25.74
DOCUMENT TYPES	
article	193
article; book chapter	6
review	3

Source: Authors own compilation using Bibliometric Analysis

The analysis covered publications from 2015 to 2024, reflecting scholarly output in the years following the adoption of the Sustainable Development Goals. A total of 202 documents were included after a rigorous selection process. Scientific output in this area has grown steadily, with an annual increase of 4.04%. The average of 8.56 citations per document suggests strong academic engagement with the selected works. Most entries were journal articles (193), alongside a few book chapters (6) and reviews (3). The dataset included 746 authors, with 25.74% of contributions involving international co-authorship, indicating a notable level of global collaboration. The average age of the documents was 5.03 years, underscoring the recent and evolving nature of research on mental health in agriculture.

Annual Scientific Production

Following the adoption of the good health and well-being sustainable development goal, there has been an increase the annual scientific production on mental health among female farmers from 2015 to 2024 as seen in *Figure 2*.

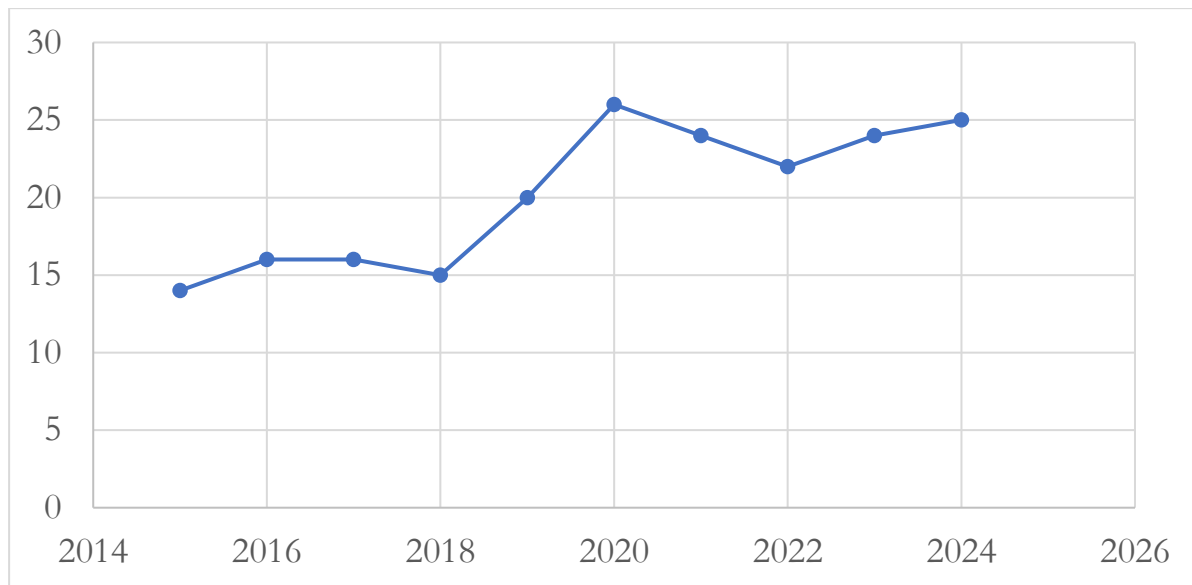


Figure 2: Annual Scientific Production

Source: Authors own compilation using Bibliometric Analysis

This trend shows that researchers have increasingly focused on the mental health of female farmers in relation to SDG 3 (Good Health and Wellbeing). From 2015 to 2018, the trend remained relatively steady, indicating a modest but consistent level of interest. A sharp increase began in 2019 and peaked in 2020. The presence of “COVID-19” as one of the keywords in Figure 3 provides justification that this surge could be linked to the impacts of the pandemic, which brought heightened global attention to mental health, especially among vulnerable populations. Although there was a slight decline in publications between 2021 and 2022, interest picked up again through 2024, suggesting continued relevance of this research area within global health and development discussions.

Notably, the research on mental health among female farmers has evolved showing a distinct of the top 10 trending topics as seen in Figure 3.

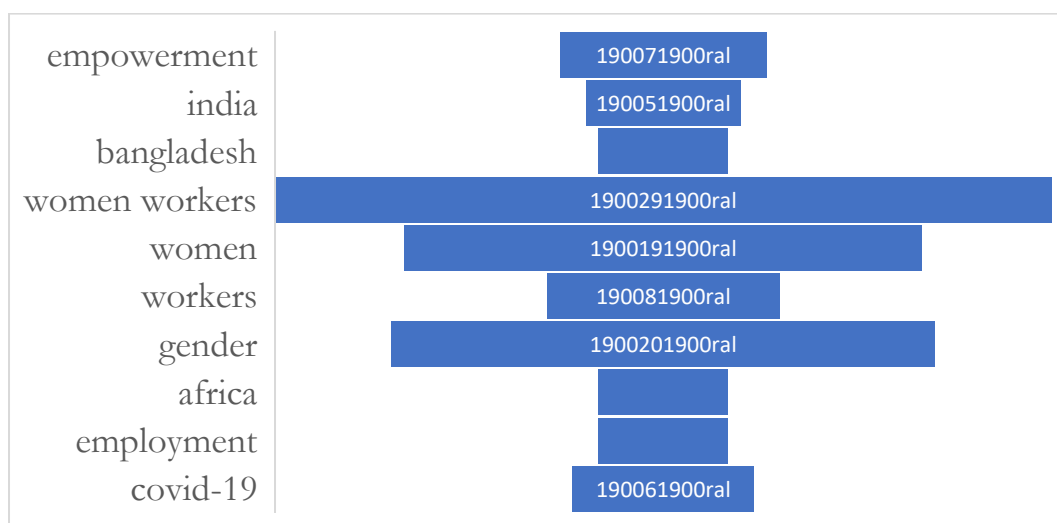


Figure 3: Trending Topics

Source: Authors Own compilation using Bibliometric Analysis

Figure 3 presents the top 10 trending topics related to women’s mental health in agriculture, based on keyword frequency in the analyzed literature. The most frequently occurring terms include “women workers” (30), “gender” (21), and “women” (20), followed by terms such as “empowerment” (8), “employment” (5), and “COVID-19” (7). Regional identifiers like “India,” “Bangladesh,” and “Africa” also appear, each with 6,5,5 mentions, suggesting concentrated research focus in those areas. This pattern reflects the thematic direction of scholarly work in the selected timeframe.

Most Relevant Sources

The study further examined the most relevant sources publishing articles related to women mental health, depression and good health and well-being SDG based on the number of articles published per annum and their H Index from Scimago Journal Ranking. The results are shown in Table 2.

Table 2: Most Relevant Sources

Sources	H Index	Number of Publications
Indian Journal of Labor Economics	21	7
International Journal of Environmental Research and Public Health	198	6
Asian Journal of Women’s Studies	19	3
Current Science	137	3
Indian Journal of Occupational and Environmental Medicine	37	3
Review of International Political Economy	88	3
Workplace Health and Safety	50	3
Annals of Occupational and Environmental Medicine	30	2
BMC Public Health	197	2
BMC Women’s Health	64	2
Gender Work and Organization	95	2

Source: Authors own compilation from Bibliometric Analysis

The findings show the top journals in this topic. The *Indian Journal of Labor Economics* leads with 7 articles (H-index: 21), followed by the *International Journal of Environmental Research and Public Health* with 6 articles (H-index: 198). Journals with 3 articles each include the *Asian Journal of Women’s Studies* (H-index: 19), *Current Science* (H-index: 137), *Indian Journal of Occupational and Environmental Medicine* (H-index: 37), *Review of International Political Economy* (H-index: 88) and *Workplace Health and Safety* (H-index: 50). Journals contributing 2 articles each are the *Annals of Occupational and Environmental Medicine* (H-index: 30), *BMC Public Health* (H-index: 197), *BMC Women’s Health* (H-index: 64), and *Gender, Work and Organization* (H-index: 95). These results reflect a multidisciplinary approach and consistent publication of impactful research across journals.

Most Cited Articles

The study further assessed the most cited articles. Table 3 summarizes a content analysis of the most frequently cited academic articles from 2015 to 2024 that address themes relevant to the mental health of women in agriculture

Table 3: Content Analysis of the highly cited papers

Paper	Themes Identified	Methodology	Theoretical Contribution	Relevance to Female Farmers' Mental Health	Total Citations	Citations per Year
Lahoti & Swaminathan, 2016	Gender inequality, economic empowerment	Quantitative index development (Global Gender Gap Index)	Redefines poverty measures with a gender lens	Highlights gender-based structural inequalities that contribute to women's psychosocial stress	80	8.00
Memon et al., 2018	Climate change, water/food insecurity	Empirical environmental impact analysis	Links climate vulnerability with health outcomes	Environmental uncertainty is a key stressor for small-scale women farmers	64	9.14
Hirve et al., 2015	Migration, WASH, health inequities	Mixed methods (surveys + observations)	Exposes health service gaps for marginalized mobile populations	Access to basic health and hygiene influences well-being, especially in seasonal agricultural contexts	57	5.18
Said-Allsopp & Tallontire, 2015	Informal labor, circular economy, gendered work	Qualitative case studies	Recognizes unpaid women's labor as part of economic systems	Undervalued labor increases mental burden and economic insecurity	50	4.55
Earl & Taylor, 2015	Aging, workforce participation, mental well-being	Longitudinal survey analysis	Framework for productive aging and late-life work	Older women in agriculture face physical and emotional strain with little retirement security	46	4.18

LeBaron, 2021	Labor exploitation, forced work, psychological harm	Mixed methods (interviews, surveys)	Links labor policy to mental harm in global supply chains	Shows how coercive labor conditions impact mental health in agricultural sectors	44	7.33
Venugopal et al., 2016	Urban slum health, inequality, environmental exposures	Cross-sectional survey, spatial analysis	Spatial dimensions of urban vulnerability and health	Parallels with rural female farmers facing similar environmental and health access stressors	42	4.20
Calkin, 2015	Neoliberal gender empowerment, development critique	Discourse and policy analysis	Critiques surface-level empowerment narratives in aid/development	Shows how structural solutions may overlook mental health and well-being	33	3.30
Curtis et al., 2018	Occupational health, toxic exposure	Workplace hazard and exposure analysis	Evidence linking workplace exposure to health outcomes	Toxic exposure contributes to chronic stress and health anxiety	32	4.00
Jones-Bitton et al., 2020	stress, anxiety, depression, and resilience	Online cross-sectional Survey, psychometric assessments	High prevalence of psychological distress among farmers	Need for Targeted mental health interventions among farmers.	27	2.45

Source: Authors own compilation from Microsoft Excel

Table 3 presents the ten most cited scholarly articles related to women farmers' mental health between 2015 and 2024. Lahoti (2016) was the most cited, with 80 citations, followed by Memon (2019) with 64 and Hirve (2015) with 57. The articles addressed a range of themes including gender inequality, unpaid labor, environmental stressors, health service gaps, aging, and occupational hazards. Methodologies varied, with most studies using mixed methods, qualitative case studies, or empirical survey analysis. Although not all articles focused solely on women in agriculture, each contributed frameworks or findings relevant to understanding mental health outcomes within gendered agricultural settings. The citation frequency suggests that issues such as climate vulnerability, informal labor, and structural inequality have received significant scholarly attention over the last decade.

Collaboration Network

Figure 4 illustrates the international collaboration network among countries contributing to research on women farmers' mental health. India emerges as the most connected node, with strong co-authorship links to countries such as the United States, United Kingdom, Australia, Canada, and Germany. In Asia, India also collaborates frequently with Bangladesh, Pakistan, Vietnam, Malaysia, South Korea, Singapore, and Thailand. African countries with notable collaboration links include South Africa, Uganda, and Tanzania. The United States and the United Kingdom also act as central hubs, forming dense partnerships with countries across Europe, North America, and Asia. The network additionally shows smaller but meaningful contributions from countries such as Guatemala, North Macedonia, and Cambodia. These patterns indicate a globally distributed research effort, with a few dominant countries serving as central connectors.

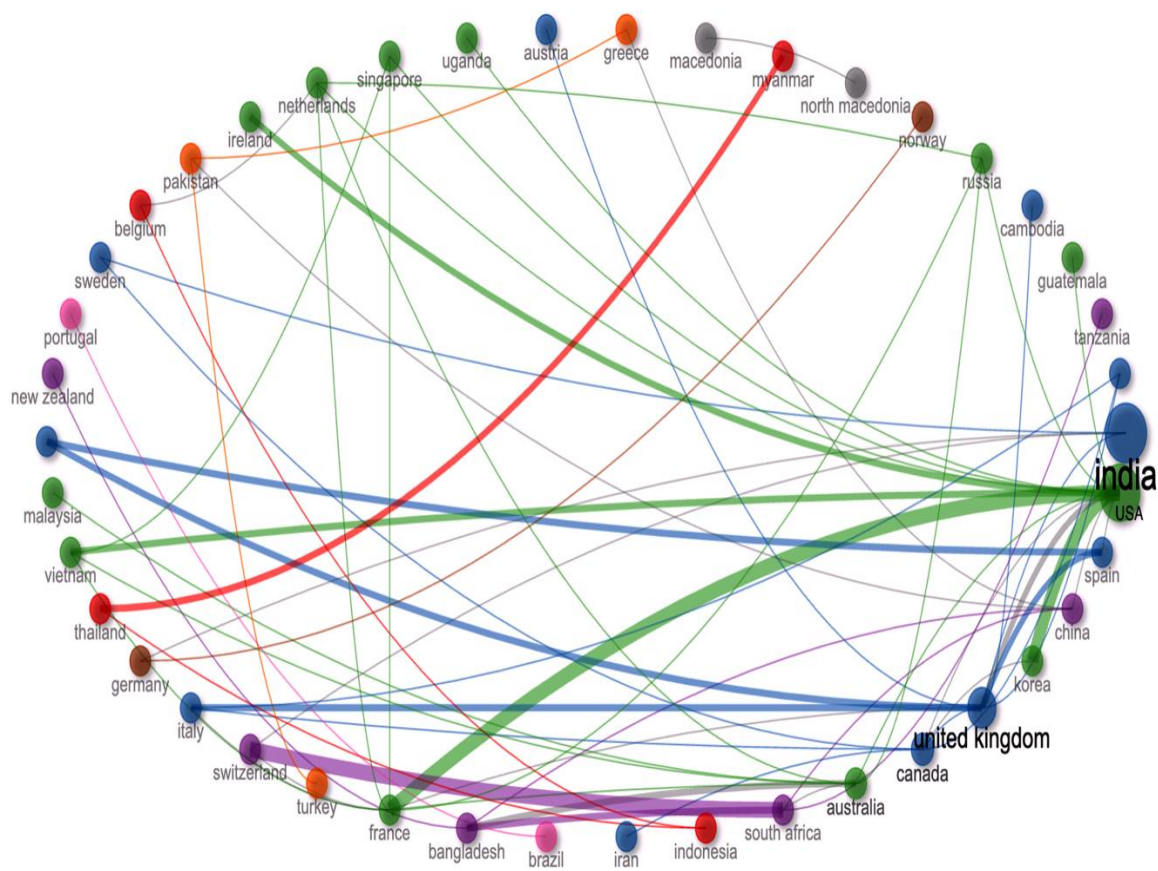


Figure 4: Collaboration Network

Source: Authors own compilation from Bibliometric Analysis

Most Relevant Affiliations

The study also evaluated the top ten affiliations including organizations and universities that had collaborated to produce the highest quantity of publications addressing the topic. Table 4 lists the top institutional affiliations contributing to highly cited research on women farmers' mental health, ranked by PageRank score (Fiala & Tutoky, 2017). It also includes each institution's position in the QS World University Rankings (2025), offering a perspective on both scholarly influence and global academic standing.

Table 4: Most Relevant Affiliations

Rank	Institution	PageRank Score	QS World University Rankings 2025
1	University of Nottingham	0.063	108th
2	University of Colorado	0.043	188th
3	Colorado State University	0.043	Not ranked in top 500
4	Universitas Muhammadiyah Magelang	0.043	Not ranked in top 500
5	Dongguk University	0.043	Not ranked in top 500
6	Western University (Canada)	0.043	172nd
7	National Taiwan University (NTU)	0.043	68th
8	National Taiwan University Hospital	0.043	Part of NTU
9	Gyeongsang National University	0.043	Not ranked in top 500
10	Gyeongsang National University Hospital	0.043	Part of Gyeongsang National University

Source: Authors own compilation from Microsoft Excel

The University of Nottingham had the highest score and is ranked 108th globally. Other notable institutions include National Taiwan University (68th), Western University (172nd), and the University of Colorado (188th). Several institutions, such as Colorado State University, Dongguk University, Gyeongsang National University, and Universitas Muhammadiyah Magelang, also ranked highly in the collaboration network but are not listed in the QS World University Rankings 2025 top 500. This group of institutions reflects a mix of global and regional contributors actively engaged in interdisciplinary research related to female farmers' mental health.

Discussion of Findings

This study set out to explore how the intersection of gender and mental health in agriculture is reflected in academic literature, with a particular focus on the challenges faced by women farmers. The bibliometric analysis confirmed a growing interest in this area, especially following the COVID-19 pandemic. The rise in publications around 2020 aligns with global recognition of mental health as a public health priority during crisis periods. The spike in research also echoes prior findings by (Rodríguez & Camacho, 2024) who noted an increase in emotional strain among rural women during lockdowns. The findings of this study affirm the hypothesis that women's mental health in agriculture is systematically underrepresented in academic literature and, where addressed,

is frequently situated within generalized or androcentric paradigms. The bibliometric analysis revealed that while gender is increasingly cited as a keyword, relatively few studies center the unique psychological burdens faced by women farmers.

Thematic Emphasis and FPE Alignment

The trending keywords "women workers," "gender," "empowerment," and "COVID-19" indicate a movement toward issues important to a Feminist Political Ecology (FPE) perspective. These themes highlight interlocking structural burdens: women farmers suffer not only the economic strains of agricultural labor, but also the invisible and underappreciated weight of caring, which is frequently done without institutional assistance (Glazebrook et al., 2020). This combined burden is an important concept in FPE, which examines how environmental and labor disparities interact to disproportionately affect women's well-being (Elmhirst, 2015).

Highly cited articles reinforce these themes. (Lahoti & Swaminathan, 2016) reimagines poverty measurement through a gendered lens, questioning economic paradigms that fail to account for the emotional costs of inequality. Similarly, (LeBaron, 2021; Said-Allsopp & Tallontire, 2015) focus on unpaid labor and labor exploitation, which FPE defines as forms of dispossession that undermine both agency and mental health. (Calkin, 2015) criticizes "empowerment" terms within development, highlighting FPE's worry that conventional solutions frequently overlook the emotional and structural violence hidden in women's agricultural roles.

The risk to the environment has also emerged as a key problem. (Memon et al., 2018) connects food and water shortages to stress in smallholder women, whereas (Hirve et al., 2015) and (Venugopal et al., 2016) highlight how inadequate health infrastructure and exposure to environmental dangers intensify women's mental distress. These findings support FPE's emphasis on how damage to the environment, gender norms, and policy gaps all influence lived experiences, particularly in rural areas.

Geographical Focus and Research Leadership

Although numerous studies are conducted in locations such as India, Bangladesh, and Africa, where women play important roles in agriculture, the majority of publications are still published by universities in developed nations. The collaboration network shows limited intra-regional collaboration, particularly across Africa. This reveals a gap between where the research is being produced and where it is being led. FPE scholars have long critiqued this "epistemic imbalance," arguing that knowledge about marginalized communities is often generated externally, without engaging local voices or perspectives (Elmhirst, 2015).

There is encouraging diversity in contributing institutions, ranging from globally ranked universities to regional institutions not featured in global rankings. This suggests that impactful work is being done outside elite academic circles. Journals publishing on the topic span disciplines including public health, gender studies, occupational safety, and labor economics, reflecting the complex, cross-sectoral nature of the issue.

Underexplored Gaps and Opportunities

The analysis also uncovers significant gaps. While suicide among male farmers dominates statistics and narratives, women's chronic psychological distress remains underrepresented in health systems and data. Few articles focus exclusively on mental health in women farmers, and most treat gender as a secondary variable rather than a central axis of analysis. This aligns with FPE critiques that call for deeper, intersectional engagement with how structural inequalities are embodied and emotionalized (Elmhirst, 2015).

Moreover, terms like “psychological safety” and “aging” that appear in the cited works (Earl & Taylor, 2015; Jones-Bitton et al., 2020) are not yet widely reflected in agricultural health policy discussions. These topics offer critical entry points for future research, particularly in designing support systems for older women or improving workplace dignity in farming environments.

Conclusion and Recommendation

This study highlights an important yet underexplored area in global health and agricultural research, the mental well-being of women in farming. The findings show that while there is a growing body of literature addressing gender and mental health in agriculture, the focus remains limited and often overshadowed by studies centered on male farmers. Structural inequalities, environmental stress, informal labor conditions, and limited access to healthcare are consistently identified as major contributors to the psychological distress experienced by female farmers. Although the COVID-19 pandemic brought mental health issues to the forefront and spurred increased academic output, much of the research remains concentrated in specific regions such as Africa, India, and Bangladesh. Despite this regional focus, collaboration between countries within these regions is still weak, particularly in Africa, where agriculture is a key economic sector. Most partnerships are led by institutions in developed nations, leaving significant gaps in regional and context-specific knowledge production. Farmers have a significant psychological load, so it is necessary to provide them with more mental health care by viewing mental health as a medical service and an essential component of sustainable development plans.

The study suggests funding gender-sensitive studies that faithfully capture the day-to-day experiences of women in agriculture. To improve local research capacity and exchange knowledge, stronger cooperation is needed among countries with sizable farming populations, especially in Africa. National agricultural and rural development plans should incorporate mental health care, particularly targeted programs that address the unique stressors faced by women. In order to eliminate stigma and give women the confidence to seek treatment, awareness campaigns are also required. Lastly, to enhance the welfare of women who provide the world with food, inclusive solutions must integrate viewpoints from the fields of health, agriculture, gender, and policy.

Limitations of the study

This study examined articles from 2015 to 2024, coinciding with the implementation of the Sustainable Development Goals. However, as research in this area evolves, subsequent studies may find emergent themes and trends that were not caught during this time period. Furthermore, the analysis was based on keywords determined by the Feminist Political Ecology framework, which may have omitted publications that used different terminologies or alternative conceptual approaches. Future study could broaden the scope by experimenting with more general or localized keywords in order to collect a broader range of insights.

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