

**LITERATURE REVIEW ON
“CORRELATES ASSOCIATED WITH FARMER’S SUICIDE”**

**A Dissertation submitted as a part of the internship program on
Agricultural Psychology**

Submitted by:

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Under the supervision of

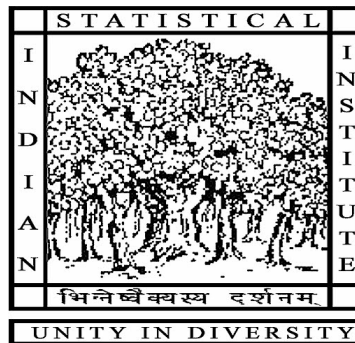
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ABSTRACT

Agriculture is the backbone of any economy in the world. In India agriculture plays a vital role in building its economy. India's 70% of population depends upon agriculture. Changes in climatic conditions and other factors or correlates including drought, lack of irrigation facilities and high levels of debt. These factors have created a crisis among farmers which leads to the farmers committing suicide. In India it is estimated that approximately 16,000 farmers die by suicide each year and at rates far above those of the general population. Socioeconomic factors are associated with farmers suicides with increased indebtedness playing the predominantly role, available research suggests that this agrarian crisis affecting most vulnerable farmers. Indebtness and numerous factors relating to this clearly identified as the most important risk factors. The objective of the present study was to review the literature related to the correlates associated with farmer's suicide. Studies related to correlates or factors associated with farmer's suicide were compiled and analyzed. In the present study, relevant studies in Google, Google Scholar, Pub Med, Ovid were searched and reviewed. The study shows greater rate of indebtedness, high drought prone areas, increase rate of money lending from the private money lenders leads to a negative impact on the farmers which compelled them to commit suicide. Study suggests the government must take measures to tackle this issue at the earliest. It must set up exclusive agricultural zones that allow specifically agricultural activities. Moreover, there must be certain programs that teach farmers about modern techniques related to farming. It will help in enhancing the production of crops. Furthermore, the irrigation facilities for the crops must be enhanced. In addition, there must also be genuine crop insurance policies that cover the loss of these farmers so they don't go into debt. Moreover, the government must also ensure they learn new skills which will help them get some additional income into the family. This way, they won't be solely dependent on their crops and will have a backup with them.

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1.

INTRODUCTION

AGRICULTURAL PSYCHOLOGY: In contrast, to other social sciences that have developed specialized sub disciplines and/or application interests in agriculture, psychology historically has not been known for its concern with rural issues. For instance, there has been not been any psychological counterpart to such social science specialties as agricultural economics, rural sociology, agricultural marketing, or rural geography. Nonetheless, psychological perspectives have interacted with agricultural issues in several domains: Assessment of the therapeutic needs of rural populations, Investigation of farming tasks and skills, Analysis of expert agricultural judges, Evaluation of farm management decisions, and Statistics and experimental design. (Henggeler,1983).

Agriculture is the main source of national income for most developing countries. However, for the developed countries, agriculture contributes a smaller percentage to their national income. Agriculture plays an important role in Indian economy. India's 70% of population depends upon agriculture. Most of the Indians live in rural areas and earn their livelihood primarily from agriculture and its allied activities. Agriculture in India is the means of livelihood of almost two-thirds of the people. Farmers plays a vital role in our daily lives and are responsible for the food we put on our tables three times a day. It is often overlooked that growth of agriculture is closely related to the mental well-being of agricultural farmers. Despite of high production, farmers commit suicide, recent report reveals high incidence of suicide in rural areas.

SUICIDE: Edwin Shneidman has defined suicide as the conscious act of self-induced annihilation. It is a way out of problem or crisis that is invariably causing intense suffering. Assuming suicide is a solution for insoluble problem and termination of distressing thoughts and feelings, farmers committed suicide. It is an act of intentionally causing one's own death. Farmer's suicides are not a phenomenon by itself; rather it is an extreme manifestation of the

underlying agrarian crisis prevailing within the country for a longer period of time. Worldwide, suicide is among the three leading causes of death among those aged 15-44 years and the second leading cause in the 10-24 years age group. Every year about one million people die from suicide; giving a "global" mortality rate of 16 per 100,000. Mental illness is a well-researched risk factor for suicide. Farmers are an occupational category with high suicide risk. Though farming is considered as a peaceful and healthy way of life, agriculture has the highest rates of mortality in any industry. In some farming communities, suicide rates are reportedly higher than the general population.

DURKHEIMIAN THEORY AND FARMER SUICIDES IN INDIA- India is largely an agrarian society with around 60% of its population working in the primary or the agricultural sector. Most of them find their livelihood by depending directly or indirectly on the agrarian economy. Though 60% of the population is engaged in agricultural activities, the contribution of agriculture to GDP is just 14.6%. This gap between human input and economic output shows how inefficient is our administrative system and throws light over the poor performance of policy makers in transferring such a large share of human effort and resource into economic benefit. In other words, though 60% of human capital of the country is used for agricultural activities, only one-fourth of it is transferred to the economy.

There are several reasons why a farmer commits suicide. First reason is the sudden developments in the pre-planned agricultural activities. This includes unexpected changes in monsoon patterns, changes in government policies, lack of proper public distribution system (PDS) etc. As a result, the farmers, who are supposed to feed the population, find it difficult to feed and support their families. In 2003, a study was conducted regarding the psychological state of farmers who tried and failed to commit suicide. Most of them responded to the survey team that they felt alienated and helpless after the continuous crop failures. The government officials, according to the farmers, didn't show any interest in listening to the problems of farmers. In many cases, farmers felt like they are becoming a liability to the entire family.

Another reason pointed out by the study was that most of the farmers felt insecure to be a part of society that largely neglected the problems of those who produced the essential commodity for the survival of the human beings.

In his classical study of suicide, Durkheim points out that a suicide is the result of social factors which pushes the individual to think about suicide in order to fade away from the society which doesn't appreciate or support the group which kills the starvation of the society. Durkheim mentions four kinds of suicides in his work and clearly states that a suicide can be any of these four in nature or a mixture of two or more kinds.

Using the findings of Emile Durkheim and applying them to the context of farmer suicides in India, we can say that most of the suicides of farmers comes under two categories of suicides as defined by Durkheim; anomic and egoistic. Anomic suicide is the kind of suicide committed by an individual when a sudden, unexpected event takes place in the life of the individual. In our given case, most of the farmers committed suicides due to the unexpected events; the unexpected event of crop failure due to some natural disasters or the unsupportive response from the part of bureaucracy and government who are obliged to protect and safeguard the agrarian community, who forms the back bone of the society.

The reason why one must categorize these suicides also under egoistic suicides is that farmers kill themselves due to the isolation and alienation that they feel after a crisis. According to Durkheim, egoistic suicides are committed due to alienation of an individual from the rest of the society. Alienation includes the breakage of social ties, isolation from other individuals, weakening of the social bonds etc. As mentioned before, a farmer, who has lost everything, will find himself as a loser and thinks that he is no more an asset to the society or his family. This emotion is largely due to the response of the society towards the farmer. Elderly people commit suicide because they feel loneliness and consider themselves as good for nothing. Such suicides of old people are often cited as an example of egoistic suicides. Similarly, the farmer suicides also exhibit the nature of egoistic suicide as their action of killing themselves is largely due to the response that they receive from the society they live.

CORRELATES ASSOCIATED WITH FARMER'S SUICIDE- One of the observations frequently made about Indian planning is that it has not given adequately high priority to agriculture and that is responsible for most of the problems with which economy is beset. (Raj, 1975). A farmer committing suicide in a particular state or region does not attract attention but when such thing turns out to be epidemic proportion, serious concerns has to be raised. This

issue has been brought in notice by the media in 1990s and turned out to be the most distressing phenomenon of the last decade. According to study by Nagraj (2008) based on National Crime Records Bureau (NRCB), every seventh suicide in a country was a farm suicide in the time period of 1997- 2006. Statistical evidences namely educational level, occupation, mode of suicide can assume high incidence of suicide among the agricultural farmers. 47% of suicide victims had no education (21.8%) or only education upto class IV (25.2%). Most of them were self employed (41.9%) and modes of suicides were either poisoning through insecticides (34.8%) or hanging (31.7%). The reasons of suicide were related to family problems and illness. Suicide rates were higher in agriculture based states such as Maharashtra (12.4%), West Bengal (12.1%), Andhra Pradesh (12.1%) and Tamil Nadu (11.3%).

Some agro-economic reasons for committing suicide among the farmers of Andhra Pradesh as explained by Kumar and Bhatt (2007) -

- Chronic drought and scanty rainfall
- Lack of underground water
- High cost of cultivation with inadequate reasons
- Crop failures and low yields
- Lack of remunerative prices for the farm produce
- Lack of sustainable irrigational facilities; spurious fertilizers, pesticides and seeds
- Inadequate agricultural market facilities for farmers
- lack of sufficient institutional credit flows; high rates of rent charged by land owners and high interest rates charged by private money lenders

- lack of water generating through wells and bore wells
- lack of agriculture related cooperative banks in lending money to farmers.

It is also identified some psychological factors as loss of self-esteem, ego and prides; feeling of shame and insult; feeling hurt; suffering from alienation characterized by helplessness, powerlessness and self-estrangement. The most common factors associated with farmers suicide are crop failures, inability to meet the rising cost of cultivation and indebtedness which is mostly found in the state of Maharashtra.

With a 17% share in the national gross domestic product and with 22% of the total population (according to the 2011 census) engaged in farming, the overall health of the agriculture sector is vitally important. From the humanitarian point of view, the tragedy of farmers suicide demands prompt attention. The solution of farmers suicide is the farmers need to be protected from falling into the trap of the spiraling debt, which is the primary risk factor for suicide, such solutions are- small and marginal farmers should be encouraged to pool their farmland to leverage the advantages associated with larger land holdings such as the use of modern and mechanized farming techniques, Farmers must necessarily be educated about modern farming techniques and practices, and younger professionals must be encouraged to participate in farming activities.

The purpose of our study is to explore the correlates associated with farmer's suicide through literature survey.

2.

OBJECTIVE OF THE STUDY

The present dissertation work entitled ‘Literature Review on the “Correlates associated with Farmer’s suicide” has been carried out with the following objective:

- **To explore the Correlates associated with Farmer’s suicide through literature survey.**

3.

METHOD

Agricultural psychology largely uses the same quantitative and qualitative methods as other psychological disciplines. The main research methods used in agricultural research include questionnaire studies, field studies, case studies and interviews.

In the present study the different literature was searched, followed by grouping of the articles of interest and a time scale respective web- analysis was done.

A. Literature Search

A literature search in different scientific database was employed to identify studies that examine the link of farmer's suicide, mainly from 2001 to 2019.

Relevant studies in Google scholar, Google, Pub Med, Ovid, were systematically searched using keywords: agricultural psychology, farmer's suicide theory, factors or correlates associated with suicide of the farmers.

Relevant papers in key journals were also searched such as **International Journal of management studies, Journal of Neuroscience in rural practices, Journal of Epidemiol and global health, Indian J psychiatry, American journal of rural development** used for searching dissertations and theses.

The search for papers was considered complete when various databases provided no more new papers on this topic.

In the present study 150 literature was searched for understanding the correlates associated with farmers' suicide.

Study Obtained 25 research articles, published mainly, in 2010- 2019. The majority of studies were published in rural development journals.

B. Inclusion and Exclusion Criteria

The following inclusion and exclusion criteria were included in this meta- analysis:

1. Except for dissertations and theses, these articles had to be published in peer-reviewed international journals.
2. The articles were written in English.
3. The studies had followed standard statistical analysis (where applicable).

4.

SUICIDE

Suicide is an intentional act of self-harm that results in death. This can include "indirect or passive". Self-harm, such as deliberately not moving from the path of an oncoming car (Maris et al. 2000). A suicide is sometimes referred to as a **completed suicide**, distinguishing a fatal act from a nonfatal suicide attempt.

A **suicide attempt** is an act of self-harm committed with intent to die but not resulting in death. It may or may not result in injury (O'Carroll et al. 1999). This also can be referred to as a **suicide gesture**.

Intentional, direct injury of one's own body constitutes **self-harm**. This includes "actions such as self laceration, self-battering, taking overdoses or exhibiting deliberate recklessness." These behaviors are ways of coping with distress and may be done with or without the intent to die (ASHIC 2003).

Whether an act of self-harm results in death depends on the **lethality** of the method employed.

Lethality is the likelihood that a given method of self-harm -- e.g., gunshot wounds, drug overdose, cutting -- will result in death. In this application, lethality indicates the likelihood that a person will complete suicide in the near future (Shneidman 1996).

Intent, in terms of suicide, is the conscious desire to harm one's self and/or to die as a result of self injury. A person's intent directly contributes to his or her lethality.

Suicide threat is behavior that implies -- either directly or indirectly -- that a suicidal act may occur in the near future. This does not involve any actual self-harm (O'Carroll et al. 1999).

Intent to die involves **suicidal ideation**, which is any thought about harming one's self. Ideation ranges from fleeting thoughts about committing suicide (sometimes called passive suicidal ideation) to developing a detailed suicide plan.

A **suicide act** can result in death, injury, or neither. It is any action committed for which there is proof that a person intended to kill himself or herself (O'Carroll et al. 1999).

THEORIES OF SUICIDE:

- **COGNITIVE THEORIES-** Cognitive theories of suicide focus on the thoughts of suicidal individuals. In his study of suicide theories, Lester (1998) noted that cognitive theory was the most descriptive. Aaron Beck is most closely associated with cognitive-behavioral theory. His work essentially asserts that the cognitive link between depression and suicide is hopelessness.

This hopelessness manifests itself in suicidal people's negative views of the future, themselves, and their situation/problem:

- **Future:** unrealistic expectations of continued suffering, frustration, difficulty, and isolation
- **Self:** feelings of incompetence, helplessness, and being unloved
- **Situation/problem:** insurmountable, unsolvable, and unbearable

These negative views result in the individual's desire to escape, as life becomes less desirable than death. He or she believes that the current situation will not improve and that there will be no end to current suffering.

Cognitive-Behavioral Therapy is currently a popular strategy used by therapists and psychologists to counter distorted thinking patterns that lead to hopelessness and suicidal thoughts. This therapy is based on the concept that thoughts -- not external events -- dictate feelings and behavior, and altering negative thought patterns can improve how one feels and lives. The therapy employs individual counseling, as well as practical applications and assignments outside of sessions, to help people develop healthy responses to stressors and understand that psychological suffering can end without self-harm (NACBT 2003).

- **DURKHEIM AND SOCIOLOGICAL THEORIES OF SUICIDE-** Emile Durkheim's (1951) work provides the basis for most sociological theories of suicide. His ideas, which date to the 19th century, are based upon epidemiological studies. His theory states that there are 2 dimensions of social influence on individuals: **social integration**, which is the degree of connection between an individual and a social network, and **social regulation**, which is the degree of influence that society has over an individual.

These 2 forces may lead to 4 different types of suicide. In the dimension of social integration, there are 2 types of suicide: egoistic and altruistic.

Egoistic suicide results from a lack of social integration, due to a limited or nonexistent social network.

Altruistic suicide, on the other hand, results from extreme social integration; an individual who commits altruistic suicide feels overly obligated in his or her duties to others.

Fatalistic and anomic suicides are functions of social regulation. Those who commit **fatalistic suicides** do so because they have been rejected by society. **Anomic suicides**, on the other hand, are committed by those attempting to deviate from social expectations in their deaths.

Large-scale societal crises may result in heightened suicide rates because the existing social order is challenged. An economic depression, for example, may be accompanied by an increased suicide rate. This is not due, however, to poverty or unemployment specifically but rather a result of a rapid change of conditions, expectations, and individuals' self-regard.

- **PSYCHOLOGICAL THEORIES: FREUD AND MENNINGER-** **Sigmund Freud** did not study suicide in detail but claimed that depressed individuals did not have the energy to kill themselves unless they had identified an external object or person whom they wished to kill, internalized that object, and turned their aggression against it.

Karl Menninger expanded on this theory to develop the concept of the suicidal person's 3 wishes: the wish to be killed (**guilt**), the wish to kill (**revenge**), and the wish to die (**hopelessness**) (Maris et al., 2000). Individuals who are suicidal wish to be killed in order to relieve their loved ones of a burden. Yet they also wish to kill in order to express their anger and aggression at those they feel have wronged them. Finally, they wish to die, due to the unbearable pain they experience.

- **PSYCHOLOGICAL THEORIES: SHNEIDMAN** **Shneidman (2001)** describes suicide as a "drama of the mind." He coined the term **psychache**, which is the psychological pain -- consisting of negative emotions and unmet psychological needs -- that an individual experiences. It differs from physical pain since it stems from emotional, rather than physical, discomfort.

Psychache creates an overwhelming amount of distress in an individual so that he or she perceives suicide as the only way to escape the pain.

Shneidman's needs classification originated with **Henry A. Murray** (Shneidman 1996). He identified five groups of psychological needs that, if not met, are closely linked to suicide:

- **Succorance and affiliation:** These are basically the needs for love and close relationships.
- **Achievement, autonomy, order, and understanding:** When these needs are undernourished in an individual, he or she feels a lack of control, order, and consistency.
- **Dominance, aggression, and counteraction:** When these needs are frustrated, anger often results.
- **Affiliation and nurturance:** Loss of relationships gives way to a thwarted need for affiliation and nurturance that then leads to suicide.
- **Affiliation, defense, and shame-avoidance:** When these needs are frustrated, one can feel shame, humiliation, and disgrace.

Shneidman puts these needs into 2 groups: **modal** and **vital**. When an individual is under limited or no stress, he or she focuses on modal needs, the daily needs that one is capable of surviving without (e.g., entertainment). The needs that one lives with on a daily basis are modal, while the needs that must be met for life to be bearable are vital. When an individual comes under duress, his or her focus transfers from modal to vital needs. When a loved one dies, for example, the individual's focus may shift from a need for entertainment to a need for succorance. A denial of vital needs often can lead to suicide acts. However, it is not solely the unmet need that results in suicide but also the shift of attention from modal to vital.

Shneidman (1996) also states that the combination of **perturbation** (i.e., psychache) and lethality -- the willingness and ability to kill oneself -- results in suicide. However, denying a suicidal individual access to lethal means will not eliminate the lethality of that individual. To reduce the person's lethality, an intermediary must try to identify and alleviate the suicidal person's psychache (Shneidman, 1996). According to this theory, the most important question to ask such persons is, "Where do you hurt?" (Shneidman 2001).

➤ **BIOLOGICAL THEORIES:**

Recently, there has been a great deal of research on possible biological explanations for suicide.

A significant number of suicide cases exhibit dysfunction in the prefrontal cortex (PFC), which has been called the "executive control center" of the brain. Studies have identified low levels of and abnormal interactions among -- neurotransmitters in the PFC (specifically serotonin, dopamine, and nor epinephrine) as common traits among those who attempt and complete suicide.

- **Kraemer and colleagues (1997)** linked reduced serotonin function to aggressive, impulsive, and risk-taking behaviors, all of which are associated with suicide.
- **Placidi and colleagues (2001)** examined patients who were diagnosed with major depression. Those who had made serious suicide attempts had significantly lower levels of serotonin than both the controls and those who had made less lethal attempts. They noted no difference in levels of dopamine or norepinephrine.
- **Ordway (1997)** discussed the depletion of norepinephrine and the co-occurring increase in noradrenergic proteins that have been found in individuals who have committed suicide, suggesting that they have experienced chronic stress and depression.
- **Engstrom and colleagues (1999)**, however, examined the interaction between serotonin, dopamine, and norepinephrine metabolites in cerebrospinal fluid.

They found that those who attempted suicide had abnormal relationships between the metabolites of their neurotransmitters as well as low levels of dopamine metabolite HVA, compared to control subjects. However, the suicide attempters did not exhibit lower levels of serotonin metabolite 5-HIAA, contradicting the findings of similar studies. While suicidal individuals have presented regularly with neurobiological dysfunctions in recent studies, the precise dynamics of these dysfunctions remain unclear.

Durkheimian theory and farmer suicides in India

India is largely an agrarian society with around 60% of its population working in the primary or the agricultural sector. Most of them find their livelihood by depending directly or indirectly on the agrarian economy. Though 60% of the population is engaged in agricultural activities, the contribution of agriculture to GDP is just 14.6%.

This gap between human input and economic output shows how inefficient is our administrative system and throws light over the poor performance of policy makers in transferring such a large share of human effort and resource into economic benefit. In other words, though 60% of human capital of the country is used for agricultural activities, only one-fourth of it is transferred to the economy.

There are several reasons why a farmer commits suicide. First reason is the sudden developments in the pre-planned agricultural activities. This includes unexpected changes in monsoon patterns, changes in government policies, lack of proper public distribution system (PDS) etc. As a result, the farmers, who are supposed to feed the population, find it difficult to feed and support their families. In 2003, a study was conducted regarding the psychological state of farmers who tried and failed to commit suicide. Most of them responded to the survey team that they felt alienated and helpless after the continuous crop failures. The government officials, according to the farmers, didn't show any interest in listening to the problems of farmers. In many cases, farmers felt like they are becoming a liability to the entire family. Another reason pointed out by the study was that most of the farmers felt insecure to be a part of society that largely neglected the problems of those who produced the essential commodity for the survival of the human beings. **In his classical study of suicide**, Durkheim points out that a suicide is the result of social factors which pushes the individual to think about suicide in order to fade away from the society which doesn't appreciate or support the group which kills the starvation of the society. Durkheim mentions four kinds of suicides in his work and clearly states that a suicide can be any of these four in nature or a mixture of two or more kinds.

Using the findings of Emile Durkheim and applying them to the context of farmer suicides in India, we can say that most of the suicides of farmers comes under two categories of suicides as defined by Durkheim; anomic and egoistic. As mentioned in the introduction, Anomic suicide is the kind of suicide committed by an individual when a sudden, unexpected event takes place in the life of the individual.

In our given case, most of the farmers committed suicides due to the unexpected events; the unexpected event of crop failure due to some natural disasters or the unsupportive response from the part of bureaucracy and government who are obliged to protect and safeguard the agrarian community, who forms the back bone of the society.

The reason why one must categorize these suicides also under egoistic suicides is that farmers kill themselves due to the isolation and alienation that they feel after a crisis. According to Durkheim, egoistic suicides are committed due to alienation of an individual from the rest of the society. Alienation includes the breakage of social ties, isolation from other individuals, weakening of the social bonds etc. As mentioned before, a farmer, who has lost everything, will find himself as a loser and thinks that he is no more an asset to the society or his family. This emotion is largely due to the response of the society towards the farmer. Elderly people commit suicide because they feel loneliness and consider themselves as good for nothing. Such suicides of old people are often cited as an example of egoistic suicides. Similarly, the farmer suicides also exhibit the nature of egoistic suicide as their action of killing themselves is largely due to the response that they receive from the society they live.

5.

REVIEW OF LITERATURE

5.1 AGRICULTURAL PSYCHOLOGY- Agriculture is intrinsic to humanity. Sustainable production of food and fibre is literally vital to the human population and the earth's environmental integrity. From the primary source to the consumer, agriculture involves the work of millions of people working in a vast variety of occupations and industries. Psychology can and should contribute to sustainable agriculture by way of research, development, and practices that effect the attraction, retention, and engagement of workers in occupations embedded in the international value chain, including semi-skilled, trade, and professional work. In the Encyclopedia of Psychology and Behavioral Science, the entry for "Agricultural Psychology" begins: "In contrast to other social sciences that have developed specialized sub disciplines and/or application interests in agriculture, psychology historically has not been known for its concern with rural issues" (Shanteau 2001). The author suggests that psychology can be useful to agriculture but presumably had little research evidence.

5.2 FARMERS SUICIDE IN INDIA- refers to the national catastrophe of farmers committing suicide since the 1970s, often by drinking pesticides, due to their inability to repay loans mostly taken from private landlords and banks.

The National Crime Records Bureau of India reported that a total 296,438 Indian farmers had committed suicide since 1995. Out of these, 60,750 farmer suicides were in the state of Maharashtra since 1995 and the remaining in Odisha, Telangana, Andhra Pradesh, Madhya Pradesh, Gujarat and Chhattisgarh, all states with loose financial and entry regulations.

Earlier, governments had reported varying figures, from 5,650 farmer suicides in 2014 to the highest number of farmer suicides in 2004 of 18,241. The farmer's suicide rate in India had ranged between 1.4 and 1.8 per 100,000 total population, over a 10-year period through 2005, however, the figures in 2017 and 2018 showed an average of more than 10 suicides daily.

There are accusations of states manipulating the data on farmer suicides, hence the real figures could be even higher.

India is an agrarian country with around 70% of its people depending directly or indirectly upon agriculture. Agriculture had 15.4% share in economy of India in year 2017. Around 41.49% of total labors are associated with agriculture in year 2020. Farmer suicides account for 11.2% of all suicides in India. Activists and scholars have offered a number of conflicting reasons for farmer suicides, such as anti farmer laws, high debt burdens, poor government policies, corruption in subsidies, crop failure, public mental health, personal issues and family problems.

According to a report by the National Crime Records Bureau, the states with the highest incidence of farmer suicide in 2015 were Maharashtra (3,030), Telangana (1,358), Karnataka (1,197), Madhya Pradesh (581), Andhra Pradesh (516), and Chhattisgarh (854).

Tamma Carleton, a researcher at the University of California at Berkeley, compared suicide and climate data, concluding that climate change in India may have “a strong influence” on suicides during the growing season, triggering more than 59,000 suicides in 30 years. More than 23,000 farmers have committed suicide in the state of Maharashtra between 2009 and 2016.

Various reasons have been offered to explain why farmers commit suicide in India, including: , floods, drought, debt, use of genetically modified seeds, public health, use of lower quantity pesticides due to less investments producing a decreased yield. There is no consensus on what the main causes might be but studies show suicide victims are motivated by more than one cause, on average three or more causes for committing suicide, the primary reason being the inability to repay loans. Panagariya, an economist at the World bank states, "farm-related reasons get cited only approximately 25 percent of the time as reasons for suicide" and "studies do consistently show greater debt burden and greater reliance on informal sources of credit" among farmers who commit suicide.

A study conducted in 2014 found that there are three specific characteristics associated with high-risk farmers: "those that grow cash crops such as coffee and cotton; those with 'marginal' farms of less than one hectare; and those with debts of 300 Rupees or more."

The study also found that the Indian states in which these three characteristics are most common had the highest suicide rates and also accounted for "almost 75% of the variability in state-level suicides.

A study conducted in 2012 did a regional survey on farmers' suicide in rural Vidarbha (Maharashtra) and applied a Smith's Saliency method to qualitatively rank the expressed causes among farming families who had lost someone to suicide. The expressed reasons in order of importance behind farmer suicides were – debt, alcohol addiction, environment, low produce prices, stress and family responsibilities, apathy, poor irrigation, increased cost of cultivation, private money lenders, use of chemical fertilizers and crop failure. In other words, debt to stress and family responsibilities were rated as significantly higher than fertilizers and crop failure. In a different study in the same region in 2006, indebtedness (87%) and deterioration in the economic status (74%) were found to be major factors for suicide.

Studies dated 2004 through 2006 identified several causes for farmers suicide, such as insufficient or risky credit systems, the difficulty of farming semi-arid regions, poor agricultural income, absence of alternative income opportunities, a downturn in the urban economy which forced non-farmers into farming, and the absence of suitable counseling services. In 2004, in response to a request from the All India Biodynamic and Organic Farming Association, the Mumbai High Court required the Tata Institute to produce a report on farmer suicides in Maharashtra, and the institute submitted its report in March 2005. The survey cited "government's lack of interest, the absence of a safety net for farmers and lack of access to information related to agriculture, as the chief causes for the desperate condition of farmers in the state."

An Indian study conducted in 2002 indicated an association between victims engaging in entrepreneurial activities (such as venturing into new crops, cash crops, and following market trends) and their failure in meeting expected goals due to a range of constraints.

Economists like Utsa Patnaik, Jayati Ghosh, and Prabhat Patnaik suggest that structural changes in the macro-economic policy of the Indian Government that favored privatization, liberalization, and globalization are the root cause of farmer suicides.

PILOT STUDY- The Council for Social Development has carried out a micro level study between October 2004 and March 2005 for Social Development across different districts of Andhra Pradesh and Telengana. Through purposeful sampling method 125 affected families were selected for in- depth study. Similarly, under control group sample 125 farmers who are at risk were also identifies through few participative research appraisal techniques for the study. Control group produce commercial crop as well as paddy cultivation, whereas, the non-control group produce commercial crops only. In the focus group discussion with some of the farmers under control group, it was revealed that even if the commercial crop failed in giving substantial income they were able to maintain the food requirements because along with the commercial crops they were cultivating paddy for the family consumptions. Such risk mitigating mechanisms was among the families under non-control group.

Result: Agricultural Practice- Affected farmers by first the traditional methods and adopted innovative agricultural methods were risk is too high. It is evident that farm shed seeds were totally replaced by the high yielding varieties produced by the multinational company and marketed through local traders who are again agricultural advisers, farm finance providers to the farmers. In the early stages of practicing, new agricultural methods and experimenting with high yielding variety of seeds, the farmers were totally unaware of the risk associated with the new seed varieties. New seed variety is far more sensitive to variation in water supply, so that particularly in the rain fed areas, yield per hectare could be expected to fluctuate dramatically. Spurious seeds, pest attack affected adversely the farmers.

Source of Finance- Non- controlled group farmers borrowed money mainly from the banks.

Cost of Input- During the focus group discussion, it was mentioned that before shifting into the commercial crops there was hardly any such huge expenditure on agricultural inputs. Now with new agricultural practices, the input cost had gone beyond their hands and this is one of the major reasons for not being able to clear the loans, amounts as per schedule.

Quality of Seeds- Farmers who have committed suicide said to have germinated seeds instead of the traditional seeds.

Agricultural linked problems- Farmers from non-controlled group and controlled group have faced more or less similar problems- (1) High rate of interest from money lenders (93%), (2) Inaccessible banking system (91%), (3) High input cost (80.8%), (4) Lack of remunerative price (77.3%), (5) Less access to water (69.2%), (6) Low quality seeds (63%).

Family linked problems- With respect to family related problems farmers reported- (1) Substantial crisis (72%), (2) No support from community (67.8%), (3) Using domestic assets (64%), (4) Less support from kin (60.3%), (5) Lack of alternative profession (55.2%).

5.3 CORRELATES ASSOCIATED WITH FARMERS SUICIDE IN INDIA:

GM crops and BT cotton - A number of social activist groups and studies proposed a link between expensive genetically modified crops and farmer suicides. **BT cotton (*Bacillus thuringiensis* cotton)** was claimed to be responsible for farmer suicides. The BT cotton seeds cost nearly twice as much as ordinary ones. The higher costs forced many farmers into taking ever larger loans, often from private moneylenders charging exorbitant interest rates (60% a year). The moneylenders force farmers to sell their cotton to them at a price lower than it fetches on the market. According to activists and studies, this created a source of debt and economic stress, ultimately suicides, among farmers. Increasing costs in farming associated with decreasing yields even with use of BT cotton seeds are often quoted cause of distress among farmers in central India. **A 2015 study in Environmental Sciences Europe found** that farmer suicide rates in India's rain fed areas were "directly related to increases in Bt cotton adoption." Factors leading to suicide included "high costs of BT cotton" and "ecological disruption and crop loss after the introduction of Bt cotton." Other scholars, however, say that this BT cotton theory made certain assumptions and ignored field reality. In 2008, a report published by the International Food Policy Research Institute, an agriculture policy think tank based in Washington DC, noted that there was an absence of data relating to "numbers on the actual share of farmers committing suicide who cultivated cotton, let alone BT cotton." In order to evaluate the "possible (and hypothetical)" existence of a connection the study employed a "second-best" assessment of evidence relating to farmer suicides firstly, and to the effects of Bt cotton secondly.

The analysis revealed that there was no "clear general relationship between Bt cotton and farmer suicides"] but also stated that it could not reject the "potential role of Bt cotton varieties in the observed discrete increase in farmer suicides in certain states and years, especially during the peak of 2004 in Andhra Pradesh and Maharashtra." The report also noted that farmer suicides predate the official commercial introduction of Bt cotton by Monsanto Mahyco in 2002 (and its unofficial introduction by Navbharat Seeds in 2001) and that such suicides were a fairly constant portion of the overall national suicide rate since 1997. The report noted that while Bt cotton may have been a factor in specific suicides, the contribution was likely marginal compared to socio-economic factors.

Elsewhere, **Gruere et al.** discuss the introduction and increase in use of Bt cotton in the state of Madhya Pradesh since 2002, and the observed drop in total suicides among that state's farmers in 2006. They then question whether the impact of the increase in use of Bt cotton on farmers' suicide in Madhya Pradesh has been to improve or worsen the situation. In **2011**, a review of the evidence regarding the relationship between Bt cotton and farmers' suicides in India was published in the Journal of Development Studies, also by researchers from IFPRI, which found that "Available data show no evidence of a 'resurgence' of farmer suicides. Moreover, Bt cotton technology has been very effective overall in India." **Matin Qaim** finds that BT cotton is controversial in India, irrespective of the scholarly evidence. Anti-biotech activist groups in India repeat their claim that there is evidence of a link between Bt cotton and farmer's suicides, a claim that is perpetuated by mass media. This linking of farmer's suicide and the biotech industry has led to negative opinions in the public policy-making process. **Stone** suggests that the arrival and expansion of GM cotton led to a campaign of misinformation, by all sides, exacerbating the farmer's situation; activists have fuelled the persistence of a legend of failure and rejection of Bt cotton with sensational claims of livestock death and farmer suicide, while the other side has been incorrectly pronouncing Bt cotton a major success based on literature that is actually inconclusive. The cotton cash crop farmer's situation is complex and continues to evolve, suggests **Stone**. **Gilbert, in a 2013 article** published in Nature, states, "contrary to popular myth, the introduction in 2002 of genetically modified Bt cotton is not associated with a rise in suicide rates among Indian farmers".

In another 2014 review, Ian Plewis states, "the available data does not support the view that farmer suicides have increased following the introduction of Bt cotton. Taking all states together, there is evidence to support the hypothesis that the reverse is true: male farmer suicide rates have actually declined after 2005 having been increasing before then".

Misdirection of government subsidies and funds- As per reports by the central government and NCRB, government farming subsidies from **1993 to 2018** mostly went to producers and dealers of seeds and fertilizers, and not to farmers. In 2017, Rs. 35,000 crores of loans and subsidies were given to entities in the cities of New Delhi and Chandigarh, cities that do not have any farmers. Similarly, in Maharashtra, 60% of government loans and subsidies were given to people and entities residing in Mumbai. This has resulted in money being circulated between the government, banks large and small corporations, and politicians, without any of it reaching farmers, aggravating their woes. Most farmer loans were less than Rs. 50,000.

Deadly Drought- Due to poor artificial irrigation facilities, as much as 79.5% of India's farmland relies on flooding during monsoon season, so inadequate rainfall can cause droughts, making crop failure more common. In regions that have experienced droughts, crop yields have declined, and food for cattle has become scarcer. Agricultural regions that have been affected by droughts have subsequently seen their suicide rates increase.

Suicide idea- Economist Patel found that southern Indian states have ten times higher rates of suicides than some northern states. This difference, they say, is not because of misclassification of a person's death. The most common cause of suicide in South India is a combination of social issues, such as interpersonal and family problems, financial difficulties, and pre-existing mental illness. Suicidal ideation is as culturally accepted in south India as in some high-income countries. The high suicide rates in southern states of India may be, suggest Patel et al., in part because of social acceptance of suicide as a method to deal with difficulties. Suicide ideation among surviving family members of farmers' suicide victims is another worry. A recent study shows that almost a third of suicide survivors (family members left behind) had suicide ideation in one month prior to assessment.

Debt- Many of the suicides by Indian farmers have been linked to the large amounts of debt and interest that many of these individuals accumulate. **According to a 2006 study by P. Sainath,** the percentage of farmers who were in debt in Andhra Pradesh, Punjab, Karnataka, and Maharashtra was 70%, 65%, 61%, and 60%, respectively.

The Government of Maharashtra, concerned about the highest total number of farmer suicides among its rural populations, commissioned its own study into reasons. Indira Gandhi Institute of Development Research in Mumbai did field research and found the top causes of farmers suicides to be: debt, low income, and crop failure, family issues such as illness and inability to pay celebration expenses for daughter's marriage, lack of secondary income occupations and lack of value-added opportunities.

Statistical evidences namely educational level, occupation, mode of suicide can assume high incidence of suicide among the agricultural farmers. 47% of suicide victims had no education (21.8%) or only education up to class IV (25.2%). Most of them were self employed (41.9%) and modes of suicides were either poisoning through insecticides (34.8%) or hanging (31.7%). The reasons of suicide were related to family problems and illness. Suicide rates were higher in agriculture based states such as Maharashtra (12.4%), West Bengal (12.1%), Andhra Pradesh (12.1%) and Tamil Nadu (11.3%). It is also identified some psychological factors as loss of self-esteem, ego and prides; feeling of shame and insult; feeling hurt; suffering from alienation characterized by helplessness, powerlessness and self-estrangement. The most common factors associated with farmer's suicide are crop failures, inability to meet the rising cost of cultivation and indebtedness which is mostly found in the state of Maharashtra.

Prof. Radhakrishna Murty in his article on farmers suicide in Andhra Pradesh, reported critical psychological factors that abetted and aggravated the situation where the victims were motivated to commit suicide are-

- a) Loss of self- esteem, ego and pride.
- b) Feeling of shame and insult.
- c) Feeling hurt.

d) Suffering from alienation characterized by helplessness, powerlessness and self estrangement.

There study suggests six characteristics of suicide phenomenon associated with the farmers under the study. They are –

1. Belief that suicide represents a solution to an insoluble problem. To suicidal person, taking one's life is not a pointless or accidental occurrence.
2. Consciousness represented constant psychological pain, but suicide represented a termination of distressing thoughts and feelings.
3. Depression, hopelessness, helplessness, meaninglessness, powerlessness, guilt, shame and other negative emotions were frequently at the basis of these suicides.
4. The inability to attain high standards or expectations developed the feelings of frustration, failure and worthlessness. When progress toward goals is blocked, they became vulnerable to suicide.
5. Pessimism about the future and a conviction that nothing can be done to improve one's life situation perhaps might have predisposed them to suicide.
6. Their vision is constricted. They had great difficulty in seeing the larger picture of their family and their society in which they are living. Their cognitive state was suffering from "tunnel vision" (Shneidman:1992), they were unable to consider other options or alternatives. For them death is the only way out.

5.4 FARMERS SUICIDE OUTSIDE INDIA- World Health Organization (WHO) in 2008 reported high incidence of suicide among the people in agricultural communities in low, middle income countries such as China, India and Sri Lanka. Among the victims, pesticide poisoning rate is very high. It is estimated that there are 250,000 deaths from pesticide poisoning every year, most of which are international and which account about one- third of all deaths from suicide worldwide.

According to the National Crime Records Bureau (NCRB), at least, 2, 70,940 Indian farmers have taken their lives since 1995. This occurred at an average of 46 farmer's suicides a day. The matter is also becoming a global concern. In France, there is a farmer suicide every two days, in the United States of America (US) the rate of farmer suicide is just under two times that of suicide amongst the general population, and Australia reports one farmer suicide every four days.

Broadly speaking, the causes of farmer suicide can be divided into three factors: the economic, social and the physical factors. Each of these has been explored below.

5.5 CORRELATES ASSOCIATED WITH FARMERS SUICIDE OUTSIDE INDIA:

First, are the economic factors, most farms are exposed to the volatility of commodity markets, the variability of weather patterns and the influence of respective government regulations. In the long term, the financialisation of commodity market in hedging the risk and in price discovery may be the solution. However, in the short term, it leads to the prices in agriculture market being unpredictable, driven mainly by speculations and hoarding. The volatility in price rises as speculators or intermediaries in the commodities market determine the prices rather than the farmers and consumer. These speculators are short-term investors and buy and sell based on their expectations of future prices of the commodity. This creates volatility in the derivative market, which seeps into the value of the underlying commodity. Therefore, farmers who opt for derivatives as a model for hedging their risk are negatively affected. The financialisation of the Derivatives make the instrument volatile and even those farmers, who remained uninvolved, find themselves affected.

Farming requires fixed investments and consistent liquidity. However, there is no assurance of consistent returns as it depends upon changeable factors. The reasons for failure in returns may vary from the uncertainties arising from unfavorable weather conditions, impact of pest infestation or unpredictable animal disease. For instance, in Ireland, a deal with such uncertainties. Thus, after intense labour and capital investments, often through loans from informal markets, farmers like Gajendra Singh are left penniless after the unseasonal rainstorm.

Unusually wet winter in 2012 resulted in trouble growing hay for animal feed. Similarly, during the outbreak of foot-and-mouth disease in 2001 in the United Kingdom, the government made all farmers slaughter their animals. In countries such as India, the insurance market has not developed enough.

Second, are the social factors, as mentioned in an article in *The Huffington Post*, farming in India is a fairly isolated occupation with a small, close-knit community of co-workers and family. Such concentrated communities tend to be highly affected and pressurised by the social norms. The stigma attached to mental illnesses is common across the globe. A farmer who talks about his depression is often labeled outlandish or irrational, by his fellow farmers and acquaintances. Even curable mental illnesses like depression are left untreated. Being a family-owned and operated business, roles between work, home and family are often blurred. Hence, unlike other occupations, farming becomes a way of life. The severe misdistribution of psychiatrists and psychologists among the rural and urban population is a global problem. The lack of education plays an important role in narrowing the outlook and career scope for farmers. These factors together lead to high stress levels and without a support system, farmers tend to opt for options such as self-mutilation or suicide. Recent studies and articles show farming as one of the most dangerous industries associated with a suicide rate.

In a paper titled “**Farming and mental health problems and mental illness**”, the authors conclude that farming is associated with a unique set of characteristics, potentially hazardous to mental health. They also note the lack of conclusive data on farmer suicides. A reason for this may be that data collection suffers from problems such as misreporting of suicides. For example, in US the farmer deaths are often reported as accidents (hunting, equipment or farming) instead of suicides. In India, a ‘farmer’ is defined as a holder of a land title. This excludes farmers without land holding, agricultural day labourers, and women, who often get categorised simply as ‘wives’. Suicide is also often misrepresented as an ‘accident’ to the NCRB. Suicide being a crime, further deters the intentions to reveal the facts.

Third, are factors associated with the physical environment, PB Behere and MC Bhise in their paper Farmer suicide: Across culture mention that farming environments are characterized by a broad and changeable range of physical, biological and chemical hazards that are similar across cultures. The increase in the number of pesticides has a detrimental effect on the health of farmers. Instead, there is a global debate about the correlation between the Genetically Modified (GM) crops and suicide rates amongst farmers.

Arguments in support fall short of substance when they start holding incidents of farmers drinking pesticides to commit suicide, against GM crops. Factors such as declining ground water level, falling levels of soil nutrients and climate change affect farmers and farming negatively. Additionally, agriculture in India and in most developing countries is still a physically stressful task as many of the processes within farming are still labour intensive.

LITERATURE SURVEY:

Deepak Justine Viswanathan, A.M Veerakumar and Hemalatha Kumarasamy (2019) – Depression, suicidal, ideation and resilience among rural farmers in drought prone area of Trichy district of Tamil Nadu. Journal of Neuroscience in rural practices, 10(2): 238- 244.

Author- Deepak Justine Viswanathan, A.M Veerakumar and Hemalatha Kumarasamy

Year- 2019

Objective- The objective of this study was to find out the prevalence of depression and suicidal ideation, to measure the resilience, and to find out the factors that influence depression and resilience among farmers.

Sample- The sample size was 191 and cluster sampling was used to select the participants.

Method- A community-based cross-sectional analytical study was performed among farmers residing in a drought-affected area of Tiruchirappalli district of Tamil Nadu.

Instrument- Structured, pretested questionnaires were used to find the prevalence of depression, suicidal ideation, and resilience among farmers. Pearson Correlation, Student's t-test, analysis of variance, and Pearson Chi-square test were used to identify the factors influencing depression and resilience.

Result- A total of 194 farmers participated in the study. The mean age of the farmers was 46.68 ± 12.6 years, majority 64% were males and 89% were literates. Among the participants, 97.4% had some form of depression, and 67% had severe depression. About 60% of the farmers had suicidal ideation. Male farmers, farmers with few years of farming experience, and severe reduction in yield had a higher level of depression. Suicidal ideation was influenced by gender, small-scale farming, fewer years of experience in farming, and the impact of drought on yield. The mean resilience score was 49.4 ± 10 . Gender and years of experience in farming had a significant association with resilience.

High prevalence of depression and suicidal ideation and low level of resilience has been observed among the farmers. Interventions need to be provided for marginal and small-scale farmers, male farmers in the affected area to reduce the impact of drought in these farmers.

Manik Changoji Bhise and Prakash Balkhrushna Behere, (2016) - A case-control study of psychological distress in survivors of farmer's suicide in Wardha District in Central India. Indian J Psychiatry, 58:147- 51.

Author- Manik Changoji Bhise and Prakash Balkhrushna Behere.

Year – 2016

Objectives- To assess the psychological distress and its correlates in survivors of farmers' suicides.

Sample- Case-control study design was used in Wardha District of Vidarbha region in the central India.

Method- A predesigned and pretested semistructured questionnaire was used to assess sociodemographic variables.

Instrument- Self-Reporting Questionnaire-20 was used to evaluate psychological distress in 98 survivors of farmers' suicides and 98 age, sex, and occupation-matched controls.

Result- Significance of differences between case and control groups were assessed using Chi-square test or Fisher's two-tailed exact test for class variables. For continuous variables, Student's t-test was used $P < 0.05$ was considered. Significantly higher proportion of survivors had psychological distress than controls. Female survivors, spouse and parents of suicide victims had a high risk of distress. Psychological distress was commonly expressed by depressive and somatic symptoms.

Shraddha Shivaji Jadav and Gaurav Pradeep Mumbikar (2019)- Psychological distress in survivors of farmers suicide in drought prone areas of Aurangabad and Jalna Districts of Marathwada region in Maharashtra, India, Ann Indian Psychiatry, 3:143-7.

Author- Shraddha Shivaji Jadav and Gaurav Pradeep Mumbikar.

Year- 2019

Objective- The objective was to assess psychological distress and its correlates in survivors of farmers' suicides

Sample- A group of 93 farmers who are the survivors of suicide from the two districts of marathwada region in Maharashtra were taken as sample.

Method-This was a cross-sectional study from two districts of Marathwada region of Maharashtra. A predesigned and pretested semi-structured questionnaire to assess sociodemographic variables was used.

Instrument-A predesigned and pretested semi-structured questionnaire to assess sociodemographic variables was used. Self-reporting questionnaire-20 was administered to evaluate psychological distress in 93 survivors of farmers' suicides. Standard descriptive statistics (percentages, means, and Chi-square test) were used.

Result- Female-to-male ratio was 2.8:1. Majority (76%) survivors were young adults and 97.8% were from rural area. Most survivors assessed in study were spouse (68.8%) followed by parents (9.6%), siblings (2.2%), progeny, and others (19.35%) of suicide victims. Of all survivors, 75% were doing farming, while rest had other sources of income in addition to farming. Out of 93 survivors, 81.7% of survivors were experiencing significant psychological distress. Twenty-eight percent survivors themselves had thought of ending their life during 1 month prior to assessment. Most commonly, distress was expressed through somatic symptoms and depressed mood. There was no significant correlation of psychological distress with age, sex, occupation, and place of residence of survivors. There was no significant correlation between psychological distress and relationship of survivor with suicide victim.

Survivors of farmers' suicides are suffering from significant psychological distress due to drought prone condition in the region.

Vishavadeep Sharma, Anand Kurian and Ishan Janbandhu (2015)- Analysis on Farmer suicides: A study with reference to the year 2015. International Journal of Management studies, October, 2015, 4(2).

Author- Vishavadeep Sharma, Anand Kurian and Ishan Janbandhu

Year- 2015

Objective- To analyze the linkages of farmer suicides with rainfall, irrigation facilities and policies like loan waiver.

Sample- Group of farmers was taken from the states of Uttar Pradesh, Jharkhand and Bihar.

Method- A Literature search was undertaken on Ovid of the Embrace (1980–2015 Week 18), Global Health (1973–2015 Week 17) and Ovid MEDLINE® in-process and other non-indexed citations and Ovid MEDLINE® (1946 to present) databases. The search term was “[India and farm and (suicide or death)]”. This returned 362 results (301 unique), and all titles and abstracts were read and assessed. A total of 67 were isolated as having potentially some relevance to farmer suicides and read in full. More elementary searches of Google, Google Scholar, and Pub Med were done.

Instrument- Qualitative data was taken through interview technique.

Result -1. Based on ordered Logistic model, the following factors significantly explains farmer to non-farmer suicide ratio. A. Log (index) and Rain (dummy) with excess, Rain (dummy) with normal rainfall and indebted households at 5 % level of significance. B. Below Poverty is significant at 10 % level of significance. C. The cut level is also significant.

2. Whereas family problems, loan waiver (dummy), percentage of farmers below poverty are not significant even at 10 % level of significance.

3.Improvement/increase in log (index) which means improvement in state wise irrigation percentage of the respective crops, state wise production level of the respective crops and

state wise productivity of the respective crops i.e. in cotton, sugarcane, food grains, it is more likely to have low farmer suicides to non-farmer suicides.

4. As the rainfall is normal/good, it is more likely that suicides of farmer to non-farmer ratio falls in lower category.

5. With increase in indebtedness, it is more likely that farmer to non-farmer suicide ratio fall in lower category i.e. lower level of farmer suicides compared to non-farmers.

6. Increase in percentage of population under below poverty category shows more likelihood that farmer to non-farmer suicide ratio fall in lower category i.e. lower level of farmer suicides compared to non-farmers.

7. Coefficient of MSP Cotton quantity indicates lower farmer suicides compared to non- farmers but is not significant in explaining the variation.

8. Based on simple correlation analysis MSP for cotton and loan waiver in states shows negative association with ratio of farmer to non-farmer suicides, which signifies the benefit of the above schemes.

9. Based on simple correlation analysis the association between number of below poverty and proportion of marginal farmer suicides with ratio of farmer to non-farmer suicide is also negative which may signify that suicide is not a major concern for below poverty or marginal farmers.

10. Based on simple correlation analysis family problems, illness, drug abuse, poverty are major cause for farmer suicides of which drug abuse shows the highest association with farmer suicides followed by family problems and illness.

Dominic Marriott (2015) - Factors associated with the farmers suicide crisis in India. Journal of Epidemiol and Global Health December, 2016; volume- 6, issue-4, pages- 217-227.

Author- Dominic Marriott

Year- 2015

Objective- In India, it is estimated that 16,000 farmers die by suicide each year, and at rates far above those of the general population. This paper reviews much of the literature concerning the factors associated with this crisis.

Sample- It consists of 200 victims from Vidarbha region of Maharashtra, India and suicide victims from Andhra Pradesh.

Method- A literature search was undertaken from multiple databases on Ovid, as well as more elementary searches of Google, Google Scholar, and Pub Med.

Instrument- Qualitative data was taken through interview technique.

Result- Socioeconomic factors, rather than mental health problems, are associated with farmer suicides, with increased indebtedness playing the predominant role. Available research suggests this has arisen to a greater extent recently, due to an agrarian crisis affecting the most vulnerable farmers. This has multiple manifestations, including a lack of agricultural investment and irrigation improvement, use of cash crops, the increased use of non institutional credit sources, and the reduction of trade barriers. BT cotton is unlikely to be an important factor and no studies reported a significant burden of mental health problems. Indebtedness and numerous factors relating to this are clearly identified as the most important risk factors.

Indebtedness- Most studies identified indebtedness as the predominant single factor associated with farmer suicides. Dongre and Deshmukh found that farmers in the Vidarbha region of Maharashtra ranked debt as the most important reason for farmer suicides, followed by addictions, environmental problems, and price issues, amongst others.

Two other studies concluded that unpaid loans are a correlate of those who die by suicide. **Kale found** that in a small sample from Vidarbha, 95% of farmer suicide victims were indebted, while of control households, this was only 25%. Another in the same region found that 197 of 200 victims (98.5%) were indebted. Mishra also found that debt was the most common factor in Maharashtra at 86.5%, followed by deterioration in the farmers' economic status (73.9%). A comparison of these farmers with those who had not died by suicide showed they had three times as much debt, and the difference was significant to the 95% confidence interval. An investigation of the socioeconomic causes of farmer suicide in Karnataka also found that agricultural debt was given as the primary factor, leading to farmer suicides in 29/30 suicide cases and Gedela calculates that indebtedness is one of the statistically significant factors identifying suicide farmers from controls in Andhra Pradesh.

Credit- A.Sadanandan shows that after 1989, the percentage of total bank loans going to agriculture began to reduce sharply, from approximately 20–12% by 1994. By the 2000s it had halved, with even less (8%) being lent directly to farmers. This drop does not appear to simply mirror the decline in agriculture's part of the country's gross domestic product, but is a decline in formal sources of finance that has led to higher rates of loans from non institutional sources, such as local moneylenders, who charge much higher interest rates. According to one report, the vast majority of loans from formal sources charge 12–20% per annum, but from informal sources, two-fifths charge >30% per annum, and another one-third charge between 20% and 25% . Across India, **A.Sadanandan** found that where there was more foreign and private competition amongst banks, farmers had more debt and relied more on private moneylenders for credit, suggesting that these were significant factors explaining why farmers died by suicide more in certain states. The impact of foreign banks on Indian agriculture may partly be explained by the priority sector lending demands the Reserve Bank of India places on commercial banks. Domestic commercial banks must lend 40% of their deposits to priority sectors, with 18% of the total targeted to agriculture, while foreign banks currently have a lower target of 32%, with no specific agriculture target.

While foreign banks are a small part of the Indian banking system overall, holding 7% of banking deposits, it is plausible that in regions where they have made an impact, they may have pushed out banks more amenable to lending to farmers, and thus forced many to use non institutional sources.

Irrigation facilities- Declining agricultural investment is highlighted particularly in regard to irrigation, which has seen little improvement since the reforms, leading to a reliance on rainfall for crop growth. **Sadanandan** states that only 35% of land used for agriculture in India is irrigated. In some areas of Vidarbha, one of the worst affected areas of the crisis, **Kale** suggests that around 85% of the area is rain-fed, making farmers particularly susceptible to extreme variations in yields and therefore returns. This appears to be one factor affecting suicide rates, and **Kale et al.** Found that 69% of victims in a sample from Vidarbha had no water source and relied entirely on monsoon rains for their fields. Gedela found that non-suicide farmers had a higher proportion of their land area that was irrigated than suicide victims in Andhra Pradesh. Poor irrigation may not only be a direct cause of increased debt by lowering returns and potentially causing crop failures, but also be partly responsible for the move towards moneylenders, as banks may be reluctant to lend to farmers who lack irrigation facilities as the return they receive on their investment is less assured.

Dilip R. Khairnar, Madhurani J. Bhosale and Mahadev A.Jadav (2015) - Lack of irrigation facilities, Draught conditions and Farmers suicides in Marathwada region, India. American Journal of Rural Development. 2015; vol- 3, no.3; pp- 74-78.

Author- Dilip R. Khairnar, Madhurani J. Bhosale and Mahadev A.Jadav

Year- 2015

Objective - Marathwada region of Maharashtra state is drought prone area of India. The draught conditions are affecting the farmers in region. Until Oct 2015, 800 suicides were reported. In this study, farmer's financial positions, choice of crops, irrigation facilities, loans and their repayments are responsible for the farmer's death. We found that farmers were facing nonproductive, non-irrigated and very low land holdings. The family problems like daughter's marriages one of the main reasons behind the overburdened socially and economically conserved farmers.

Sample- The data was collected from 90 identified families for farmer suicide from Marathwada region. Interviewers, who were known to the communities from previous rounds of fieldwork, were trained to collect information on the causes of death from any close associate/relative of the deceased. The most common respondents for the 90 male suicides above age 15 years were the parents of the deceased, his wife or neighbors; the remaining informants were usually other household members.

Method- Details of the study design, assignment of the underlying causes of death, statistical methods and preliminary results for various diseases and risk factors have been published. In brief, we have selected randomly 90 farmers who committed suicide in the region. From each house, a death had been recorded and one field-surveyor visited to collect information about the cause of death as well as information on marital status, occupation, alcohol use and education. The underlying cause of each death was sought by an enhanced form of verbal autopsy, known as the routine, reliable, representative, re-sampled household investigation of mortality with medical evaluation (RHIME). The RHIME method involves a structured investigation of events prior to the death, including a written report in the local language of the household.

The data was collected from farmer families having one suicidal death by survey method using interview schedule with respect to issues like, landholding, irrigation facilities, supplementary business, choice of crop, seed source, technical facilities availability, sale of the product, indebtedness, monthly income and expenditure and reasons behind suicides.

Instrument- The data was collected from farmer families having one suicidal death by survey method using interview schedule with respect to issues like, landholding, irrigation facilities, supplementary business, choice of crop, seed source, technical facilities availability, sale of the product, indebtedness, monthly income and expenditure and reasons behind suicides.

Result- We had calculated total suicidal deaths (to inform health planners), age-standardized rates (to understand variation), and risks (to inform individuals). Analyses focused on ages 15 or older. We applied the age- and sex-specific proportion of suicidal deaths within the 2001–03 survey to the 2010 United Nations (UN) estimates of absolute numbers of deaths (and age-specific risks) for all causes in India. The 2010 UN totals of 9·8 million total deaths were used to provide contemporary comparisons with other diseases such as cancer and vascular disease. Moreover, the use of the UN totals corrects the slight undercounts reported in the total death rates in the SRS15–16 and for the 12% of SRS deaths missed in the survey. We used logistic regression to compare the following variables for each gender: age at death (15–19, 20–29, 30–44, 45–59, 60–69 years); education (below primary, primary or middle, secondary or higher); geographical region (Southern states, rest of India); occupation (non worker, cultivator, agricultural labor, business/professional); alcohol drinking status (drinker, non-drinker); religion (Hindu, Muslim, Buddhist/Jain, Christian); residence (rural, urban); and marital status (never married, married/remarried, widow/separated/divorced) and, as a measure of community wealth, the household fuel type used (gas/electricity/kerosene versus coal/firewood/other) in each SRS unit.

Land Holdings by Farmer Families- We have studied farmer financial position with respect to the suicide cases. The comparative analysis of the land holding of the farmer shows that the 2.5 to 5 acre landowners, which are more proven for suicides. We found that 33% of the total farmer population doesn't hold any land.

This clearly shows the poor economy of the farmers which drag them to do suicide. The agricultural products are depending on the water facilities. The irrigation facilities are mainly responsible for the better yield. The major portion 43% of the land is non-irrigated; this is followed by 32% of land, which is seasonal irrigated. Most of the suicidal cases were reported in the non-irrigated land owners/regions. The water management facilities are not available and the production depends upon weather conditions. More than 58% of the farmers opted for cotton as their favorite cash crop. This is because it is the largest market-holding crop in India. The farmers are also growing crops as maize (21%) and soybean (10%). These crops are totally depended on the water facility. Due to lack of water facilities, the farmers may lose their crops, and the annual income will be low. Therefore, farmers have to take loan for their daily household expenses and other needs.

In this study, we found that the daily needs are responsible for the suicides. Loans are taken by the farmers for the purpose of agricultural expenses (56.7%), daughter marriages (41.1%), health problem due to heavy use of pesticides (24.4%), and educations (6.7%) if the farmer loses its cycle of crop production due to water shortage or draught condition. The conditions were found very depressing and the loan repayment was not achieved due to the low yield income. We found that 57% of farmers were not able to repay their loan amount. These amounts lead to majority of the suicide in Maharashtra. The low land holders cannot repay their loans and therefore cannot prefer extra additional loan from the same banks or other banks from the region, therefore farmers prefer to move towards the private illegal loans. The interest rate of non-bank loan is very high (24 % to 60% per annum) as compared to Government acquired banks (Crop loans 4% per annum).

6.

DISCUSSION

Farmers' suicide in India refers to the national catastrophe of farmers committing suicide since the 1970s, often by drinking pesticides, due to their inability to repay loans mostly taken from private landlords and banks.

The National Crime Records Bureau of India reported that a total 296,438 Indian farmers had committed suicide since 1995. Out of these, 60,750 farmer suicides were in the state of Maharashtra since 1995 and the remaining in Odisha, Telangana, Andhra Pradesh, Madhya Pradesh, Gujarat and Chhattisgarh, all states with loose financial and entry regulations.

Earlier, governments had reported varying figures, from 5,650 farmer suicides in 2014 to the highest number of farmer suicides in 2004 of 18,241. The farmer's suicide rate in India had ranged between 1.4 and 1.8 per 100,000 total population, over a 10-year period through 2005, however, the figures in 2017 and 2018 showed an average of more than 10 suicides daily. There are accusations of states manipulating the data on farmer suicides, hence the real figures could be even higher.

India is an agrarian country with around 70% of its people depending directly or indirectly upon agriculture. Agriculture had 15.4% share in economy of India in year 2017. Around 41.49% of total labor are associated with agriculture in year 2020. Farmer suicides account for 11.2% of all suicides in India. Activists and scholars have offered a number of conflicting reasons for farmer suicides, such as anti farmer laws, high debt burdens, poor government policies, corruption in subsidies, crop failure, public mental health, personal issues and family problems.

According to a report by the National Crime Records Bureau, the states with the highest incidence of farmer suicide in 2015 were Maharashtra (3,030), Telangana (1,358), Karnataka (1,197), Madhya Pradesh (581), Andhra Pradesh (516), and Chhattisgarh (854).

Various reasons have been offered to explain why farmers commit suicide in India, including: , floods, drought, debt, use of genetically modified seeds, public health, use of lower quantity pesticides due to less investments producing a decreased yield. There is no consensus on what the main causes might be but studies show suicide victims are motivated by more than one cause, on average three or more causes for committing suicide, the primary reason being the inability to repay loans. Panagariya, an economist at the World bank states, “farm-related reasons get cited only approximately 25 percent of the time as reasons for suicide” and “studies do consistently show greater debt burden and greater reliance on informal sources of credit” among farmers who commit suicide.

The National Crime Records Bureau of India reported in its 2012 annual report, that 135,445 people committed suicide in India, of which 13,755 were farmers (11.2%). Of these, 5 out of 29 states accounted for 10,486 farmers suicides (76%) – Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh and Kerala.

In 2011, a total of 135,585 people committed suicide, of which 14,207 were farmers.[82] In 2010, 15,963 farmers in India committed suicide, while total suicides were 134,599.[83] From 1995 to 2013, a total of 296,438 Indian farmers committed suicide. During the same period, about 9.5 million people died per year in India from other causes including malnutrition, diseases and suicides that were non-farming related, or about 171 million deaths from 1995 to 2013.

In 2012, the state of Maharashtra, with 3,786 farmers’ suicides, accounted for about a quarter of the all India’s farmer suicides total (13,754).From 2009 to 2016, a total of 25,613 farmers committed suicide in the state.

Farmer suicides rates in Bihar and Uttar Pradesh – two large states of India by size and population – have been about 10 times lower than Maharashtra, Kerala and Pondicherry.[86][87] In 2012, there were 745 farmer suicides in Uttar Pradesh, a state with an estimated population of 205.43 million. In 2014, there were eight farmer suicides in Uttar Pradesh.

According to IFPRI study number of suicides during 2005–09 in Gujarat 387, Kerala 905, Punjab 75 and Tamil Nadu 26.

While 1802 farmers committed suicide in Chhattisgarh in 2009 and 1126 in 2010, its farmers suicide dropped to zero in 2011, leading to accusations of data manipulation.

According to the 2012 statistics, from the National Crime Records Bureau, the farmer suicides statistics are as follows (Note: The NCRB lists suicides in the different employment categories, but it is not necessary that farming or crop-failure is the cause of the suicides listed in the “farmer” category)

As per National Crime Records Bureau, the number of suicides by farmers and farm labourers increased to 12,360 in 2014, against 11,772 in 2013. Of these suicides, 5,650 were farmers suicides.

As of 2018, the Indian government has not published data on farmer suicides since 2015. National Crime Records Bureau director Ishan Kumar said that the data is under scrutiny and the report for 2016 is likely to be published later.

Annual farmers’ suicide incidence rate data on a 100,000 farmers basis, depending on the estimated total number of farmers for that year. Estimates for the total number of farmers in India vary widely. Some count the total number of cultivators, some include cultivators and agricultural laborers in their definition of total farmers, while others include anyone engaged in any form of farming and agriculture activity. Estimates for a total number of farmers in India, for 2011, accordingly range from 95.8 million (8%) to 263 million (22%) to 450 million (38%), out of a total population of over 1.2 billion.[98] Others[100] estimate the total number of farmers in India to be about 600 million (50% of the total population). With about 14,000 suicides in 2011 by those engaged in farming and agricultural activities, the different estimates of total farmers has led to different suicide incidence rate estimates on per 100,000 farmers basis. Additionally, the reliability of official statistics has been questioned. K. Nagaraj suggests that official data may be overestimating the number of total farmers in India, and undercounting the total number of farmer suicides every year.

Tom Brass, in contrast, suggests that official census and surveys in India systematically underestimate the total number of people engaged in agriculture in India.

RESPONSES TO FARMERS SUICIDE:

The government appointed a number of inquiries to look into the causes of farmers' suicide and farm-related distress in general. Krishak Ayog (National Farmer Commission) visited all suicide-prone farming regions of India, then in 2006 published three reports with its recommendations. Subsequently, former Prime Minister Manmohan Singh visited Vidarbha in 2006 and promised a package of ₹110 billion (about \$2.4 billion). The families of farmers who had committed suicide were also offered an ex gratia grant of ₹100,000 (US\$1,400) by the government, though this amount was changed several times.

2006 relief package - In 2006, the Government of India identified 31 districts in the four states of Andhra Pradesh, Maharashtra, Karnataka, and Kerala with a high relative incidence of farmer suicides.[106] A special rehabilitation package was launched to mitigate the distress of these farmers. The package provided debt relief to farmers, improved supply of institutional credit, improved irrigation facilities, employed experts and social service personnel to provide farming support services, and introduced subsidiary income opportunities through horticulture, livestock, dairy, and fisheries. The Government of India also announced ex-gratia cash assistance from Prime Ministers National Relief Fund to the farmers. Additionally, among other things, the Government of India announced.

In the Vidarbha region of Maharashtra, which had received considerable mass media news coverage on farmer suicides, all farmer families of Vidarbha in six affected districts of Maharashtra were given a cash sum of ₹05 million (US\$70,000) each, to help pay off the debt principal.

₹7.12 billion (US\$100 million) in interest owed, as of 30 June 2006, was waived. The burden of payment was shared equally between the Central and the State government.

The Government created a special credit vehicle for Vidarbha farmers, to the tune of ₹12.75 billion (US\$180 million).

Special teams comprising NABARD and banks were deputed to ensure fresh credit starts flowing to all farmers of the region. An allocation of ₹21.77 billion (US\$310 million) was made to improve the irrigation infrastructure so that the farmers of the Vidarbha region had assured irrigation facilities in the future.

Agricultural debt waiver and debt relief scheme, 2008- The Government of India next implemented the Agricultural debt Waiver and Debt Relief Scheme in 2008 to benefit over 36 million farmers at a cost of ₹653 billion (US\$9.2 billion). This spending was aimed at the writing part of the loan principal as well as the interest owed by the farmers. Direct agricultural loan by stressed farmers under the so-called Kisan Credit Card was also to be covered under this Scheme.

Regional initiatives- Various state governments in India have launched their own initiatives to help prevent farmer suicides. The government of Maharashtra set up a dedicated group to deal with farm distress in 2006 known as the Vasantao Naik Sheti Swavlamban Mission, based in Amravati.[108] A group to study the Farmers Suicides was also constituted by the Government of Karnataka under the Chairmanship of Dr. Veeresh, Former Vice-Chancellor of Agricultural University and Prof Deshpande as a member.

Maharashtra Bill to regulate farmer loan terms, 2008- The State government of Maharashtra, one of the most farmer suicide-affected states, passed the Money Lending (Regulation) Act, 2008 to regulate all private money lending to farmers. The bill set maximum not legally allowed interest rates on any loans to farmers, setting it to be slightly above the money lending rate by Reserve Bank of India, and it also covered pending loans.

Maharashtra Relief Package, 2010- The State Government of Maharashtra made it illegal, in 2010, for non-licensed moneylenders from seeking loan repayment. The State Government also announced that it will form Village Farmer Self Help Groups to disburse government-financed loans, a low rate Crop Insurance program whose premium will be paid 50% by the farmer and 50% by the government, and the launch of alternate income opportunities such as poultry, dairy, and sericulture for farmers in suicide-prone districts.

The government further announced that it will finance a marriage fund under its Samudaik Lagna with ₹10 million (US\$140,000) per year per district, for community marriage celebrations, where many couples get married at the same time to help minimize the cost of marriage celebrations – a cause of suicides among farmers as identified by its own study.

Kerala Farmers’ Debt Relief Commission (Amendment) Bill, 2012- Kerala, in 2012, amended the Kerala Farmers’ Debt Relief Commission Act, 2006 to extend benefits to all distressed farmers with loans through 2011. It cited continuing farmer suicides as a motivation.

2013 diversify income sources package- In 2013, the Government of India launched a Special Livestock Sector and Fisheries Package for farmers in suicide-prone regions of Andhra Pradesh, Maharashtra, Karnataka, and Kerala. The package was aimed to diversify the income sources of farmers. The total welfare package consisted of ₹912 million (US\$13 million).

Effectiveness of government response- The government’s response and relief packages have generally been ineffective, misdirected, and flawed, states Surinder Sud. It has focused on credit and loan, rather than income, productivity, and farmer prosperity. Due to Anti Farmer laws, there is no scope for farmers to do the business or sell or lease farm or farm products. Assistance in paying off outstanding principal and interest helps the money lenders but has failed to create reliable and good sources of income for the farmer going forward. The usurious moneylenders continue to offer loans at interest rates between 24 and 50 percent, while the income-generating potential of the land the farmer works on has remained low and subject to weather conditions. Studies state that the government has failed to understand that debt relief just postpones the problem and a more lasting answer to farmer distress can only come from reliable income sources, higher crop yields per hectare, irrigation and other infrastructure security.

Golait, in a Reserve Bank of India paper acknowledged the positive role of crop diversification initiative announced in government’s response to reports of farmer suicides.

Golait added, “Indian agriculture still suffers from: i) poor productivity, ii) falling water levels, iii) expensive credit, iv) a distorted market,

v) many middlemen and intermediaries who increase cost but do not add much value, vi) laws that stifle private investment, vii) controlled prices, viii) poor infrastructure and ix) inappropriate research.

Thus the approach with a mere emphasis on credit in isolation from the above factors will not help agriculture". Furthermore, recommended Golait, a more pro-active role in creating and maintaining reliable irrigation and other agriculture infrastructure is necessary to address farmer distress in India.

7.

CONCLUSION

India is an agrarian country with around 70% of its population depends directly or indirectly upon agriculture for their livelihood. The agriculture industry contributes more than 15% to India's GDP. All the economic development in the country is possible only if, the farmer's community is taken care of on a priority basis. Agriculture has been practiced in India for ages; it is called the backbone of the Indian economy. Agriculture is the process of utilizing the land for growing different varieties of crops. Though farmers feed the nation, their conditions are far from satisfactory. The agrarian crisis has been one of the worst disasters to have hit our country in the last couple of decades. There are a lot of reasons as to why farmer suicides happen in our country. Many social, economic, political, and individual crises have forced them to end their lives. As a known fact, agriculture in India is referred to as "gamble of the monsoon", which means it's too much dependent on nature so whenever there is a failure of monsoons, there is a failure of crops even irrigation facilities are not so developed in India and because of this, they have to take heavy loans for growing crops and later they kill themselves due to their inability to repay loans mostly taken from landlords and banks. Also, family pressure is too high for farmers, they fail to make ends meet and thus commit suicide because of this failure. When a farmer commits suicide, compensation is facilitated by the farmer's family. However, when female farmers commit suicide they are not compensated as they are not recognized as 'Farmer'.

Scholars have given various reasons such as monsoon failure, climate change, high debt burdens, government policies, mental health, personal issues and family problems among the reasons for farmers' suicides in India. The reasons are:

The surge in input costs: A major cause of the farmers' suicides in India has been the increasing burden on the farmers due to inflated prices of agricultural inputs.

The culmination of these factors is seen in the overall increase in the cost of cultivation, for wheat, the cost at present is three times than it was in 2005.

Distressed due to loans: NCRB data points out that in 2474 suicides out of the studied 3000 farmer suicides in 2015 the victims had unpaid loans from local banks. This is clear enough an indication for drawing correlations between the two. Whether or not the banks had been harassing them, however, is a long-drawn debate and needs more specific empirical evidence.

Lack of awareness: The digital divide, as well as the literacy gap, has made the marginal and small farmers particularly vulnerable due to their inability to utilize the positives of government policies. This is reflected in the continued unsustainable cropping practices – like cultivating sugarcane in water-deficit regions.

Water crisis: The concentration of these suicides in the water-deficit regions of states like Maharashtra, Karnataka is a manifestation of how the water crisis and thereby failure to meet production demands have intensified the menace. This is particularly true in the backdrop of continued failed monsoons.

Climate change: has acted as the last nail in the coffin by resulting in furthering of the uncertainties associated with the already uncertain monsoon system and hence agricultural production. While incidents like flash floods have led to crop losses, deferred monsoons have seen production shortfall year-in and year-out

The indebtedness of farmers is one of the main reasons driving them to commit suicide. The problem starts with the availability of timely credit. The banking sector is not ready to provide credit or loan to agriculture for avoiding risk. From 1991 to 2001, the indebtedness of farmers has grown by two times. Agriculture credit became a low priority, with some committees suggesting withdrawal of credit support to farmers. Credit for housing and buying a car is available at a 9% to 11% rate of interest while the crop loans to the farmer are 17%. This shows the lack of government support for the farmers.

The government of India needs to take measures to prevent this issue.

The government must provide proper institutional financial support to farmers, a good crop insurance scheme in cases of crop failure, and provide genuine relief to the affected farmers. The government should not only encourage consumers but also farmers to adopt the organic farming mechanism. This can be so by the creation of separate marketing channels for organic produces, creating demand by encouraging more awareness programs, making announcements on premium prices for staple foods, investment in organic farming, and cheap and quick certification processes. It is also important to note that organic farming practices have a great impact as far as sustainable development is concerned. Organic farming can be used to reduce these cases of farmers' suicides in India and other parts of the world. Most of the cases of farmers' suicides have been as a result of farmer's inability to settle debts which they have incurred while acquiring artificial chemicals. Additionally, farmers should be aware that artificial agricultural methods have negative impacts on the environment and hence should be avoided. Organic farming methods ensure that there is sustainability in the agricultural sector due to its environmental and economic aspects. The government must take measures to tackle this issue at the earliest. It must set up exclusive agricultural zones that allow specifically agricultural activities. Moreover, there must be certain programs that teach farmers about modern techniques related to farming. It will help in enhancing the production of crops.

Furthermore, the irrigation facilities for the crops must be enhanced. In addition, there must also be genuine crop insurance policies that cover the loss of these farmers so they don't go into debt.

Moreover, the government must also ensure they learn new skills which will help them get some additional income into the family.

This way, they won't be solely dependent on their crops and will have a backup with them. Most importantly, the weather risk management system must be introduced. This way the farmers can be told beforehand about the upcoming extreme weather conditions. This will help them become cautious and also minimize the loss to a great extent.

8.

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ANNEXURE

Reference	Objective	Studied populations	Methodologies	Results
Deepak Justine Viswanathan, A.M Veerakumar and Hemalatha Kumarasamy (2019)	The objective of this study was to find out the prevalence of depression and suicidal ideation, to measure the resilience, and to find out the factors that influence depression and resilience among farmers.	The sample size was 191 and cluster sampling was used to select the participants. A community-based cross-sectional analytical study was performed among farmers residing in a drought-affected area of Tiruchirappalli district of Tamil Nadu.	Structured, pretested questionnaires were used to find the prevalence of depression, suicidal ideation, and resilience among farmers. Pearson Correlation, Student's t-test, analysis of variance, and Pearson Chi-square test were used to identify the factors influencing depression and resilience.	A total of 194 farmers participated in the study. The mean age of the farmers was 46.68 ± 12.6 years, majority 64% were males and 89% were literates. Among the participants, 97.4% had some form of depression, and 67% had severe depression. About 60% of the farmers had suicidal ideation. Male farmers, farmers with few years of farming experience, and severe reduction in yield had a higher level of depression. Suicidal ideation was influenced by gender, small-scale farming, fewer years of experience in farming, and the impact of drought on yield. The mean resilience score was 49.4 ± 10 . Gender and years of experience in farming had a significant association with resilience.
Manik Changoji Bhise, Prakash Balkhrushna Behere (2016)	To assess the psychological distress and its correlates in survivors of farmers' suicides.	Data were collected from 98 survivors of farmers' suicides and 98 age, sex, and occupation-matched controls. Case-control study design was used in Wardha District of	A predesigned and pretested semistructured questionnaire was used to assess sociodemographic variables. Self-Reporting Questionnaire-20 was used to evaluate psychological distress in	Significance of differences between case and control groups was assessed using Chi-square test or Fisher's two-tailed exact test for class variables. For continuous variables, Student's t-test was used $P < 0.05$ was considered. Significantly higher proportion of survivors had psychological distress than controls. Female survivors, spouse and parents of

		Vidarbha region in the central India.	98 survivors of farmers' suicides and 98 age, sex, and occupation-matched controls.	suicide victims had a high risk of distress. Psychological distress was commonly expressed by depressive and somatic symptoms.
Shraddha Shivaji Jadav and Gaurav Pradeep Mumbikar (2019)	The objective was to assess psychological distress and its correlates in survivors of farmers' suicides	A group of 93 farmers who are the survivors of suicide from the two districts of Marathwada region in Maharashtra were taken as sample.	This was a cross-sectional study from two districts of Marathwada region of Maharashtra. A predesigned and pretested semi-structured questionnaire to assess sociodemographic variables was used. Self-reporting questionnaire-20 was administered to evaluate psychological distress in 93 survivors of farmers' suicides. Standard descriptive statistics (percentages, means, and Chi-square test) were used.	Female-to-male ratio was 2.8:1. Majority (76%) survivors were young adults and 97.8% were from rural area. Most survivors assessed in study were spouse (68.8%) followed by parents (9.6%), siblings (2.2%), progeny, and others (19.35%) of suicide victims. Of all survivors, 75% were doing farming, while rest had other sources of income in addition to farming. Out of 93 survivors, 81.7% of survivors were experiencing significant psychological distress. Twenty-eight percent survivors themselves had thought of ending their life during 1 month prior to assessment. Most commonly, distress was expressed through somatic symptoms and depressed mood. There was no significant correlation of psychological distress with age, sex, occupation, and place of residence of survivors.
Vishavadeep Sharma, Anand Kurian, Ishan	To analyze the linkages of farmer suicides with rainfall, irrigation facilities and	Group of farmers was taken from the states of Uttar Pradesh,	A Literature search was undertaken on Ovid of the Embrace (1980–2015 Week 18), Global Health	Based on ordered Logistic model, the following factors significantly explains farmer to non-farmer suicide ratio. A. Log (index) and Rain (dummy) with excess, Rain

<p>Janbandhu (2015)</p>	<p>policies like loan wavier.</p>	<p>Jharkhand and Bihar.</p>	<p>(1973–2015 Week 17) and Ovid MEDLINE in-process and other non-indexed citations and Ovid MEDLINE(1946 to present) databases. The search term was “[India and farm and (suicide or death)]”. This returned 362 results (301 unique), and all titles and abstracts were read and assessed. A total of 67 were isolated as having potentially some relevance to farmer suicides and read in full. More elementary searches of Google, Google Scholar, and Pub Med were done. Qualitative data was taken through interview technique.</p>	<p>(dummy) with normal rainfall and indebted households at 5 % level of significance. B. Below Poverty is significant at 10 % level of significance. C. The cut level is also significant. Improvement/increase in log (index) which means improvement in state wise irrigation percentage of the respective crops, state wise production level of the respective crops and state wise productivity of the respective crops i.e. in cotton, sugarcane, food grains, it is more likely to have low farmer suicides to non-farmer suicides. With increase in indebtedness, it is more likely that farmer to non-farmer suicide ratio fall in lower category i.e. lower level of farmer suicides compared to non-farmers. Increase in percentage of population under below poverty category shows more likelihood that farmer to non-farmer suicide ratio fall in lower category i.e. lower level of farmer suicides compared to non-farmers.</p>
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<p>Dominic Marriott (2015)</p>	<p>In India, it is estimated that 16,000 farmers die by suicide each year, and at rates far above those of the general population. This paper reviews much of the literature concerning the factors associated with this crisis.</p>	<p>It consists of 200 victims from Vidarbha region of Maharashtra, India and suicide victims from Andhra Pradesh.</p>	<p>A literature search was undertaken from multiple databases on Ovid, as well as more elementary searches of Google, Google Scholar, and Pub Med. Qualitative data was taken through interview technique.</p>	<p>Socioeconomic factors, rather than mental health problems, are associated with farmer suicides, with increased indebtedness playing the predominant role. Available research suggests this has arisen to a greater extent recently, due to an agrarian crisis affecting the most vulnerable farmers. This has multiple manifestations, including a lack of agricultural investment and irrigation improvement, use of cash crops, the increased use of non institutional credit sources, and the reduction of trade barriers. BT cotton is unlikely to be an important factor and no studies reported a significant burden of mental health problems. Indebtedness and numerous factors relating to this are clearly identified as the most important risk factors.</p>
<p>Dilip R. Khairnar, Madhurani J. Bhosale, Mahadev A.Jadav (2015)</p>	<p>Marathwada region of Maharashtra state is drought prone area of India. The draught conditions are affecting the farmers in region. Until Oct 2015, 800 suicides were reported. In this study, farmer's</p>	<p>The data was collected from 90 identified families for farmer suicide from Marathwada region. Interviewers, who were known to the communities from previous rounds of fieldwork, were</p>	<p>Details of the study design, assignment of the underlying causes of death, statistical methods and preliminary results for various diseases and risk factors have been published. In brief, we have selected randomly 90 farmers who</p>	<p>We had calculated total suicidal deaths (to inform health planners), age-standardized rates (to understand variation), and risks (to inform individuals). We used logistic regression to compare the following variables for each gender: age at death; education; geographical region; occupation; alcohol drinking status; religion; residence; and marital status as a measure of community wealth, the household fuel type used in each</p>

	<p>financial positions, choice of crops, irrigation facilities, loans and their repayments are responsible for the farmer's death. We found that farmers were facing nonproductive, non-irrigated and very low land holdings. The family problems like daughter's marriages one of the main reasons behind the overburdened socially and economically conserved farmers.</p>	<p>trained to collect information on the causes of death from any close associate/relative of the deceased. The most common respondents for the 90 male suicides above age 15 years were the parents of the deceased, his wife or neighbors; the remaining informants were usually other household members.</p>	<p>committed suicide in the region. From each house, a death had been recorded and one field-surveyor visited to collect information about the cause of death as well as information on marital status, occupation, alcohol use and education. The underlying cause of each death was sought by an enhanced form of verbal autopsy, known as the routine, reliable, representative, re-sampled household investigation of mortality with medical evaluation (RHIME). The RHIME method involves a structured investigation of events prior to the death, including a written report in the local language of the household. The data was collected from farmer</p>	<p>SRS unit.</p> <p>In this study, we found that the daily needs are responsible for the suicides. Loans are taken by the farmers for the purpose of agricultural expenses (56.7%), daughter marriages (41.1%), health problem due to heavy use of pesticides (24.4%), and educations (6.7%) if the farmer loses its cycle of crop production due to water shortage or draught condition. The conditions were found very depressing and the loan repayment was not achieved due to the low yield income. We found that 57% of farmers were not able to repay their loan amount. These amounts lead to majority of the suicide in Maharashtra. The low land holders cannot repay their loans and therefore cannot prefer extra additional loan from the same banks or other banks from the region, therefore farmers prefer to move towards the private illegal loans. The interest rate of non-bank loan is very high (24 % to 60% per annum) as compared to Government acquired banks (Crop loans 4% per annum).</p>
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