

Review Article

The Effect of Depression, Suicidal Ideation and Resilience on the Well Being of Indian Farmers: A Review

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Abstract

Drought has been the focus of a majority of studies in terms of its influence on agriculture, the economy, health, and the social well-being of farmers, but less research has been done in comparison concerning the psychological well-being of farmers in India. Limited research is available on drought, and even less on the psychological impact of drought. Drought causes a variety of psychological problems that can significantly influence the well-being of farmers. As the psychological health of farmers becomes a more pressing matter with increased psychological distress, this paper focuses on analyzing the studies that explore the impact of drought on the mental health of Indian farmers. The review of literature presented highlights the breadth of research examining factors influencing depression and suicidal ideation among Indian farmers over the last twelve years. Further, the paper also presents the effect that resilience can have on the well-being of farmers and will examine whether resilience plays a role in diminishing the levels of depression and suicidal ideation in farmers. Furthermore, an analytical discussion on depression, suicidal ideation, and Resilience among Indian farmers is also the focus of the paper. This paper can help novice researchers understand the psychological impacts of drought in regards to the mentioned variables and gain clarity on any relationship between them.

Keywords

Drought, Indian Farmers, Depression, Suicidal Ideation, Resilience

1. Introduction

India, with its agrarian economy, relies heavily on farmers for the bulk of its food production and economic growth. Despite their critical role, farmers in India face myriad challenges that significantly affect their mental health and overall well-being. Among the most prominent issues are depression and suicidal ideation (SI), which have reached alarming levels in rural communities. A combination of socio-economic pressures, environmental unpredictability, and lack of adequate support systems has led to a mental health crisis among farmers. Suicidal ideation among farmers often linked to

chronic debt, crop failure, and social stigma, has become a national concern. The psychological toll on farmers is immense, leading to a growing demand for understanding the connection between depression, resilience, and farmer well-being. While resilience is a crucial factor in helping farmers cope with adversity, its presence is not enough to counterbalance the multiple stressors that many face daily. The incidence of farmer suicides in India has been rising annually, driven by financial distress from crop failure and compounded by external factors such as rising input costs,

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Received: 30 December 2024; **Accepted:** 21 January 2025; **Published:** 17 February 2025



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drought, climate change, and broader socio-economic challenges.

Over the past several decades, researchers have focused extensively on understanding the factors contributing to depression and suicidal behavior among farmers. Initial studies centered on developing measurement tools and identifying factors related to depression and suicidal tendencies. This focus evolved into comprehensive assessments of suicidal behavior and its associated factors. For instance, Hirsch and Cukrowicz [1] reviewed the literature on rural suicide, highlighting the increasing volume of empirical, theoretical, and preventive research across various countries. Vins et al. [2] examined the impacts of drought on mental health, illustrating these effects in a conceptual diagram. Similarly, Padhy et al. [3] reviewed the consequences of mental health of global climate change in a developing nation context, while Merriott [4] explored the factors underlying suicide crisis of the farmer in India. Ramadas and Kuttichira [5] provided a comparative review of farmer suicides and mental disorders in India and Australia, and Hagen et al. [6] critically reviewed 676 articles on outcomes of mental health among worldwide farming populations.

Further studies expanded on the reasons behind agricultural crises and farmer suicides, such as poverty, debt, crop failures, and lack of technology access [7]. Yazd et al. [8] conducted a systematic review of research on farmers' mental health, examining study designs, methods, and locations. Chen et al. [9] reviewed literature on mental health outcomes from natural disasters, suggesting that resilience often prevails over pathological effects. Patel et al. [10] analyzed how disasters impact mental health globally, emphasizing India's context. Tang and GAJRC [11] reviewed climate change's underexplored mental health impacts, while Santos et al. [12] investigated suicide-related factors among farmers through a review of 14 studies. Batterham et al. [13] systematically examined environmental factors—such as drought, climate

events, and land conditions—and their effects on mental well-being in rural areas. Chandra et al. [14] explored various aspects of farmers' happiness, including stress, poverty, and climate change impacts. Palmer and Strong [15] reviewed global studies on post-disaster mental health in farmers, and Beniwal and Mathur [16] conducted a scoping review on farmers' psychological and social well-being. Shrivastava [17] explored the effects of mental health on climate change, highlighting its significant impact.

Most of the above article focuses on various aspects of farmer's problems and suggests remedy. It would be fairly important to conduct an in-depth review of depression, suicidal ideation, and resilience of Indian farmers. Therefore, the inspiration for carrying out this review is to consolidate existing knowledge and highlight recent research advancements on depression, suicidal ideation, and resilience of Indian farmers. This paper aims to synthesize current knowledge and recent research on these topics, with a focus on Indian farmers' experiences with depression, suicidal ideation, and resilience.

The rest structure of the paper is as follows: Section 2 describes the methodology and research question, Section 3 presents a review of related works, Section 4 provides a critical discussion whereas Section 5 provides a brief conclusion.

2. Methodology and Research Problems

A comprehensive literature search was conducted to examine published articles on depression, suicidal ideation, and resilience among Indian farmers over a 12-year period, from 2012 to 2024. Relevant articles were identified by searching electronic databases such as PubMed, Web of Science, Scopus, and Google Scholar using keywords such as "Mental health", "depression", "suicidal ideation (SI)", "anxiety", and "resilience," in combination with "Indian farmer."

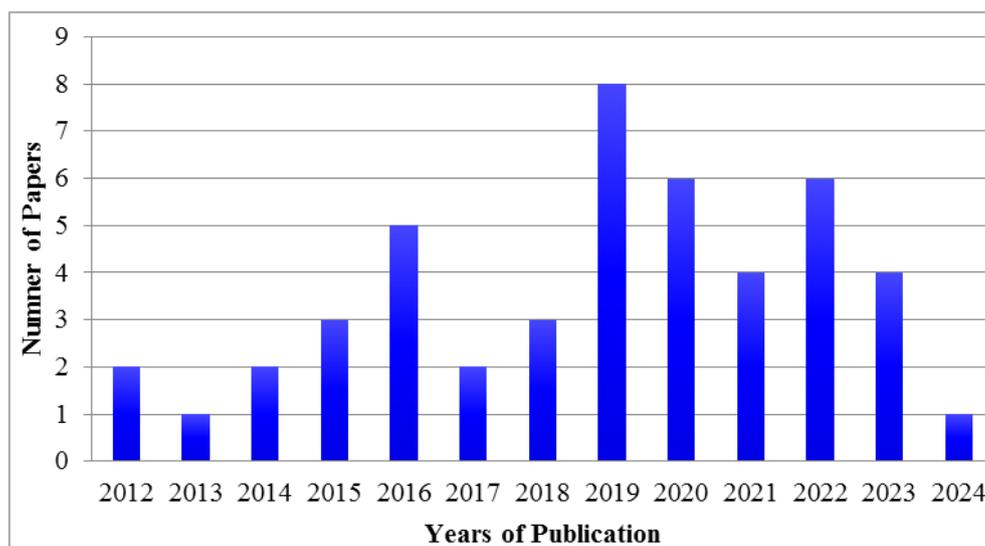


Figure 1. Trends of publication during the years 2012–2024.

This search yielded 70 research articles after excluding duplicates. Screening the titles and abstracts led to the selection of 47 studies for further review. Figure 1 illustrates the trends of these articles published during past twelve years (2012–2024). Among these, 36% studies were literature reviews and 64% studies were regular papers and are depicted in Figure 2. These articles were then evaluated against following specific research questions. Of the 47 studies included, 9 articles were selected for detailed discussion.

Research Questions

- 1) Does resilience play a role in diminishing the level of anxiety and depression among farmers?
- 2) Is there any cause-and-effect relationship between depression and suicidal ideation?
- 3) How is the well-being of farmers influenced by depression, SI and resilience?

Objectives

- 1) Review the influence of depression on the well-being of farmers.
- 2) Review the influence of SI on the well-being of farmers.
- 3) Review the influence of resilience on the well-being of farmers.
- 4) Review the relation between depression and SI, depression and resilience, and SI and resilience.

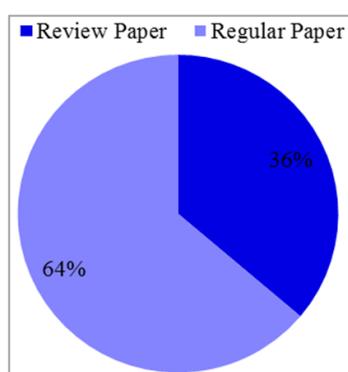


Figure 2. Trends of reviews and regular papers.

3. Review of the Related Works

The review of related works highlights the breadth of research examining factors influencing depression and suicidal behavior among Indian farmers over the last twelve years, categorizing these influences into socio-economic, psychological, and environmental factors.

Economic and Social Stressors: Financial instability, indebtedness, crop failure, and poor irrigation are recurring issues. Early studies, such as those by Dongre and Deshmukh [18], identified financial hardships and low socioeconomic status as core factors in farmer suicides in Maharashtra. Kale [19] reinforced these findings, pointing to low education, nuclear family structures, and issues with irrigation and low

income as significant stressors. Kannuri and Jadhav [20] examined how local-national-international factors intersected to form social distress of farmers in Warangal district, a cotton growing village of Telangana, India. Arya et al. [21] analyzed socio-economic factors influencing suicide rates in India from 2001 to 2013 using data from the Census of India as well as the National Crime Records Bureau. Bhise and Behere [22] highlighted psychiatric sickness, economic problems, and hectic life events as suicide risk factors among rural farmers, while Kumar and Raghavendra [23] suggest income improvement strategies as potential solutions.

Environmental and Agricultural Challenges: Studies such as those by Udmale et al. [24] discussed the impact of drought and water scarcity on agriculture and food security, emphasizing their contribution to farmer distress in Maharashtra. Later research by Goutam [25] and Kumar et al. [26] examined the impact of climate change on mental health, with Goutam noting that climate change adaptation is vital for mental health support in rural communities. Patel et al. [27] also discuss the psychological impacts of these environmental stressors. Swami et al. [28] explored how crop failure and credit issues contribute to farmer indebtedness, using structural equation modeling to link climate and socioeconomic factors to mental health.

Psychological Factors and Mental Health: Several studies addressed the psychological impacts of farming stress. Patel et al. [29] noted that suicide risks were higher among educated individuals, while Khairnar et al. [30] linked financial strain, irrigation access, and crop choices to suicide risk. Shidhaye et al. [31] found a baseline prevalence of depression in rural communities, connecting it with demographic factors and socioeconomic status. Shobana et al. [32] analyzed the levels of anxiety, depression, observed social support, and emotional well-being among farmers in the district of Tenkasi. Chaudhary and Shourie [33] and Deegan and Dunne [34] highlighted the role of social support in buffering stress among farmers, indicating its potential to mitigate mental health issues. Studies by Joshi and Bant [35] reveal that high-stress levels linked to crop failure and debt contribute significantly to suicidal ideation.

Resilience and Mental Health Support: The authors such as Viswanathan et al. [36] and Mehra et al. [37] examined the resilience and mental health of farmers, finding that resilience and social support can positively influence mental health outcomes. Padhy and Raju [38] examined the mental health challenges faced by farmers, highlighting the impact of stress on their overall well-being. Devadiga et al. [39] analyzed government and NGO efforts to support farmers, while Saju et al. [40] examined personal, social, and environmental protective factors that impact farmer well-being, underscoring the importance of multifaceted support.

Climate Change and Psychological Impact: The impacts of climate change, including droughts, extreme weather events, and water scarcity, introduce further risks. Manning and Clayton [41] and Chique et al. [42] presented evidence on the

psychological toll of climate-related stressors, showing that extreme weather can aggravate mental health issues. Pailler and Tsaneva [43] specifically linked hot weather to worsening psychological well-being in rural adults. Dhanya and Ramachandran [44] examined farmers' views of climate change and its impacts, identifying adaptation needs for the Kharif season in South India. Research by Barve et al. [45] explores how adverse climate events impact agricultural productivity and, consequently, farmers' mental health.

Policy and Intervention Strategies: Parvathamma [46] analyzed the effectiveness of government policies aimed at reducing farmer suicides, recommending improvements in state-level support and response strategies. Padhy [47] explored

various psychological issues faced by farmers and suggested potential remedies to address these challenges. Devadiga et al. [39] provided an updated analysis of policy effectiveness and the role of NGOs in reducing the burden on farmers.

4. Discussion

A total of 47 research articles examining factors related to depression and suicidal behavior among Indian farmers were analyzed. After applying specific research criteria, 9 studies were selected for detailed discussion, with a summary of these studies presented in Table 1.

Table 1. Summary of articles identified the effect of depression, resilience, and suicidal ideation of Indian farmers.

Serial No	Author	Description of Study	Important Results
1	Patel et al. [29]	Selected 6671 areas from the entire parts of India and examine every births and deaths from 2001 to 2003.	Man's suicide deaths is 40% and women's suicide deaths is 56% at ages of 15–29 years. A cumulative risk of 1.3% for 15-year-old person dying from suicide before 80 years of age.
2	Kale [19]	Selected 178 villages including 34 tahsils from 6 districts of Vidarbha and Interview of 200 family members	65.5% of the cases had completed suicide with insecticide where as 24.5% hanging cases were the next most common. 50% of the farmers' suicide was younger than 40 years. 92% were educated up to 10th grade.
3	Bhise & Behere [22]	Out of 111 suicide households visited, 98 farmers' suicide victims selected for study	36.7% of suicide households were BPL. Methods of suicide were: 68.37% consumption Pesticide, 15.31% by hanging, and 12.24% by drowning whereas 3.06% by self-immolation.
4	Shidhaye et al. [31]	Interview 1456 individuals between the ages of 18–87 years in 30 villages of Amravati district.	14.6% cases of current depression were observed, 4.3% cases of contact coverage for current depression were observed
5	Arya et al. [21]	NCRB and census data during 2001–2013 in India	Suicide rates of male remained steady (14 per 100,000) where as suicide rates of female decreased from 9 to 7 per 100,000 population. Highest suicide rate observed in male age of 45–59 years where as in female age of 15–29 years observed the highest suicide rate.
6	Viswanathan et al. [36]	Interview of 194 farmers in Tiruchirappalli district of Tamil Nadu	97.4% had some form of depression; Of 194 cases, 117 (60.3%) had suicidal ideation; The score of mean resilience was 49.4 ± 10 . Minimum and maximum scores were 21 and 69, respectively. Also, 61.7% of farmers from small scale and 16.7% of farmers from large scale had suicidal ideation.
7	Swami et al. [28]	Interview of 400 farmers in Buldhana of Vidarbha and Parbhani of Marathwada regions from Maharashtra	Of the farmers, 36% had suicidal thoughts over the past five years, 69% of the farmers was indebted, while 31% not shown any indebtedness. Increase in indebtedness result increase in suicidal ideation significantly among farmers
8	Joshi and Bant [35]	Interview of 324 farmers in t in the villages of Kalghatagi talukof Karnataka	Reported 25.3% suicidal ideation in the earlier 6 months. The scores of mean stress were high among those with suicidal ideation (12.69 ± 1.12 s.d.).
9	Mehra et al. [37]	Interview of 375 farmers in Hisar, Bhiwani, Fatehabad, and Sirsa of Haryana	$r = 0.519$ revealed that the suicidal ideation was +ve correlated with depression and -ve with resilience where $r = -0.381$. Resilience shown -ve correlation with suicidal ideation ($r = -0.624$).

Patel et al. [29] reported approximately 187,000 suicide deaths in India in 2010 among individuals aged 15 or older, with 115,000 deaths among men and 72,000 among women. The majority of these deaths were in the 15–69 age group, with only a small number under 15 (57 cases) or over 80 (20 cases). Notably, 40% of male and 56% of female suicide deaths occurred in the 15–29 age range. Suicide rates peaked at a median age of 25 for women and 34 for men. Suicide deaths were more prevalent in rural areas, where age-standardized rates for those 15 and older were roughly twice as high as in urban areas.

Kale [19] found that suicide rates were nearly evenly distributed among young (36.5%), middle-aged (37.5%), and older adults (26%). Among those who had education, 27% had completed high school, 24% primary school, 19% middle school, and only 9.5% higher secondary school, with just 4% having college-level education. Of the 200 cases studied, 97% were male and 3% female. Most suicides (43.5%) were among small farmers with landholdings between 1.01 and 2.00 hectares, followed by 23.5% marginal farmers with less than 1.00 hectare, while fewer suicides occurred among those with larger landholdings. Additionally, 69% of the farmers who died by suicide had no access to irrigation and relied solely on monsoon rains.

Bhise & Behere [22] studied 98 farmer suicide cases, finding that half of the victims were under 40, and 92% had an education up to the 10th grade. Among suicide households, 36.7% were below the poverty line (BPL), compared to 43.9% in control households. The primary methods of suicide were pesticide ingestion (68.4%), followed by hanging (15.3%), drowning (12.2%), and self-immolation (3.1%). Behavioral changes prior to suicide were observed by family members in 56.1% of cases, and 19.4% of victims had discussed suicidal thoughts within a month of their death. Additionally, 60% had a psychiatric illness, with 37.7% diagnosed with depression.

Shidhaye et al. [31], in a study of 1,456 individuals aged 18–87, found a 14.6% prevalence of current depression. Depression rates varied significantly by location, with Chandur Bazaar showing a higher prevalence (19.5%) compared to Dhamangaon (8.7%). Severe depression affected 3.9% of participants, also with location differences: 6.2% in Chandur Bazaar and 1.1% in Dhamangaon.

According to Arya et al. [21], during the study period, age-standardized suicide rates remained steady for males at 14 per 100,000, whereas female rates decreased from 9 to 7 per 100,000. The southern states exhibited the maximum suicide rates, in contrast to the northern states, which had the smallest rates for both genders. Notably, males aged 45–59 years had the maximum suicide rates, while the highest rates for females were observed in the 15–29 age groups. States with higher suicide rates for both males and females also tended to have greater levels of development, agricultural employment, literacy, and a higher proportion of the Hindu population. Additionally, elevated male suicide rates were associated with higher unemployment levels.

In the study by Viswanathan et al. [36] involving 194 farmers, an alarming 97.4% were found to have some form of depression, with males exhibiting significantly higher depression scores than females. Marginal and small-scale farmers reported high levels of depression compared to their large scale counterparts. Additionally, 60.3% of the farmers experienced suicidal ideation, with 19.1% having such thoughts for several days in the past two weeks, 21.1% for more than half the days, and 20.1% almost every day. Suicidal ideation was more prevalent among males and among marginal and small-scale farmers (61.7%) compared to large scale farmers (16.7%). Authors also highlighted that the impact of drought on agricultural yields influenced significantly the presence of suicidal ideation among farmers. The average resilience score was 49.4 ± 10 , with scores ranging from a minimum of 21 to a maximum of 69. Resilience increased with age, and males demonstrated significantly higher resilience scores compared to females. Large-scale farmers also had higher resilience scores than marginal and small-scale farmers.

Swami et al. [28] reported that 36% of farmers experienced suicidal thoughts over the past five years, with 69% of them being in debt, while 31% showed no signs of indebtedness. The study's findings indicated that increased indebtedness was strongly associated with heightened suicidal ideation among farmers. Conversely, adaptation practices had a significant protective effect, as indicated by a negative indirect path coefficient of -0.54 , suggesting that farmers who adopted multiple adaptation strategies were less likely to experience suicidal thoughts.

In a study by Joshi and Bant [35], 324 farmers were interviewed, with the majority of 37% citing debt and 35.5% crop failure as primary sources of stress. The key determinants of stress among the farmers were identified as crop failure, debt, and family issues. Additionally, 25.3% of the farmers reported experiencing suicidal ideation in the past six months, with such thoughts being linked closely to crop failure and debt. Farmers with suicidal ideation had significantly higher mean stress scores compared to those who did not report suicidal thoughts during the same period.

Mehra et al. [37] analyzed a sample of 375 male farmers aged 25–40 from the Haryana districts of Hisar, Bhiwani, Fatehabad, and Sirsa. Findings revealed that mental health, anxiety, and severe depression were all significantly and negatively correlated with land ownership ($P < 0.01$), as was suicidal ideation ($P < 0.01$). Additionally, both social dysfunction and resilience showed significant correlations with land ownership ($P < 0.01$). Severe depression and suicidal ideation were found to be positively correlated with anxiety ($P < 0.01$), while severe depression, suicidal ideation, and resilience each showed a negative correlation with social dysfunction ($P < 0.01$). Suicidal ideation was positively associated with severe depression ($P < 0.01$) and negatively associated with resilience ($P < 0.01$), indicating that as depression levels increase, suicidal ideation also rises.

The above discussion on 9 studies underscores a concerning prevalence of mental health challenges, particularly depression and suicidal ideation, among Indian farmers, driven by socioeconomic stressors such as debt, crop failure, land ownership disparities, and reliance on monsoon-dependent agriculture. High suicide rates, especially among younger individuals and those in rural areas, reveal the extent of the crisis, with significant geographic and demographic variations observed.

5. Conclusions

This paper presented a comprehensive analysis of the impact of drought on the mental health of Indian farmers, with a particular focus on the role of resilience in supporting their well-being. The paper examined whether resilience contributes to reducing depression and suicidal ideation among farmers.

In conclusion, the findings across this paper suggest a multi-faceted approach to addressing farmer suicides, one that includes mental health support, financial stability, and resilience-building, with particular attention to small-scale and marginal farmers in high-risk regions. Initiatives aimed at reducing indebtedness, expanding access to mental health services, and promoting adaptive farming practices could be pivotal in alleviating the mental health crisis among Indian farmers. Further, this review aims to offer valuable insights for researchers into the psychological effects of drought on these variables, helping clarify potential relationships and guiding future studies in this area.

Abbreviations

SI	Suicidal Ideation
NGO	Non-Governmental Organization

Author Contributions

Zoya Nisar: Conceptualization, Methodology, Visualization, Writing – original draft

Roomana N Siddiqui: Methodology, Supervision, Visualization, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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