



PATTERNS AND DETERMINANTS OF FARMER SUICIDES IN INDIA

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ABSTRACT

Farmer suicides in India are a complex issue driven by various economic and social factors. India's farmer suicide rates vary sharply among the states, and causes are disputed. This study examines what factors may drive the farmers to take this extreme step, using the Newey-West estimator, taking into account heteroskedasticity and autocorrelation. The study uses secondary dataset from 2001 to 2022, and found that the parameters such as credit allocation, rainfall, agricultural production, and agricultural labourers are negatively associated with the farmer suicides, while the parameter like credit outstanding is positively associated with the farmer suicides in India.

KEYWORDS: Farmer Suicides, Socio-Economic, Environmental And Financial Factors.

INTRODUCTION

India, an agrarian nation, has approximately 70% of its population reliant on agriculture directly or indirectly. The National Statistical Office (NSO) reported that in 2018, over 50% of agricultural households in the country were in debt. Since 2013, the Central Government has reported every year around 12,000 suicides in the agricultural sector and it make up around 10% of all suicides in India (*Mahapatra, 2017*). The National Crime Records Bureau (NCRB-2022) reported a 3.7% increase in farmer suicides in 2022, with 11,290 reported deaths, compared to 10,281 in 2021 and 5.7% from 2020. Only Maharashtra, Karnataka, Telangana, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, and Tamil Nadu, account for 87.5% of total suicides in the farming sector in India.

REVIEW OF LITERATURE

Farmer suicides in India are a significant issue, accounting for 11.2% of all suicides in the country (*Parvathamma, 2016*). The drought and below-average rainfall are directly linked to an increase in farmer suicide (*Mishra, 2023*). The revealed that a 5% average rainfall deficit led to 810 farmers dying annually due to suicide. The farmer suicides in India are driven by inability to get right prices, crop failures, and debt, linked to inefficient supply chains, lack of irrigation, and association between agricultural output and rainfall (*Banik, 2017*). As well as, the rise in farmer suicides is largely attributed to various factors such as monsoons, indebtedness, water crisis, technological inadequacy, and the Covid-19 pandemic (*Saboo and Sharma, 2023*). The transitory economic shocks, particularly related to rainfall, significantly impact suicide rates among farmers, with increased poverty correlating with higher male suicides (*Hebous and Klonner, 2014*). Furthermore, indebtedness as a predominant risk factor, exacerbated by an agrarian crisis, lack of investment, and reliance on non-institutional credit (*Merriott, 2016*). The roots of this crisis are rural indebtedness and the adverse effects of liberalization policies, which have led to increased dependency on costly inputs and monoculture practices (*Mukherjee, 2009*). Addressing these, imperative to track the determine factors of the farmers' suicide in India. The study aims to understand the issue and patterns of farmer suicide and examine its determine factors using secondary dataset from 2001 to 2022, which obtained from NCRB, NSSO, and RBI reports.

DATA SOURCE AND METHODOLOGY

The study uses a secondary cross-sectional dataset spanning over 22 years from 2001 to 2022, which was obtained from various authorized reports such as NCRB, NSSO, and RBI. The study uses descriptive statistics and the Newey West variance model was employed to identify the factors influencing farmer suicides. The model follows as is;

$$Y = \alpha + \beta_1 CA + \beta_2 CO + \beta_3 RF + \beta_4 MSPP + \beta_5 MSPW + \beta_6 FA + \beta_7 PR + \beta_8 AL + \varepsilon$$

In this context, Y is the dependent variable, such as the number of farmer suicides, whereas α represents the intercept, which is the autonomous value when all independent variables are held constant. β is the slope of independent variables and the independent variable such as credit allocation (CA), credit outstanding (CO), rain fall (RF), minimum supporting price of paddy (MSPP) and wheat (MSPW), total production (PR), agricultural labours (AL) and ε is error term, which was unknown factor to the researcher.

RESULT AND DISCUSSION

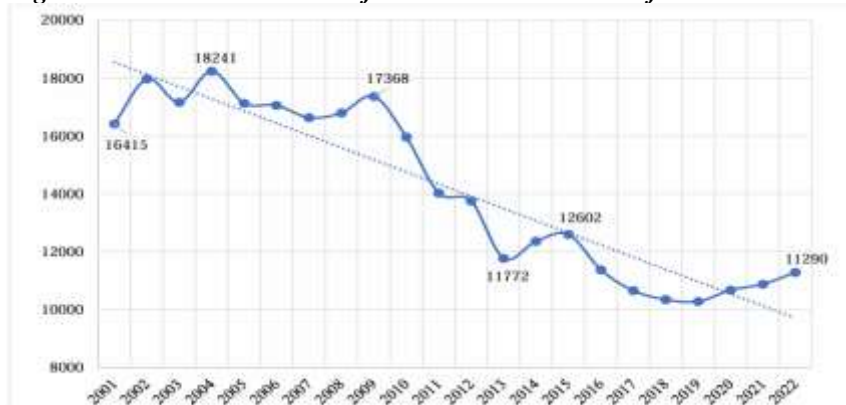
Table 1: Descriptive statistics of model selection variables.

Variable	Minimum	Maximum	Mean	Std Dev	CV
No. of Farmer Suicide	10281.00	18241.00	14125.86	2938.78	20.80
Production	102.70	172.90	136.43	18.53	13.58
Agri labour	234.10	272.80	255.52	15.41	6.03
Credit Allocation	53753.00	2164844.00	718207.32	632775.87	88.10
Credit Outstanding	105502.00	2867231.00	888712.18	797688.47	89.76
Rainfall	1945.60	2556.00	2196.88	164.13	7.47
MSP for Paddy	510.00	2060.00	1186.50	529.47	44.62
MSP for Wheat	610.00	2122.00	1296.91	502.34	38.73

Source: Author's Calculation.

Table 1 represents the descriptive statistics. The study observed a minimum of 10,281 farmer suicides and a maximum of 18,241 with an average of 14,125.86 farmer suicides. The coefficient of variation of 20.80% indicates a moderate level of variability relative to the mean. However, the study found a minimum of 53,753 crore credit allocation and a maximum of 21,64,844 crore credit allocation. Credit Allocation exhibits extremely high variability with remarkably high CV of 88.10% and the standard deviation is very close to the mean. The study found that an average of 888712.18 crore credit outstanding, with a minimum of 105502 crore and a maximum of 2867231 crore. It shows exceptionally high variability, with a CV of 89.76%. Furthermore, the study observed a minimum of 102.70MT production and maximum of 172.90MT production with an average of 136.43MT production. with a coefficient of variation of 13.58%. It shows relatively tightly clustered around the mean of 136.43, with a low CV of 13.58%. The variable of the number of agricultural labourers were found with a minimum of 234.10M and a maximum of 272.80M with a mean of 255.52M. The variable shows lowest variability among all, with a CV of least of 6.03%. The values for agricultural labour are very consistent. In the context of rainfall, the study observed a minimum of 1945.60mm rainfall and a maximum of 2556mm rainfall, with an average of 2196.88mm. It shows relatively low variability, with a CV of 7.47%. The MSP shows that the minimum support price per quintal ranges from Rs. 510 for paddy and Rs. 610 for wheat to a maximum of Rs. 2060 for paddy and Rs. 2122 for wheat, with an average of Rs. 1186 and Rs. 1296, respectively. The MSP for Paddy, MSP for Wheat also shows substantial variability, with a CV of 38.73%, though slightly less variable than paddy (CV of 44.62%).

Figure 1: Trends and Patterns of Farmer suicide in India from 2001 to 2022.



Data source: NCRB report

Figure 1 describes the patterns of farmer suicide in India from 2001 to 2022. The National Crime Records Bureau reported that 310,769 farmers committed suicide between 2001 and 2022. A total of 11290 persons involved in the agriculture sector (which consists of 5207 farmers and 6083 agricultural labourers) committed suicide in India in 2022, accounting for 6.6% of the country's total suicide victims. In 2004, the study observed the highest number of farmer suicides in India at 18,241. Due to the macro level factors such as the poor government policies, improper subsidies, crop failure, debt burden, and many other factors. The lowest number of farmer suicides is 10,281, found in 2019 due to the relief packages, agricultural debt relief and waiver program, the package to diversify income streams, the implemented PM Fasal Bima Yojan, and many others. The data indicates that the farmer suicides drastically reduced over a period of time; it shows a downward trend in the number of farmer suicides in India.



Table 2: Determinant factors of Farmer Suicide

Variable	Parameter Estimates	Pr > t
Intercept	119568	<.0001
Credit Allocation	-0.00490	0.0106
Credit Outstanding	0.00238	0.0012
Rainfall	-1.594	0.0004
MSP for Paddy	-4.033	0.1535
MSP for Wheat	-3.783	0.1193
Agricultural Production	-20.963	0.0528
Agricultural labourers	-85.164	<.0001
R square	0.985	
Dependent variable	Number of farmer suicides	

Source: Author's Calculation.

Table 2 represents the determined factors of the farmer suicides in India over a period of time. The estimation found an R-square value of 0.985, which means 98.5% of total variations in farmer suicide are actually explained by the model around its mean value. While the intercept value is 119568 and statistically significant, which is the number of farmer suicides when all the explanatory variables are put as constants. The parameter estimation of credit allocation was found statistically significant ($P > 0.0161$) and negatively associated with farmer suicide (-0.00490). It explains that a unit of increase in credit allocation, the farmer suicide is estimated to declines by -0.00490. The study suggests that better access to credit might alleviate distress among farmers. On the other hand, the parameter estimation on credit outstanding was found to be statistically significant ($P > 0.0012$) and positively associated with the farmer suicide (0.00238), which indicates that for a unit increase in credit outstanding, the farmer suicides estimated to increase by 0.00238, due to the farmer distress due to debt burdens. The parameter estimation on rainfall was found to be statistically significant at the 1% level ($P < 0.002$) and negatively associated with the farmer suicides, which indicates that for a unit increase in rainfall, the farmer suicides estimated to decrease by -1.594, holding remaining factors constant. This is intuitively sensible, as adequate rainfall is crucial for agricultural productivity and farmer well-being, reducing the likelihood of crop failure and stress. The parameter estimation on total production indicates a negative sign and was found statistically significant (0.0528) at 5% level. The parameter indicates that a unit increase in total agricultural production, the farmers suicides is estimated to decline by -20.963 units. Higher production generally leads to better income and reduced financial stress for farmers. Furthermore, the parameter estimation on agricultural labourers was found statistically significant ($P < .0001$) at the 1% level and found negatively correlated with the farmers suicides. It indicates that for a unit raise in agricultural labourers, the farmer suicide is estimated to decline by 85.1638 units. The larger labour force indicates more robust agricultural activity. The mechanism underlying this issue requires further investigation. While the parameter estimation on the minimum support price paddy and wheat shows a potential inverse relationship, the p-value indicates no statistically significant effect.

CONCLUSION

India, a nation that relies heavily on agriculture, has a high rate of farmer suicides. The model explains a significant portion of farmer suicides, highlighting the role of financial factors such as credit allocation, outstanding debt, environmental factor like rainfall, and socio-economic factors like agricultural production and agricultural labourer in contributing to or alleviating farmer distress. The study reveals a negative correlation between credit allocation and farmer suicides, suggesting that the government should improve access to institutional credit. The burden of debt is also a significant factor, requiring debt counselling and financial literacy programs. Rainfall is a significant factor, requiring investment in irrigation facilities. Higher agricultural output can reduce distress, and modern farming techniques, access to quality seeds and pest management solutions, are needed. Additionally, employment opportunities in rural sectors, such as promoting rural industries and handicrafts, can reduce farmer suicides. Hence, the government should implement appropriate programs which help to enhance farmers' standard of living.

REFERENCES

1. Aastha Mahesh Saboo and Ashish Sharma. (2023, October 16). *Suicides within India's Agricultural Industry: How Climate Change and Government Policy are Impacting Human Rights*. Retrieved from Oxford Human Rights Hub: <https://ohrh.law.ox.ac.uk/suicides-within-indias-agricultural-industry-how-climate-change-and-government-policy-are-impacting-human-rights/>
2. Banik, N. (2017). *Farmer Suicides in India and the Weather God*. *Information Technology and Quantitative Management*, 10–16: <https://isiarticles.com/bundles/Article/pre/pdf/135337.pdf>.
3. Hebous, Sarah ; Klonner, Stefan. (2014). *Economic Distress and Farmer Suicides in India: An Econometric Investigation*. University of Heidelberg, Discussion Paper Series No. 565, DOI: 10.11588/heidok.00016937.



4. King, J. K. (2014). *The political economy of farmers' suicides in India: indebted cash-crop farmers with marginal landholdings explain state-level variation in suicide rates*. *Globalization and Health*, Article number: 16: <https://doi.org/10.1186/1744-8603-10-16>.
5. Mahapatra, D. (2017, May 3). *Over 12,000 farmer suicides per year, Centre tells Supreme Court*. Retrieved from *The Times of India*: <https://timesofindia.indiatimes.com/india/over-12000-farmer-suicides-per-year-centre-tells-supreme-court/articleshow/58486441.cms>
6. Merriott, D. (2017). *Factors associated with the farmer suicide crisis in India*. *Journal of Epidemiology and Global Health*, 6:4, 217–227, DOI: <https://doi.org/10.1016/j.jegh.2016.03.003>.
7. Mishra, S. (2023, May Wednesday 10). *Climate change is causing increase in farmer suicides in India*. Retrieved from *Independent*: <https://www.independent.co.uk/climate-change/news/india-farmer-suicide-heatwave-drought-b2335830.html>
8. Mukherjee, S. (2009). *Examining Farmer Suicides in India: A Study of Literature*. Munich Personal RePEc Archive: <https://mpra.ub.uni-muenchen.de/35675/>.
9. Parvathamma, G. L. (2016). *Farmers Suicide and Response of the Government in India -An Analysis*. *IOSR Journal of Economics and Finance (IOSR-JEF)*, Volume 7, Issue 3. Ver. I, PP 01-06.