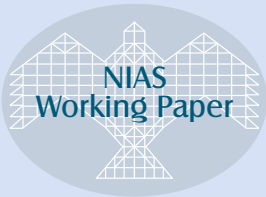


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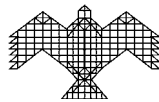
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DURKHEIMIAN INSIGHTS INTO FARMERS' SUICIDES IN INDIA

Introduction

Even as farmers' suicides have remained in the forefront of political discourse in India, there are still few signs of a comprehensive national response to this challenge. There could be many reasons for this policy shortfall, but one of them has to be the absence of adequate academic attention being paid to the national dimensions of the problem. Much of the research undertaken on the issue has been largely focused on individual cases of those committing suicide and the immediate rural context in which this has happened. Studies trying to put together these individual insights into a common framework at the national level have been relatively fewer in number, and have focused primarily on capturing patterns of suicides rather than exploring the causes for this phenomenon. Consequently while there are several situation specific insights into the causes for farmers' suicides from the village studies, there has been little effort to see if the macro pattern provides us some insights into the causes of this tragedy.

This paper seeks to build a macro model of farmers' suicides over a 19-year period in India in order to delineate the causes for the phenomenon. For this, it falls back on Emile Durkheim's classic study of suicides, picking elements from that model to understand the processes that generated an increase in farmers' suicides across many states between 1995 and 2013. The paper begins with building a case for using elements of Durkheim's method to understand the causes for farmers' suicides in India, more than a century after that classic work was first published. It then goes on to outline the methodological steps needed to identify variables that match the criteria used by Durkheim. Next it evaluates each of these types of causes in the context of the larger macro picture in India. Based on these results, the paper points to statistically significant causes for farmers' suicides in India.

Why Durkheim?

Theories of suicide have largely been focussed around biological, psychological and social factors. For example, biological

theories of suicide (Guynup, May 12, 2000) suggest that genetic factors play a crucial role in determining peoples' suicidal inclination. Psychological theories (Shneidman, 1985) (Menninger, 1966) suggest that all suicides are caused by human emotions such as depression and guilt and victims of suicides suffer from unbearable psychological pain and death seems to be the only solution to their individual problems. Social theories, on the other hand, distinguish social facts from psychological and biological facts by noting that suicides are rooted in group sentiments and social values, attitudes, and beliefs.

Among the sociological theories, Durkheim's theory is of particular value in the current Indian rural context. Durkheim's concerns with regard to suicide were not individual differences between the people committing suicide but on how social integration and social regulation as factors affects behaviour. These are two major factors at work in rural India. The consistent decline in the share of agriculture in GDP has affected the relative status of farmers vis a vis the rest of Indian society. This has contributed to pressures on social integration. At the same time the declining effectiveness of the procurement price led Green Revolution mechanism of regulation has also its effects on the

functioning of Indian agriculture. This is not to suggest that all aspects of his work of more than a century earlier for Europe can be relevant for India of the twenty-first century. His backdrop of religion related social change was also quite different from what emerged in the current Indian social milieu but, if we move beyond the specifics of his empirical analysis to the method he used, there may be much to gain from Durkheim for three specific reasons.

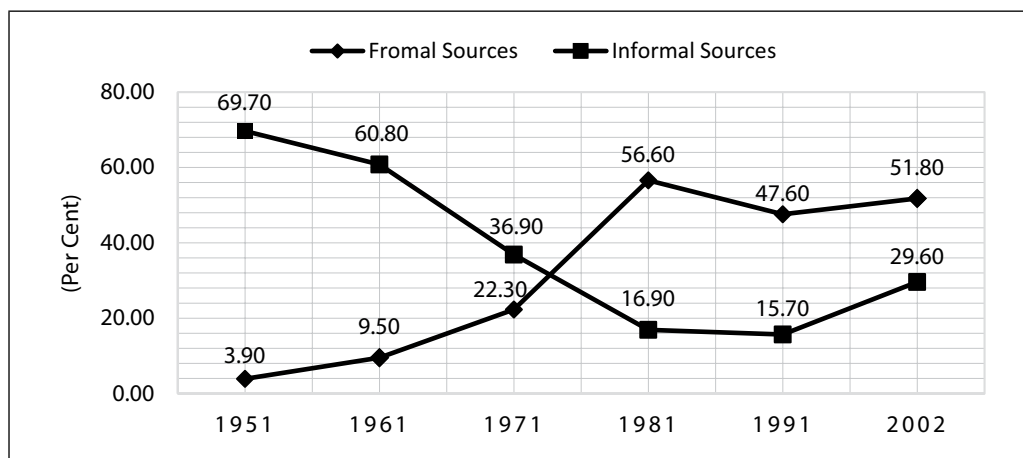
First, Durkheim recognized the significance of the picture that emerges from macro data across regions; a picture that not only captures patterns but also helps identify specific causes for suicides the method thus allows for an exploration of the reasons that emerge from data over an extended period of time and across states. This helps address a serious lacuna in studies of farmers' suicides in India. Much of this debate has focused on extensive village studies. Even when Durkheim's work has been used, the focus has been on the types of causes he identified rather than his method. As a result, the studies building on Durkheim's work too focus on a specific village rather than adopt his method to see if larger patterns point to specific causes. While village studies provide important insights into the causes of farmers' suicides in specific cases there is little evidence of

just how representative these pictures are. Consequently there are a wide range of causes being cited, each of which may be true for their specific region. For example, field studies conducted in Vidarbha (Mishra, Farmers' suicides in Maharashtra, 2006), and various districts of Vidharbha, Marathwada and Khandesh regions in Maharashtra (Tata Institute of Social Sciences, 2005) have explained that indebtedness, economic downfall, crop failure, dent in social status as causes of farmers' suicide (Jeromi, 2007); (Mohanakumar & Sharma, 2006) investigated the causes of farmers' suicide in Kerala and found that factors like trade liberalisation, excessive concentration on export oriented perennial crops, fall in prices, absence of proper macroeconomic policies addressing farmers' problems, etc., led to rise in farmers' indebtedness and suicides. Parthasarathy and Shameem (1998) studied farmers in Warangal district in Andhra Pradesh and found that the farmers there are faced with deep stress mainly due to the inaccessibility of institutional credit and dependence on moneylender at high rates of interest. There are a few studies available on farmers' suicides in Karnataka and Andhra Pradesh ((Assadi, 1998) (Revathi, 1998) (Vasavi, 1999)) that featured failure of technology, lack of support

to the farmers on new technology, spurious inputs, and failure of markets, ecological crisis and the absence of support mechanism. Among these the failure of technology and lack of support system were the most important. However, studies on cotton, by (Bennett, Kambhampati, Morse, & Ismael, 2006) in Maharashtra; (Reddy, Tirapamma, & Reddy, 2011) in Andhra Pradesh; (Pemsl, Waibel, & Orphal, 2004) in Karnataka found positive economic impact of technology, namely, BT cotton adoption by farmers. While these factors identified by economists are crucial to explain farmers' suicide, further research is also needed to understand the social milieu that might have been causing alienation of farmers from their family, friends and society and increasing the tendency to suicides.

Second, Durkheim's method provides a prominent place for individual reactions to society at a time of transformational social change. In economic terms, there is no denying the magnitude of the transition in the nature of the Indian economy over the seven decades since Indian independence. From a predominantly agrarian economy at independence, India has moved to becoming an economy largely dependent on services. From 1951 to 2011, the contribution of Indian agriculture to the GDP has steadily fallen

Figure1: Access to formal and informal sources of credit in rural households



Source: RBI Financial Inclusion in India: An Assessment

from around 51 per cent to 14 per cent. In the dramatic economic transformation, particularly since the 1980s, agriculture has declined to around half the share of industry, which in turn accounts for just half the share of services.

Third, Durkheim's perspective especially emphasises the impact of major social transformations on uncertainty. There is also evidence to suggest that the transition is not confined to the movement from agricultural activities to non-agricultural ones. There is also a major transition within agriculture. For those who are left behind in agriculture, the declining returns is coupled with other factors such as the unpredictability

of monsoons, fluctuations in price and yield of crops, expensive methods of irrigation and procurement of seeds, thereby making them vulnerable. In order to counter the vulnerabilities, those left behind in agriculture make use of a variety of coping mechanisms as well as safety nets. One of the main fall back options in such a scenario has been through borrowing from informal finance. This has been substantiated by data obtained by the National Sample Survey Organization (NSSO), which shows a sharp increase since 1991 in the number of loans borrowed from informal sources.

Durkheim's typology of suicides

The primary understanding furthered by Durkheim in his study of suicide (Durkheim, 1897/1951) is the nature of suicide as a social phenomenon, which is dependent on a variety of causes including social, political and economic. Thus, as a result, Durkheim views the phenomenon of suicide not as a single tendency but as a multiplicity of tendencies which can be separately studied. Having identified the multiplicity of tendencies, Durkheim tries to identify effective causes which lead to different types of suicides. As long as the nature of the causes of suicide is different, they will have differing tendencies or effects which can then be classified by the very causes that produce them.

For Durkheim, the structure in which society is organized is through two independent parameters, viz. social integration and social regulation. (Bearman, 1991) defines social integration as "the extent of social relations binding a person or a group to others such that they are exposed to the moral demands of the group" while social regulation is defined as "the normative or moral demands placed on the individual that come with membership in a group" (Bearman, 1991). Though both regulation and integration operate together, it is possible that an

individual can be placed in a society which has high levels of one and low levels of the other. Durkheim's primary concern in his work on suicide was to try and identify how an individual is placed in a society structured through the process of integration and regulation, thereby allowing for an analysis between an individual's position and larger macro-level social factors. Thus, from the process of regulation and integration acting together, Durkheim arrives at a four-fold classification of suicides as follows:

- i) **Anomic suicide:** When an individual is integrated into a society while at the same time, there aren't any mechanisms by which the individual is regulated to meet the normative demands of the group; the tendency that arises from can be termed as anomic suicide (Bearman, 1991). Anomie refers to a situation where there is an abrupt breakdown of social norms or behaviours. (Bearman, 1991) defines anomie in Durkheim thus: "is a psychic condition experienced by people living in societies which are in temporary disequilibrium. Anomic social positions are seen as temporary products of crises that disrupt economic and social life". When in a society, individuals fail to achieve their targets due

to lack of means for attaining them, disappointment and feelings of failure is generated for the disproportion between aspirations and achievements, which lead to the growth of the suicidal impulses. These types of suicides are referred as anomic suicides.

- ii) Egoistic suicide: In this type of suicide, the levels of integration of a person in society are low (Durkheim, 1897/1951) and when faced with the lack of integration, an individual becomes reliant on his/her own resources. This happens largely in societies which are largely individualist rather than collectivist in nature and every individual is considered unique and there is no common social norm which allows for expression as a group (Bearman, 1991). As a result, individuals are forced to pursue ends which are highly individual in character. For (Durkheim, 1897/1951), “The more weakened the groups to which he belongs, the less he depends on them, the more he consequently depends only on himself and recognizes no other rules of conduct than what are founded on his private interests. If we agree to call this state egoism, in which the individual ego asserts itself to excess

in the face of the social ego and at its expense, we may call egoistic the special type of suicide springing from excessive individualism.”

- iii) Altruistic Suicide: This type of suicide occurs in societies where the levels of social integration of the individual into society are very high such that the individual has no identity of her/his own but owes the identity to the society to which they belong. In such a situation, it is impossible to distinguish between various individuals. A homogeneous society which is defined thus either comprises of individuals who are a full members of the society or are out completely (Bearman, 1991). Owing to these high levels of integration, the act of suicide becomes a virtuous act and individuals are willing to sacrifice themselves for the sake of society, almost blindly. For Durkheim, “. . . the man who renounces life on least provocation of circumstances or through simple vainglory . . . A social prestige . . . attaches to suicide, which receives encouragement from this fact (Durkheim, 1897/1951).
- iv) Fatalistic Suicide: This type of suicide is characteristic when there are low levels of integration and yet

there exist high levels of regulation. For Durkheim, "It is the suicide deriving from excessive regulation, that of persons with futures pitilessly blocked and passions violently choked by oppressive discipline." (Durkheim, 1897/1951).

Having discussed Durkheim's typology of suicide, we now contextualise Durkheim's theory in Indian the context to explain farmers' suicide in India. In doing so, the first challenge we face is to define farmers in India. This is crucial to our study because total number of farmers is used as denominator to calculate farmers' suicide rates. We show that many existing studies have erroneously defined farmers and farmers' suicides rates are then over estimated. We discuss the reasons behind this error. Second, we establish farmers' suicides in India is not a homogenous but an heterogeneous incidence with considerable regional variability and one needs to incorporate such regional variation in explanations of farmers' suicide in India. Third we also compare farmers' suicide rates with that of non-farmers' to compare relative vulnerability of farmers vis-a-vis others. These will explain the scope of our study. Rest of the paper is organised as follows. In the following section we discuss the challenges of measuring farmer's suicides as discussed

in the preceding paragraph. This is then followed by the estimation results of Durkheim causes of farmers' suicides in India. i.e. anomic causes, egoistic causes, altruistic causes and fatalistic causes.

Challenges of estimation in India

Viewed in this perspective, three major challenges confront the study of farmer suicides in India, particularly at the macro level. The first challenge relates to the estimation of farmers' suicides in India. Theoretically, this farmers' suicide rates can be defined as the number of farmer suicides divided by the overall farming population in the region we are considering. However, there are two related challenges. First is to show to define the farming population in India. Indian agriculture is characterised by the presence of main cultivators, marginal cultivators, main agricultural labour and marginal agricultural labours. Are all these to be taken into account in calculating the farming population or to exclude the marginal cultivators and labour who are active in agriculture for less than six months. Those who are engaged in agriculture as cultivators or agricultural labours for than six months are categories as main cultivators or main agricultural labours. We call this the *denominator challenge*. Second, to

understand the severity of the issue, we must compare farmers' suicide rates with that of the non-farmers in order to gauge if farmers as a group are more vulnerable to suicide. Third, since ours is a state-level analysis and farming and non-farming populations vary considerably across the states, to understand whether farmers' suicide is an issue in a particular state we must compare the two. In the following section we explain these challenges in detail.

The denominator challenge

The denominator in the case of farmer-suicide rate is not easily defined. In the Census of India, cultivators are those who cultivate their land for more than six months a year.¹ Thus, a landowner who cultivates his or her own land for less than six months a year and works on another person's land for the rest of the year would be classified as agricultural labour and not as a cultivator. Even if we assume that the National Crime Records Bureau (NCRB) only classifies all those who are involved in agriculture and own land as farmers, this category would include those who the Census data would list as agricultural labourers. Ignoring agricultural labour would then underestimate the total number of farmers and thereby overestimate the

rate of suicide. This would suggest that farmers' suicide rates are overestimated in studies carried out by (Mishra S. , 2014) and (Nagaraj, 2008). In order to correct this overestimation, (Basu, Das, & Misra, 2016) have included not just 'main workers' classified as agricultural labour, but 'marginal workers' as well. This might, however, be an overcorrection. Several marginal workers in agriculture may well be identified with other categories in the suicide data, particularly among women classified as housewives. Including marginal workers who are agricultural labour in the overall category of farmers could then overestimate the number of farmers and thereby underestimate the rate of suicides. It may be prudent then to take the sum of main cultivators and main agricultural labour as the total farmers. The method of data collection employed by the NCRB suggests that a farmer is defined as anybody whose main activity is associated with farming. This includes not just cultivators, but also agricultural labour, particularly those among the agricultural labour who own land. This has been confirmed by the recent NCRB data, where the break-up of data between cultivators and agricultural labour shows that NCRB always considered farmers as cultivators

¹ For a detailed statement on the denominator challenge, see (Banerjee, 2016)

plus agricultural labour.

In addition, it is clear that the data will include those who are employed in agriculture as a main activity, which means that people who are engaged in other activities and are engaged in agriculture as a marginal activity do not count in the definition as well as calculation of the farmer-suicide rate. Thus, for the purpose of this study, 'Main Cultivators' plus 'Main Agricultural Labour' is taken to be the closest approximation to the definition of farmer in the NCRB suicide data.

Thus, we can define the Suicide Mortality Rate of Farmers (SMRF) as follows:

$$\text{SMRF} = [\text{FS} / (\text{CL} + \text{AL})]$$

where

SMRF= Suicide Mortality Rate of Farmers

CL= Main Cultivators

AL= Main Agricultural Labour

Regional dimension of farmers' suicides

In this section we focus on understanding if there are regional patterns to the farmer suicides happening in different parts of the country which necessitates a state-level analysis. Popular discourse and literature on the topic has tended to focus on particular parts of the country such as Marathwada (Khairna, Bhosale,

& Jadhav, 2015), Telangana ((Sridhar, 2006); (Vakulabharanam, 2004); (Rao & Suri, 2006)), Wayanad ((Münster, 2012); (Mohanakumar & Sharma, 2006); (George & Krishnaprasad, 2006)) to show that farmer suicides as a phenomenon is restricted to certain pockets of the country. Thus, it is important to look at the regional element of farmer suicides, in order to see which areas deserve more attention for public policy intervention in agriculture.

This can be explored in three ways. Firstly, on the face of it this should be captured by the Suicide Mortality Rates for farmers in individual states. As can be seen from Table 1, there is a clear regional dimension to the crisis of farmers' suicides. Farmers in some states are far more significantly prone to suicide than those in other states. There are states where the average of their annual suicide rates over the twenty year period are well above the average of the all India rate over the same period, and some that are well below. The state where the vulnerability to suicide among farmers is most significant is undoubtedly Kerala which has a much more significant level of farmers' suicides across the twenty-year period than any other state. The other states where the levels are above the national average are Kerala, Sikkim, Chhattisgarh,

Table 1: State-wise averages of farmers' suicide rates in India, 1995-2014

Manipur	0.29	Assam	6.13
Nagaland	0.42	Gujarat	6.68
Bihar	0.49	Haryana	7.05
Meghalaya	1.73	Tamil Nadu	7.35
Uttarakhand	2.15	Madhya Pradesh	10.08
Mizoram	2.15	Andhra Pradesh	10.68
Uttar Pradesh	2.31	West Bengal	11.88
Jharkhand	2.56	Tripura	14.94
Punjab	2.61	Maharashtra	16.05
Himachal Pradesh	3.67	Goa	19.19
Odisha	4.27	Karnataka	19.72
Rajasthan	4.67	Chhattisgarh	20.41
Jammu & Kashmir	5.01	Sikkim	20.70
Arunachal Pradesh	5.34	Kerala	70.69
ALL INDIA	8.88		

Karnataka, Goa, Maharashtra, Tripura, West Bengal, Andhra Pradesh and Madhya Pradesh. At the other end of the spectrum are states with much lower suicide rates, particularly Manipur, Nagaland and Bihar. It may be argued that the rates in Bihar are low because these relatively backward states are prone to underreporting of all deaths. But it may not be prudent to dismiss the data on this score as other backward states

have recorded higher suicide rates.

Second, the Suicide Mortality Rate of Farmers (SMRF) can be looked at on a state-wide basis over two decades (1995-2014). This will help us identify individual trends of farmer suicides in particular states and will also help establish a direct relationship between factors such as number of suicides and size of the state, etc. The results obtained by states are as follows:

Figure 2: State-wise variation in farmers' suicide rates

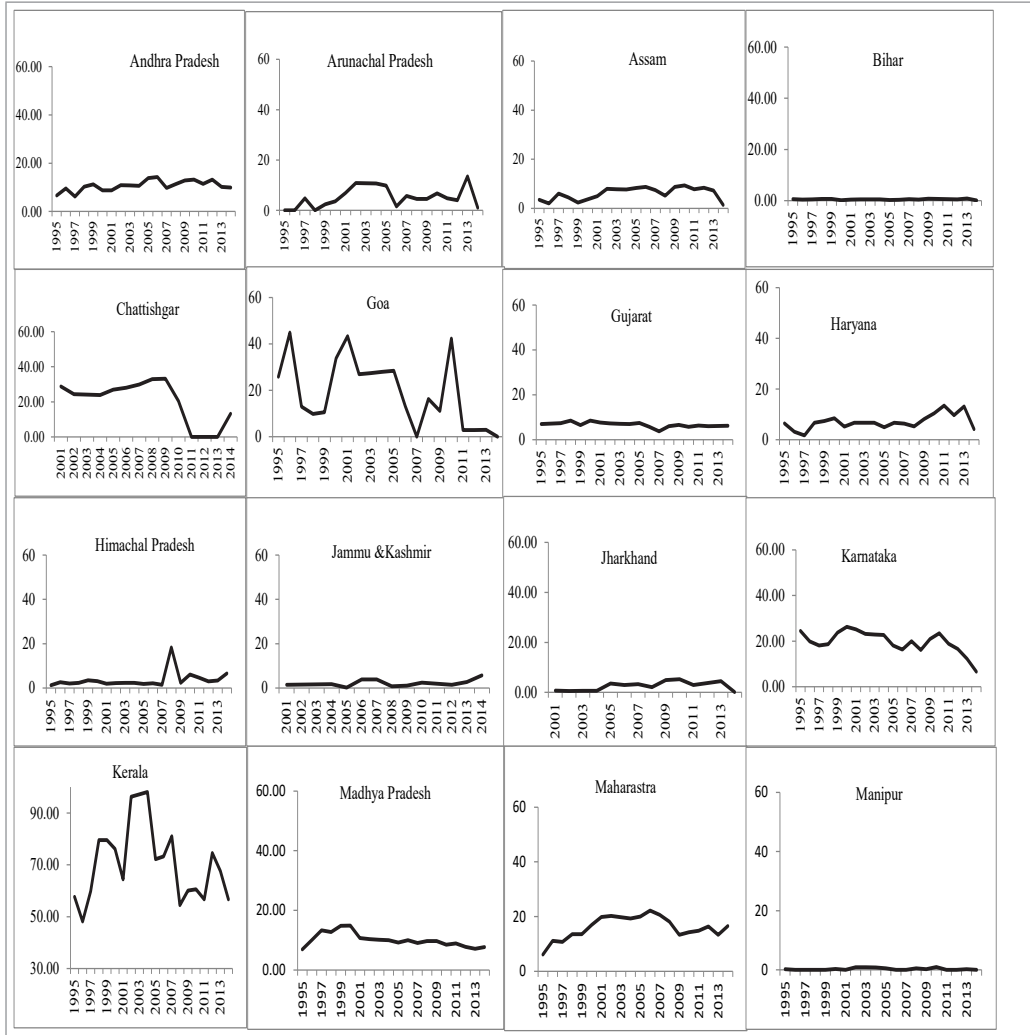
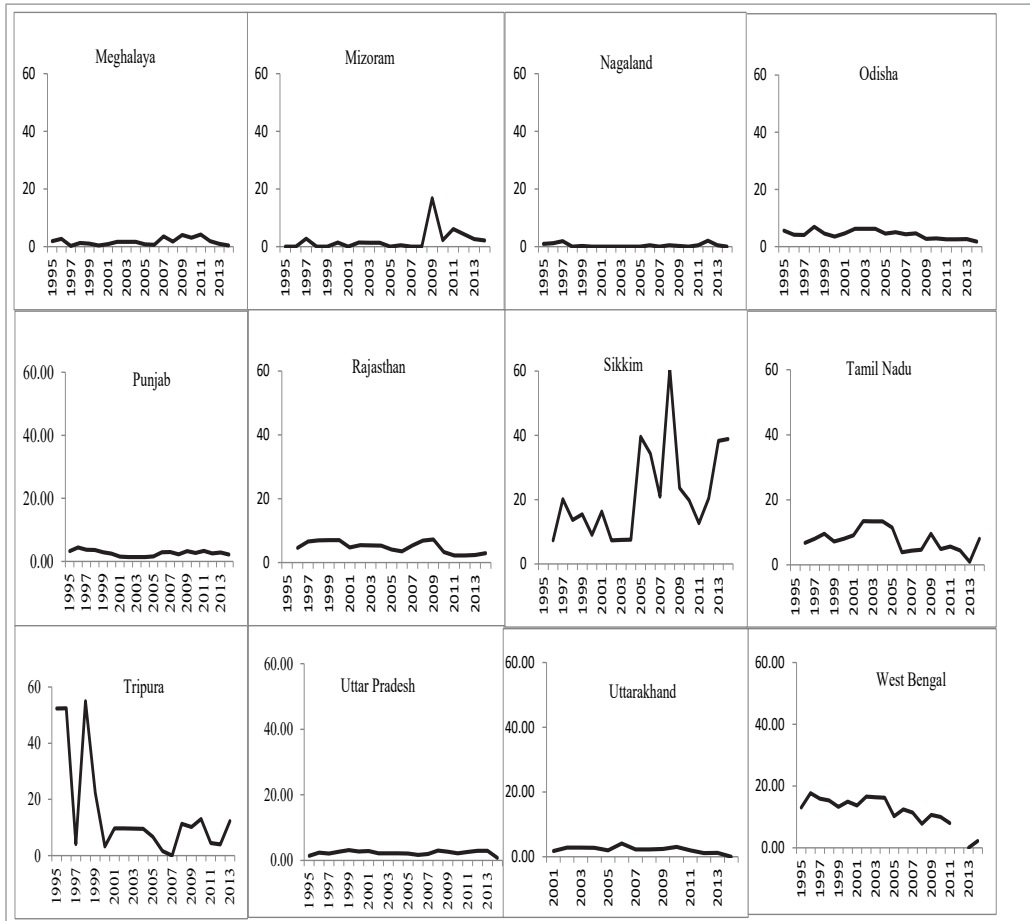


Figure 2: State-wise variation in farmers' suicide rates (Contd.)



The results indicate that the greatest amount of variation in the rates of suicides is in the states which are small, geographically as well as by population. The larger states tend to have lesser variation in the rate of farmer suicides.

The third method by which the regional dimension can be empirically measured is by looking at the overall

vulnerability of farmers as a group when compared to non-farmers over the period 1995-2014. This can be done by calculating a Suicide Mortality Rate Ratio (SMRR) which is the ratio of farmer suicides to non-farmer suicides for each individual state over the above mentioned period. The results of this exercise are shown in Table 2.

Table 2: Comparison of Suicides by farmers and non-farmers

States	Average SMRR farmers to non-farmers	Number of years SMRR>1 in twenty years	States	Average SMRR farmers to non-farmers	Number of years SMRR>1 in twenty years
Andhra Pradesh	0.64	0	Maharashtra	1.18	13
Arunachal Pradesh	0.64	4	Manipur	0.19	0
Assam	0.59	0	Meghalaya	0.5	2
Bihar	0.52	1	Mizoram	0.38	4
Chhattisgarh	1.1	9	Nagaland	0.21	1
Goa	0.88	9	Odisha	0.37	0
Gujarat	0.65	0	Punjab	0.37	0
Haryana	0.65	2	Rajasthan	0.7	4
Himachal Pradesh	0.52	1	Sikkim	0.86	7
Jammu & Kashmir	1.16	7	Tamil Nadu	0.36	3
Jharkhand	0.84	5	Tripura	0.83	0
Karnataka	0.91	9	Uttar Pradesh	1	10
Kerala	2.78	20	Uttarakhand	0.78	4
Madhya Pradesh	0.9	7	West Bengal	0.66	3

Note: Farmers suicide numbers are normalised by total agricultural population consisting of main agricultural labour and main cultivators. Accordingly, non-farmer population was calculated from the census population data and used in normalisation of non-farmers' suicide numbers.

There are two variables which taken together can help us gauge the overall vulnerability of farmers as compared to non-farmers: (i) the number of years in the twenty-year period for which the SMRR is greater than one, and (ii) the average SMRR of farmers to non-farmers calculated by state for the time period of 1995-2014.

Relative vulnerability of farmers when compared to other groups

The suicide prone nature of India as a whole can be established from

data obtained by the World Health Organization (WHO), which ranks India as the 11th in overall national suicide rates in the world. The Million Deaths Survey (MDS) also estimates the suicide rate in India to be 22 per lakh of the population which puts it in the upper half of countries prone to suicide (Patel, et al., 2012).

Thus, in order to establish if farmers are the most vulnerable group to commit suicides in India, it is necessary to compare suicide rates for farmers with that of non-farmers. While the farmer

suicide rate has been defined as the SMRF, we can define the non-farmer suicide rate (SMRNF) as follows:

$$SMRN = \frac{NFS}{(TP - (CL + AL))}$$

where

SMRN= Suicide Mortality Rate of Non-Farmers

NFS= Total number of non-farmer suicides

TP= Total Population

CL= Main Cultivators

AL= Main Agricultural Labour

Thus, the overall vulnerability of farmers when compared to the overall non-farming population can be defined by a Suicide Mortality Rate Ratio (SMRR). This ratio SMRR can help us gauge if the problem of farmer suicides is one that

needs particular attention (SMRR>1) or if the phenomenon of suicide in India is a more general problem (SMRR<1). We can thus define the SMRR as follows:

$$SMRR = SMRF / SMRN$$

where,

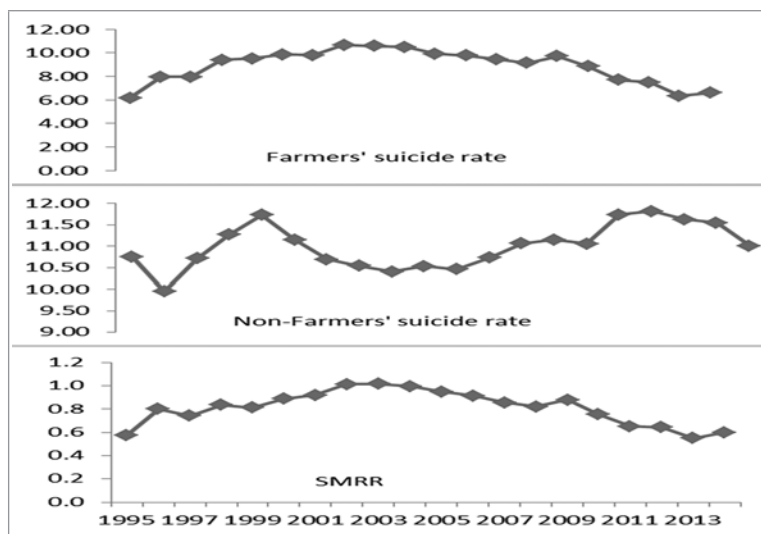
SMRR= Overall vulnerability of farmers to suicide when compared to other groups

SMRF= Suicide mortality rate of farming population

SMRN=Suicide mortality rate of non-farming population

Tracing this ratio for the country as a whole, over a period of twenty years (between 1995 and 2014) for which NCRB data is available yields the results shown in Figure 3.

Figure 3: Farmers' and non-farmers' suicide rate in India, 1995-2014



The data over the twenty-year period shows that SMRR has always been below 1. Thus, for the country as a whole, it appears that farmers are not more vulnerable to suicide than non-farming groups.

At the outset, it therefore must be clarified that to understand farmers' suicide we must define farmers in Indian context appropriately. Without understanding actual population in consideration with might have wrong estimates of suicide rates and its causes. Furthermore, since we observe sufficient regional variations in farmers' suicide rates across the states, this motivates a state level analysis of causes of farmers' suicide. In the following section we attempt to analyse these causes at the state level using Durkheim's framework of suicide.

Estimation of Durkheim's causes of suicide in Indian agriculture

Having explained the usefulness of Durkheim's insights into understanding farmer suicides in India and having established the challenges of estimation of farmer suicides in India, we can now elaborate on Durkheim's typology of suicides and see how it can be used in the Indian context to help understand farmer suicides. The four broad categories are as follows:

Anomic suicide

As described earlier, anomic suicide occurs in societies which are in times of great flux. In translating Durkheim into the context of Indian agriculture, the first step involved is to identify the process of transition that is taking place. Within this context, the transition is along two directions. Firstly, there is a transition from an agrarian society into a non-agrarian society. This transition is fraught with complexities and leads to times of great flux, as has been the case throughout history when such transitions have occurred. The second transition is that which is happening within agriculture itself, namely, the general shift in agricultural practices in the country, as landholding sizes are on the decline.

There has been considerable literature on the changing context of agriculture in India. (Mohanty, 2013) has highlighted that rapid economic growth and the process of neo-liberalization creates a sort of despair and disappointment due to a gap between their aspirations and achievements. When an economy moves from being primarily agrarian to non-agrarian, there is general shift in aspiration levels of those who try to benefit from it by investing more. Frustration increases, however, when return does not match the expected level, thereby rendering

this population vulnerable to suicide. Alongside, vulnerability also arises due to the pressure, faced by individuals as well as communities to cope with changes that are happening around them, particularly in the condition of their lives, when society is in a state of flux (Sridhar, 2006).

Considering that anomic suicide is representative of the nature of change, two separate variables have been used to measure it. The first variable is the difference in the proportion of people in agriculture in total main workforce decennially (1991–2001 and 2001–2011) using data from the 1991, 2001 and 2011 census. We further normalise the difference between 2001 and 1991 by 1991 total main workforce and that between 2011 and 2001 by 2001 total main work force. This variable helps realize an estimate of the change in the population employed in agriculture. In other words, it captures movement away from agriculture within two spans of ten years each (1991–2001 and 2001 to 2011). Thus, we have a two-year panel for movement away from agriculture.

The second variable is the ratio of main cultivators to main agricultural labourers (CL/AL). This data has been obtained state-wise from 1991, 2001, 2011 census with the values for the in-between years being interpolated. The CL/AL ratio represents a movement away from a peasant-dominated economy

and can be seen as an indicator of transition within agriculture, showing the numerical dominance of wage labour and is also consistent with two opposing schools of thought. In the neo-classical understanding, the consolidation of profits by the peasantry is what leads to the transition away from agriculture and into the cities and, for this consolidation, at a certain point the peasants need to make use of hired labour. Thus, there is a point at which there is a movement in agriculture away from family labour into hiring labour from outside the family. From the opposing Marxist perspective, one of the necessary conditions (Patnaik, 1971) for the movement away from a peasant-dominated agrarian system is the presence of hired wage labour, which can be captured by the ratio of main cultivators to main agricultural labour in the agrarian system (CL/AL).

Model1a in Table 3 takes CL/AL as the explanatory variable and shows that it exerts a significantly negative impact on farmers' suicides in the states. This reflects that peasant-dominated agriculture captured by CL/AL, has lower suicide rates among farmers compared to the labour-dominated agriculture. It also explains that movement within agriculture from a peasantry- to a labour-driven system creates higher pressure on farmers, making them more vulnerable. Model1b takes movement away from

agriculture as the explanatory variable and thereby constitutes a two-year panel analysis, but cannot establish any significant impact of it. In Model1c, once we consider both, movement within (CL/AL) and movement away from agriculture, and take out the effects separately, both variables turn out to be significant. As before, CL/AL still exerts a negative impact; movement away shows a positive impact on farmers' suicides indicating that as more people move out of agriculture, greater pressure and frustration is created among those who are left behind and stifling their aspirations.

Table3: Anomic causes explaining farmers' suicides in India

Dependent variable: SMRR			
Explanatory variables	Model 1a	Model 1b	Model 1c
CL/AL	-0.01 (0.04)		-0.02 (0.00)
Movement away from agriculture		0.11 (0.84)	1.01 (0.02)
No of observations	507	52	52

Note: in Model1a and Model1b are Panel data models with standard errors adjusted for 28 clusters in states; Hausman test results for both models generate insignificant chisq. indicating Random effects; probability values of the estimated coefficients are reported in the parentheses. Model 1a considers the full panel 1995-2013; Model 1b and Model 1c are two-year panel analyses.

Egoistic suicide

There has been an increasing trend among the farmers towards individualism (Mohanty, 2005). Cultivator binds ties with market but not with each other and there has been break down of the concept of community with the rise of concept of individual with agriculture becoming an individual business. In the changing context farmers don't interact with each other to exchange information or extend labour support to each other due to increased egoism. The essence of an egoistic suicide is the assertion of individual ego characterized by excessive individualism. In the context of Indian agriculture, egoistic suicide can be viewed as the aspirations of people who are unable to move out of agriculture and as a result, remain left behind and are forced to rely on individual returns in order to survive and meet the uncertainties and cope with the vulnerabilities stemming from the transition. In other words, in situations of agricultural uncertainties, those who lacks social support due to excessive individualism and do not have access to other coping mechanism often end up with lower farm income and increased vulnerabilities. Furthermore, in Indian agriculture this could be relevant, as in the absence of adequate formal financial/credit support, farmers are often left to rely on informal support

such as credit from their buyers or village moneylenders so and. Such transactions to a large extent are based on informal agreements, which if broken, bear greater social implications. In spite of this, however, informal finance continues to be prevalent in the rural setting. This has been highlighted in various parts of the country. Various state-specific, as well as region-specific insights from the literature have pointed to this process. Gill (2005) has argued that the highly commercialized form of agriculture with declining social support has pushed the farmers towards suicide. (Parthasarathy & Shameem, 1998), found that rising indebtedness as well as the price and yield instability of cotton crop as the main reason straining the farmers in Maharashtra, but also pointed that farmers did not commit suicide only for their economic loss but also for social disintegration and alienation in society. Similarly, it has been shown that small farmers are extremely vulnerable to crop losses, price fall and decline in productivity due to rainfall fluctuations leading to price and yield shock ((Mohanakumar & Sharma, 2006); (Jeromi, 2007) in Kerala; (Mishra, Farmers' suicides in Maharashtra, 2006) in Maharashtra). NSSO data (Rounds 48, 59 and 70) have shown a general increase in borrowing from informal

sources since 1991. This increased level of indebtedness itself is seen as a major cause of farmer suicides (Sidhu & Gill, 2006). Within this, the diminishing role of formal institutions has led to greater levels of borrowing from informal sources, thereby increasing suicide (Mishra, 2006). This dominant position of non-institutional sources has been documented in small and medium farmers in Punjab (Gill & Singh, 2006) and Maharashtra which has led to farmer suicides (Mohanty, We are Like the Living Dead?: Farmer Suicide in Maharashtra, 2005).

Measurement of egoistic suicide is done by using two separate models: in Model 2 we estimate the impact of uncertainties captured by yield and price variability in the state and in Model 3 we consider impact of informal institutions for borrowing on the incidence of farmers' suicide.

In Model 2 represented in Table 4 impact of uncertainty is controlled by two variables : (i) price of first main food crop and (ii) yield of the first main crop in the state for the years 1995 to 2013. This was done first by classifying crops in each state by the maximum area under their cultivation. . Second, yield and price of the identified crop in the state has been considered to be representative of price and yield of the most relevant

crop affecting farmers. The data for this was collected from Agricultural Census of India. An index was created to capture variability in yield and price of the most important crop in the states. 2013 in our case serves as the base year. Price and yield of the identified crop in each state are marked as 100 in 2013. For the remaining years, 1995-2012, values are transformed as proportions of the base year. This was done in order to arrive at a single function being representative of price and yield in the state. Yield and price taken together are then regressed with SMRR.

In our study, egoistic causes of farmers' suicide are linked with vulnerability of farmers due to price and yield fluctuations. This is particularly so for those who do not adopt the risk pooling in social networks due to insufficient social disintegration and without any access to social safety nets. We estimate individual as well as joint effects of both the variables and find that yield (Model2a) and price (Model2b) fluctuations both are having positive impacts on suicide rates. When considered jointly these effects still survive, indicating higher vulnerability of Indian farmers due to inadequate risk and uncertainty coping mechanism, such as insufficient access to social safety nets and social capital.

Table4: Egoistic causes explaining farmers' suicides in India-1

Dependent variable: SMRR			
Explanatory variables	Model 2a	Model 2b	Model 2c
Yield of main crop	-0.004 (0.03)		-0.004 (0.00)
Price of main crop		-0.004 (0.01)	-0.003 (0.03)
No of observations	502	336	336

Note: in Model2a, Model2b, Model2c standard errors are adjusted for 28 and 24, 24 clusters in states; Hausman test results generates insignificant *chisq*. Indicating Random effects; probability values of the estimated coefficients are reported in the parentheses.

In the second model of egoistic suicide, reliance of farmers on informal institutions for borrowing is measured by using NSSO data of rounds 48, 59 and 70 (Debt and Investment Survey of India) which gives the number of loans per thousand of loans in rural households by sources. Within the informal institutions, the NSSO data gives the breakup of informal sources as credit from the Landlord, Agricultural Moneylender, Professional Moneylender, Traders, and Relatives/Friends. We include all of these variables as explanatory variables of causes of farmers' suicide at the state level. A panel data regression is then run on the variables representing informal sources of loan with SMRR.

Our results in Table 5 show that credit from the traders has been reducing farmers’ suicides in India. This is opposite of what we conjectured in our analysis. Instead of increasing social pressure, traders, with whom farmers often share a long standing relationship and receive input support even before cultivation, are found to relieve farmers from a number of pre-harvest financial crisis. Sometimes farmers also receive credit support from their traders to fulfil their personal needs which increases level or trust and individual bonding between them.

Table 5: Egoistic causes explaining farmers’ suicides in Indi-2

Dependent variable: SMRR	
Explanatory variables	Model3
Landlords	2.254 (0.22)
Agricultural/ professional money lender	.35 (0.71)
Traders	-1.31 (0.06)
Relatives/friends	-.52 (0.70)
No of observations	55

Note: in Model3 standard errors are adjusted for 20 clusters in states; Hausman test result generates significant chisq.indicating Fixed effects; probability values of the estimated coefficients are reported in the parentheses.

Altruistic suicide

Altruistic suicides occur when the level of social integration is high and

individuals are willing to die for society or a group. Individuals in such cases are willing to sacrifice their lives for a larger social cause. The larger social cause could reflect distress among specific groups in society. In the context of farmers in India altruistic suicides would occur when farmers commit suicides in a public display of a willingness to sacrifice their lives to highlight farmers’ distress.

There have been cases in India where farmers have committed suicide publicly to protest against agrarian distress.

In April, 2015, a farmer committed suicide during an Aam Aadmi Party rally in New Delhi. He hanged himself in front of hundreds of protesters gathered to rally against the government’s contentious reform of land purchasing laws. The public tragedy focused nationwide attention on the plight of India’s farmers, who were adversely affected by weather shocks.

In July, 2017, a sixty-one year old farmer from Tamil Nadu protesting in Delhi tried to commit suicide by consuming sleeping pills. He was protesting with other farmers to press their demands including a drought relief package, loan waiver, adequate remuneration for agriculture produce, crop insurance as well as linking of rivers to address the water crisis.

Important as these cases are in helping highlight farmers' distress and to mobilize public opinion in their favour, there would be some difficulty in treating this as an independent major cause of farmers' suicides. By their very nature such suicides are an option that is rarely exercised, and are typically sporadic. While they do form an important part of the story, they cannot be expected to occur in large enough numbers to influence macro statistical analysis. Their value is in highlighting the crisis rather more than being the dominant pattern.

Fatalistic suicide

Fatalistic suicide, for Durkheim, occurs due to excessive regulation, particularly through organizations or institutions. In the context of Indian agriculture, the oppression can be viewed as the indebtedness owing to institutional sources or formal sources of lending. Though this has shown a decrease since 1991, issues including those of access and barriers to entry and strict enforcement and regulation mechanisms still remain in formal lending methods. In our study, we relate fatalistic suicide with the presence of excessive regulation in accessing formal financial support by farmers and argue that farmers who most of the times are without collateral cannot often receive credit from banks or other

public organisations. This not only makes farmers frustrated with public credit system but also makes them financially vulnerable.

The specific literature has highlighted this point in various ways. The general trend is that there is an increase in level of indebtedness over time, thereby leading to suicides (Sidhu & Gill, 2006). A major proportion of this debt of farmers is owed to institutional sources (Vaidyanathan, 2006). Within this, there is a significant rise in short-term loans issued by formal financial institutions, thereby raising indebtedness (Jeromi, 2007). Local credit networks have also had a role to play in this process, where membership and outstanding loans to agricultural co-operative credit societies has substantially increased (Mohanty & Shroff, 2003).

The NSSO data of rounds 48, 59 and 70 give data on the number of loans per thousand in rural households in terms of formal sources as Government, Commercial Bank and Cooperatives credit societies. We regress state-level SMRR on each of these variables to understand how fatalistic causes have been affecting vulnerability of Indian farmers.

Our results in Table 6 on government, cooperative society and commercial bank lending in Model4

shows that only cooperative lending has a significant impact on farmers' suicides. It might, therefore, be possible that cooperative societies that are often dominated by local elites and other pressure groups, who might be putting higher pressure on the framers in case of defaults. Farmers are often exposed to various social pressures in case they receive support from cooperative credit and cannot comply with the regulations. One has to study carefully the effects of elite capture in cooperative societies and the resulting consequences for the Indian farmers.

Table 6: Fatalistic causes explaining farmers' suicides in India

Dependent variable: SMRR	
Explanatory variables	Model4
Government	-0.27(0.88)
Cooperative society	1.58(0.06)
Commercial Bank	0.45(0.46)
No of observations	56

Note: in Model4 standard errors are adjusted for 20 clusters in states; Hausman test result generates insignificant chisq.indicating Random effects; probability values of the estimated coefficients are reported in the parentheses.

Farmers' suicides and agrarian transition in India

Long term trends in the relationship between farmers' suicides and agrarian

practice confirm Durkheim's emphasis on the inability to cope with change being a driving social factor in suicides. At the heart of the tragedy of farmers' suicides in India is the inability to cope with the pressures generated by agrarian transformation. A major part of this transition is within agriculture. With each passing generation there has been a division of the family farm, leading to a consistent decline in the size of the farm. As large farms have gotten smaller it has hurt the ability of individual farmers to make large capital investments in their farming. The effect on small farms has predictably been greater, with the division making several small farms unviable. This is led to a large number of farmers being forced to become agricultural labour. This change is captured in the decline in the ratio of cultivators to agricultural labourers. It is thus no surprise that there is a negative and statistically significant relationship (at a level of significance of <0.05) between the ratio of cultivators to agricultural labourers and the Suicide Mortality Rate Ratio of farmers to non-farmers.

The transition to agricultural labour is not always a viable option. In situations where farmers have options outside the village they may choose to migrate, often leaving their land fallow. As the fallows increase there is a corresponding decline

in the availability of jobs for agricultural labour. This labour too has to then seek options outside the village. As those with options leave the village those who do not are forced to remain, even if the village no longer offers them the opportunities it once did. Thus while the extent of migration out of the village is a positive indicator for those who once lived in the village, it is not necessarily so for those who are left behind. Those who are left behind have to cope not just with the declining opportunities but also the pressure of not doing as well as others they know who have found options outside the village. This contributes to the indicators of the extent to which people leave agriculture being associated significantly and positively (at a level of significance $p < 0.05$) with the Suicide Mortality Rate Ratio of farmers to non-farmers.

The challenge for those left behind is made greater by the pressure increase their individual returns. As the need to step up investments increases so does their dependence on borrowing. These loans are usually seen as the main cause for suicides. There is also no doubt from the vast number of specific cases that have been studied that debts are a trigger for suicides. Before we treat loans as the main cause for suicides we must however address a statistical reality. A majority of

the rural households have loans (The NSS round on debt and investment conducted in the year 2013 shows that nearly 52% of agricultural households in India have outstanding loans). What is it that ensures only some of the borrowing households are pushed to suicide while the vast majority do not? A partial answer to this question lies in varied effects of different types of loans. Our results show that there is no significant relationship between indebtedness to informal sources, such as money lenders or friends and relatives, and the Suicide Mortality Rate Ratio of farmers to non-farmers. The only informal source of indebtedness that shows a relationship with farmers' suicides is loans from traders (at a level of significance of $p < 0.1$). But this relationship is a negative one, that is the greater the loans from traders the less the tendency among farmers to commit suicide. This would suggest that farmers in distress could fall back on traders for loans to keep up agricultural production in the next year. The absence of this facility contributes to the tendency to commit suicide.

In the formal sector too not all loans have the same effect on farmers' suicides. Loans from formal sources such as banks or government loans do not have an impact on the Suicide Mortality Rate Ratio of farmers to

non-farmers. This could be because of expectations of loan waivers. These expectations, and the accompanying lack of pressure to recover loans, ensures farmers are not pushed to an extreme step such as suicide. Consequently, there is no statistically significant relationship between loans taken from formal sources such as banks or governments and the Suicide Mortality Rate Ratio of farmers to non-farmers. Where this pattern does change is in the case of loans from cooperatives. The relationship between indebtedness to cooperatives and the Suicide Mortality Rate Ratio of Farmers to Non-farmers (SMRR) is positive and statistically significant (at a level of <0.1). This is likely to be the result of the nature of cooperatives. The cooperatives are known to be typically controlled by locally powerful individuals. When these individuals, and the cooperatives they control, exert pressure on farmers to repay loans, this pressure pushes them towards suicide. The precise manner in which this works could change from region to region and would require a more detailed local analysis, but it would seem to be clear that cooperative loans do trigger farmers' suicides.

If we see indebtedness as the trigger there is a need to recognise the more fundamental causes that lead farmers to the point where they are susceptible to

suicide. This could include a variety of factors ranging from growing aspirations resulting from the relative success of those who have left the village, to an increase in the number of individuals dependent on an acre of land. These pressures could result in farmers taking investment decisions that are not always sustainable. This would be particularly true in cases where they invest heavily in a crop, often with substantial borrowings, in the hope that the higher returns from the will leave them with sufficient resources not just to repay their loans but also sustain a higher standard of living. If, however, the crops fail, they are left with loans that they have no way of repaying. In such a situation the gap between expectations and outcomes in crop production and prices could become a major factor contributing to farmers' suicides. This is consistent with our results where the relationship between yield of the main crops and SMRR is negative (at a level of significance of $p<0.05$). Similarly, the relationship between the price of the main crop and SMRR too is negative (at a level of significance of $p<0.05$). The negative relationship shows that sharp declines or loss in yield and price can have a devastating impact on those left behind, thereby increasing their vulnerabilities and driving them to commit suicide.

Taken together, if we view the results in the context of Durkheim's typology of suicides, the picture that emerges is that farmer suicides in India are due to the nature of changes happening not just in agriculture but also in the nature of change happening due to the transition away from agriculture. This is represented in Durkheim's typology by anomic suicide. For those who are left behind in agriculture, the uncertainties are more and hence the dependence on individual returns such as yield and price become important and this is representative of Egoistic suicide in Durkheim. While individual cases of farmers committing suicide to highlight the plight of farmers is present, this is not the dominant pattern, thereby not being able to establish Durkheim's Altruistic suicide in the case of farmers in India. Fatalistic suicide in Durkheim is represented by the pressure of indebtedness, which is undoubtedly greater from formal sources of loans, especially, when operations of the formal sector are influenced by local pressure groups, such as political groups or local elites.

These insights from the use of Durkheim's framework to understand farmers' suicides in India point to the need to see this phenomenon not just in

terms of the details of individual cases but also in the context of the larger agrarian transition taking place in the country. The fact that the suicides are largely a problem faced by those who get left behind in agriculture at a time when their contemporaries are finding opportunities outside this sector has implications for an effective strategy to address this tragedy. The challenge is then not just one of reducing the pressures in agriculture, but also one of enabling an honourable exit for those who cannot continue to earn a livelihood in that profession.

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