

**FARMERS' VULNERABILITY TO AGRARIAN DISTRESS IN
UNDIVIDED ANDHRA PRADESH**

Dissertation submitted to Jawaharlal Nehru University

in partial fulfillment of the requirement for

the award of the degree of

MASTER OF PHILOSOPHY

KIRTI SHARMA



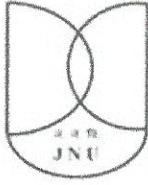
CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT

SCHOOL OF SOCIAL SCIENCES

JAWAHARLAL NEHRU UNIVERSITY

NEW DELHI-110067, INDIA

2017



JAWAHARLAL NEHRU UNIVERSITY
Centre for the Study of Regional Development
School of Social Sciences
New Delhi-110067

DECLARATION

This is to certify that the dissertation entitled "*Farmers' Vulnerability to Agrarian Distress in undivided Andhra Pradesh*" is my original research work under the supervision of Professor Sucharita Sen. I hereby submit this dissertation in partial fulfillment of the requirements for the award of the degree of Master of Philosophy of this University. This study has not been submitted in part or full for any other diploma or degree of any other University to the best of my knowledge.


Kirti Sharma


CERTIFICATE


It is hereby recommended that this dissertation may be placed before the examiners for evaluation.



Prof. Sucharita Sen

Supervisor

 Centre for the Study of Reg. Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi - 110067


Prof. Balbir Singh Butola
Chairperson
Centre for the Study of Reg. Dev.
School of Social Sciences
Jawaharlal Nehru University
New Delhi - 110067

ACKNOWLEDGEMENT

I would like to express my sincere gratitude towards my supervisor Prof. Sucharita Sen, Centre of Study of the Regional Development (CSR), Jawaharlal Nehru University for guiding me throughout this research. It is her incessant support and motivation that provided me new energy to proceed. She has always been ready for any discussion despite of her busy schedule.

I am very grateful to the Union Grants Commission (UGC) for providing me the economic support in form of Junior Research Fellowship (JRF) during this research endeavor of mine otherwise it would have been very difficult for me to pursue research. I am also very thankful to all my friends who provided me valuable inputs whenever needed.

Kirti Sharma

CONTENTS

1. Introduction	1-21
1.1 Introduction	
1.2 Background of Agrarian Distress in India	
1.3 Need for a Spatial Analysis of Agrarian Distress	
1.4 Review of Literature and Research Gaps	
1.5 Research Question	
1.6 Selection of Study Area	
1.7 Previous Work on Andhra Pradesh	
2. Farmers` Suicide and the Agrarian Distress	22-47
2.1 Introduction	
2.2 Relevance of Farmers Suicides in Understanding the Agrarian Crisis	
2.3 Defining a ‘farmer’	
2.4 Temporal Analysis of Farmers` suicides in India	
2.5 Gendered Analysis of Farmers` Suicide	
2.6 Regional Pattern of Farmers` suicide	
2.7 Regional Pattern of Farmers` Suicides and its Implication on Agrarian Situation	
2.8 farmers` Suicide & Size-Class of Farmers	
2.9 Farmers` suicides in Andhra Pradesh	
3. Level of Development and Agrarian Condition in Andhra Pradesh	47-74
3.1 Introduction	
3.2 Agrarian Situation in Andhra Pradesh	
3.3 Level of Development in Andhra Pradesh	
3.4 Regional Disparity in Andhra Pradesh	
3.5 Level of Development and Agrarian Distress in Andhra Pradesh	
3.6 Summary	
4. Farmers` vulnerability to Agrarian Distress Across Various Regions in Andhra Pradesh	75-116
4.1 Introduction	
4.2 Factors Leading to Farmers` Vulnerability to Agrarian Distress	

4.2.1 Nature and Dependence of Agricultural Households on Cultivation	
4.2.2 Cost of cultivation and Profitability of Farming	
4.2.3 Availability of Credit and Indebtedness	
4.3 Summary	
5. Conclusion	117-123
References	124-128
Appendix	i-iv

LIST OF TABLES

Table No.	Title of the table	Page No.
2.1	Farmer suicides and General Suicide in India	31
2.2	Rate of general and suicides and farmers' in India	32
2.3	Number and rate of suicides for the general population and Farmers in major states of India (2001)	37
2.4	Number and rate of suicides for the general population and Farmers in major states of India (2011)	38
2.5	Farmers' suicides and general suicides in major states in India (2015)	43
3.1	Average per capita income across major regions in Andhra Pradesh	49
3.2	Farmers' suicides across various regions in Andhra Pradesh	55
3.3	Rate of farmers' suicides across various regions in Andhra Pradesh	55
3.4	Estimated number of operational holdings by size class of farmers across various regions in Andhra Pradesh (2012-13)	57
3.5	Distribution of operational holdings (%) by size class of farmers across various regions in Andhra Pradesh (2012-13)	57
3.6	Inequality in distribution of operational holdings across various size class of farmers in different region of Andhra Pradesh (2012-13)	58
3.7	Cropping pattern across various regions in Andhra Pradesh in Kharif season (2012-13)	59
3.8	Cropping pattern across various regions in Andhra Pradesh in Rabi season (2012-13)	61
3.9	Cropping pattern across various regions in Andhra Pradesh (Kharif + Rabi) (2012-2013)	62
3.10	Value of output and aggregate yield across various regions in Andhra Pradesh (Rs. Per hectare), 2012-13	63

3.11	Area under irrigation across various regions in Andhra Pradesh (2012-13)	65
3.12	Area under different sources of irrigation (as a % of gross irrigated Area (1999-2000 & 2012-13)	66
3.13	Value of output per hectare and irrigated area under crops for major crop producing regions in Andhra Pradesh, Kharif season (2012-13)	69
3.14	Value of output per hectare and irrigated area under crops for major crop producing regions in Andhra Pradesh, Rabi season (2012-13)	72
4.1	Principal source of income for agricultural households across various regions in Andhra Pradesh (2012-13)	76
4.2	Principal source of income according to size class of farmers across various regions in Andhra Pradesh (2012-13)	77
4.3	Average annual income per agricultural household from various regions in Andhra Pradesh (2012-13)	79
4.4	Monthly income and consumption expenditure across various size classes of agricultural households (2012-13)	81
4.5	Cost of cultivation and returns from cultivation (Rs. Per hectare) across various regions in Andhra Pradesh, Kharif season (2012-13)	83
4.6	Cost of cultivation and returns from cultivation (Rs. Per hectare) across various regions in Andhra Pradesh, Rabi season (2012-13)	89
4.7	Cost of cultivation and returns from cultivation (Rs. Per hectare) for various regions in Andhra Pradesh, Yearly (2012-13)	90
4.8	Profitability of major crops cultivated in Andhra Pradesh (2012-13)	92
4.9	Source of input for farmers cultivating cotton (Cotton seeds) (%)	95

4.10	Source of input for agricultural households cultivating paddy (Paddy seeds) (%)	97
4.11	Source of input for farmers cultivating groundnut (groundnut Seeds) (%)	97
4.12	Average cost of paddy seeds by agency (Rs. Per hectare)	98
4.13	Average cost of groundnut seeds by agency (Rs. Per hectare)	99
4.14	Average cost of cotton seeds by agency (Rs. Per hectare)	99
4.15	Source of input for fertilisers (%)	100
4.16	Agricultural households leasing-in land across various size class of farmers in different regions of Andhra Pradesh (%)	101
4.17	Agency for disposition of crops-Paddy (per 1000 households reporting sale of crop, AndhraPradesh (2012-13)	103
4.18	Agency for disposition of crops-cotton (per 1000 households reporting sale of crop, Andhra Pradesh (2012-13)	104
4.19	Agency for disposition of crops-groundnut (per 1000 house- holds reporting sale of crop, Andhra Pradesh (2012-13)	104
4.20	Source of credit across various regions in Andhra Pradesh (per 1000 agricultural households), 2012-13	108
4.21	Average amount of debt amongst agricultural households (Rs.) across various regions in Andhra Pradesh, 2012-13	110
4.22	Average amount of debt per indebted households (Rs.) by size class of farmers (2012-13)	111
4.23	Average amount of outstanding debt per indebted household according to major source of credit across various regions in Andhra Pradesh (2012-13)	112
4.24	Source of credit for marginal and small farmers (per 1000)	112
4.25	Average amount of debt and average value of asset (Rs.) for major size-classes of farmers, Andhra Pradesh (2012-13)	113

LIST OF FIGURES

2(a) Farmers` Suicide in India (1997-2015)	27
2(b) Trend of Farmers` suicides and General Suicides in India (1997-2015)	32
2(c) Male Suicide Rates in India (1997-2015)	34
2(d) Rate of Farmers` Suicides Across Various States in 2001-2011	35
2(e) Farmers` Suicide as a % of All Suicides for Major Group of States	40
2(f) Farmers` suicides Across Major Classes of Farmers` for Major Crops	42
2(g) Farmers` Suicides and General Suicides in Andhra Pradesh (1997-2015)	44
2(h) Rate of Farmers Suicide in Andhra Pradesh(1997-2015)	45
2(i) Causes of Farmers `Suicides Among Cultivators in Undivided Andhra Pradesh	46
4(a) Share of Different Inputs in Total Input cost(%), Coastal Northern Andhra Pradesh (Kharif Season)	86
4(b) Share of Different inputs in Total Inputs (%), Coastal Southern Andhra Pradesh (Kharif Season)	87
4(c) Share of Different inputs in Total inputs Cost(%), Rayalseema (Kharif Season)	87
4(d) Share of Different Inputs in Total input costs(%), Telangana (Kharif Season)	88

APPENDIX

Table 1. Cost of cultivation and Returns from Cultivation (Rupees per hectare) in coastal Northern Andhra across various size class of farmers (2012-13)	i
Table 2. Cost of cultivation and Returns from Cultivation (Rupees per hectare) in coastal Southern Andhra across various size class of farmers (2012-13)	ii
Table 3. Cost of cultivation and Returns from Cultivation (Rupees per hectare) in Rayalseema across various size class of farmers (2012-13)	iii
Table 4. Cost of cultivation and Returns from Cultivation (Rupees per hectare) in Telangana across various size class of farmers (2012-13)	iv

Farmers' Vulnerability to Agrarian Distress in Undivided Andhra Pradesh

Chapter-1

Introduction

1.1 Introduction: Today's Indian Economy can be clearly identified as a neo-liberal economy and the politics today has come to be recognised as "Globalized politics" (Jong, 2012). Policies are often divorced from the reality and therefore serve only as ad-hoc measures to the issues arising out of such a politico-economic scenario. Therefore, in this scenario it is very difficult to directly isolate the impact of the developmental models on the lives of the rural household. Two different types of crisis related to the agricultural sector can be identified: the one can be referred to as the "Agricultural crisis" while the other can be referred to as the "Agrarian Crisis" (Sainath, 2017). While the former is associated with the declining agricultural productivity and its declining share in the Gross Domestic Product (GDP) of the country, the latter is associated with the lives of the agricultural households. It is related with the livelihood issues faced by the farming community and therefore, this kind of distress can be traced in the growing indebtedness among farmer households, distress induced migrations and on the top of it as desperate acts of farmers resorting to suicides. The agrarian crisis therefore is not the "crisis of production" but the "crisis of the producer".

The Economic reforms of 1991 marking the move towards a liberalised, globalised and privatised economy didn't only mark the swift import and export of various commodities but it is characterised by a complete export and import of "Production systems" from the developed countries to the developing countries. This can be traced to the adoption of market oriented production process and highly input and capital driven system of output generation. Agriculture sector has been no exception to the changes in the mode of production as was introduced by the economic reforms. However, the roots of the current crisis can't be merely attributed to the Economic reforms but the ground for the eruption of the crisis in the lives of the farming community were well laid in the phase representing the later Green Revolution period itself. Nevertheless, it is to be highlighted that suicides by farmers wasn't a recurring phenomenon before the onslaught of the economic reforms (Vasavi, 2012). Though one may argue that statistical evidence to the same can't be provided since the only Government authority undertaking such an exercise of collating data related to the suicides by farmers, the National Crime Records Bureau, started giving the profession-wise data for "Self-employed

in Agriculture” only since 1995 and the media has often reclused the rural issues to the “Shadow Spaces” (Vasavi, 2012). Nevertheless, such incidents of farmers resorting to suicide could largely be described as sporadic in nature before the Economic reforms. The wider contours of agricultural development and associated issues finally culminating into what has today come to be recognised as Agrarian crisis are summarised below.

1.2 Background of the Agrarian distress in India:

1.2.1 Agrarian situation in the pre-reform period: The pre-reform period can be broadly divided into the period before the green revolution and the period following the green revolution. The agrarian situation in the post-independence period was miserable till the coming up of the Green revolution. The poor state of the peasantry has been the by-product of the land tenure system under the British administration. As a result of this, most of the farmers belonging to the previous Permanent Settlement areas namely parts of Bengal, Bihar and Uttar Pradesh continue to still remain in abject poverty. The land reform initiatives by the government included land to the tiller, consolidation of the land-holding and abolition of Zamindari. However, the land reforms were only half-hearted and the feudalism still continued in a hidden manner. Still, the issue of agrarian crisis didn't translate into suicides by farmers.

Further, the Green Revolution which has been often hailed for its capability in advancing India into a self-sufficient economy and thus propelling us from being a food deficient country to the one which now has a distinction in being one of the exporters of food grains including rice and wheat. However, the Green Revolution is often also blamed for deteriorating the condition of agriculture and agricultural households in India. The loss of biodiversity and the ecological loss it has created in States like Punjab, Haryana and Western Uttar Pradesh have precipitated into what can be largely referred to as the agricultural crisis. It also led to wide inter-regional and inter-personal disparities. The inter-regional disparities are largely the outcome of introducing and propagating the Green Revolution technology to the irrigated areas of Punjab, Haryana, western Uttar Pradesh and irrigated parts of various States including Andhra Pradesh. Therefore, the other parts in the country which have not been so much benefitted by the Green Revolution continued to experience subsistence based agriculture. Also, the regions which were benefitted by the Green Revolution have witnessed large inter-personal disparities since the capital intensive agriculture benefitted only the large farmers who could invest in the irrigation, fertilisers and pesticides that came as a part of the

“HYV Seed” package. Even though the Post Green Revolution period didn’t translate into an agrarian crisis of the present form but it certainly laid the grounds for the present crisis. The farmers and regions which were by-passed by the Green Revolution adopted the Cash-crop based agriculture more readily finding it as a lucrative source of raising their income from agriculture. This cash intensive agriculture has proved to be one of the leading factors behind the crisis of agricultural households.

There also exists a fundamental difference between the periods from Green Revolution to the Economic reforms. While the success of Green Revolution to a large extent was hinged on the active participation of the State, the reform period was characterised by the symbolic participation to a complete withdrawal of the State. Public investment in the irrigation was one of the most significant features of the Green Revolution however; the economic reform marked a sharp decline of the public investment in agriculture. Nevertheless the need for irrigation didn’t decline simultaneously; rather it increased with the introduction of hybrid variety of seeds which required a greater amount of irrigation. The private investment in irrigation has been suggested a major cause of the rising indebtedness of farmers (Citizens’ Report on Andhra Pradesh).

1.2.2 Agrarian situation in the post-reform period: The paradox in India has been that the reforms have been superimposed without removing the discrepancies of the pre-reform period. In the post-reform period, India has seen a spurt in the growth rate as compared to the pre-reform period. However, since then, the share of agriculture in GDP has been steadily declining and it is also a fact that the growth story of India has been dictated by the achievements in the service sector primarily and to a considerably lesser extent from manufacturing but the performance of the agricultural sector with respect to other sectors has been dismal. In this situation, the condition of the small and marginal farmers, agricultural labourers is worst. Along with the earlier risks of weather and monsoon, the farmer is now exposed to a multitude of other issues like risks associated with market, access to credit and volatility of the prices of the produce. The farmer now faces stiff competition from the global producers who are better equipped and well-facilitated by the government. Such is a situation of the farmer today that social responsibilities like education, healthcare and marriages are becoming a burden for the poor farmer and the poorer agricultural labourer. The paradoxical situation that the agrarian sector is faced today with is that the one who is producing doesn’t have enough to eat himself and to sustain his family! This has been interpreted to be the impact of the economic reforms and the structural adjustment programme of the government

on the peasantry of India (Mishra, 2007). The commercialisation of agriculture has not only led to the growth in the inter-regional and inter-personal inequalities but in fact it has made even the sustenance of a poor farmer questionable. In the present context, 17% of the Gross Domestic Product is contributed by agriculture but it still continues to employ 49.6% of the total worker population (Economic Survey, 2016-17). Also, within the agricultural sector, there has been a shift in the incremental value of output from traditional crops to high value added crops including fruits and vegetables. Further, the high agricultural productivity of two main Green revolution crops namely rice and cereals is declining.

The green revolution technology was confined to irrigated areas and therefore the dry land areas were either completely by-passed by the introduction of new High Yielding Variety of seeds or were late adopters only with the help of government. This is in contrast to the later periods characterised by the areas where earlier green revolution didn't make any inroads. The farmers in these arid and semi-arid regions which were once bypassed by the Green Revolution were propelled by the State to undertake the cultivation of cash crops in order to boost their incomes and also to boost the agricultural growth (Vasavi, 2012). While the green revolution period placed high importance on the agricultural productivity, the new understanding in the post-reform period is characterised by a race for the growth rates in various States. One thing common to both Green Revolution and the new paradigm of development adopted in the wake of economic reforms of 1990s is the complete focus merely on increasing the output and the welfare of farmers and the farming community has been largely side-lined. Thus on the one hand the green revolution gave rise to wide inter-personal disparities, the economic reforms further accentuated the deep divide between the rich and the poor farmers especially worsening the situation of the small and the marginal farmers.

1.2.3 Symptoms of the Agrarian Crisis in India:

a. Farmers' suicides: Since 1995-2011, almost two and half lakh farmers have committed suicides across India, including states like Andhra Pradesh, Maharashtra, Karnataka, U.P., Punjab, Haryana and Kerala. It has also been found that the majority of the victims are small and marginal farmers and many also belong to the backward class and scheduled castes. Also, there continues to be a dramatic increase in the number of suicides that are being committed year after year (P. Sainath, 2012; Murthy, 2013).

b. Indebtedness of farmer household: The onslaught of commercial agriculture in India has led to an increase in cost of cultivation and fluctuating income from agriculture. As a result, many farmers who took loans in order to take the cultivation of high value cash crops have not been able to generate expected returns from the cultivation. This has led to increasing indebtedness among farmers. The 59th round of NSS report 498, 2005 indicates that fifty per cent of the farmer households are indebted. The proportion of indebted farmers household is considerably higher in states like Andhra Pradesh, Tamil Nadu, Punjab and Kerala which account for 82%, 74.5%, 65.4% and 64.4% of the indebted farmers' households respectively. Also, these states have a higher investment of borrowings in agriculture too including Andhra Pradesh (77% of the borrowings), followed by Karnataka (73%) and Maharashtra (83%). One thing to be noticed is that the borrowings from institutional sources are only 30% in states like Andhra Pradesh.

c. Rise of small and marginal farmers: There has been a rise in the number of small and marginal farmers in the Indian agriculture¹. Distress sale of land has also led to the cultivators becoming landless agricultural labourers. Also, big framers and landlords are moving out of agriculture.

d. Growing rural poverty: The food security issues have further been aggravated in the country-side as there is a shift from cultivation of staple food crops to cash crops. This has led to a sharp decline in the per capita food availability even to the one who produces for the country. The commercialisation of agriculture has led the farmers to shift towards cash crops due to which the poor farmers have a degraded condition if their crop fails or they don't make profit on their produce. The increasing pauperisation of farmers and agricultural labourers is an apparent symptom of the agrarian crisis. Only suicides aren't the indication of the pitiable condition of the farmers but the deaths due to hunger are also an ugly dimension to it. Furthermore, the output and per capita availability of cereals and pulses has fallen which has led to their import in the present time. As a result, these essential components of a balanced diet are being sold at an exorbitant price which is most of the time unaffordable for the poor peasantry and the agricultural labourers who are already under a burden of unpaid debts. The consumption data of the National Sample Survey indicates that the food grain consumption as well as per capita total calorie intake has reduced especially for the bottom 40 percent of the population (Ghosh, 2005).

¹ 43% of land is under the small and marginal farmers and they constitute almost 86% of the total farmers (2001).

e. Unemployment situation in rural India: Another dimension to the agrarian crisis is the collapse of rural employment opportunities. As the agriculture is becoming unviable, the people presently working as cultivators and agricultural labourers have been looking for avenues of employment in the non-farm sector. However, the employment opportunities open for them in the non-agricultural sector are very limited. Even though they have tried migrating to the urban areas in search of work but the spurious urbanisation happening in India doesn't tend to be absorptive for them. As a result, they have to return back to agriculture itself and continue with the unprofitable agriculture. The NSS data on Employment and Unemployment situation in India (55th round, 1999-2000) has also indicated that there has been a decline in the rate of employment generation² in rural areas which has declined from 2.4% in 1983-94 to 0.6% in 1994-2000 (Ghosh, 2005) including all forms of employment namely casual, self-employed, part-time. Predominantly, there has been a casualization of work as the rate of increase of permanent jobs has been negligible. Also, there has been an increase in the rate of unemployment³ with a sharp decline in rate of growth of the labour force. Due to this shortage of jobs, many people have turned out to be out of the labour force. Additionally, the worst impact has been felt by the agricultural sector as the employment elasticity of output growth has declined from 0.7 to 0.01 from 1983-94 to 1994-2000. This has been an outcome of the growing mechanisation of farming. Moreover, the public spending on rural employment generation has declined since the reforms (Ghosh, 2005).

1.2.4 Causes of the crisis situation:

I. Economic causes of the distress: “The economic reforms in Indian agriculture intensified the process of public as well as private resource crisis brewing from the mid-1980s⁴” (Mishra, 2008). Gross Capital Formation (GCF) in agriculture in 1999-2000 has steadily declined to one-third of the level in 1980-81. Also, the private investment in agriculture has not increased significantly. The plan expenditure of the government on rural development initiatives has

² The rate of growth of employment, defined in terms of Current Daily Status refers to the flow measure of extent of jobs available.

³ The rate of unemployment in rural India as a whole increased from 5.63 per cent in 1993-94 to 7.21 per cent in 1999-00, and was more than 15 per cent in some states. (Ghosh, 2005).

⁴ Mishra, S and Reddy, N (2008) “Crisis in Agriculture and Rural distress in Post-reform India” India Development Report, pp. 44.

also dropped (Gupta, 2005 as cited by Mishra, 2008). The institutional credit available to farmers has also seen a decline. This has been a major blow to the peasantry and is often cited as one of the main causes of the indebtedness of the farmers. The share of credit from Scheduled commercial Banks (SCBs) and formal institutional sources has decreased⁵. The worst sufferers have been small and marginal farmers as they are forced to buy from non-institutional sources which charge a heavy rate of interest from them. Additionally, the increased cost of cultivation is also a feature of the post-reform period agriculture. There has been an increase in the Fertiliser Price Index (FPI) from 1999 to 2001. Acharya, 2004 has stated that there has been a growth of FPI from 99 to 228 from 1990 to 2001 showing that it has increased at a rate of eleven per cent compound annual rate. Also, he has concluded that fertilisers today account for almost 29% of the cost incurred by the farmers on inputs. Even the water prices have considerably increased in many states (Acharya 2004 as cited in Mishra and Reddy, 2008). One of the primary objectives of the liberalisation model in agriculture was to provide a greater access to higher prices in the global markets but in fact, there has been a decline in the global market for some of the agricultural produces. The prices for certain crops like cotton, rubber, sugarcane etc. has declined in the global regime. The price volatility has increased. The crops in which India had a comparative advantage in have turned out to be unfavourable in the post-reform period. With the relaxing of Quantitative Restrictions (QR), there has been a fall in global prices of cotton.

The Farm-Business Income (FBI)⁶ which was increasing in the 1980s has started to decline since 1990s. There has been a deceleration in growth of FBI per hectare from 3.21 per cent in 1980s to 1.02 per cent in the 1990s. Furthermore, the growth of real FBI per cultivator declined from 1.78 per cent in 1980s to 0.03 in 1990s and in actual terms also it seems to have declined in the states of Andhra Pradesh, Bihar, Gujarat, Karnataka, Maharashtra, Orissa, and Rajasthan (Sen and Bhatia 2004). The important measures of the Economic liberalisation in Indian Agriculture are as follows:

In the External Trade sector, the policy initiatives included placing all the products in Generalised System of Preferences (GSP) by 1997, QRs were dismantled for as many as 470 agricultural commodities by 1998. Further, 1200 products were brought under Open general

⁵ Scheduled commercial banks' share of credit to agriculture has declined from 18 per cent in December 1987 to 11 per cent by March 2004 (Shetty, 2006). A study of credit from formal institutional sources shows that between 1980–81 and 1999–2000, agricultural sector's share of short-term credit declined from 13.3 per cent to 6.1 per cent. During the same period, agriculture's share in terms of lending declined from 16.9 per cent to 8.3 per cent (Rao 2002).

⁶ FBI refers to the difference between the value of output produced and the costs actually paid out.

Licensing (OGL) and the average tariffs on the agricultural imports reduced from 100 per cent to 30 per cent from 1990 to 1997.

Under the process of internal market liberalisation, 100% foreign equity in the seed sector has been allowed since 1991 leading to a more liberalised import of seeds. There has been an apparent decline in fertiliser subsidies following the post-reform period. The power sector too has been opened to the private sector and certain states have revised their tariff rates on power access including Andhra Pradesh where the power charges have significantly increased. The water charges too have increased and certain states such as Andhra Pradesh have made it mandatory for the stakeholders to contribute towards the investment done by the state in the irrigation project. In the institutional credit sector, the role of Regional Rural Banks' (RRBs) targeted priority sector lending has been diluted by the Narasimham committee and Khursro Committee (1992). These have resulted in the additional cost of cultivation being incurred by the farmer as farming is becoming an unproductive exercise. This has deep rootedness in the reforms initiated under the guidelines of the International Monetary Fund (IMF)⁷.

II. Political Economy of Agrarian crisis in India: The present crisis in the country-side seemed to be impossible after the initial success of Green Revolution wherein the country not only became self-sufficient in food grains but also started exporting rice. The farmers lobbies were strong enough to bargain with the government and claim for their welfare activities. Flipping through the pages of the history of planning in India, it becomes apparent that the roots of the distress can be traced back to the planning policies adopted by the government. The planning model under Jawaharlal Nehru and Mahalanobis considered agriculture to be the base for the development of Industries. However, soon after the death of Pandit Nehru, the New Agricultural policy under C. Subramaniam led to a culmination of what is today identified as the Agrarian Crisis which is exemplified in the trivialisation of the agrarian issues in the National Policy agenda. The success of Green Revolution led to the emergence of several large farmers who reaped heavy returns from the technology. This also was instrumental in the surfacing of "Rural lobbies" which were very powerful. Since they themselves were also the part of the cultivating class, they raised strong voices and demanded subsidies from the government. They also influenced the output prices in such a way that farming was a profitable exercise for the rich and poor farmers both. These lobbies had strong influence and therefore, all political parties took great care of their concerns. Therefore, much

⁷ Acharya (2004, p. 677); Chand (2006); Dorin and Jullian (2004, p. 206); and Vakulabharanam (2005, p. 975).

like other countries where there was a diversion of resources from agriculture to industries, such a thing was next to impossible in India. In fact, there was a significant transfer of resources into agriculture in the period following independence (Posani, 2007; Varshney, 1995; Krishna, 1987)⁸. But this continued only till the first three decades after independence. Later on the government suffered various issues like technological limitations and fiscal deficit related issues. Also, in order to keep the food inflation under a check, the government had to undertake certain measures to keep a check on the output prices of the agricultural produce. However, in the period following the reforms, not only the government's investment into the agricultural sector has declined but also the peasant lobbies that existed earlier have diluted considerably. This dilution is primarily because of two reasons: first, the huge migration of people from the villages and second, the interest of the large farmers and poorer farmers don't coincide anymore. Furthermore, the nature of politics in rural India has come to be recognised on the basis of ethnicity, caste and religion rather than the development issues especially those pertaining to the farming community. The trajectory of agricultural development and the politics associated with it can be discussed as below:

a. *Agrarian question (Political economy of "Town-Country" struggles, 1947-1990):*

Posani, 2007 has discussed the Agrarian question in India from 1947 to 1990. There has been a consensus amongst all developmental Economists that the trajectory of development follows the path of structural transformation wherein the resources from agriculture are transferred to industries and other sectors because the demand to agricultural products tend to decline as the surplus production takes place. However, the transfer of resources shouldn't be the squeeze of resources from agriculture. The terms of transfer of resources from the agricultural sector to industrial sector are referred to as the agrarian question. This is the "Town-country" debate (Varshney, 1995; Corbridge and Harriss, 2000; Posani, 2007).

After independence, India was also given a poor state of agriculture by the britishers. Much of the agriculture was dependent on rainfall and the prospects of irrigation were limited. Therefore under the Nehruvian model of development, it was ascertained that the agricultural production has to be increased significantly. However, the path to be followed for such an endeavour was widely debated. On the one hand, the technocrats

⁸ Posani, B. (2009) "Crisis in the countryside: Farmer suicides and The Political Economy of Agrarian Distress in India", Development Studies Institute, London School of Economics and Political Science, London, pp.10.

supported the increase in the food prices and thereby investing in new technologies to improve agriculture and supporting farmers to adopt these technologies by way of subsidising the inputs required by the farmers whereas, on the other hand, the institutional approach was being advocated by a few wherein the focus was to be given to land reforms, farm-service cooperative and local self-government. The technocratic approach was not followed by Nehru-Mahalanobis because the government was committed to keep the food prices low in order to check inflation of the economy. Therefore, the institutional approach was adopted. The land reforms were initiated to provide the land rights to the tiller, the farm-service cooperatives were meant to incentivise the economies of scale to function and thereby leading to an increase in the farm output. The local self-government was aimed at improving the condition of the landless agricultural labourers who could exercise their voting rights and keep a check on the growing landed class.

Although, the agricultural production increased between 1951-52 and 1959-60 but this was primarily due to a good monsoon rather than an increase in yield but by the 1960s the production started to decline again. The institutional strategy failed because it didn't give a much needed focus to the "Political micro-foundations"⁹ required for the proper functioning of the institutions. The land reforms were far from successful and it served only the interest of the large farmers. The coming up of Subramaniam as the new agriculture minister after the death of Nehru led to a shift in the approach of the government from being institutional to technocratic. Under his policy, Subramaniam adopted a three pronged strategy focusing on incentivising farmers to increase productivity, enhancing investment in technology, creation of institutions for better management of aforesaid objectives. Under this approach, the Green Revolution technology was adopted by India. All these culminated in a very different involvement by the state in the agricultural sector. Two new institutions were established, namely Agricultural Prices Commission (APC) and Food Corporation of India (FCI). The role of APC was to give price recommendations and the FCI was set up to buy and sell the agricultural produce at the price suggested by APC. However, the package technology led to the increased fiscal demand from the government upon the agricultural sector as the crops now required expensive fertilisers, irrigational facilities and relatively more

⁹ Ibid pp.16.

expensive seeds as compared to the pre-green Revolution period. Therefore, the government had to give huge input subsidies to farmers. Nevertheless, agriculture continued to be a no-revenue sector. It was out of question to tax the peasantry at that point of time. This led to an imbalance in the fiscal demands. However, since the initial period of the Green Revolution was a huge success, the government was able to fulfil its objectives of self-sufficiency in food grains and it considered that the agriculture sector now was ready to stand on its own. This led to the steady withdrawal of government from the agricultural scene and diverting its attention more to the other sectors of the economy.

In the post reform period (1990s and onwards), the state has further reduced the investment in agriculture and therefore this has led to the culmination of crisis in the rural India.

- b. ***Political Economy of the post-reform period***¹⁰: in the neo-liberal era, it is apparent that the State has stopped to influence the agricultural markets and only provides input subsidies, technological and extensional support to a very limited extent. On the contrary, the State is now involved in providing welfare measures to the poor and needy people in the rural areas. With this kind of state support, a considerable proportion of poor farmers are propelled to become petty-commodity producers (Murthy, 2013). This has come to be recognised as a feature of the “post-colonial capitalist democracy”¹¹. Consequently, there arise few fundamental questions: first, how is the petty production influenced by the distress conditions; second, what is the coping strategy of the small farmers and third, how does the state react to this distress situation. The neo-liberal reforms have catapulted the recent agrarian crisis. The macroeconomic regime under the neo-liberal state is typified by the deflationary tendencies and the “Structural Reforms” therefore do not allow the State to intervene in the agricultural sector too. It now can’t extend the institutional protection and credit to the agricultural sector. The transfer of affordable technology by the public sector has also been checked under the new regime. As a result of this, the Terms of Trade have eventually turned out to be against the agricultural sector. Even the Minimum Support Price (MSP) offered by the government is found to be falling short of the actual cost of cultivation incurred by the farmers. The capitalist farmers are therefore

¹⁰ Murthy, R.V. (2013) “Political Economy of Agrarian crisis and Subsistence under Neo-liberalism in India”, *The NEHU Journal*, Vol. XI, No. 1, January 2013, pp. 19.

¹¹ Ibid.

running into losses. Only the paid-out costs are being accommodated for and there remains no profit once the cost of family labour, interest on own land etc are being accounted for. Under such circumstances, the market price as determined by the MSP set by the State provides only subsistence to “Self-Exploiting farmers” and generates no amount of re-investible surplus for him. Subsequently, under such technological circumstances, a capitalist farmer is unable to cope up. The State has been unworried because despite the sorry state of affair of the poor farmer, they are still able to access the needed agricultural produce because the petty producers are ready to sell their produce at any price and are also ready to offer unpaid labour in return of subsistence. This free market economy has led to an emergence of private money-lenders and manipulative market structures which further accentuate the distress situation among the petty producers and trap them in a perpetual cycle of debt and misery. “The paradox to this condition is the ever increasing army of small and marginal farmers, a putative antediluvian category under classical theory, but marching into the suicidal enterprise of agriculture” (Murthy, 2013).

III. Socio-cultural causes of the distress: Reports from the five major states including Maharashtra, Andhra Pradesh, Kerala, Karnataka and Punjab indicate that most of the victims of suicides had been practising commercial agriculture. This introduced them to a number of new risks in the form of risks associated with production, climatic conditions, marketing and availability of credit. However, the victims mostly included those farmers who didn't have access to the economic and social fulcrum necessary to be able to survive in the Green Revolution game. It is also seen that most of the victims were the marginal cultivators followed by small and semi-medium cultivators¹² and cultivators belonging to backward classes or from lower ranked caste groups. Also, it is seen that there has been an increase in the number of suicides committed by the traditionally non-agricultural castes for example, in Anantapur district, Reddy and Baliga have been known as the traditional cultivating castes but most of the suicides have been reported from the non-agricultural castes including Sale, Besta and Uppara castes¹³. Similarly, in Amravati and Yavatmal district, most of the victims were from non-cultivating castes namely Telis, Beldars and Banjara and the Scheduled

¹² Marginal cultivators are those who have less than 1 hectare of land, Small cultivators having 1 to 2 hectares, Semi-medium having 2 to 4 hectares.

¹³ Vasavi, A.R. (2007), “ Suicides and the making of India's Agrarian distress”, pp.4.

communities like the Mahar, Nav-Buddha, Chamar¹⁴. This is particularly significant because it reflects that how the traditional occupation of these castes has been affected in the post-globalisation period. Most of the people belonging to castes like potters, weavers, artisans, craftsmen etc have lost their jobs owing to the greater integration with the rest of the world. This has led to the decrease in the demand for their goods and services. As a result, they attempted to integrate themselves in the agricultural sector which seemed to be lucrative to them following the Green Revolution and thereby enhance their income by marketing their produce. Nevertheless, they lacked the credit facilities and the social capital required to prosper in this endeavour. Socio-cultural causes can be summarised as below:

- a. ***Incongruity in the diffusion of Agricultural Knowledge:*** In the traditional times, the farmers produced the seeds themselves and therefore they had a comprehensive understanding of the requirement of the crops. The farmers nurtured their crops like their own child and raising the crop and harvesting were the acts of merry and celebration for the rural folk which is apparent in the custom of harvest songs in most of the agrarian societies. Also, the farmers shared their agricultural knowledge through cultural and social structures. However, the coming up of the New agricultural regime has changed these equations of reciprocity amongst the farmers. The farmers are dictated by the market-led strategies of production which they are themselves not conversant with. The use of Hybrid variety of seeds followed by the Genetically Modified (GM) seeds regime has made the farmers the slave of the technology. They are not aware about the ratio of inputs required for raising their crops and thereby lead to unprecedented crop losses. Although the technology has been increasingly being popularised in India but there have been no attempts towards educating the farmers to use them appropriately. This has led to the problem of “**Deskilling of Agricultural workers**”¹⁵.
- b. ***Agricultural Individualisation:*** The increasingly commercialised agriculture has also hampered the social ties among the peasants whereby they are competing against each other in a quest to make additional profits. Following the adherence to the Green revolution technology and other forms of commercial agriculture, the traditional support during the crisis period as offered by the patron-client relationship has

¹⁴ Mohanty, B.B. (2005) “We are like living Dead: Farmer suicides in Maharashtra, Western India”, *The Journal of Paesant Studies*, Vol 32, No. 2. April, pp.254.

¹⁵ Stone, G.D. (2007) “Agricultural deskilling and the spread of Genetically Modified Cotton in Warangal”, *Current Anthropology*, Vol 48, No. 1. pp.77.

dismantled. The socio-cultural structures that acted as a basis for mutual cordiality and interdependence have been demolished by the market forces (Vasavi, 2007). Another dimension to the burgeoning crisis of individualisation amongst the agricultural masses is the constitution of nuclear families out of joint families. This leads to the problem of fragmentation of land-holdings leading to a decreased productivity on the one hand and absence of sharing of losses on the other.

- c. ***Advanced marginalisation of the rural:*** The rural economy and affairs of the rural society have been largely neglected by the State and also the mainstream media. No longer, the popular quote by Mahatma Gandhi, “India lives in its villages” holds true. In the fanfare of increasing the level of urbanisation, the greater impetus is given to the cities and towns and not to the issues of poverty, education, healthcare, employment in the rural areas. We are living in the regime of a government who talks about the Smart cities but not about smart villages, who has billions and trillions to invest in urban planning but not to invest in a scheme like Mahatma Gandhi National Rural Employment Guarantee Scheme! Such is the state of affairs in our country.

IV. Ecological causes of the crisis: The intensive mono-cropping and increased cropping intensity has led to a decline in the agricultural productivity. The loss of soil fertility has been a major cause behind the stagnation of agriculture even in once productive areas like Punjab and Haryana. Further, extensive irrigation using ground-water has led to problems of contamination of groundwater thereby has led to further deterioration of the soil health (Reddy, Ratna et al, 2001 as cited in Murthy, 2013).

1.3 Need for a spatial analysis of Agrarian Distress:

If we consider farmers’ suicides as a symptom of the growing agrarian distress, it becomes apparent that not all States are equally prone to the suicide by farmers. There are underlying corollaries which can only be simplified by looking at the role “Space” plays as a container. Few of the corollaries are summarised as below:

- a. If the current crisis relates to poverty and economic backwardness of farmers (especially the small and marginal farmers) then why the suicides committed by farmers in Bihar and Jharkhand low in comparison to that committed by farmers in Karnataka, Maharashtra and Kerala?

- b. If it is related to the droughts then what explains the high number of suicides despite periods of relatively “normal monsoon” and why persistently rainfall deficient areas such as Rajasthan do not witness the same menace of suicides?
- c. If it is related to the cultivation of cash crops (or plantation crops) and the market linkages of these crops then why are the north-eastern States relatively insulated from the agrarian distress?
- d. If it is related merely to the cultivation of “Bt-Cotton” then why are farmers in Maharashtra, Karnataka and Andhra Pradesh more vulnerable than a farmer in Gujarat despite the fact that Gujarat records the highest production of cotton and also bears the distinction of being the first State to have introduced Bt-Cotton even when it was not introduced in the country at large?

Thus, the impact of Green Revolution, Economic reforms of 1991 and the introduction of Genetically Modified Crops such as cotton has been different for different regions and it necessitates a regional analysis of the issue of the agrarian crisis.

1.4 Review of literature and research gaps:

Even though a lot of work has been done towards identifying the causes and implications of agrarian distress but studies pertaining to the spatial pattern of the distress are very limited. A few studies highlighting the regional dynamics have been discussed below.

Patel et al (2012) have tried to reflect upon the substantial geographical variations in the rate of suicides across various states in India. The study reveals that farmers' suicide rates are more than ten times higher in "Wealthier" States like Kerala as compared to other states, Bihar for an instance is one of the poorest states in India and has the least number of farmers' suicide. Similarly, Nagaraj and Sainath (2008) have attempted to give a comparative regional account of the variations in number and rate of farmers' suicides in the country and they have highlighted that the farmers' suicides are more predominant in the developed states as compared to the less-developed states.

So the question that arises is what are the factors responsible for the large inter-state and inter-regional variations in the extent and cause of farmers' suicides and thereby the agrarian crisis?

Even though a large number of studies have reflected upon the agrarian crisis and its relationship with opening up of markets and scaling back of the state support followed by liberalisation of Indian Economy but at the same time, why the interstate response to the economic reforms has varied and why even states which have been "Reform-oriented" like Orissa have lesser number of farmers' suicides as compared to States like Kerala, Maharashtra, Karnataka has largely remained unanswered.

Kennedy and King (2014) have tried to explain the character of inter-state variation in suicide rates using the characteristics of the Rural Political Economy. They provide a comparative analysis across states and establish a strong positive relationship between socio-economic characteristics such as cash crop cultivation, proportion of marginal farmers and indebtedness amongst farmer households with the suicide rates. Their study identifies that three states having the highest number of suicides namely Andhra Pradesh, Kerala and Tamil Nadu have highest proportion of marginal farmers as well whereas other states like Punjab and Rajasthan having lowest number of farmers suicides are also the states where the percentage of marginal farmers is also very less. At the time, states like Bihar, Jammu and Kashmir, Uttar Pradesh have a high percentage of marginal farmers but low suicide rates. These states also have a very limited area under cash crops and indebtedness of farmers is relatively lesser. Therefore, the study suggests that the size of holdings matter more for creating the agrarian distress when the farmers are cultivating cash crops and are indebted. Also, Suicide rates are found to be higher in states which are more unequal (Kennedy and King, 2014).

The study establishes that the area under cash crop and the indebtedness of farmer households are positively correlated to the rate of male farmers' suicide in various States across India and the percentage of marginal holdings becomes significant only when the percentage of indebted households and the percentage of area under cash crop cultivation are high. Even though the results are found to be significant but the study identifies Farmer suicide as an effect and indebtedness as a cause. Such a linear relationship between suicides and indebtedness may not be taken as a reflective of the agrarian crisis because indebtedness in itself isn't a cause of agrarian distress but rather an outcome of the market induced agricultural practices which has led to dwindling income and thus inability to pay off their debts due to fluctuations in prices, increasing cost of cultivation and declining income from agriculture. Also, the study doesn't highlight the reason behind the spatial differences in the rate of farmers' suicides.

Additionally, it still remains a puzzle as to why states with a high percentage of area under cash crop cultivation such as Rajasthan and Gujarat have relatively lesser number of farmers' suicide.

Predominantly, most previous studies either provide a National picture while trying to ascertain the cause and extent of agrarian crisis or are restricted to relatively smaller areas like Vidharba region of Maharashtra, Wayanad district and neighbouring areas of Kerala, plains of Karnataka, and Telangana region of Andhra Pradesh. Previous studies have identified that developed states are more prone to farmers' suicides but the spatial spread of agrarian crisis even beyond these conventionally distressed regions calls for a more holistic and detailed regional analysis of the dynamics of the crisis in the countryside.

Further, the research focus of most of the studies has been concentrated towards identifying farmer suicide prone areas and studying the factors responsible for it. However, given an understanding that farmers' suicides are only a symptom of the agrarian crisis and not the actual problem, it becomes important to understand how regions vary in terms of vulnerability to agrarian crisis. As farmers suicides are also being reported from relatively poorer, food crop based and less capital intensive agricultural states as well, it becomes important to locate the factors which are leading to the vulnerability of these regions which are currently not so much into the "Distress".

1.5 Research questions: The focus of the present research is to find:

- a. Whether farmers living in agriculturally backward regions are more vulnerable to agrarian distress or not contrary to the state level picture?
- b. What is the pattern of cost of cultivation, returns from cultivation and profitability of farming across various regions?
- c. What role does level of development in a region perform in shaping the present agrarian crisis and farmers' vulnerability to it?

1.6 Selection of Study area: Andhra Pradesh has been chosen for the present analysis. The three distinct regions namely Coastal Andhra, Rayalseema and Telangana have different levels of development, historicity, institutional settings and infrastructure. The three regions

also vary in terms of impact of the Green Revolution and the Economic reforms. The distinct cropping pattern along with the underlying agro-ecological and climatic conditions can be considered to be representative of the agricultural scenario in other parts of the country for an instance the rice growing region of Coastal Andhra under irrigated conditions represents similarity with the typical rice growing regions of Punjab, Haryana and Western U.P; the dry belt of Rayalseema cultivating predominantly groundnut characterises a cash crop intensive agriculture under semi-arid conditions without adequate irrigational support and the Telangana region specialising in cultivation of cotton represents another distinct agricultural region with a large percentage of area under Bt-cotton or the “Suicide Seed” which has often been suggested as the biggest cause of farmers’ suicides especially in Vidharbha and Marathwada region of Maharashtra. It thus offers a wide canvas to understand the regional variations in vulnerability to the agrarian crisis.

1.7 Previous work on Andhra Pradesh:

Andhra Pradesh has been known as the State which has been infamous for having the largest number of farmers’ suicides. This comes as an inconsistency with the State’s Economic Development policies. It has been an active participant in the Structural Adjustment Programme of the government since the very beginning of the reform period. It has the distinction of being amongst the foremost states to have adopted the Liberalisation model, including in the agricultural sector¹⁶.

Even though Andhra Pradesh and Telangana have been ranked amongst the top performing States in the “Ease of Doing Business Index” prepared by the Department of Industrial Policy and Promotion (DIPP, 2015) but no one has really bothered to prepare such an Index for Ease of doing Farming even when a large percentage of population is engaged in agricultural activities. Furthermore, the state governments have undertaken several reform measures as well such as waiving the loan of farmers and promoting pro-poor measures in the form of irrigation schemes. Nevertheless, the impact of such schemes has not been analysed. In fact, as Suri, 2008 has clearly highlighted, the excessive dependence on irrigation leading to incurring of higher investments in irrigation with declining water tables is also one of the major factors behind the on-going distressed situation of the farmers. The NCRB statistics records a 322% rise in the farmers’ suicides in Andhra Pradesh from 2014 to 2015. This raises serious concerns regarding the

¹⁶ Supra note 4, pp. 13.

government interventions in the state and also to the impact of this crisis upon lives of the farmers and their families (Samdani, 2017).

It is also alarming that as many as five lakh farmers have migrated from one of the districts of Andhra Pradesh, namely Ananthapuram which has been marked as severely drought hit area since three consecutive years. This distressed migration is nothing but a reflection of the culminating agrarian crisis in the State (Samdani, 2017).

The problems of the farmers include droughts, soil degradation, lack of institutional credit, lack of insurance facilities available to the farmer and excessive dependence on money-lenders. Farmer suicides are often regarded as only “the tip of the iceberg” for the agrarian crisis looming in the state but in fact the crisis has deep roots which are evident by the declining food consumption, per capita calorie intake amongst the poor and forced migration of the workers. Also, the agricultural production has declined. The price of crops has become more volatile since 1996 and the volume of trade has been severely impacted. Crops like cotton and groundnut have seen a major fluctuation in prices which are the most cultivated crops in Andhra Pradesh.

Initially, the state made substantial gains in agriculture especially when the state moved from traditional rain-fed cereals to non-food cash crops. There was a shift in the cropping pattern from jowar and ragi to groundnut, oilseeds and cotton. This change in cropping pattern was driven by various factors such as a need for a higher income for the farmers’ households and having better avenues for consumption and cultivation. The cash crop production including rice cultivation requires more monetary inputs in terms of an increased cost on fertilisers, seeds, pesticides. This higher input cost was incurred by taking debts especially by the input dealers who were also the traders. When the debt was incurred, it was required by the farmer to undertake the cultivation of the same crop in order to repay the loans, the returns from production being lower than the returns from producing the cash crops. This led the farmer to shift away from the subsistence agriculture to commercial agriculture. As the debt increased, the farmers’ suicide started becoming widespread. The deaths of the farmers have been the most barefaced indication of the rural devastation. The most pre-dominant reason of suicides has been the inability to repay. Also, the large number of farmers including tenants, woman, tribal who didn’t have a formal title to land had no access to formal credit too so they had no resort than to approach to the money-lender (Ghosh, 2005). The debt burden is however only a symptom. The input prices have sky-rocketed in Andhra Pradesh and therefore the farmers who had gone for cash crop cultivation has been more volatile to the global market. Along with this, the agricultural extension services of the

government have tended to disappear which has further propelled the farmers to rely on the private money lenders. The private money-lenders are also input suppliers in many a cases therefore, the prices of seeds, fertilisers, pesticides and other inputs are abusively high and are mostly unregulated. Furthermore, there is a crisis in water and irrigation facilities also. Since privatisation of means of irrigation has been widespread, the situation has worsened for small and marginal farmers.

However a major gap exists in analysing the regional dimension of agrarian crisis across various regions in Andhra Pradesh. Only a few studies like Kumar, 2007 which have compared the Coastal Andhra region and the Telangana region but this study is limited to the study of differences in degree of commercialisation and irrigation issues in the two regions and how they are related with the agrarian crisis.

Galab and Revathi (2007) in their paper have linked the manifestations of the agrarian crisis to the regional disparities in the state. They hold growing commercialisation in agriculture, dependence on groundwater for irrigation, informal credit, volatile prices and absence of regulation on the quality of inputs as the major causes behind the agrarian distress.

Reddy (2006) has analysed the agrarian crisis in four worst affected districts of Andhra Pradesh namely, Anantapur, Guntur, Warangal and Karimnagar. He has taken into consideration the lack of sufficient rainfall, irrigation deficits and increasingly high burden of input costs as the major cause behind the agrarian crisis in Telangana and Rayalseema region.

As a contribution to the existing literature on agrarian distress in the country in general and Andhra Pradesh in particular, this study tries not to restrict to the areas which are already showing signs of alarming distress in form of farmers' suicide as a reflection to it but tries to study the temporal and spatial variation in vulnerability to agrarian distress and factors associated with it.

1.8 Structure of the Study:

The study is divided into three sections. The first section deals with spatio-temporal analysis of farmers' suicide as a symptom of agrarian distress for India in general and Andhra Pradesh in particular.

The second section is divided into three sub-parts. The first sub-part deals with the analysis of regional disparities in the agricultural development across the four regions of undivided Andhra Pradesh namely Coastal Southern Andhra, Coastal Northern Andhra, Rayalseema and Telangana.

The third part is concerned with the analysis of cost of cultivation and net returns from cultivation along with an analysis of input and output linkages with the market.

Chapter-2

Farmer Suicides and the Agrarian Distress

2.1 Introduction: While suicides have often been described as a global phenomenon, it has been found that people living in low income countries are more prone to committing suicides. The World Health Organisation (WHO) describes suicide as a point of crisis in one's life where all the mechanisms to cope the stresses in life have failed. More often, suicides are attributed to be a psychological phenomenon however, suicides are not just related to mental health of an individual but it is far more complex than that and involves interplay of various factors which may be societal, cultural economic or behavioural. Due to increasing number of suicides across the globe it has been recognised as a public health concern and therefore has been studied elaborately (Staples and Widger, 2012 as quoted by Hofle, 2012).

However, the Suicides by farmers and that too in India can be identified as a distinct case because of two reasons, firstly, they are not reported from poorer states but rather from well-developed States such as Maharashtra, Karnataka, Punjab, Tamil Nadu; Madhya Pradesh and Chhattisgarh being an exception and secondly, these Suicides are reported from States which have openly adopted the economic reform agenda into their policy stances and have by and large applied the economic reforms in its entirety. The late twentieth century witnessed the increasing number of farmers' suicides in India which came to be regarded as the indicator of the growing agrarian crisis in the country-side. Between 2005 and 2006 there was a tremendous upsurge in the number of suicides reported especially from states like Maharashtra, Karnataka, Andhra Pradesh, Punjab and Kerala. Over the years, suicides by the farmers have become a political act rather than being a silent struggle. It is not just a culmination of the miserable and desperate state of the peasants but is also an attempt to bring it to the attention of the government to revise its policies to bring respite to them.

Bhandaram, 2015 defines Farmer suicide as a "socio-economic phenomenon". It was only in the 1990s that the government recognised the suicide by farmers as the most plaguing "Epidemic" in the countryside. As many as 898 farmers in 2014 and 1,358 farmers committed suicide in Telangana in 2015. Telangana has one of the highest rates of farmers' suicide in India.

Farmers' suicides in India are the symptom of a larger malady of the rural India. While much has been written and discussed about the farmers' suicides recurring in various parts of the country, not much has been written about the spatial tessellation of the suicides and the causes behind it keeping in view the regional idiosyncrasies of rural India. Farmers' suicides are merely a representation of the tip of the iceberg whilst the burgeoning agrarian crisis is the bigger cause of disquiet. Vasavi, 2007 has termed the recent agrarian distress as an "Epidemic of Suicides". However, this epidemic is far from natural as has been regarded by the government and various committees that have been formed by the government in order to diagnose the problem in the rural India, for instance, the main cause behind the farmers suicide in the Vidharba region has been reported to be the droughts, without giving any due attention to the severely indebted farmers cultivating the Bt cotton. There are certain misconceptions about the suicides by farmers engaged in agricultural activities. These can be summarised as follows:

- a. Suicides by farmers have been largely considered as an "Individual" act as a result of various psychological and personal issues and therefore the officials have maintained a viewpoint where suicides have not been identified as related to the farm crisis.
- b. Farmers' suicides have been termed as a "Seasonal Phenomenon" and thus more often it has been related to the vagaries of the monsoon and erratic rainfall. As a result of this, these farmer suicides have not led to the wider reflection about the systemic issues that are related to the agricultural sector in general and its impact on the farmers and their livelihood in particular.

Given the fact that it is almost every day that we read about a farmer committing suicide in one State or the other, it needs to be recognised that these suicides by farmers are neither individualistic nor seasonal in nature but represent the deep agrarian crisis in the countryside where the farmers have been gripped in such a never ending cycle of losses and desperation that suicide is probably the only way to end this perpetual cycle. Also, the acts of self-immolation by farmers or a large number of farmers coming out to protest indicates that the crisis is deepening and widening each passing day. While numbers aren't appropriate to reflect upon the condition of the agriculturalists but the number of farmers suicides still are very significant in locating the roots of the distress in the agricultural sector and in the lives of people associated with agriculture as a means of livelihood.

2.2 Relevance of Farmers' Suicides in understanding the agrarian crisis: Though the cultivators and agricultural labourers today account for 118.7 million and 144.3 million respectively of the total population of India standing at 1.30 Billion today, the interest in the farming sector and the lives of the farming community has been declining persistently. The population of cultivators has declined by nine million from 2001 to 2011 but at the same time, there has been an increase of 33 million in the population of agricultural labourers (Priya, 2017). A recent article read, "Everyone is bored of the farmers' suicides" (Vishwanathan, 2017) to highlight the reductionist tendencies relating to the farmers' suicides. Farmers' suicides have been accepted as normal and therefore, the underlying causes of the farmers' suicides undergo completely side-lined today.

Emile Durkheim highlighted that as high as ninety per cent of the suicides could be traced to psychological and neuro-biological issues but when such a phenomenon is being reported from a whole sub-group of the population, it then highlights the existence of socio-economic issues and risks. Thus, the suicides by farmers as a sub-group of the population highlight the plight of the agriculturalist today.

Farmers' suicides before 1997 can be seen as historical aberrations since instances of such acts of suicides by agriculturalists were merely reported. Even though the agrarian distress existing out of the desperate condition of farmers existed previously as well but primarily such occurrence in the seventeenth and the eighteenth centuries resulted in either migration of entire village or groups of people to abandonment of agriculture altogether. Nevertheless the episodes of farmers resorting to suicide could still not be found in the historical analysis. Vasavi, 2012 mentions that one of the rare instances of suicides by farmers in the 1970s has been that relating to the suicide by agriculturalists in the Bundelkhand region of Uttar Pradesh when due to widespread loss of crops and high incidence of indebtedness the farmers resorted to suicide (Siddiqi, 1973 as quoted by Vasavi, 2012).

What is the most interesting thing about the suicides in the post 1997 period is the existence of a deep corollary where on the one hand we have been witnessing high level of economic growth and on the other hand, we are also witnessing the high incidence of suicides by farmers. For an instance, in 2004 when India witnessed as many as 18241 suicides by farmers which is the highest number of officially reported farmers' suicides by NCRB, India was being lauded for its accelerating growth rates and for overcoming what had been famously termed as the "Hindu Rate of Growth". While earlier the suicides by farmers could be

directly correlated to situation of famine, the contemporary suicides by farmers can't be merely viewed as a natural issue arising out of fluctuations merely in the level of rainfall.

The on-going crisis can be rather attributed to the multi-faceted issues that the agrarian economy is facing today and the suicides by farmers can be only seen as a window to peep through and get deeper insights about what exactly is happening inside the house! The crisis in the country-side not only throws light on the apathy of the peasantry today but also the inability of the Economic growth model we chose for ourselves during the Economic reforms of 1990s. The "Trickle-down" model of growth has hardly materialised and in fact it would not be an exaggeration to say that the urban is in reality feeding upon the rural (Harris White, 1999; Vasavi, 2012). In the bid to base our economic development on the manufacturing and services sector, the governments both at the State and the central level are diverting resources to these sectors and thus agriculture has been facing a continuous setback ever since the Economic reforms.

The suicides by these farmers can be seen as a reflection of the structural issues associated with the agricultural economy and also the agrarian polity. The penetration of capital into the hinterland has marked a phenomenal shift in the lives of the rural population in general and the farmers in particular. Rural India today is characterised by utmost degradation, deterioration, marginalisation and backwardness. While this is truer for the small and marginal farmers, this is equally true for the farmers and the general rural population. The paradigm that hinges the economic growth on the urban in itself relegates rural to the backward and "unwanted".

The penetration of the market forces into the rural areas marks the penetration of aspirations also. These areas which were earlier untouched by the economic forces were thus blinded by the bright prospects these forces promised of, little did they know that it would be hard to deliver. In a bid to reorient themselves to the commercial agriculture, the farmers adopted the commercial crops for cultivation replacing their subsistence farming with more market-driven forms of agriculture. This was predominantly done by the small and marginal farmers (Vasavi, 2012). In a few years itself, the supposed way out of distress turned into being one of the causes of the distress. The suicides don't only mark the economic losses faced by the farmer but also the loss of one's individuality, social ties and "everything that gave meaning to their lives" (Berger, 1979). The distressed households are now recognising agriculture as "noose" around their necks which is slowly and gradually tightening its grip and therefore

claiming life every now and then. The farmer suicides are also a reflection of the erosion of the existing knowledge systems and the cultural basis by the ingression of the new technological and economic regimes.

The distress in the country-side is also suggestive of the inequitable sharing of fruits of globalisation. The main cause of the distress is not the displacement of a pre-capitalist form of agriculture with the capitalist mode of production but in fact in the existence of both the old and the new system simultaneously for an instance the access to market has increased for all classes of farmers but the caste and the feudal system still exists.

Therefore, to summarise, the continuity, spread and the growing magnitude of the farmers' suicides represents the tip of the "ice-berg" which can be utilised to study the submerged part of the ice-berg in what can be called the "Agrarian Crisis".

2.3 Defining the "Farmer":

Till the year 2013 there had been an ambiguity about who is a "Farmer" as included by National Crime Records Bureau (NCRB) in its Accidental Death and Suicide in India (ADSI) report. While, most of the eminent researchers including Nagaraj, 2008 and Mishra, 2006; 2012 have identified this to include those farmers who have a title to land. Nagaraj (2008) has suggested that even a suicide committed by a farmer who had the land in the name of his father would also not have been identified as a farmer committing suicide according to NCRB. Mishra, 2012 has suggested that the NCRB statistics would have included the tenants (cultivating leased land) and cultivators (owning land) but the agricultural labourers who don't have any legal association with the land would not have been included in the NCRB statistics. Further, Mishra has also explained why farmers and agricultural labourers should not be considered as one group as has been done in most of the European countries. Generally, farmers and workers have been taken as one group because often they constitute a very small section of the population. However, in India both cultivators and agricultural labourers constitute large groups which are representative in themselves. Hence, while analysing the farmer suicide rate, only the main and marginal cultivators were included by both Nagaraj (2008) and Mishra (2012).

It is only since 2014 that NCRB has started to give disaggregated data and has started to provide farmer suicide data both for agricultural labourers and cultivators/tenants. It was expected that with the inclusion of agricultural labourers, the number of farmers' suicide

would become more representative and account for the under-counting in the farmer suicide data. To the contrary, it may be a possibility that ever since NCRB started recording the farmer suicides, they have been reporting both the suicides committed by agricultural cultivators/tenants and agricultural labourers. This view has been presented by Basu (2016¹⁷). Also, if we plot the data for farmers' suicide in India from 1997 to 2015 (the latest available data for farmers suicide, ADSI, 2015) we can clearly see that the number of farmers suicides committed by people engaged in farming as defined by NCRB includes farmers who cultivate their own land with or without agricultural labourers, those who cultivate leased land and also those who work as agricultural labourers.

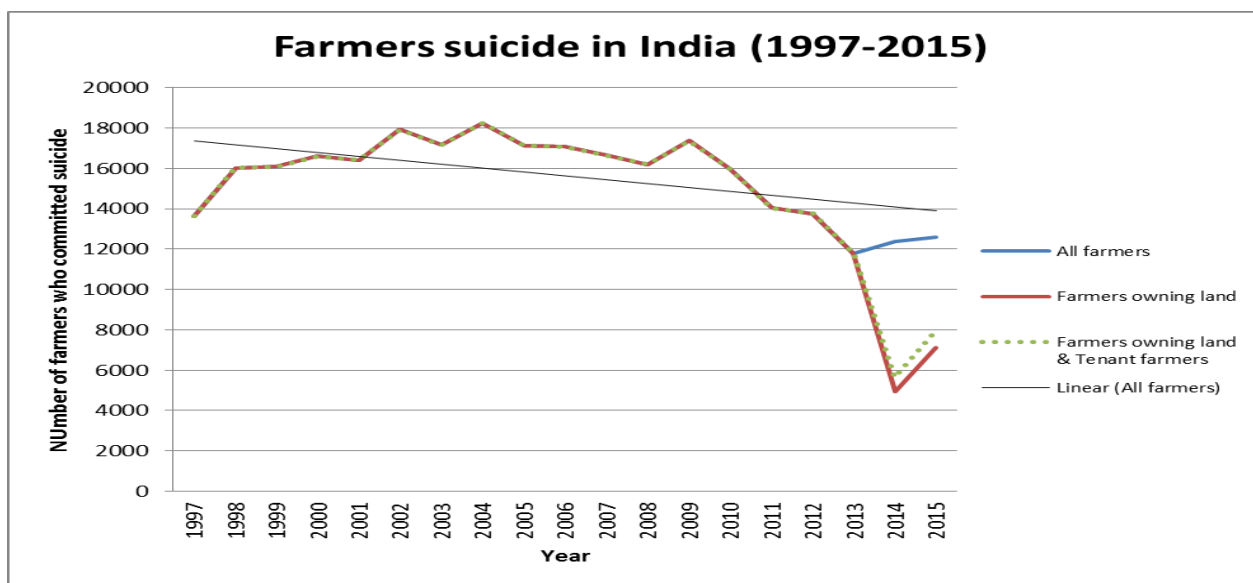


Figure 2 (a). Farmers' suicides in India (1997-2015)

Source: Accidents Deaths and Suicides in India, NCRB, Ministry of Home affairs (Various years).

The above graph shows that if we compare the values for 2014 and 2015 considering only the farmers owning land or even the farmers owning land in addition to those working as tenants, there is a very sharp difference in the trend of suicides over the period from 1997-2013 to 2014-15. However, the differences aren't so sharp if we plot the total number of suicides committed by all farmers (includes cultivators, tenants, as well as agricultural labourers). This suggests that over the period of time, all the quantitative analysis which tended to consider "title to land" as a prerequisite to be classified as a self-employed in agriculture by NCRB have over-estimated the rate of farmers' suicides. Pointing out to this doesn't mean that farmer suicide is a less serious an issue as has been previously highlighted but this just

¹⁷ Basu, Deepankar; Das, Debarshi; Misra, Kartik (2016), "Farmer Suicides in India: Levels and Trends across Major States, 1995-2011". *Department Working Paper Series*. 200. Available at http://scholaroworks.umass.edu/econ_workingpaper/200

intends to highlight that the studies that have used the NCRB statistics and census figures to standardise the suicide figures may have reported a high rate of farmers suicides from some states where the agricultural labourer population accounts for a larger proportion in the agricultural workforce. For an instance, let there be a State A which has an agricultural population consisting of 100 Cultivators (1/3rd of the agricultural workforce) and 200 Agricultural labourers (2/3rd of the agricultural workforce) for a census year; the farmers' suicide (as reported by NCRB) be 50. Therefore, if we compute the rate of farmers' suicides considering only the cultivators, the suicide rate would come out to be 50 in 100 but if we include both cultivator and agricultural labourer, it would be 17 in 100. Therefore, the regional pattern arising out of this definitional and identification issues needs to be reanalysed to get a clear picture of the farmers' suicide in India.

Nevertheless, even if the definition of a farmer as has been used by NCRB has been found to be more inclusive, this doesn't suggest that the element of under-reporting doesn't exist. Also, other flaws that exist with the NCRB statistics are listed as follows:

- a. Suicide being considered as a criminal "offence" rather than a civil "issue" suggests that under-reporting by the police departments from various districts may be one of the cases. Further, there is also an element of stigma associated with a suicide. Therefore, reporting by the deceased family may be also one of the constraints posed in the collection of the data especially so in the rural areas.
- b. The increasing incidence of farmers' suicides in various parts of the country and increasing media attention to the issue has led to the politicization of the suicides committed by farmers. As a result, states have themselves tried to "regulate" this "phenomenon". While SCRB compiles the statistics from various districts under it, the NCRB only compiles the figures shared by various SCRBs across India. This leads to a heavy control in the hands of the State administration to influence the reporting from the States. High fluctuations in the number of suicides in States like Chhattisgarh, Gujarat and Kerala points to this. Also, states like West Bengal have not reported the Statistics for suicides (both General Suicides and Farmers' Suicides) in 2012 and after that the suicides have suddenly declined to zero in the subsequent years (2013 and 2015). Furthermore, the mechanism of Right to Information and the policy of intentional sharing of all government data online as a maxim under the present "Minimum Government, Maximum Governance" scenario seems to be deceptive when it comes to the States for an instance, even though the suicide

statistics are available online for most of the States on the NCRB website, the SCRB websites for most states are either found to be dysfunctional or non-existent. Andhra Pradesh and Telangana which have been selected for the present studies have no functional website maintained by the CBI which has the SCRB as a sub-branch. Most of the district level studies on farmers' suicide have either used personal data collection mechanisms or have compiled it from various police stations. The intentional disclosure of information has been very limited.

- c. Even though the earlier belief that woman were under-represented in the farmers' suicide statistics because they lacked the title to the land has been negated to some extent but this still doesn't explain as to why females constituting the farmers' suicide are limited. In fact, given the active participation of woman in the farming activities there is no reason to believe that they have not been impacted with the on-going agrarian crisis as has been the case with the males. Therefore, under-reporting of farmers' suicide by females is one of the most probable issues with the NCRB statistics.
- d. The NCRB Statistics doesn't give an indication about the rural urban scenario and also the suicides among scheduled castes, scheduled tribes, other backward classes and general population isn't clearly indicated.
- e. Further, the biggest flaw with the NCRB data being that even though the suicides are reported according to the profession but it doesn't point to the cause behind the suicide. This means that a suicide committed by a farmer as classified by NCRB may not be due to agricultural factors but still it would be called a farmer suicide. Therefore, misreporting also can't be completely negated.

Nevertheless, despite all the limitations mentioned above NCRB statistics have been the most widely used data source for the farmers' suicide because it is the only source which provides such data on such a scale. Other datasets such as those provided by various NGOs associated with farmer welfare are generally regional in nature and therefore are not so useful in understanding the overall spatial dynamics of the farmers' suicides in the country. Therefore, this study also makes the use of the NCRB data to bring out the spatio-temporal variations in the suicides committed by farmers over the years. Nonetheless it has to be borne in the mind that the analysis based on NCRB data can be described merely as indicative and not exhaustive.

2.4 Temporal analysis of Farmers' Suicides in India: As many as 2, 96,920 farmers have committed suicides from 1997 to 2015. On an average, 15627 farmers have committed suicide annually which translates to a suicide by 43 farmers per day. It also suggests that almost two farmers die every hour in India. The highest number of farmers' suicides has been reported in the year 2004 when 18,241 farmers ended their lives or 50 farmers died every day. The farmer suicides have consistently increased from 1997 to 2004 and post-2004 it has been showing a declining trend. This may be purely because of the reporting issues as have been highlighted in the preceding analysis. Nonetheless, the peak in suicides corresponds to the drought years of 2002 and 2004. The high rate of farmers' suicides in 2002 can be explained to some extent by the drought during that year in most parts of India. However, the peak in 2004 is surprising as it was during this period that India witnessed a very High rate of economic growth. This clearly indicates that the fruits of Economic growth have not been equitably distributed and more predominantly, the agricultural sector and the population engaged in agriculture have been largely by-passed.

It is to be further noted that the decline in the rate of farmers' suicides especially since 2011 may not be precisely due to the revival of the agricultural sector but due to limited reporting by States like Chhattisgarh and West Bengal as has been highlighted above.

Contrary to the previous works done by Nagaraj, 2008 and Mishra, 2006 and 2012, it can be seen that the rate of farmers suicides has been lower than the rate of non-farmer suicides in India consistently from the period between 1997-2015. This trend has also been reported by Basu, 2016. However, Basu has considered the non-farmer population without adjusting for the population (5 years and above) and therefore has over-estimated the non-farmer suicides in comparison to the farmer suicide.

Table 2.1 Farmer Suicides and General Suicides in India (1997-2015)					
Year	Farmer Suicide	Farmer Suicide as a percent of total Suicides	General Suicide	Farmer Suicide rate (per lakh)	Non-Farmer Suicide rate (per lakh)
1997	13622 (100)	14.21	95829 (100)	6.10	13.02
1998	16015 (118)	15.29	104713 (109)	7.09	13.77
1999	16082 (118)	14.54	110587 (115)	7.03	14.38
2000	16603 (122)	15.29	108593 (113)	7.18	13.72
2001	16415 (121)	15.13	108506 (113)	7.01	13.46
2002	17921 (132)	16.23	110417 (115)	7.57	13.25
2003	17164 (126)	15.48	110851 (116)	7.16	13.16
2004	18241 (134)	16.04	113697 (119)	7.52	13.14
2005	17131 (126)	15.04	113914 (119)	6.98	13.06
2006	17060 (125)	14.44	118112 (123)	6.87	13.37
2007	16632 (122)	13.56	122637 (128)	6.62	13.75
2008	16196 (119)	12.96	125017 (130)	6.37	13.83
2009	17368 (127)	13.66	127151 (133)	6.76	13.68
2010	15964 (117)	11.86	134599 (144)	6.14	14.49
2011	14027 (103)	10.35	135585 (141)	5.33	14.56
2012	13745 (101)	11.41	120488 (126)	5.16	12.53
2013	11772 (86)	8.73	134799 (141)	4.37	14.16
2014	12360 (91)	9.39	131666 (137)	4.54	13.46
2015	12602 (93)	9.43	133616 (139)	4.57	13.39

Note: The farmer population consists of both main and marginal cultivators and agricultural labourers. Also, while calculating the Non-farmer population the general population excluding the farmer population (and population aged 5 and above since neither suicides nor the workforce classification exists for the age group from 0-4 years) has been taken. The population figures have been extrapolated and interpolated using the population figures from Census of India 1991, 2001 and 2011.

The analysis of indices for the General Suicides and Farmers' suicides indicates that till 2006 farmer suicides were increasing faster than the general suicides but after 2006, general suicides have been consistently increasing at a faster rate and farmers suicides have been decreasing.

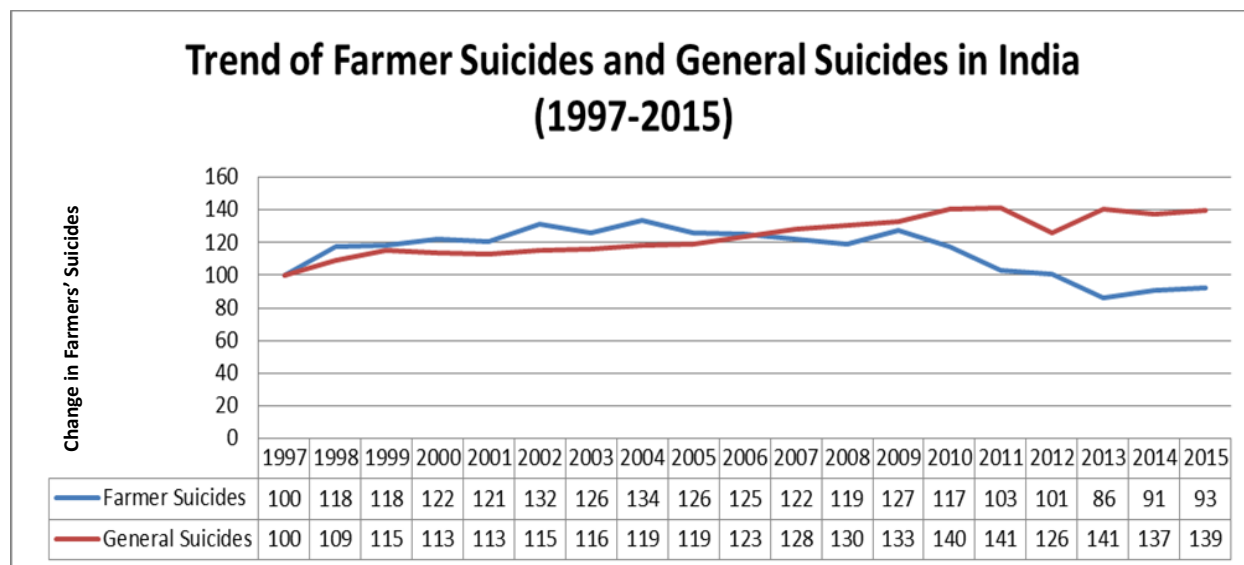


Figure 2 (b). Trend of Farmers' suicides and General Suicides in India (1997-2015)

Source: ADSI, NCRB, Ministry of Home Affairs, Government of India.

2.5 Gendered analysis of the Farmers' Suicides: It can be very clearly seen that the rate of male suicides is higher than the suicide rate amongst females and also the total farmer population. Also, the male non-farmer suicide rates are higher than the farmer suicide rates over all the time periods under consideration.

Table 2.2 Rate of general and farmers' Suicides in India (1997-2015)						
	Rate of Farmers' Suicides (per lakh population)			Rate of Non-Farmer Suicides (per lakh population)		
	Total	Male	Female	Total	Male	Female
1997	6.10	8.35	2.69	13.02	14.59	11.52
1998	7.09	9.51	3.38	13.77	15.49	12.13
1999	7.03	9.58	3.11	14.38	16.30	12.56
2000	7.18	9.41	3.40	13.72	16.18	11.47
2001	7.01	9.69	2.83	13.46	15.79	11.26
2002	7.57	10.57	2.90	13.25	15.96	10.69
2003	7.16	10.00	2.66	13.16	16.11	10.39
2004	7.52	10.67	2.48	13.14	16.16	10.32
2005	6.98	9.89	2.30	13.06	16.20	10.13
2006	6.87	9.54	2.54	13.37	16.76	10.21

2007	6.62	9.30	2.23	13.75	17.47	10.30
2008	6.37	8.93	2.14	13.83	17.58	10.38
2009	6.76	9.30	2.51	13.68	17.29	10.36
2010	6.14	8.33	2.45	14.49	18.78	10.56
2011	5.33	7.29	2.00	14.56	18.98	10.51
2012	5.16	7.11	1.83	12.53	16.68	8.74
2013	4.37	6.15	1.30	14.16	19.34	9.45
2014	4.54	6.29	1.48	13.46	18.56	8.84
2015	4.57	6.60	1.02	13.39	18.62	8.66

Note: The farmer population consists of both main and marginal cultivators and agricultural labourers. Also, while calculating the Non-farmer population the general population excluding the farmer population (and population aged 5 and above since neither suicides nor the workforce classification exists for the age group from 0-4 years) has been taken. The population figures have been extrapolated and interpolated using the population figures from Census of India 1991, 2001 and 2011.

The rate of farmers' suicides amongst males being higher than the females may indicate a possible under-reporting of the suicides committed by women engaged in agriculture. It is also interesting to note that the suicides reported by female farmers are higher in the southern States including Kerala, Karnataka, Maharashtra, Tamil Nadu and Andhra Pradesh. The southern States have a distinction of being more gender balanced as compared to the Northern States. Also, females occupy a considerable proportion of the population engaged in the agricultural sector. One of the possible reasons for reporting of maximum number of female suicides from the southern States can also be due to the relatively more incidence of reporting in the southern States for an instance, Kerala is the State which is known to have maximum number of instances of violence against women, necessarily not because of a higher prevalence of it but merely because of proper reporting; both self-reporting and reporting by the police. Another possible reason for a relatively lower rate of suicides by women engaged in agriculture may be explained by the fact that even though women participation in agriculture may be high but still she is not the decision maker in most of the agrarian households, the male is often the sole decision maker and the sole bread-earner of the family. Even though it may be a case that NCRB has always recorded farmers including cultivators, tenants and agricultural labourers contrary to the previous belief that only farmers having a title to the land have been included, nevertheless access to land especially in the rural areas often has wider significance such as a greater access to credit, indebtedness in the male headed household may be larger than the female headed household and therefore greater vulnerability of the male farmers to the death due to indebtedness.

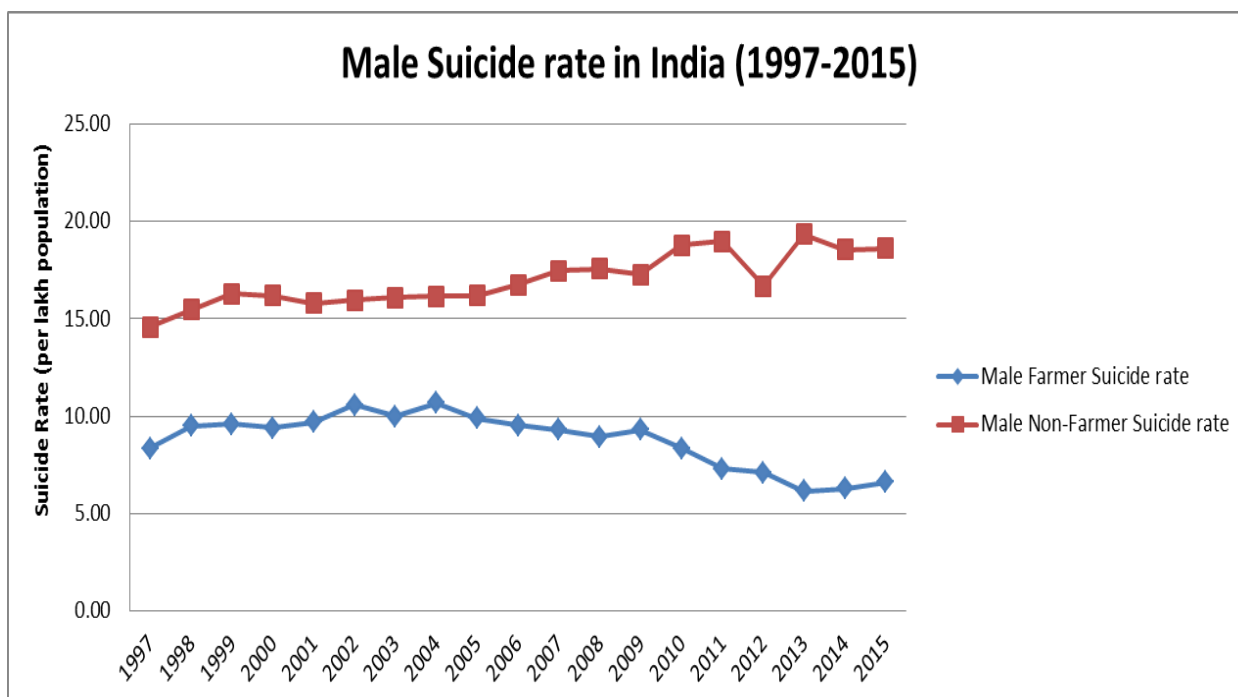


Figure 2 (c). Male Suicide rate in India (1997-2015)

Source: The data for farmer’ suicides has been taken from NCRB and the population data has been taken from the Census 1991, 2001 and 2011.

It can be clearly seen that the difference between Farmers’ Suicides and Non-Farmer suicide Rates for males has been increasing from 1997-2015. However, it must be noted that this difference becomes sharper from 2009 onwards. On the face of it, it indicates that suicides amongst farmers have been declining over the years but a close analysis would reflect that this may be purely because of an assumingly under-reporting from Chhattisgarh especially from 2010-2012 (Mishra, 2014). Also, West Bengal has also been showing similar trends. The State didn’t report any suicide during 2012. Also, ever since then, the number of suicides reported from West Bengal has declined considerably which may not be the actual scenario. Also, there hasn’t been a parallel decrease in the suicides committed by general population. This indicates that the under-reporting of farmers’ suicides may be purely because of the definitional advantage NCRB makes available to experiment with, for an instance, the decline in Chhattisgarh specifically may be related to the shifting of the number of suicides under the category of “Self-Employed in Farming” to “Self-Employed in others” and “Others” category (Mishra, 2014).

2.6 Regional Pattern of the Farmers’ Suicides: The rate of farmers’ suicides for 2011 is the highest for Kerala followed by Karnataka, Maharashtra and Andhra Pradesh. While the

farmer suicide rate has decreased from 2001 to 2011 for most of the States including Kerala, Karnataka, Tamil Nadu, Maharashtra, the rate of decline has been the sharpest in Chhattisgarh, Puducherry and West Bengal (most probably an outcome of data discrepancies). Also, the rate of farmers' suicide has increased sharply for Andhra Pradesh, Haryana and Punjab contrary to the general Nation-wide decline.

Spatially, it can be seen that the southern States (also few of the most developed States in India and votaries of Economic reforms) including Karnataka, Maharashtra, Tamil Nadu, Kerala have higher than National rate of farmers' suicides. While Andhra Pradesh had below national rate of farmers' suicides in the year 2001, it has increased more than the national rate in the year 2011. The state has recorded the highest percentage change in comparison to other States. Nonetheless, these southern States constitute the epicentre of the problem of the Farmer Suicide.

The poorer States lying in the Eastern region (most backward States of the country) including Jharkhand, Bihar, Odisha have the lowest rate of farmers' suicides in comparison to other States rates are lowest in Northern and North-eastern States.

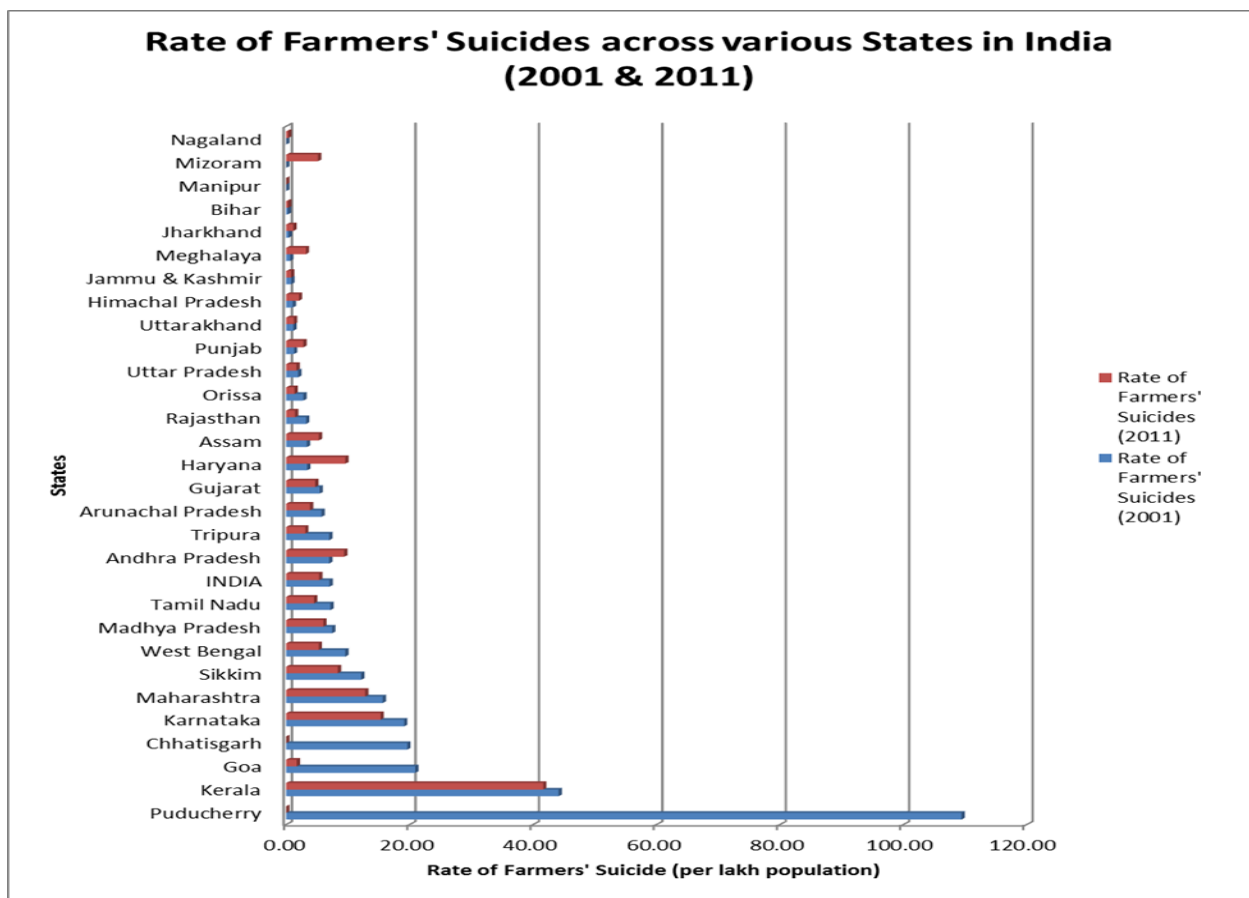


Figure 2 (d). Rate of farmers' suicides across various states in 2001 and 2011

Nagaraj, 2008 has classified the 21 major States into four categories on the basis of the magnitude & rate of farmers' suicide in 2001 along with the percentage of farmers' suicide to the general rate of suicides in the State. This study also uses the same frame of analysis to study the regional pattern of farmers' suicide in the period from 2006 onwards.

The Group I states include Maharashtra, Chhattisgarh, Andhra Pradesh, Madhya Pradesh and Karnataka. These states not only have a high incidence of farmers' suicides but also the farmers' suicide constitutes a large percentage of the general suicides. Also, these states are contiguous with respect to their territorial boundaries and therefore could be taken to represent one region.

Group II states include Kerala, Goa, Puducherry, West Bengal, Tripura and Tamil Nadu. This group of State even though has a very high number of farmers' suicide (especially Kerala and Puducherry for the year 2001 but at the same time general suicide rate is very high with respect to other groups of State and the farmer suicides as a percentage to the general suicides is very low.

Group III state includes Assam, Haryana, Gujarat and Odisha. This group of States has a moderate level of both farmers' suicides and the general suicides.

Group IV states including contiguous states lying predominantly in the Himalayan region and the Ganga Plains namely Bihar, Jharkhand, Punjab, Uttar Pradesh, Uttarakhand, Rajasthan and other States including Jammu & Kashmir, Himachal Pradesh. These States have both a low level of farmer suicides and also a very low level of general suicides in comparison to other groups.

The table below analyses the changes in the number and rate of farmers' suicides and general suicides from 2001 to 2011. These two periods have been considered because the remaining analysis is based on the extrapolation and interpolation of data which may over/under-estimate the actual population of farmers in the country since agriculture is slowly and gradually becoming an unwanted profession and people are fast moving out of agriculture. So the rate of change of farmer population cannot be closely estimated. Therefore the census years 2001 and 2011 can be used for better and precise analysis. Even though the category of cultivators or agricultural labourers corresponding to the census doesn't exactly represents the farmers as "defined" by the NCRB, but it can still be used for getting a close estimate of the population engaged in agriculture.

Table 2.3 Number and Rate of Suicides for the General Population and Farmers in Major States of India (2001)							
State	Farmer Suicide	General Suicide	Farmer suicide as a % of all suicides	Rate of Suicides(per lakh)			
				rate of farmer suicide (main only)	rate of farmer suicide (main+marginal)	General suicide rate	Non-farmer suicide rate
Group I							
Andhra Pradesh	1509	10522	14.34	8.76	6.96	15.13	18.84
Chhattisgarh	1452	4025	36.07	28.81	19.62	21.90	23.44
Karnataka	2505	11881	21.08	25.12	19.11	24.80	26.94
Madhya Pradesh	1372	6860	20.00	10.72	7.44	12.95	15.89
Maharashtra	3536	14618	24.19	19.84	15.63	16.74	17.12
Group II							
Goa	18	256	7.03	43.35	20.88	20.58	20.56
Kerala	1035	9572	10.81	64.37	44.14	32.92	31.94
Tamil Nadu	985	11290	8.72	9.12	7.16	19.70	23.66
Tripura	41	854	4.80	9.74	6.96	29.40	35.11
West Bengal	1246	13690	9.10	13.72	9.57	18.87	20.90
Group III							
Assam	167	2647	6.31	5.04	3.34	11.21	13.31
Gujarat	594	4791	12.40	7.65	5.42	10.55	12.19
Haryana	145	2007	7.22	5.12	3.37	10.64	12.78
Orissa	256	4052	6.32	4.63	2.77	12.19	15.83
Group IV							
Bihar	61	603	10.12	0.39	0.28	0.84	1.08
Himachal Pradesh	22	307	7.17	1.96	1.07	5.56	8.22
Jammu & Kashmir	15	153	9.80	1.43	0.82	1.67	1.88
Jharkhand	27	250	10.80	0.73	0.40	1.06	1.32
Punjab	45	648	6.94	1.52	1.27	2.91	3.23
Rajasthan	505	3195	15.81	4.77	3.22	6.48	8.00
Uttar Pradesh	688	3516	19.57	2.82	1.93	2.42	2.57
Uttarakhand	21	311	6.75	1.74	1.15	4.11	5.05
INDIA	16415	108506	15.13	9.82	7.01	11.82	13.46

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

In 2001, among the group I states Maharashtra had the highest number of suicides followed by Karnataka but Chhattisgarh had the highest number of suicides with respect to the general suicides followed by Maharashtra and Karnataka (constituting 36%, 24% and 20% of the general suicides respectively). Therefore, the percentage of the farmer suicides to the general suicides was the highest for the group I states. Correspondingly, the rate of farmers' suicides

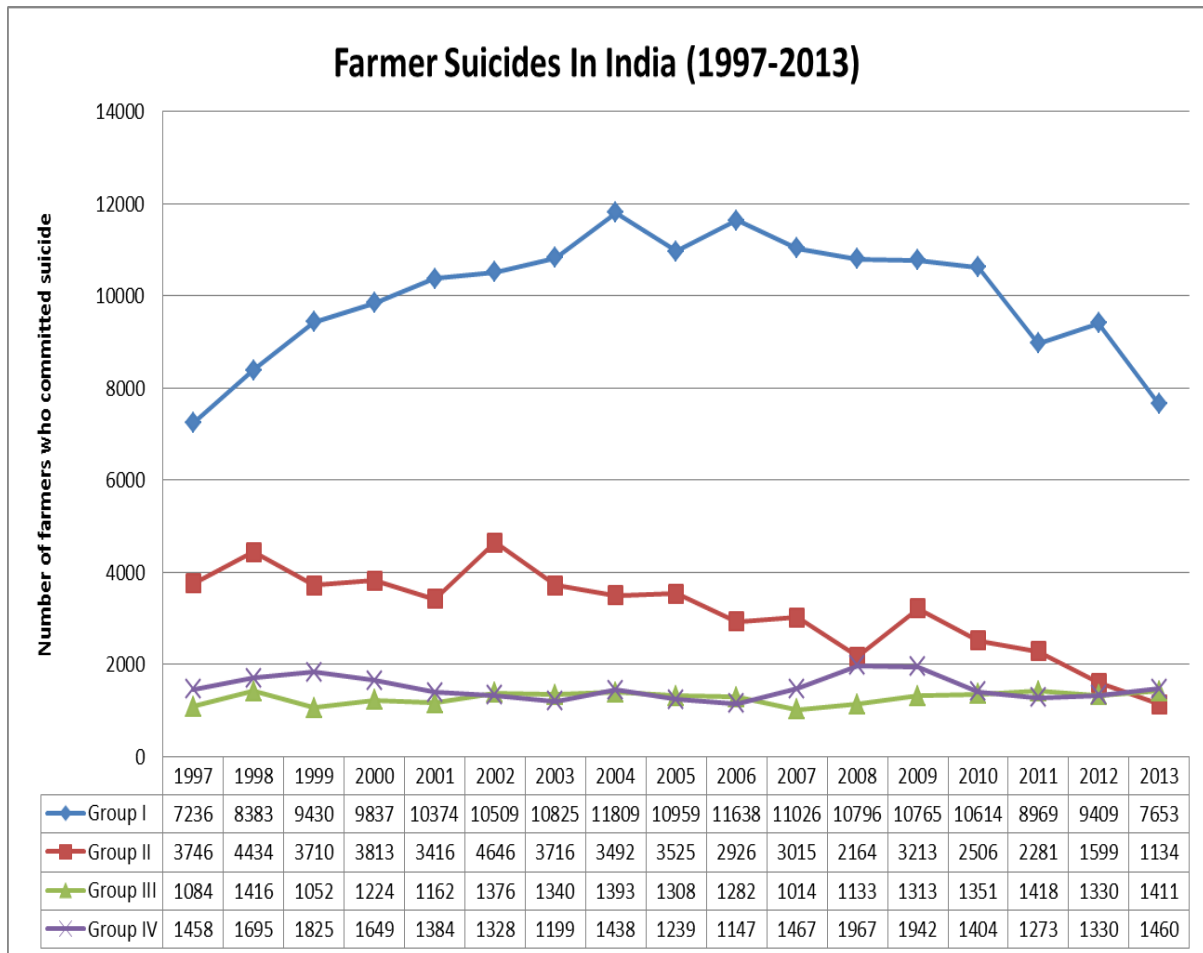
was the highest in Chhattisgarh followed by Karnataka. Andhra Pradesh had the lowest rate of farmers' suicides amongst the group I states.

Amongst the group II states, West Bengal and Kerala have the highest number of suicides however; the farmer suicides constitute only 9% and 10% of the general suicides in these two States.

State	Farmer Suicide	General Suicide	Farmer suicide as a % of all suicides	Rate of Suicides (per lakh population)			
				rate of farmer suicide (main only)	rate of farmer suicide (Main+Marginal)	General suicide rate	Non-farmer suicide rate
Group I							
Andhra Pradesh	2206	15077	14.63	11.44	9.40	19.26	23.47
Chhattisgarh	0	6756	0.00	0.00	0.00	29.37	48.58
Karnataka	2100	12622	16.64	18.82	15.29	22.52	24.87
Madhya Pradesh	1326	9259	14.32	8.93	6.02	14.21	18.40
Maharashtra	3337	15947	20.93	14.80	12.81	15.48	16.39
Group II							
Goa	1	293	0.34	2.87	1.72	21.59	22.47
Kerala	830	8431	9.84	56.69	41.64	27.24	26.25
Tamil Nadu	623	15963	3.90	5.62	4.50	23.87	28.94
Tripura	20	703	2.84	4.46	3.08	20.98	25.28
West Bengal	807	16492	4.89	8.01	5.27	19.65	22.85
Group III							
Assam	312	2726	11.45	7.72	5.28	9.74	10.93
Gujarat	578	6382	9.06	6.26	4.70	11.61	13.59
Haryana	384	3245	11.83	13.45	9.58	14.12	15.07
Orissa	144	5241	2.75	2.53	1.33	13.68	18.55
Group IV							
Bihar	83	795	10.44	0.56	0.32	0.87	1.08
Himachal Pradesh	46	443	10.38	4.65	2.06	7.01	9.72
Jammu & Kashmir	14	287	4.88	1.93	0.78	2.58	2.92
Jharkhand	94	1212	7.76	2.90	1.14	4.13	5.30
Punjab	98	966	10.14	3.30	2.78	3.77	3.93
Rajasthan	268	4348	6.16	2.23	1.44	7.10	9.56
Uttar Pradesh	645	4843	13.32	2.55	1.65	2.70	2.99
Uttarakhand	25	317	7.89	1.93	1.26	3.46	4.07
INDIA	14027	135585	10.35	7.70	5.33	12.35	14.56

Note: The farmer population consists of both main and marginal cultivators and agricultural labourers.

In 2011, amongst the Group I states, Andhra Pradesh had the second highest number of farmers' suicides preceded only by Maharashtra. The rate of farmers' suicides at 10 per lakh of the total agricultural population is higher than the national average of 5 per lakh. In the group III states, Assam and Haryana record the highest rate of farmers' suicides.



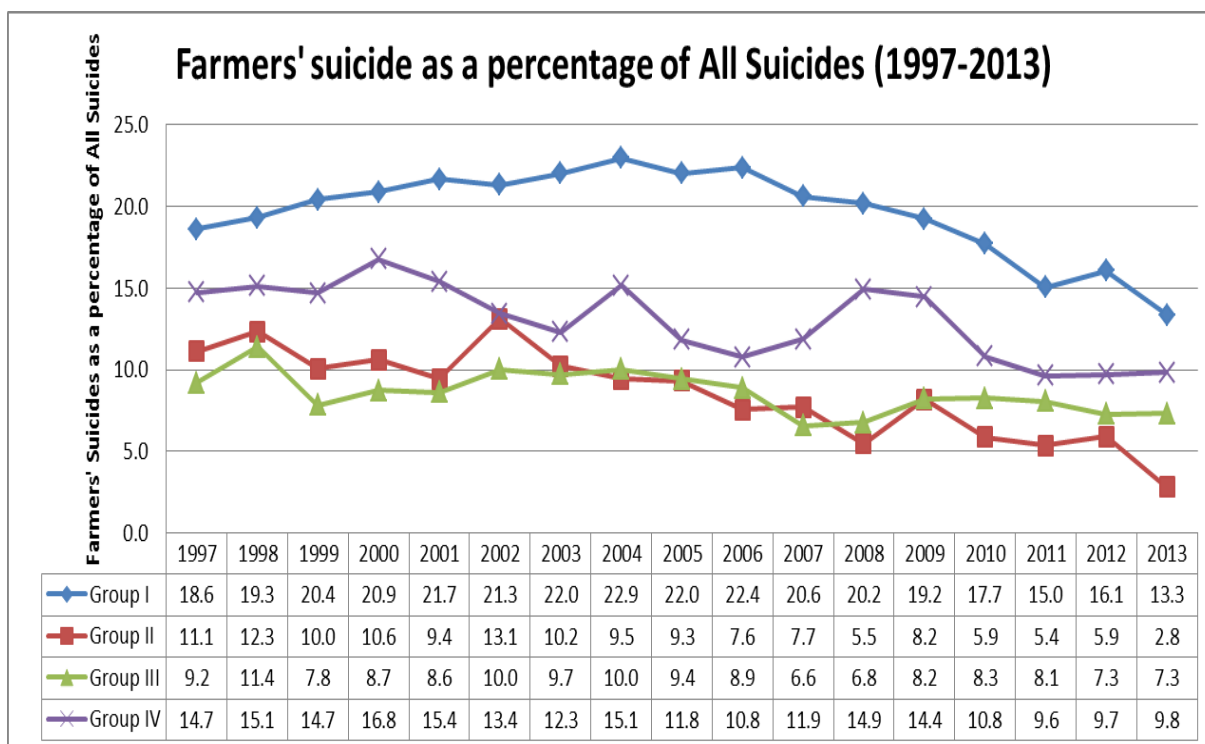


Figure 2 (e). Farmers' suicides as a percentage of all suicides for major Groups of States.

2.7 Regional pattern of Farmers' suicide in India and its implications on the Agrarian Situation:

Most of the suicides from 1997-2015 have been reported primarily from five States including Maharashtra, Karnataka, Andhra Pradesh, Madhya Pradesh and Chhattisgarh which has been referred to as the “Big Five”. These are also the States which have recorded higher levels of Economic growth except Madhya Pradesh (including Chhattisgarh). The pertinent question that arises is why haven't been reported from relatively poorer states such as Bihar, Jharkhand or even the north-eastern States. Also, what merits attention is the fact that in these States referred to as the “Big Five” the farmers' suicides as a percentage of general suicides is high for almost all the years. Thus, the peculiarities of these regions or the “suicide hotspots” need to be analysed vis-à-vis the relatively poorer regions and therefore identify the commonality between these distressed regions.

Following commonalities can be traced with respect to the suicide prone belts of India:

- a. These suicide prone-belts are not continuous in nature rather are the enclaves of fragile ecological regions amidst prosperous states for an instance the Vidharba and Marathawada region of Maharashtra, Telangana and Rayalseema region of Andhra

Pradesh, Northern region of Karnataka, Malwa belt of Madhya Pradesh and Chhattisgarh, mountainous region of Kerala consisting of Idukki and Wayanad. These suicide hotspots are regarded as the most backward regions within their respective States and are below average than other regions of the State on almost all development indices (Vasavi, 2012).

- b. These States are also the ones which have been staunch supporters of the Economic reforms and have promoted the model of Economic Liberalisation on a large scale and the agricultural sector was no exception to it. The Economic policies adopted by these States has largely give a specific preference to the urban over the rural and have also allowed the infusion of capital and capitalists into the rural areas where on the one hand State has withdrawn from investment in public infrastructure but on the other hand, the private investment has been found to be higher than the National average (Mishra and Reddy, 2008).
- c. A major commonality between these States is also the shift from food grains to cash crops. The regions which were earlier known for the cultivation of coarse food-grains such as millets have shifted to high value capital Intensive cash crops such as groundnut, cotton, and other horticultural crops for an instance Bidar district of Karnataka which has been known for the cultivation of millets and pulses has seen a shift towards water intensive crops such as cotton, groundnut and tobacco in its drier belts; farmers in Idukki and Wayanad districts of Kerala have taken to more riskier high value crops such as Vanilla (Vasavi, 2012).
- d. These regions have also recorded an unprecedented increase in the use of agricultural inputs such as fertilisers, pesticides, etc (Bhalla and Singh, 2009) and also an overall increase in the cost of cultivation as compared to other regions within the same State or in comparison to other States which are cultivating majorly food crops.
- e. A high level of Indebtedness is yet another commonality. These States have witnessed a tremendous increase in the number of private money-lenders and an increase in the inter-linkages in the market. This phenomenon has been described by Vakulabharanam as “Distress inducing growth” which means the inter-linked market along with the growing need for inputs sourced from the market, increasing cost of cultivation and non-remunerative income from cultivation traps the agriculturalist into a never ending cycle not only of debt but also of production.
- f. Further, each of these regions is also witnessing a tripartite exposure to vulnerability in the form of Economic, ecological and social crisis.

2.8 Farmers' Suicides and Size class of farmers:

In the year 2015 maximum suicides have been reported from Maharashtra followed by Karnataka, Telangana, Madhya Pradesh, Chhattisgarh and Andhra Pradesh.

Further, it can also be seen that maximum suicides have been committed by small and marginal farmers. Additionally, agricultural labourers too are highly prone to suicides. A cause of such a high level of suicides amongst agricultural labourers can be the lack of employment available to them in the rural areas especially in States like Telangana and Andhra Pradesh where maximum number of agricultural households is dependent on cultivation as the major source of income. Given the limited income diversification options in these states, landless, small and marginal cultivators are highly vulnerable to agrarian distress.

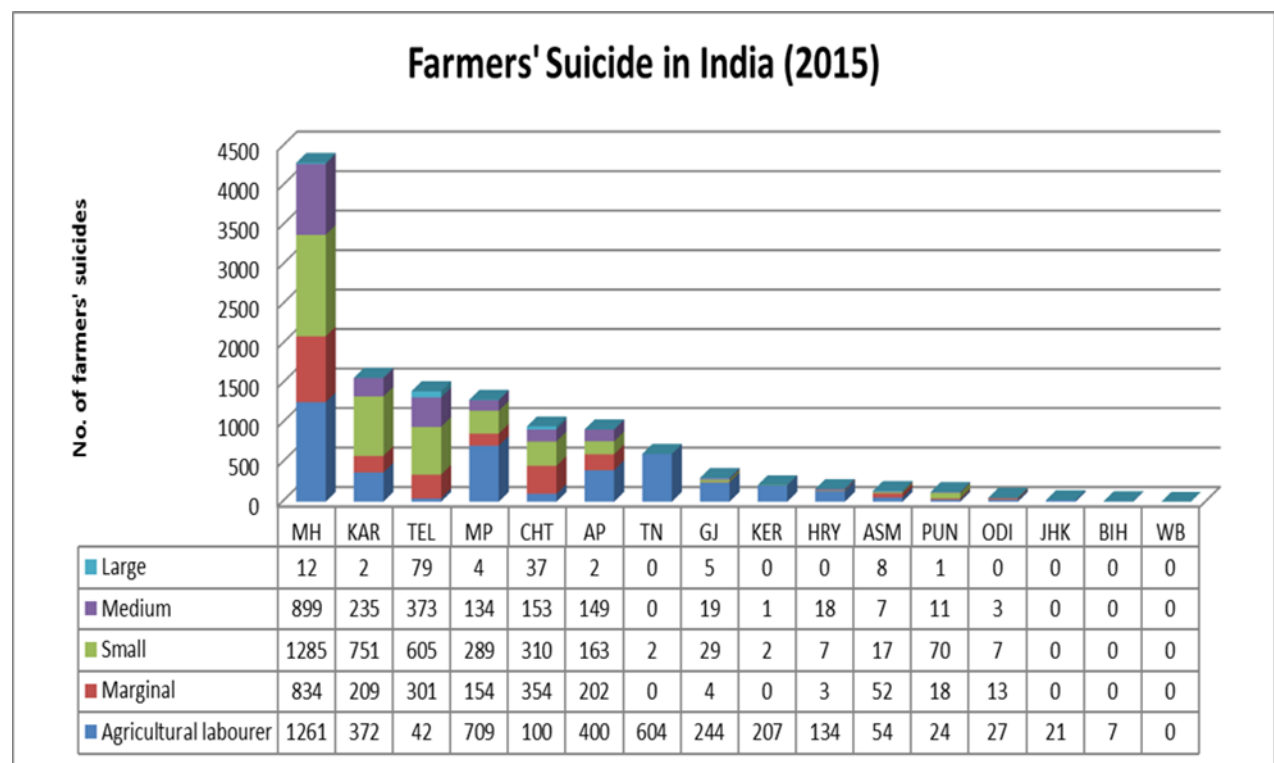


Figure 2 (f). Farmers' suicides across major size classes of farmers for major states.

However, there doesn't seem to be a direct relationship between farm size and the farmers' suicides suggesting that the agrarian crisis may not be restricted to particular class of farmers but rather to the whole farming community barring large farmers due to their relatively better position to ward off the economic and socio-political vulnerabilities.

Table 2.5 Farmers Suicides & General Suicides in Major States across India (2015)									
	General suicides	Cultivator	Tenant	Agricultural labourer	total agricultural pop	Farmer suicide as a % of all suicides	cultivator as % of farmers suicides	tenant as % of all farmers' suicides	agricultural labourer as % of all farmers' suicides
<i>Group I</i>									
Andhra Pradesh	6226	390	126	400	916	14.71	42.6	13.8	43.7
Chhattisgarh	7117	769	85	100	954	13.40	80.6	8.9	10.5
Karnataka	10786	1127	70	372	1569	14.55	71.8	4.5	23.7
Madhya Pradesh	10293	472	109	709	1290	12.53	36.6	8.4	55.0
Maharashtra	16968	2826	204	1261	4291	25.29	65.9	4.8	29.4
Telangana	10138	1209	149	42	1400	13.81	86.4	10.6	3.0
AP+Tel	16364	1599	275	442	2316	14.15	69.0	11.9	19.1
TOTAL	61528	6793	743	2884	10420	16.94	65.2	7.1	27.7
<i>Group II</i>									
Goa	302	0	0	0	0	0.00	0.0	0.0	0.0
Kerala	7692	2	1	207	210	2.73	1.0	0.5	98.6
Tamil Nadu	15775	2	0	604	606	3.84	0.3	0.0	99.7
Tripura	746	0	1	48	49	6.57	0.0	2.0	98.0
West Bengal	14602	0	0	0	0	0.00	0.0	0.0	0.0
Puducherry	711	0	0	12	12	1.69	0.0	0.0	100.0
TOTAL	39828	4	2	871	877	2.20	0.5	0.2	99.3
<i>Group III</i>									
Assam	3231	37	47	54	138	4.27	26.8	34.1	39.1
Gujarat	7246	37	20	244	301	4.15	12.3	6.6	81.1
Haryana	3545	20	8	134	162	4.57	12.3	4.9	82.7
Odisha	4087	18	5	27	50	1.22	36.0	10.0	54.0
TOTAL	18109	112	80	459	651	3.59	17.2	12.3	70.5
<i>Group IV</i>									
Bihar	516	0	0	7	7	1.36	0.0	0.0	100.0
Himachal Pradesh	543	0	0	46	46	8.47	0.0	0.0	100.0
Jammu & Kashmir	372	0	0	21	21	5.65	0.0	0.0	100.0
Jharkhand	835	0	0	21	21	2.51	0.0	0.0	100.0
Punjab	1049	69	31	24	124	11.82	55.6	25.0	19.4
Rajasthan	3457	3	0	73	76	2.20	3.9	0.0	96.1
Uttar Pradesh	3902	111	34	179	324	8.30	34.3	10.5	55.2
Uttarakhand	475	0	0	2	2	0.42	0.0	0.0	100.0
TOTAL	11149	183	65	373	621	5.6	29.5	10.5	60.1
All India (ST+UT)	133616	7114	893	4595	12602	9.43	56.5	7.1	36.5

The above table indicates that the cultivators constitute 65% of the total suicides reported in the group I states including Andhra Pradesh, Maharashtra, Telangana, Madhya Pradesh, Chhattisgarh and Karnataka. Andhra Pradesh and Telangana combined have the second highest number of farmers' suicide (2316 farmers).

2.9 Farmer Suicides in Andhra Pradesh:

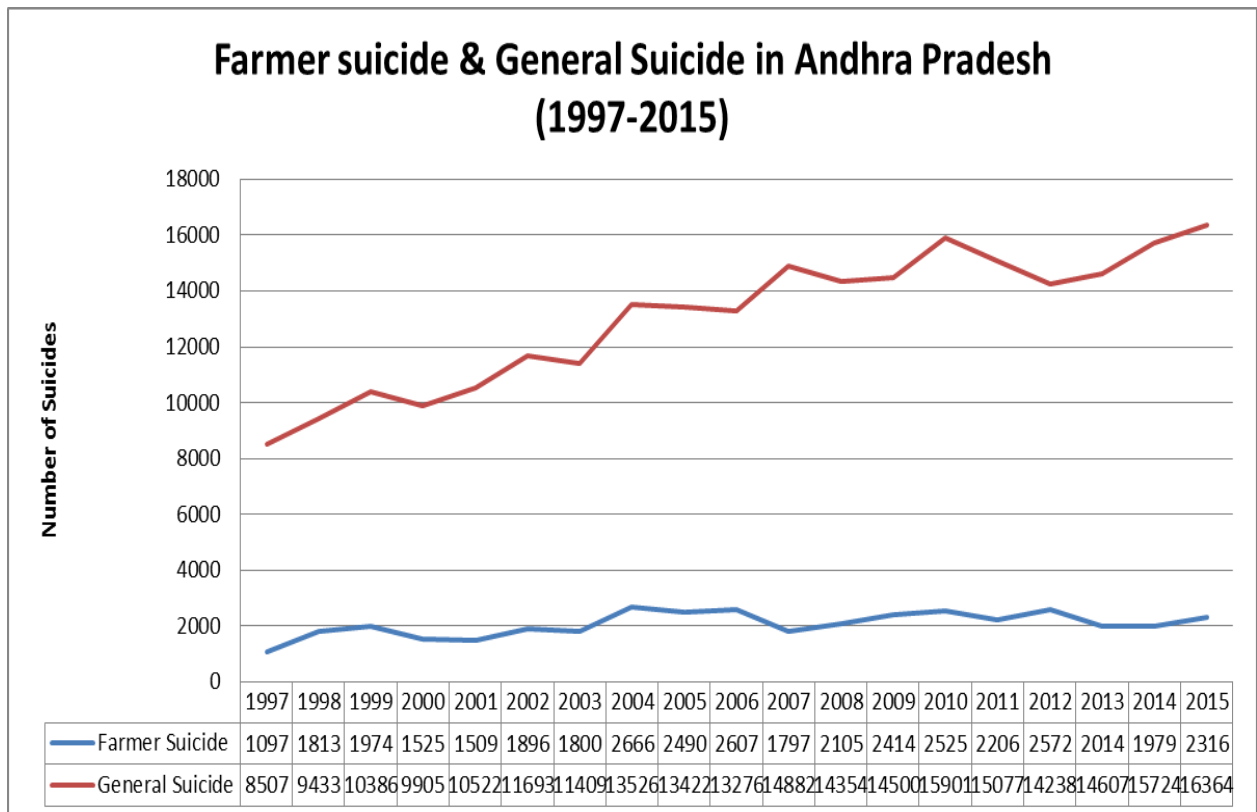
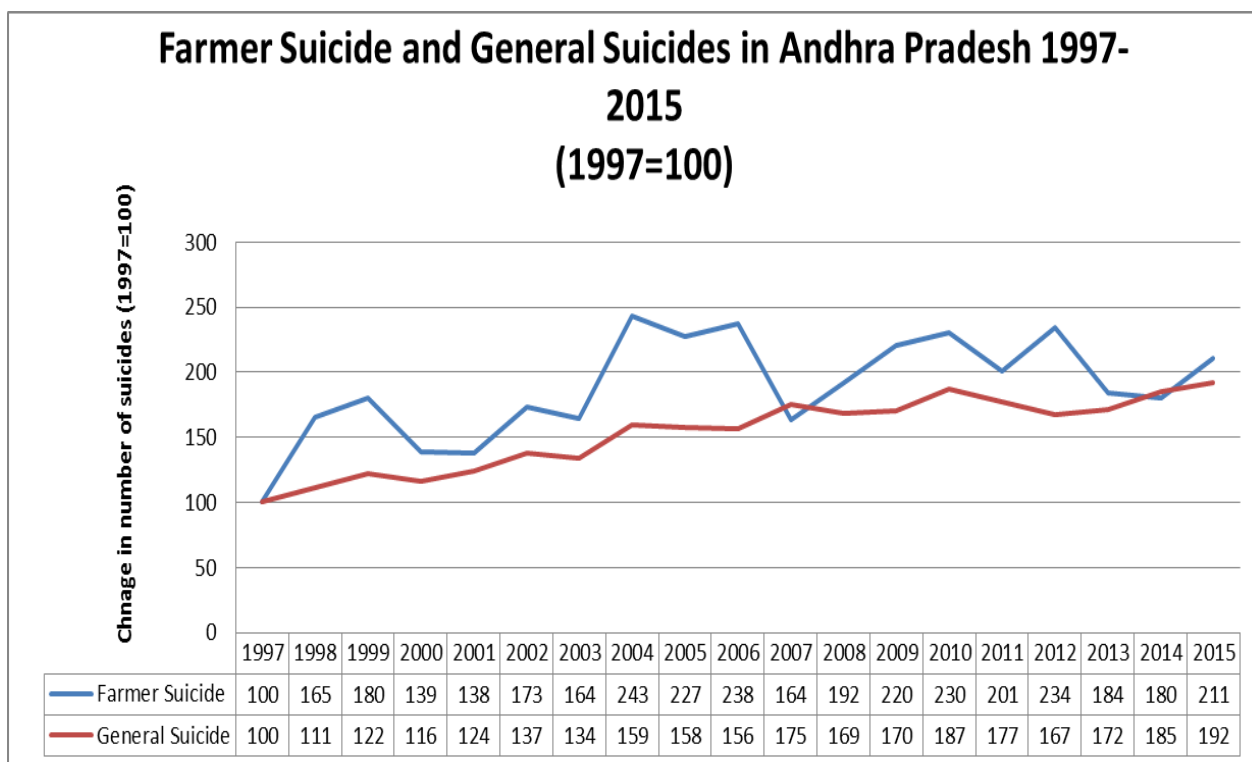


Figure. 2 (g). Farmers' suicide and general suicide in Andhra Pradesh (1997-2015)

Andhra Pradesh has the second largest number of suicides in India and the rate of farmers' suicides is higher than the national average. Also, a high rate of farmers' suicide in comparison to other states belonging to Group II, III and IV makes it an appropriate region for understanding the issues leading to the suicide by farmers at this magnitude and intensity. A total of 39305 farmers have committed suicides in undivided Andhra Pradesh from 1997 to 2015 i.e. on an average 2070 farmers have died annually or six farmers have ended their life almost every day. The highest number of suicides has been reported in 2004 and 2006 (2666 and 2607 farmers' suicides respectively).



The indices for change in farmers' suicides and general suicides indicate that the farmer suicides have increased at a faster rate as compared to the general suicides.

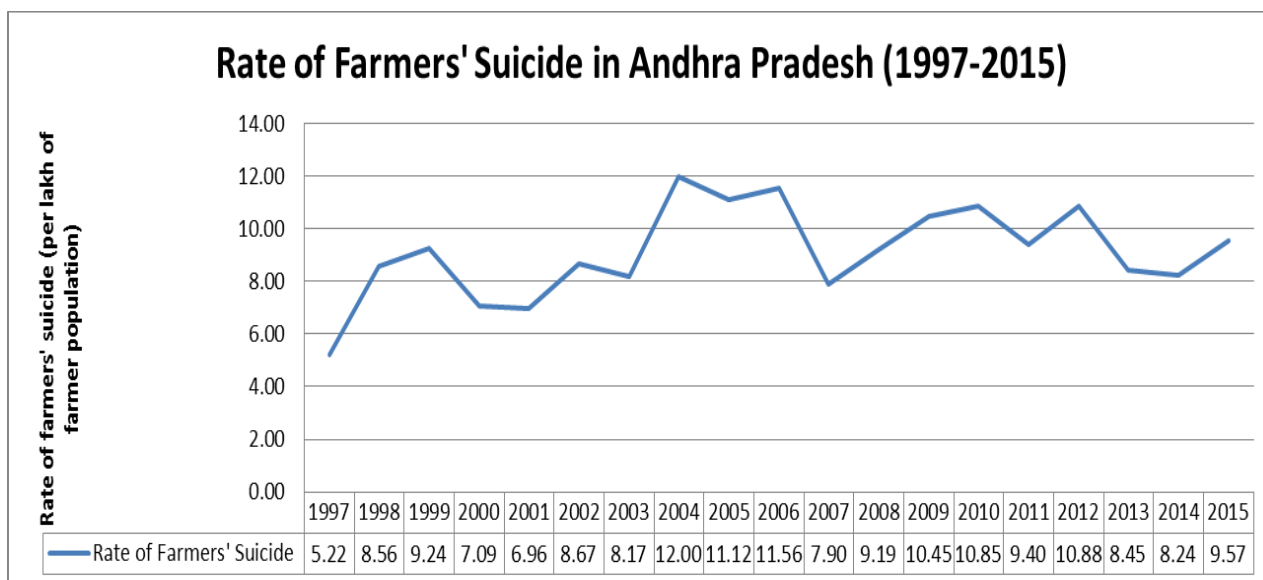


Figure.2 (h). Rate of farmers' suicide in Andhra Pradesh (1997-2015)

The rate of farmers' suicide has increased from 5 per lakh in 1997 to 10 per lakh in the year 2015. The sharp decline in 2007 may correspond to the initial good returns from the cultivation of Bt cotton on the large scale, however, since then, the rate of suicides has been increasing consistently.

Cause of farmers' suicide in Andhra Pradesh:

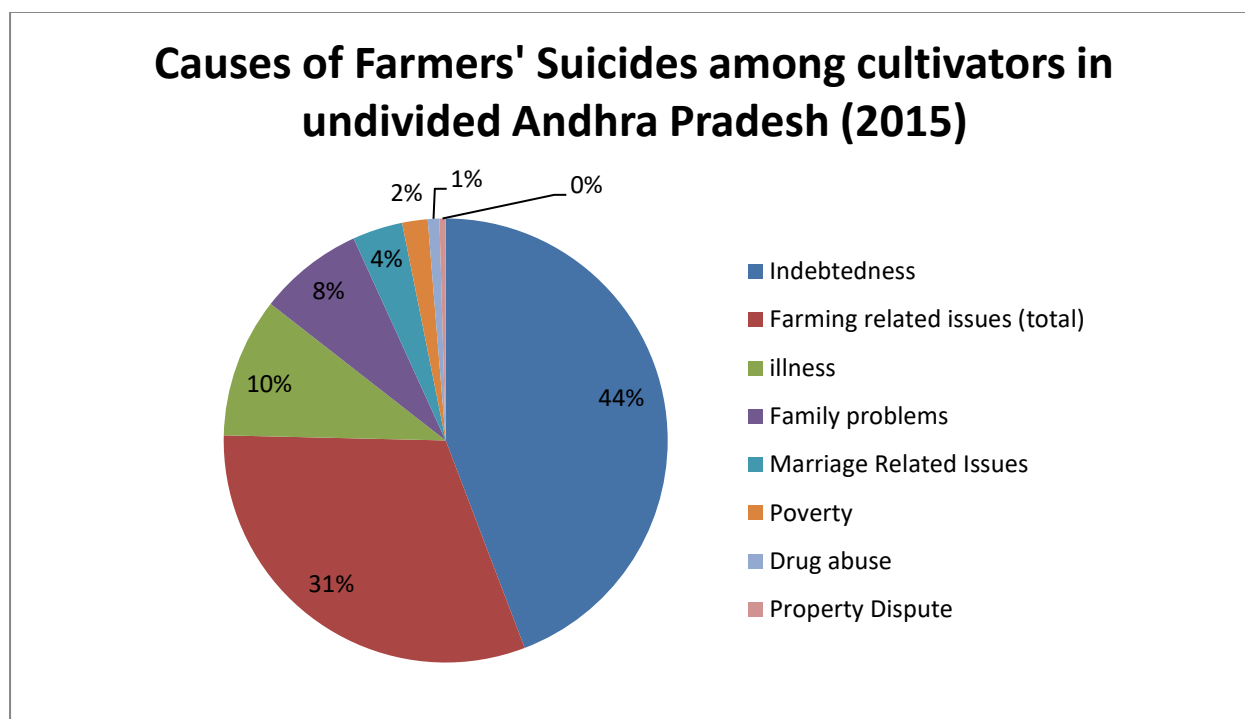


Figure 2 (i) Causes of farmers' suicides among cultivators in undivided Andhra Pradesh (2015)

According to NCRB report, indebtedness and farming related issues constitute almost 75% of the causes of the suicide by farmers (cultivators only; for agricultural labourers the major cause given by NCRB is illness and "others". Also, deaths related to indebtedness constitute merely 7% for the agricultural labourers and suicide related to farming activities hasn't been recorded for the agricultural labourers). For the present analysis farming issues and indebtedness have been separately included because indebtedness among cultivators may also exist due to other factors not necessarily related to agriculture.

Thus, from the above macro-level analysis it is clear that Andhra Pradesh can be regarded as one of the "hot-spots" of farmers suicides in India and the large number of suicides by farmers may be taken to be indicative of the burgeoning agrarian crisis in the State. Additionally, this chapter also tries to give a critique and usefulness of the NCRB statistics in throwing light upon the farmers' suicide and the regional pattern of vulnerabilities arising out of varying levels of development.

Chapter-3

Levels of development and Agrarian condition in Andhra Pradesh

3.1 Introduction: Andhra Pradesh marks a distinct place for itself in what can be termed as a hot-spot of suicides committed by farmers. It is also to be noted that the farmers' suicide is only the "Tip of the ice-berg" and therefore, the larger context of our research today shouldn't be merely giving an account of the suicides in various states but also to reflect upon the impact of agrarian distress upon various category of farmers. It is a surprising thing that most of the farmers suicides have been reported from the highly developed states for example Maharashtra, Kerala, Gujarat, Karnataka, and Andhra Pradesh. However, when one tries to look at the district level picture, it becomes apparent that the poorer districts within these rich States are the ones where the most suicides are reported from for an instance Marathawada and Vidharba region in Maharashtra, Bidar district in Karnataka, etc. So this chapter aims to examine the relationship between levels of development across various regions in Andhra Pradesh and understand the intricacies related to the shaping of agrarian distress in the spatial context.

3.2 Agrarian situation in Andhra Pradesh: Andhra Pradesh can be described as a laboratory for every experiment relating to the neo-liberal policies (Report of Commission for Farmers' Welfare, Government of Andhra Pradesh). It is one of the States where private players have been given an open field to participate and at the same time, the State has conveniently taken a backseat in almost all the regions of the State. The apparent ranking of Andhra Pradesh and Telangana amongst the highest ranking states in the Ease of doing Business Index can be taken as one of the very contemporary instances of the States' openness to economic reforms, entry of foreign capital and a greater focus on manufacturing and service sector in comparison to the agricultural sector. While the general transition from agriculture to non-agricultural sector is considered to be one of the most preliminary steps towards growth and development but when this happens at the cost of the agricultural workers and there isn't adequate apparatus set-up in place to absorb the surplus labour from the agricultural sector, the inequalities so generated are bound to create a wide ranging consequence on the lives and livelihoods of the peasantry. The excessive focus on urban centric path of development often leads to the crisis in the rural areas in general and amongst the agricultural households in particular.

Even though Andhra Pradesh and Telangana have been ranked amongst the top performing States in the “Ease of Doing Business Index” prepared by the Department of Industrial Policy and Promotion (DIPP, 2015) but no one has really bothered to prepare such an Index for Ease of doing Farming even when a large percentage of population is engaged in agricultural activities. Furthermore, the state governments have undertaken several populist measures as well such as waiving the loan of farmers and promoting pro-poor measures in the form of irrigation schemes. Nevertheless, the impact of such schemes has not been analysed. In fact, as Suri, 2008 has clearly highlighted, the excessive dependence on irrigation leading to incurring of higher investments in irrigation with declining water tables is also one of the major factors behind the on-going distressed situation of the farmers. The NCRB statistics records a 322% rise in the farmers’ suicides in Andhra Pradesh from 2014 to 2015. This raises serious concerns regarding the government interventions in the state and also to the impact of this crisis upon lives of the farmers and their families (Samdani, 2017).

It is also alarming that as many as five lakh farmers have migrated from one of the districts of Andhra Pradesh, namely Ananthapuram which has been marked as severely drought hit area since three consecutive years. This distressed migration is nothing but a reflection of the culminating agrarian crisis in the State (Samdani, 2017).

Thus, the present situation of the crisis can be very clearly seen in Andhra Pradesh (and Telangana) in the form of increasing suicides by farmers, an increase in the distressed migration and the agitation by farmers.

3.3 Levels of Development in Andhra Pradesh: In terms of per capita income (at current prices for 2011-12, coastal Southern Andhra emerges out to be the richest amongst all the regions in Andhra Pradesh with a per capita income of Rs. 38, 780 followed very closely by Coastal Northern Andhra (Rs. 38, 508 per capita) and Telangana (Rs. 37, 424). Rayalseema has the lowest per capita income (Rs.32, 678 only). Hyderabad, if included with Telangana then this region has the highest per capita income across all the regions (Rs.40, 650). However, Hyderabad is not included in the analysis because the analysis is primarily focused on agricultural population and the regions with substantial population engaged in agriculture and agricultural activities.

Region	Average per capita income	Coefficient of variation (%)
<i>Coastal Northern Andhra</i>	38508	32.03
<i>Coastal Southern Andhra</i>	38780	13.50
<i>Rayalseema</i>	32678	2.10
<i>Telangana</i>	37424	25.72

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

Even though per capita income is a very basic indicator of growth and development in a region, this is used to regionalise the study area because per capita income gives a very proximate idea about the living conditions in an area. Further, the study makes use of NSS regions to divide Andhra Pradesh. There are five NSS regions in Andhra Pradesh which are categorised according to agro-ecological conditions. These regions are Coastal Northern Andhra, Coastal Southern Andhra, inland North-western Andhra, inland North-eastern Andhra and inland southern Andhra. The inland North-western region and north-eastern region together constitute Telangana and inland Southern Andhra corresponds to Rayalseema region. While the general regionalisation of Andhra Pradesh is done as Coastal Andhra, Rayalseema and Telangana, the present analysis divides coastal Andhra Pradesh into Coastal Southern Andhra and Coastal Northern Andhra since the southern Coastal Andhra region was benefitted by the green revolution significantly when the coastal northern Andhra region, Rayalseema and Telangana were completely by-passed (Galab, Revathi and Reddy, 2009), and therefore, resource rich Southern Coastal Andhra is the most developed region amongst all the regions in Andhra Pradesh. Thus, in order to study the spatial tessellation of farmers' suicides and the agrarian crisis with the differential levels of development, four regions have been considered here.

It has been said that the crisis has been shaped by the policies of economic reform and the forces of globalisation wherein the people living in the rural areas have been excluded or left out from the process. However, it is merely a myth that they have been excluded. In fact, there has been an attempt towards greater incorporation of rural people into the market system but at the same time there exists an entrenched bias against these people which is largely an outcome of their inability to participate equally. They have been constrained considerably by the dearth of capital, limited bargaining power, poor say in the political landscape and their excessive dependence on the State. It is therefore felt that areas which

were traditionally backward and under-developed have been negatively affected far more adversely than the historically developed regions.

Further, it is apparent that different regions have participated differently with the economic forces which were unleashed in the wake of the economic reforms and the regions that have been traditionally backward have been unable to adapt to the changes introduced. Thus, backward regions of Andhra Pradesh namely Rayalseema and Telangana have been more susceptible to the distress than Coastal Andhra which is a relatively well endowed region (Galab and Revathi, 2014). Thus it is believed that the present situation of agrarian crisis is inversely related to the extent of the irrigation cover available in the region. Therefore, even though the crisis is largely present in the entire State of Andhra Pradesh but the farmers in drier regions are placed at a far more vulnerable position due to the compound effect of droughts and other socio-economic factors (Report of Commission on Farmers' Welfare, Government of Andhra Pradesh). There exists wide ranging disparities in Andhra Pradesh. These disparities though historical in origin are accentuated by the development trajectory adopted by the State after independence.

3.4 Regional disparities in Andhra Pradesh:

Historical background: More often, the present situation of agrarian crisis is blamed to be an outcome of the neo-liberal policies adopted in the wake of the economic reforms of 1991 but the regions like Telangana don't only suffer due to the impact of reforms but bears a double burden of historical backwardness and domination superimposed upon by the reforms under the liberalised regime. The formation of Andhra Pradesh was brought about the merger of Madras and Hyderabad under the Nizam. The princely States were not only poorly administered during the pre-independence period but they were also subjected to semi-feudalism (Venkatanarayan, 2004). Therefore, Telangana has been historically the most backward state even amongst the princely states.

The merger of these two separate regions namely Telangana and Andhra has been described as the merger of capitalism and feudalism where Andhra was majorly described as capitalistic and Telangana as feudalistic (Srinivasulu, 1997).

The present state of Telangana has been described as a historical process of domination and subordination. Various theories have been proposed to explain it for example; the theory of internal colonisation has been used to describe the backwardness prevalent in Telangana

(Regional Domination and Agrarian Distress in Telangana). Internal colonisation refers to a phenomenon where in there exists a conflict between the core and periphery where the core is considered to be exploiting the periphery. The classical economic theories have categorically mentioned that the process of growth and development can't happen at all places together and therefore, the core and periphery are bound to exist but in the long run, the benefits of growth will be shared by all the regions collectively (World Development Report, 2008). Further, internal colonialism describes a situation where in the nation is characterised by a dualism where some regions develop at the cost of other regions within a country. This unequal term of integration between regions has been described as Development of underdevelopment by Andre Gunde Frank. The complex situation that arises here is not about the integration of the core and the periphery but with an inappropriate integration between them. Frank highlights that the backwardness of the peripheral regions is not because of not being integrated with the core but the very integration with the core is the cause of underdevelopment and it leads to a vicious cycle of development of underdevelopment (Andre Gunde Frank, 1969). The only way Frank suggests to overcome this phenomenon is to disassociate completely with the core.

The integration of Telangana with Andhra thus represents such a situation of Development of underdevelopment and therefore the backwardness of Telangana can be traced to the unequal terms of integration. Therefore as Frank identified, various institutionalised mechanisms ensure this internal oppression perpetuates and continues unabated (Frank, 1969). Blauner has described four components of colonisation which works in tandem to establish colonialism successfully. The first deals with the mechanism of entry of colonial forces; voluntarily or forcefully followed by a policy 'prescription' as a second component to it which aims to either transform or dismantle the existent livelihood, culture, values etc. Therefore, as a third component to it, the colonial masters try to administer the lives of the colonized. Finally, as the fourth and final component of colonisation, a relationship of superior and inferior is established so that the subordination is readily accepted (Regional Domination and Agrarian Distress in Telangana).

The present situation of the peasantry can thus be understood by this theorisation. As a means to propagate internal colonialism, Andhra Pradesh was merged with Telangana. While the merger was brought about on linguistic basis but the administrators had the notion of planned economic development in their hindsight. Therefore, it would not be appropriate to say that the objective of the merger was to further deepen the backwardness of the region but the trickle down of growth and development. However, the political conditions were such that

the farmers in the coastal Andhra Region, especially those in Southern Coastal Andhra benefitted tremendously from the Green Revolution because it was relatively well endowed with sources of irrigation. Along with this, the already better off farmers in the region were able to maximize the benefits accrued to the region by building political pressure to focus on the development of irrigation of prosperous regions of coastal Andhra and not Rayalseema and Telangana. Therefore, the inroads for Capitalism in these historically backward regions were established with the merger of the States. This was followed by a policy prescription under the liberalised regime wherein shifting to cultivation of cash crops was described as a way out of backwardness. The manifold increase in the area under cash crops especially in the regions which were earlier cultivating coarse cereals and other food crops can be seen as evidence to this prescription. Further, with tools like the Minimum Support Price, the State now clearly dictates the choices relating to the crops to be grown by the farmers for an instance, the adoption of rice wheat combination in place of other cereals in states like Punjab and Haryana signifies the role played by MSP in dictating farmers choices related to cropping. Similarly, the increase in area under oilseeds after the announcement of MSP for oilseeds suggests the same. Additionally, the entire view of rural as anti-economy (Vasavi, 2012) has led to the notion that since rural is inferior, only the State can uplift it out towards the light of development. There is a growing tendency to consider agriculture as a sector inferior to manufacturing and services; considering the farmer inferior to people engaged in other secondary and tertiary sector activities; considering the rural as a banal space (Robert Woods). As a consequence to this, agriculturalists also have accepted that the State is the only saviour. The outcry by farmers to provide loan waivers rather than asking for more allocation of resources to agriculture somewhat signals the acceptance of farmers of this imposed superior-inferior relationship.

Coastal Andhra is particularly well developed in comparison to Rayalseema and Telangana region because during the time of Britishers itself, irrigation projects were initiated across the Krishna and Godavari rivers thus benefitting coastal Andhra in general and districts namely Krishna, Guntur, East and western Godavari more specifically. Also, commercial form of agriculture was thus initiated in the region. The surplus so generated led to the upliftment of lives of people engaged in agriculture especially after independence.

Disparities following the Green Revolution: The green revolution technology was boasted upon as a panacea for all classes of farmers because it was described as a scale neutral technology but eventually, the large farmers were benefitted greatly due to the fact that the

institutional setup required for the adoption of green revolution was readily suited for the medium and large farmers (Bhattacharya, 1976). Therefore, with the introduction of green revolution, richer farmers in coastal southern Andhra benefitted more than farmers in other parts of the state due to access to better irrigation and a good deal of support from the political class as well.

State's Response to the Economic reforms and impact on regional disparities: It has been highlighted in various studies that though Globalisation has immense potential for accelerating the economic growth but at the same time it may not be successful in improving the lives and livelihoods of the poor and marginal (Aggarwal, 2006). The very nature of Globalisation which integrates different regions in the most diverse manner leads to differential outcomes across regions. Murshed, 2002 has further argued that globalisation increases the level of poverty by further increasing the marginalization of the already marginalised. This is what has been described as the have(s) and haven't(s) and the gap between them may increase with the onslaught of globalisation for example the impoverishment of poor in Latin America and Africa in the recent times can be seen as an example of this. Therefore, it is imperative upon the state to take care of the welfare needs of the marginal and vulnerable population. The primary activities such as agriculture often employs some of the poorest and most marginalised people in a country and therefore, agriculture remains as a special sector which needs to be supported by the State.

Since, agriculture is a state subject, the onus lies upon the state to ensure agricultural development and protect the interest of the agricultural households. There were no specific reforms which were initiated for the agricultural sector when the economic reforms were introduced. In this scenario, Andhra Pradesh government adopted the reforms full throttle and neglected the welfare issues of farmers almost entirely. As a result, just as was happening at the National level, Andhra Pradesh followed suit and declined to provide for the welfare of the farmers. This was apparent with the decline in capital formation in agriculture; not only were the major irrigation projects stalled before completion but also the available sources not maintained properly and simultaneously the irrigation charges were increased considerably.

Additionally, as highlighted by a working paper of Department of Agriculture (1999), Andhra Pradesh, it was observed that the State not only withdrew itself from the extension services but also opened it up for the private sector. The State agriculture extension was completely eroded with the provision of any qualified graduate to become a seed, pesticide and fertiliser

dealer. Also, surveys related to soil health, market conditions etc. was left for the private sector. Thus there was a complete erosion of all the public institutions pertaining to agriculture.

Regional variation in rainfall: The annual rainfall in the region Coastal Andhra varies between 70 and 150 cm. Even though this region receives more rainfall than the Telangana and Rayalseema region but the level of rainfall varies considerably since the rainfall received by the northern and central coastal Andhra is considerably more than the southern coastal Andhra. Also, the southern Coastal Andhra region receives almost 60 per cent rainfall from the north-east monsoon whereas northern and central coastal Andhra receive maximum rainfall from the south-west monsoon. Further, the variation of rainfall is higher in southern Coastal Andhra than other the northern region.

The Rayalseema region of Andhra Pradesh is the driest region of the State. It receives rainfall in the range of 60cm and less predominantly in the summer season (South-west monsoon).

Telangana region receives rainfall between 75 and 100 cm during the South-West monsoon. Hence, the climatic variations in these four regions make them diverse regions but this diversity is translated to lead to disparities because of the policies adopted by the government wherein cultivation of water-intensive cash crops was considered to be a panacea for development of backward regions such as Telangana and Rayalseema. As a result, there was a push by the State to promote cultivation of crops which were otherwise unsuited for the adequate sources of irrigation and excessive dependence on rainfall; the farmers are trapped in the gamble with the monsoon.

3.5 Levels of development and agrarian distress in Andhra Pradesh:

<i>Table 3.2 Farmers' suicides across various regions in Andhra Pradesh (1999-2012)</i>																
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	Farmers' suicides (%)
Telangana	1550	943	995	1245	1295	2030	1802	1932	1071	1575	1213	1536	1316	1576	20079	66.74
Rayalseema	183	496	328	409	189	241	318	322	373	145	564	352	274	405	4599	15.29
Coastal Southern Andhra	101	33	43	81	153	188	172	193	215	184	218	374	376	409	2740	9.11
Coastal Northern	140	53	143	161	163	207	198	160	138	201	419	263	240	182	2668	8.87
Andhra Pradesh	1974	1525	1509	1896	1800	2666	2490	2607	1797	2105	2414	2525	2206	2572	30086	100

Source: The data for farmers' suicides across various regions (has been taken from Galab and Revathy, 2009, and Andhra Pradesh Rythu Sangam. The data for Telangana has been computed by subtracting the annual figures for Andhra Pradesh from the data provided by Andhra Pradesh Rythu Sangam for Coastal Northern Andhra, Coastal Southern Andhra and Rayalseema). The source of both these data sets is the National Crime Records Bureau.

<i>Table 3.3 Rate of farmers' suicides across various regions in Andhra Pradesh (1999-2012), per lakh agricultural population</i>															
REGIONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Telangana	19.36	11.65	12.16	15.05	15.49	24.02	21.09	22.37	12.27	17.85	13.60	17.04	14.44	17.11	
Rayalseema	4.33	11.66	7.65	9.47	4.35	5.50	7.21	7.24	8.33	3.22	12.41	7.69	5.94	8.72	
Coastal Southern Andhra	2.35	0.76	0.99	1.85	3.47	4.23	3.85	4.29	4.75	4.04	4.75	8.10	8.09	8.74	
Coastal Northern	2.91	1.10	2.95	3.31	3.34	4.22	4.02	3.24	2.78	4.04	8.38	5.24	4.77	3.60	

Source: as in Table 3.2. The data for agricultural population has been taken from Census of India 2001 and 2011 and includes both main and marginal cultivators and agricultural labourers.

It can be seen from the table above that the maximum numbers of farmers' suicides have taken place in Telangana region followed by Rayalseema and Coastal Southern Andhra. Telangana accounts for 67% of the suicides committed by farmers followed by Rayalseema accounting for another 15% of the suicides. Coastal Northern Andhra has the least number of suicides. Therefore, contrary to the state level picture, farmers' suicides are low in areas which are relatively well developed for an instance, the gross domestic product for coastal northern Andhra is the highest and the number of suicides committed by farmers is the lowest. However, there doesn't exist any linear relationship between level of development and farmers' suicides but one thing that emerges from the above analysis is that within the developed coastal Andhra region, there exists an enclave of some of the poorest districts in Andhra Pradesh which are more prone to the farmers' suicides. The disparities that exist in southern and northern Coastal Andhra depicts that how growth of urbanisation has led to development of underdevelopment in otherwise developed Southern Coastal Andhra region. Southern coastal Andhra has been one of the most developed regions in Andhra Pradesh after the green revolution since the region benefitted the most by green revolution whereas the northern coastal Andhra, Rayalseema and Telangana were by-passed completely (Galab and Revathi, 2014). It can be argued that with the increasing urbanisation, resources which were earlier utilised for the development of agriculture in southern coastal Andhra were diverted to fuel the urbanised manufacturing led growth in northern coastal Andhra. With the availability of factors conducive for urbanisation and industrialisation such as availability of ports, the northern Coastal Andhra region developed not only at the cost of Rayalseema and Telangana but also at the cost of southern coastal Andhra. This skewed pattern of growth and development deepened in the post-reform period which was characterised by a transformation of State from being a regulator to a facilitator.

Therefore, it needs to be analysed in wider details how disparities in the level of development across various regions has shaped the vulnerability of farmers. The analysis in the subsequent section is focused at understanding the spatial variations in the agrarian conditions to bring out the factors that shape the nature of vulnerabilities faced by farmers in different regions of Andhra Pradesh.

3.5.1 Distribution of landholdings:

There has been a traditional farm-size productivity debate which has long argued that small and marginal farms are more efficient than the large farms. The green revolution technology

was largely described to be scale neutral thus bringing in elements of institutional and infrastructural facilities in the analysis of farm size debate. Therefore, size of land holding not only determines the efficiency of the farm but the access to various institutional and infrastructural facilities is also dependent on the farm size for an instance access to credit, irrigation, machinery etc.

More than 50 per cent of the operational holdings in Andhra Pradesh are marginal holdings (less than 1 hectare). In absolute terms, Telangana has the largest number of marginal holdings followed closely by Coastal Northern Andhra and Rayalseema. In relative sense, Coastal Northern Andhra has the maximum percentage of operational holdings as marginal holdings (64%) followed by Coastal Southern Andhra (52%), Telangana (50%) and Rayalseema (44%).

Table 3.4 Estimated number of Operational Holdings by Size Class of Farmers					
(NSS-Region)	Marginal	Small	Semi-Medium	Medium & Large	Total
Coastal Northern Andhra	7,25,609	2,17,728	1,59,454	26,068	11,28,859
Coastal Southern Andhra	5,24,012	2,46,317	1,26,174	97,338	9,93,842
Rayalseema	6,51,814	3,95,390	2,81,797	1,45,081	14,74,083
Telangana	12,71,968	6,36,398	4,80,228	1,50,309	25,38,904
Total	31,73,404	14,95,833	10,47,653	4,18,796	61,35,686

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

Even though the percentage of marginal holdings in Coastal Andhra is comparatively higher than percentage of marginal holdings in Telangana and Rayalseema region but still even the marginal farmers in Coastal Andhra are well placed in comparison to the farmers in other regions since the region is well irrigated and also receives abundant rainfall ((Andhra Pradesh Human Development Report, 2007).

Table 3.5 Distribution of Operational Holdings by Size Class of Farmers (%) (2012-13)					
Regions	Marginal	Small	Semi-Medium	Medium & Large	Total
Coastal Northern Andhra	64.28	19.29	14.13	2.31	100.00
Coastal Southern Andhra	52.73	24.78	12.70	9.79	100.00
Rayalseema	44.22	26.82	19.12	9.84	100.00
Telangana	50.10	25.07	18.91	5.92	100.00
Total	51.72	24.38	17.07	6.83	100.00

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The Gini's coefficient gives an indication of the inequality in the distribution of the operational holdings. It can be clearly seen that the marginal holdings are most unequally distributed in the agriculturally developed region of Coastal Southern Andhra followed by Rayalseema and Telangana.

Table 3.6 Inequality in distribution of operational holdings across various size classes of farmers in different regions of Andhra Pradesh (2012-2013)	
Regions	Gini's Coefficient
Coastal Andhra Northern	0.368
Coastal Andhra Southern	0.496
Rayalseema	0.482
Telangana	0.418
Andhra Pradesh	0.447

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

3.5.2 Cropping pattern: The agricultural economy of undivided Andhra Pradesh is one that of contradictions. While some regions are adequately irrigated, other region namely Rayalseema and Telangana are severely drought prone.

The changes that beset the agricultural sector in Andhra Pradesh involve a phenomenal change in the cropping pattern. This is marked by a greater bend towards commercialisation of agriculture. This tendency as witnessed over the post 1990s has raised the risk and vulnerability of farmers firstly due to a greater dependence on purchased inputs and on a technology that is fundamentally different from the primitive mode of agricultural operations. Secondly, over-exploitation of land and ground water resources along with a higher degree of cultivation of single crops has led to stressing the available natural resources. Furthermore, otherwise unviable for cultivation marginal tracts of land are also being brought under cultivation. This puts an additional burden on the land. Along with this, cash a now form a major part of the input cost which wasn't the case earlier.

The very nature of agriculture makes it a more risky profession than others. This is due to the fact that climatic variations, rainfall patterns, vulnerability to pest and disease are more visible and impactful in agriculture especially in the developing countries. The uncertainties associated with yield and prices further accentuate the vulnerability of the farming households.

The crop economy leads to the division of farmers in two broad groups: farmers with assured returns due to the availability of proper resources and having a manageable input structure; farmers with limited resource base who are exposed to the fluctuations occurring in the factor and product market. The farmers with assured returns are primarily large farmers who have access to stable sources of irrigation. On the other hand, small and marginal farmers especially from rain fed areas have a tough time managing the outputs vis-a-vis prices and productivity. Prevalence of leasing of land means that the farmer will not have direct access to formal credit due to non-availability of title to land. This exposes him to the vagaries of the informal money market (Deshpande, 2002).

Kharif season:

<i>Table 3.7 Cropping pattern across various regions in Andhra Pradesh (2012-13)</i>											
<i>Kharif Season</i>											
	Cereals	Pulses	Sugar	Condi. & Spices	Fruits	Veg	Other food crops	Oilseeds	Fibre	Other non-food	TOTAL
<i>Area under cultivation (hectares)</i>											
Coastal Northern Andhra	860277	18148	5878	9381	30528	7883	59008	44573	44285	34633	1117398
Coastal Southern Andhra	454188	50523	1014	9076	3139	1299	927	27298	298010	16405	862162
Rayalseema	239732	174460	30262	8727	45984	67754	277	1124659	129590	19779	1841902
Telangana	1290401	387965	38014	79372	2472	8841	4546	190656	1551928	1462	3560242
<i>Area under crops (%) of the total area under cultivation</i>											
Coastal Northern Andhra	76.99	1.62	0.53	0.84	2.73	0.71	5.28	3.99	3.96	3.10	100.00
Coastal Southern Andhra	52.68	5.86	0.12	1.05	0.36	0.15	0.11	3.17	34.57	1.90	100.00
Rayalseema	13.02	9.47	1.64	0.47	2.50	3.68	0.02	61.06	7.04	1.07	100.00
Telangana	36.24	10.90	1.07	2.23	0.07	0.25	0.13	5.36	43.59	0.04	100.00

Source: Calculated from NSS 70th Round, Schedule 33 (2012-13).

The cropping pattern in coastal northern Andhra is characterised by a heavy dependence on rice cultivation. Rice alone occupies 70% of the area under cultivation in the kharif Season. Coastal Northern Andhra is also one of the regions having a high percentage of area under fruits and vegetables together accounting for almost 3.5% of the area. This region is predominantly urbanised with major cities such as Vishakhapatnam, Vizianagaram, East and West Godavari. Due to a large percentage of urban population, a diversification towards fruits and vegetables may be helpful provided adequate infrastructural and institutional facilities are made available to the farmers. This region also receives abundant rainfall from the South-west monsoon and therefore, it is well suited for the cultivation of rice.

While the coastal Northern Andhra region specialises in the cultivation of rice, coastal northern Andhra has a more diversified cropping pattern. Rice and cotton are the major crops occupying 52 per cent and 35 per cent of the area under cultivation in the kharif season. However, the region receives lesser rainfall from the south-west monsoon in comparison to the north-east monsoon. Therefore, a heavy dependence of farmers on the cultivation of cotton under un-irrigated conditions (as discussed in the subsequent part, most of the cotton cultivation even in Coastal Southern Andhra takes place under un-irrigated conditions) can make the farmers susceptible to the vagaries of the monsoon.

Rayalseema is predominantly an oilseed cultivating region. Groundnut and Castor seed are the major crops cultivated in the kharif season occupying 43 per cent and 13 per cent of the area cultivated. Further, the area under fruits and vegetables accounting for almost 6.5 per cent of the area is the largest in comparison to other regions. Therefore, the agriculture in Rayalseema is largely commercial in nature. Cereals together constitute only 13 per cent of the area cultivated and pulses another 10 per cent. Therefore, almost 70 per cent of the area is under water intensive crops such as groundnut and castor. Even though, groundnut is covered under the Minimum Support Prices offered by the government, castor seed isn't at all covered by the MSP. This is therefore completely market driven in terms of sale and prices. Additionally, given the agro-ecological conditions in the region, the preponderance of droughts and absence of adequate irrigational facilities, such a cropping pattern in itself is bound to bring in the element of uncertainty to the farmers. The ecological risks are superimposed by the market risks and therefore, the farmers in the region are extremely vulnerable to the crisis.

Telangana region is a major cotton cultivating region in the state of Andhra Pradesh. Almost 44 per cent of the area is under the cultivation of cotton followed by 27 per cent of the area under rice cultivation. Considering that the region is almost un-irrigated, cultivation of cotton is exposed to vagaries of the monsoon. Further, even though area under pulses accounts for 11 per cent of the total area under cultivation, it is predominantly covered by cultivation of Arhar (Red gram), occupying 8% of the total area alone. Arhar is a relatively water-intensive pulse and is exposed to fluctuations in terms of prices.

Rabi Season: There is an excessive dependence on irrigation for the cultivation of crops during the Rabi season. Therefore, there is a decline in the area under cultivation especially in Rayalseema and Telangana region. The area under cultivation in Rabi season is only 29.51%

of the area under cultivation during Kharif season in Rayalseema region of Andhra Pradesh while in Telangana it accounts for 65% of the area under cultivation in Kharif season (calculated using NSS round 70th, Schedule 33, 2012-2013). While the area under cultivation is still high in Coastal Northern Andhra (84% of the area under cultivation during the Kharif Season) due to availability of well-developed sources of irrigation, the area under cultivation in Rabi Season is in fact higher than the area under cultivation in Kharif season (20% increase in area under cultivation during rabi season). This can be explained by two factors; firstly, the region is well endowed with surface irrigation sources and secondly, the region receives significant amount of rainfall from the North-east monsoon.

There is a considerable decline in the area under cultivation of cereals in most of the regions, and there is a sharp increase in the area under cultivation of pulses in Coastal Andhra region including Northern and Southern Coastal Andhra. Area under pulses rather declines in Telangana and Rayalseema accounting for merely 26 and 22% of the area previously under pulses cultivation during Kharif Season. This is a point of concern because pulses consume lesser amount of water than the fibre crops such as cotton and oilseeds such as groundnut. A shift towards pulses during the rabi season which is relatively a drier period could have been beneficial to the farmers but the dependence on cotton cultivation in Telangana and groundnut cultivation in Rayalseema add to the vulnerabilities of the farmers cultivating crops in the rabi season. One of the reasons is that, even though the value of output from cotton cultivation is higher than the value of output from cultivation of pulses or cereals such as rice, the region is ecologically unsuited for the same since there is a lack of rainfall and also there are limited sources of irrigation.

<i>Table 3.8 Cropping pattern across various regions in Andhra Pradesh (2012-13)</i>											
<i>RABI Season</i>											
	Cereals	Pulses	Sugar	Condi. & Spices	Fruits	Veg	other food	Oilseed	Fibre	Other non-food	TOTAL
<i>Area under cultivation (hectares)</i>											
Coastal Northern Andhra	723952	122844	6412	2869	46584	29593	5725	42044	194	24405	1004622
Coastal Southern Andhra	311491	334301	1284	88263	53322	5159	2403	1932	199174	36433	1033762
Rayalseema	74968	39206	3702	2509	71717	63482		275014	1972	10958	543529
Telangana	963030	101595	13763	11289	3501	10680		46931	1159025	2149	2311964

<i>Area under crops (%) of the total area under cultivation</i>											
	Cereals	Pulses	Sugar	Condi. & Spices	Fruits	Veg	other food	Oilseed	Fibre	Other non-food	TOTAL
Coastal Northern Andhra	72.1	12.2	0.6	0.3	4.6	2.9	0.6	4.2	0.0	2.4	100.0
Coastal Southern Andhra	30.1	32.3	0.1	8.5	5.2	0.5	0.2	0.2	19.3	3.5	100.0
Rayalseema	13.8	7.2	0.7	0.5	13.2	11.7	0.0	50.6	0.4	2.0	100.0
Telangana	41.7	4.4	0.6	0.5	0.2	0.5	0.0	2.0	50.1	0.1	100.0

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The cropping pattern in Rabi season is almost similar to the cropping pattern in kharif season for Coastal Northern Andhra; more than 70 per cent area is under the cultivation of cereals predominantly rice. There is a shift towards cultivation of pulses in addition to rice and cotton in Southern Coastal Andhra. In Rayalseema, there is a considerable shift towards cultivation of fruits and vegetables but the cropping pattern remains very similar in Telangana with a slight shift towards cultivation of maize in addition to paddy.

In the rabi season, rice alone occupies 65 per cent of the area under cultivation in Coastal Northern Andhra. Cotton occupies the highest percentage of area in Southern Coastal Andhra (19 per cent) followed by urad (16.25%), rice (13.69%) and maize (13.62%). Also, chillies occupy 8 per cent of the area under cultivation in coastal northern Andhra. Chillies and cotton are therefore two crops which add to the vulnerability of the farmers due to greater dependence on market forces and also ineffective procurement by Cotton Corporation of India. Further, there is no MSP for chillies and prices for chillies are constantly fluctuating.

Rayalseema continues to have a greater dependence on groundnut cultivation occupying 18 per cent of the area under cultivation in rabi season followed by sunflower (14%). There is a greater dependence on fruits and vegetable cultivation (13.2 and 11.7 % of the area under cultivation). Cotton (50%) and rice (30%) are the major crops grown in Telangana during the rabi season.

Cropping pattern (Total):

<i>Table 3.9 Cropping pattern across various regions in Andhra Pradesh (2012-13)</i>											
TOTAL (July 2012-June 2013)											
	Cereals	Pulses	Sugar	Condi. & Spices	Fruits	Veg	Other food crops	Oil seeds	Fibre	Other non-food	TOTAL
<i>Area under cultivation (hectares)</i>											
Coastal Northern Andhra	1584229	140991	12290	12250	77112	37476	64733	86618	44479	59038	2122020
Coastal Southern Andhra	765679	384823	2298	97339	56461	6458	3330	29230	497184	52837	1895924
Rayalseema	314700	213666	33965	11237	117701	131236	277	1399673	131562	30736	2385431
Telangana	2253431	489560	51777	90662	5972	19520	4546	237588	2710953	3611	5872206
<i>Area under crops (%) of the total area under cultivation</i>											
Coastal Northern Andhra	74.66	6.64	0.58	0.58	3.63	1.77	3.05	4.08	2.10	2.78	100
Coastal Southern Andhra	40.39	20.30	0.12	5.13	2.98	0.34	0.18	1.54	26.22	2.79	100
Rayalseema	13.19	8.96	1.42	0.47	4.93	5.50	0.01	58.68	5.52	1.29	100
Telangana	38.37	8.34	0.88	1.54	0.10	0.33	0.08	4.05	46.17	0.06	100

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

According to the annual allocation of land for cultivation of various crops, it can be very clearly seen that rice is the predominant crop in Coastal Northern Andhra whereas Southern Coastal Andhra has a very diversified cropping pattern consisting of rice, pulses and cotton. On the other hand, Rayalseema specialises in groundnut and castor seed cultivation; Telangana in cotton cultivation followed by rice and maize. Therefore, the cropping pattern is very different in all the four regions of Andhra Pradesh.

3.5.3 Value of output:

Table 3.10 Value of output and aggregate yield across various regions in Andhra Pradesh (Rs./Ha)			
	Total Value of output (Rs.'0000)	Total Land under cultivation (Ha)	Aggregate Yield (Rs./Ha)
<i>Kharif</i>			
Northern Coastal Andhra	5294672	1117398	47384
Southern Coastal Andhra	5685507	862162	65945
Rayalseema	6976526	1841902	37877
Telangana	18317810	3560242	51451
<i>Rabi</i>			
Northern Coastal Andhra	7274554	1004657	72408
Southern Coastal Andhra	7850160	1033762	75938
Rayalseema	3422833	543529	62974
Telangana	9447798	2311964	40865
<i>Total</i>			
Northern Coastal Andhra	12569226	2122055	59231
Southern Coastal Andhra	13535667	1895924	71394
Rayalseema	10399359	2385431	43595
Telangana	27765608	5872206	47283

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The value of output per hectare is the highest for Coastal Southern Andhra in both Kharif and Rabi season (Rs.65, 945 per hectare in Kharif season and Rs.75, 938 in Rabi season). Even though the underlying institutional arrangements and irrigation facilities are very similar in both these regions of coastal Andhra but still the cropping pattern is significantly different, a larger area under cultivation of cotton in Southern Andhra explains the difference in the value of output per hectare in both the seasons. It is also interesting to note that the overall value of output per hectare is the lowest in Rayalseema (Rs.43, 595 per hectare). The annual value of output per hectare is the highest in Southern Coastal Andhra (Rs.71, 394 per hectare) followed by Northern Coastal Andhra (Rs. 59, 231 per hectare), Telangana (Rs. 47, 283 per hectare) and lowest in Rayalseema (Rs. 43, 595 per hectare). This suggests that the gross returns are the highest in coastal southern Andhra. This is attributable to the initial successes relating to Green Revolution wherein Southern Coastal Andhra was benefitted significantly more than the Northern Coastal Andhra region, Rayalseema and Telangana (Galab and

Revathi, 2009). The gross returns per hectare clearly show the relationship between irrigation, cropping pattern and profitability of cultivation wherein the annual gross returns per hectare in Coastal Southern Andhra is 17 per cent higher than Coastal Northern Andhra, 34 per cent higher than Telangana and 39 per cent higher than Rayalseema (as calculated from NSS 70th round, Schedule 33, 2012-2013).

3.5.4 Irrigation: While it is a well-known fact that Rayalseema and Telangana region lack adequate sources of irrigation and also there has been an increasing dependence towards groundwater sources of irrigation especially in Telangana. Therefore, it is expected that most of the crops grown in otherwise irrigated areas such as Coastal Northern and Southern Andhra would be grown under the irrigated conditions. As an outcome, the farmers in these regions with well-endowed sources for irrigation are considered to be immune from the vagaries of the monsoon and relatively well placed in comparison to the farmers in other regions. However, an analysis of the area under different crops and irrigation coverage in these areas, few interesting findings emerge.

Table 3.11 Area under irrigation across various regions in Andhra Pradesh (2012-13)			
	Total land under cultivation (Ha)	Land under irrigation (ha)	% area under irrigation
<i>Kharif</i>			
Coastal Northern Andhra	1117398	865256	77.43
Coastal Southern Andhra	862162	662878	76.89
Rayalseema	1841902	645903	35.07
Telangana	3560242	1574790	44.23
<i>Rabi</i>			
Coastal Northern Andhra	1004657	825882	82.21
Coastal Southern Andhra	1033762	735380	71.14
Rayalseema	543529	354536	65.23
Telangana	2311964	1124960	48.66
<i>Total</i>			
Coastal Northern Andhra	2122055	1691138	79.69
Coastal Southern Andhra	1895924	1398258	73.75
Rayalseema	2385431	1000439	41.94
Telangana	5872206	2699750	45.98

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The area under irrigation varies from 77 per cent of the total cultivated area to merely 35 per cent in the Rayalseema region during the kharif season. Further, during the Kharif season

Telangana has the lowest percentage of area under irrigation constituting 49 per cent of the area under cultivation. Even though the percentage of area under irrigation is higher in rabi season in comparison to the kharif season in Rayalseema but there is an overall decline in the area under cultivation by almost 80 per cent between these two periods. Therefore, it indicates that a very small percentage of farmers cultivate the crops in the drier period and those who cultivate these crops during the rabi season have access to relatively better sources of irrigation than other farmers who don't cultivate crops.

Annually, the area under irrigation is the highest in Coastal Northern Andhra (80%) followed by Coastal Southern Andhra (74%) and lowest in Telangana and Rayalseema (46% and 42% respectively).

Source of irrigation: Rayalseema is the least irrigated region in Andhra Pradesh followed by Telangana with only 26% and 45% of area under irrigation. Coastal Northern Andhra is the most adequately irrigated region with 66% of the gross cropped area under irrigation followed by Coastal Southern Andhra with almost 50 per cent area under irrigation (2012-13).

<i>Table 3.12 Area under different sources of irrigation (% of GIA) in various regions of Andhra Pradesh (1999-2000 & 2012-13)</i>									
<i>1999-2000</i>									
	Canal	Tank	Surface water	Tube well	Other well	Ground water	Other	Total	GIA/G CA
Coastal Northern Andhra	55.41	17.49	72.89	18.63	4.58	23.21	3.90	100	57.24
Coastal Southern Andhra	64.28	9.21	73.49	14.05	7.26	21.31	5.20	100	53.09
Rayalseema	17.49	6.13	23.62	42.10	32.07	74.17	2.21	100	26.91
Telangana	16.84	13.21	30.05	30.75	35.56	66.30	3.65	100	42.21
Andhra Pradesh	38.43	12.52	50.94	25.09	20.08	45.17	3.88	100	44.12
<i>2012-13</i>									
Coastal Northern Andhra	52.38	13.83	66.21	27.65	2.59	30.24	3.55	100	66.56
Coastal Southern Andhra	43.41	9.14	52.54	39.59	3.35	42.94	4.52	100	50.17
Rayalseema	17.02	3.94	20.96	69.90	6.75	76.64	2.40	100	26.10
Telangana	4.71	7.02	11.73	56.35	29.97	86.32	1.94	100	44.94
Andhra Pradesh	26.86	8.91	35.77	46.87	14.42	61.28	2.95	100	45.92

Source: DACNET, Ministry of Agriculture and farmers' Welfare.

There is a greater dependence on groundwater based sources of irrigation in Rayalseema and Telangana with almost 76% and 86% of the irrigated area under groundwater sources of irrigation. Canals constitute a major source of irrigation in both Coastal Northern Andhra and Coastal Southern Andhra with 52% and 43% area under irrigation being sourced from canals. While surface water based sources of irrigation are more common in Coastal Andhra but there is a general shift towards ground water based sources of irrigation in almost all the regions of Andhra Pradesh. There is almost 20% increase in the percentage of area being irrigated by ground-water based sources in Coastal Southern Andhra and Telangana. Also, amongst the ground water based sources, there is a greater shift towards tube-wells as the most important source of irrigation in Coastal Southern Andhra, Telangana and Rayalseema. There has been an increase of about 28% in the area being irrigated by tube-wells in Rayalseema and 25% increase in Telangana and Coastal Andhra.

Change in sources of irrigation and increasing liquid debts: A study by Deshpande, 2002 reveals that there exists no significant correlation between suicides by farmers and presence of small and marginal holdings in various districts of Karnataka. Similarly, he found that there is not any significant relationship between area under irrigation or the agricultural growth with the incidence of farmers' suicides. However, one thing to be noticed here is that since farmers' suicides constitute a miniscule section of the total population in general and rural and agricultural population in particular, the overall relationship between these variables and the rate of farmers' suicides may only be considered to be indicative of the problem but not exhaustive in themselves. Therefore farmers' suicides and agrarian distress needs a more nuanced analysis beyond the linear relationships that may not be able to capture the intensity of the crisis and the vulnerability of farmers to the crisis.

Fluctuating groundwater resources and increasing investment in groundwater sources has been attributed to be one of the biggest causes of indebtedness among farmer households. The overdependence on rainfall by farmers accentuates the vulnerability of farmers in the wake of the anthropologically induced climate change. Global warming has altered the rainfall regimes and extreme weather events such as flood and droughts have increased. Therefore, to counter the adversities of nature, farmers have resorted to groundwater resources for irrigation especially to combat the adverse impacts of rainfall fluctuations. In the drier regions of Andhra Pradesh namely Telangana and Rayalseema, farmers have increased their dependence on groundwater manifolds. This has also been supported by the State in the form of subsidised electricity and insurances for drilling of wells. These

initiatives have been largely described as pro-poor but in reality they have benefitted the richer farmers more in comparison to the poor farmers (Taylor, 2013). The availability of subsidised electricity along with the availability of credit and insurance for drilling wells and tube-wells led to the greater adoption of groundwater based irrigation by the small and marginal farmers. It was believed that unlike the canal irrigation system wherein the hierarchies of caste and class dictate the access to water, the groundwater is relatively immune to such hierarchies since the construction of bore wells and tube wells is dependent on private investment (Taylor, 2013). However, the groundwater revolution is also marred by inter-regional and inter-personal disparities because the capital rich farmers have been able to derive greater benefits from the irrigation sources by investing in deeper tube-wells. The adoption to the groundwater sources as also promoted by the State to boost the agricultural sector and the livelihood of the small and marginal farmers is beset with several contradictions. Firstly, the region of Deccan Plateau is fundamentally different from the Northern Plains. While, the latter is characterised by hard rock structures, the former is made up of alluvial aquifers. As a result, the technical capacity to extract groundwater is more feasible in the plain areas in comparison to the Deccan Plateau. Also, recharge of groundwater depends on the rainfall received by an area. Given the lower permeability and porosity of the hard rock structure of Deccan Plateau, the aquifers are not only small and scattered but also have limited recharge capability. As a consequence to this, in the event of drought, the groundwater is substantially reduced and therefore in opposition to act as a means to fight the drought, the dependence on groundwater acts in the same direction and multiplies the risky faced by the farmers (Taylor, 2013).

A peoples' Tribunal also conducted a study to find out the cause behind the farmers' suicides in Andhra Pradesh and it was found that almost 70 per cent of the farmers who committed suicide had taken loans for the deepening of tube-wells. It was also reported that the cause behind the death was heavy investment in tube-wells but then the tube-wells failed. It was found that almost 98 per cent of the farmers who took loans for the construction or deepening of tube-wells accessed it from informal sources and therefore, the interest rates charged by the them were very high for the farmer to pay back the borrowed amount; as a consequence the farmer ended up committing suicide (Galab and Revathi, 2014).

Sainath, 2004, Vandana and Jafri, 1998 also reported similar findings were in heavy investment in tube-wells and failure of tube-wells was the major cause of indebtedness culminating into suicide by farmers.

Therefore, the farmers in the drier parts and un-irrigated pockets are more vulnerable to fall into the liquid debt trap. Therefore, farmers in Rayalseema and Telangana undertaking investment in tube-wells are more vulnerable than farmers in the well-irrigated tracts of Coastal Northern Andhra. Also, Guntur and Prakasam districts in Coastal Southern Andhra having merely 50 per cent and 27 per cent of the area under cultivation covered by irrigation are equally vulnerable. Since coastal southern Andhra specialises in water intensive crops such as rice and cotton, irrigation is a fundamental requirement in the region and therefore, investments in irrigation are bound to increase with the increase fluctuations in rainfall and weather events.

Further, while Coastal Andhra Pradesh has been referred to as the “Rice-bowl” of South India, there has been a growing dependence on Telangana for rice in the year 2017. This is because of two major reasons: first, the gross cropped area under rice has been declining continuously in Coastal Andhra Pradesh and increasing in Telangana and second, the good monsoon in 2016 led to an ample harvest of rice in Telangana. Reportedly in the Rabi Season of 2016, Telangana received 1004 mm of rainfall which was only 629 mm in the case of Andhra Pradesh (Times of India, June 22, 2017). Additionally, it has been also suggested that since the bifurcation of the two States, the dispute relating to the Nagarajunasagar Dam has led to a decline in the water availability to the farmers in Andhra Pradesh especially the Krishna-Godavari Delta region. This has led to a crisis situation even in Andhra Pradesh where the farmers are largely dependent on the surface water sources of irrigation.

3.5.5 Crop-wise gross returns and area under irrigation:

a. Kharif Season:

Table 3.13 Value of output per hectare and irrigated area for various crops across major crop producing areas in Andhra Pradesh,2012-13					
<i>Kharif Season</i>					
<u>Rice</u>					
	VOP	Land (Ha)	VOP/ha	Irrigated land (Ha)	% irrigated land
Coastal Northern Andhra	3755862	786450	47757	703780	89.49
Coastal Southern Andhra	3467832	451209	76857	451209	100.00
Telangana	5314264	944993	56236	939457	99.41

<u>Cotton</u>					
Coastal Southern Andhra	1879217	298010	63059	176930	59.37
Telangana	8715849	1551928	56161	293097	18.89
<u>Groundnut</u>					
Rayalseema	1845782	790150	23360	87549	11.08
Telangana	461554	78979	58440	27665	35.03
<u>Maize</u>					
Coastal Northern Andhra	133359	25551	52194	14813	57.97
Telangana	1116775	277835	40196	81971	29.50
<u>Castor seed</u>					
Rayalseema	438704	240048	18276	58223	24.25
<u>Arhar</u>					
Coastal Southern Andhra	98267	34124	28797	7278	21.33
Rayalseema	77239	79339	9735	3327	4.19
Telangana	446352	296291	15065	23173	7.82

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

In the Kharif season, rice is cultivated primarily in Coastal Northern Andhra (70% of the total area under cultivation), Coastal Southern Andhra (52%) and Telangana (27%). One interesting thing to note is that even though Telangana is largely inadequate in terms of irrigation facilities but rice is predominantly cultivated under irrigated conditions. Almost 99% of the area under rice cultivation is irrigated. There exists a clear significant correlation between value of output per hectare and the area under irrigation ($r=0.95$, significant at 99% confidence interval), irrigation alone explains 90 per cent of the variation in value of output per hectare across various regions in Andhra Pradesh ($r^2=0.90$, calculated from NSS round 70th, Schedule 33, 2012-13). The value of output per hectare is the highest in Coastal Southern Andhra (Rs. 76, 875 per hectare) followed by Telangana and Coastal Northern Andhra (Rs. 56,263 per hectare and Rs. 47, 757 per hectare respectively).

Further, cotton which is majorly cultivated in Coastal Southern Andhra and Telangana (occupying 35% and 44% area under cultivation respectively) is grown primarily under un-irrigated conditions. The irrigated area is merely 60% of the area under cotton cultivation in Coastal Southern Andhra and merely 19 per cent in the case of Telangana. Area under irrigation explains almost 50% variation in the value of output of cotton. Therefore, it can be

said that a farmer growing cotton in un-irrigated conditions in either Coastal Southern Andhra or Telangana is exposed to similar conditions of vulnerability in both the regions. Nevertheless, institutional and infrastructural factors also play an important role in shaping the contours of vulnerability and the coping ability of the farmers.

Groundnut and Castor seed which are cultivated on a large scale in Rayalseema region is also grown predominantly under un-irrigated conditions wherein only 11 per cent of the area under groundnut and 25 per cent under castor seed are under irrigation. Also, the value of output for both groundnut and castor seed is the lowest amongst all the crops that are cultivated in other regions during the Kharif season. The limited availability of irrigation to a large extent explain the limited returns per hectare of land in Rayalseema region but in addition, castor in itself is completely subjected to market vulnerabilities since it is not covered by the MSP. Therefore, in addition to limited returns from cultivation of groundnut and castor seed, their commercial nature exposes the farmer to both ecological and market linked vulnerabilities.

Further, it can be clearly seen that despite being cultivated under un-irrigated conditions, cotton offers larger returns per hectare in comparison to cultivation of other crops such as maize and Arhar. Therefore, the farmers find cotton cultivation more profitable than other crops and this locks the farmer in a vicious cycle wherein despite suffering losses in one season, the farmer still finds cotton cultivation worthier than other crops since it is the only crop they consider can help them recover their previous losses.

Therefore, from the above analysis it can be clearly said that amongst the irrigated crops, rice offers the best gross returns per hectare but under un-irrigated conditions cotton offers the maximum gross returns. The value of output per hectare is the lowest in Rayalseema because both groundnut and castor which occupy almost 70% of the area under cultivation offer very low returns per hectare. The farmers are therefore constrained by the rainfall. It can be said that the farmers in Rayalseema are therefore most vulnerable followed by farmers cultivating cotton in Southern Coastal Andhra and other cash crops in Telangana.

b. Rabi Season:

Table 3.14 Value of output per hectare and irrigated area for various across major crop producing areas in Andhra Pradesh,2012-13					
<i>Rabi Season</i>					
	VOP (Rs.)	Land (ha)	VOP/ha (Rs./ha)	Irrigated area (ha)	Irrigated area (%)
<u>Rice</u>					
Coastal Northern Andhra	5739588	670436	85610	644310	96.10
Telangana	4141081	706573	58608	703019	99.50
<u>Cotton</u>					
Coastal Southern Andhra	836345	194393	43023	89623	46.1
Telangana	3246461	1159025	28010	226301	19.5
<u>Groundnut</u>					
Rayalseema	558687	94524	59106	86035	91.0
<u>Maize</u>					
Coastal Northern Andhra	266605	41822	63747	30422	72.74
Coastal Southern Andhra	945676	140824	67153	140695	99.91
Rayalseema	153965	39451	39027	8991	22.79
Telangana	898736	194194	46280	52262	26.91
<u>Chillies</u>					
Coastal Southern Andhra	2288628	86868	263459	42637	49
<u>Castor seed</u>					
Rayalseema	150025	59776	25098	841	1.4
<u>Sunflower</u>					
Rayalseema	217935	75895	28715	75759	99.8

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

Out of the major crops grown in Coastal Southern Andhra Pradesh, Chillies occupy almost 9% of the area under cultivation in Rabi season. The gross returns from cultivation of chillies are very high (Rs.2, 63,459 per hectare). However, it is primarily under un-irrigated conditions and chilly cultivation is not at all covered by MSP. Reportedly, farmers who took to cultivation of chilly in the period of good monsoon also suffered huge losses due to bumper crop for an instance, following the severe cycle of debt related deaths especially in the period from 2003-05, the farmers considered cultivating chillies. This led to some

improvement in the prices received by the farmers. However, in 2016 characterised by a relatively better monsoon and low demand, the prices of chilly declined from rupees ten thousand per quintal in 2015 to merely rupees thousand to six thousand (Deccan Chronicle, May 13, 2017). This throws light on the plight of the farmers who are entirely dependent on the market forces for the sale of their crops. Even though returns from cultivation of chillies are very high but it is equally susceptible to very high fluctuations in the prices. In the absence of MSP and irrigation facilities, chilly cultivators are particularly more vulnerable to crisis.

The value of output per hectare for cotton in Rabi season is almost half the value of output per hectare received in the Kharif season. This in itself shows the nature of fluctuations in the prices received for cotton cultivation with the change in rainfall pattern and availability of irrigation facilities.

3.6 Summary:

Therefore this chapter examined the pattern of regional development in Andhra Pradesh and the difference between various regions in terms of cropping pattern, availability of irrigation and gross returns from cultivation. It can be seen that Northern Coastal Andhra and Southern Coastal Andhra specialise in the cultivation of rice but at the same time, Southern Coastal Andhra has a more diversified cropping pattern with a large percentage of area under cultivation of cotton. Rayalseema predominantly is under oilseed cultivation namely groundnut and castor seeds while Telangana has major percentage of area under cultivation of cotton. Also, Rayalseema and Telangana have the lowest percentage of area under irrigation and the major source of irrigation in both these regions is tube-well irrigation. The major cause behind the farmers' suicides has been found to be indebtedness and greater investment in tube-wells and bore-wells is one of the major causes of indebtedness. Therefore, farmers in Rayalseema and Telangana depending on tube-wells are vulnerable to fall into the liquid debt trap and therefore the never ending debt-cycle. Nevertheless, the farmers depending on surface water sources of irrigation in Southern Coastal Andhra are also increasingly becoming vulnerable since with the economic reforms the canals are also becoming increasingly deteriorated. Additionally, the analysis also revealed that farmers cultivating cash crops in all of the regions are functioning under similar circumstances for an instance, a cotton cultivator even in coastal southern Andhra which is relatively well endowed with sources of irrigation cultivates predominantly under un-irrigated conditions;

very much similar to a cotton cultivator in Telangana. Therefore, crop specific vulnerabilities transcend the spatial vulnerabilities. Further, the value of output per hectare is the highest in Coastal Southern Andhra followed by Northern Coastal Andhra, Telangana and Rayalseema. Therefore, in terms of value of output per hectare, Rayalseema and Telangana are the most backward. However, despite the highest value of output per hectare, adequate sources of irrigation and a higher yield, Southern Coastal Andhra has a larger percentage of farmers committing suicides. Similarly, the Rayalseema region though the most backward in terms of irrigation and gross returns per hectare, has lesser number of suicides than Telangana. Therefore, the next chapter aims to capture the reasons leading to these contradictions and to analyse the profitability of cultivation across various regions in Andhra Pradesh.

Chapter-4

Farmers' Vulnerability to agrarian distress across various regions in Andhra Pradesh

4.1 Introduction: High amount of debt, high cost of inputs and marginal returns from cultivation have often been blamed to be the major causes leading to the vulnerability of farmer households to the agrarian crisis. Additionally, absence of alternative sources of income in the non-farm sector increases the dependence of farmer on cultivation and therefore to the general risks associated with farming. Generally, risk in farming for the agrarian households includes weather shocks and fluctuations in rainfall received. This translates into income risk and coupled with other factors like fluctuation in prices and other market related factors poses another challenge for the farmers. One of the factors leading to income risk can also be due to natural factors such as prolonged drought, untimely rainfall etc. leading to crop loss. Nevertheless, income risk is not only associated with these natural factors but also due to market uncertainties such as volatility in prices of crops especially in the globalised world. There have been numerous studies dealing with the impact of rainfall shocks upon “quality of life” of individual households for example, Dercon and Krishnan, 2000; Rosenzweig and Binswanger, 1993; Klonner, 2013) who have suggested a negative relation between such shocks and individual well-being. In fact, analysis done by Dercon, 2005 and Christiaensen, 2007 has shown a long term impact of rainfall fluctuations. On the other hand, other studies such as those done by Thomas, 2010 suggests no such relationship between rainfall shocks and well-being of farmer households.

In the Indian context too, there has been prevalence among Government and bureaucracy to attribute the farmers' suicide and the burgeoning agrarian crisis to such rainfall shocks primarily. Presence of such phenomenon in drought prone areas such as Vidharbha and Marathawada region of Maharashtra, Bundelkhand region of Uttar Pradesh, Telangana and Rayalseema region of Andhra Pradesh (undivided Andhra Pradesh) corroborates the “myth” propagated by Government of a relationship between agrarian distress and risk posed to farmers. What it often obliterates is the fact that rainfall shocks may be one of the factors accentuating the risk and vulnerability of farmers in these drought prone belts of India but the lack of institutional support to such farmers can also be seen as a major factor leading to the more risk prone situation of farmers especially in these “suicide belts”.

4.2 Factors leading to farmers' vulnerability to agrarian distress: This chapter therefore analyses the nature of dependence of agricultural households across various regions in Andhra Pradesh on agriculture and the overall economic situation of the farmer households in the first section. In addition the subsequent section deals with the cost of cultivation and returns from cultivation thereby shedding light on the profitability of farming across various regions. Consequently, to understand the intricacies associated with cultivation each input component is analysed in detail along with the output linkage for selected crops. The third section deals with indebtedness among agricultural households and tries to bring forth the nature and extent of indebtedness across various regions and various size-classes of farmers.

4.2.1 Nature and dependence of agricultural households on cultivation: The dependence of farmer population predominantly on cultivation is very high in Andhra Pradesh. A high dependence on agriculture translates into higher vulnerabilities across the agrarian households because income from cultivation is the sole source to support the household consumption expenditure, bear the cost of inputs and also to repay the loans undertaken by the farmers. Thus any small or major change in the returns from cultivation can lead to a very distressed situation for the farmer.

The table below analyses the dependence of farmer households on various sources of income.

<i>Table 4.1 Principal Source of Income for Agricultural Households across various regions in Andhra Pradesh (2012-13)</i>									
	<i>Cultivation</i>	<i>Livestock</i>	<i>Other Agricultural Activity</i>	<i>Non-agricultural enterprise</i>	<i>Wages</i>	<i>Pension</i>	<i>Remittance</i>	<i>Others</i>	<i>Total</i>
<i>Coastal Northern Andhra</i>	58.33	3.64	3.19	1.46	23.97	2.49	6.93	0.00	100
<i>Coastal Southern Andhra</i>	53.15	9.66	1.80	2.20	32.66	0.51	0.00	0.03	100
<i>Rayalseema</i>	63.87	2.03	0.13	5.93	28.02	0.00	0.01	0.00	100
<i>Telangana</i>	86.90	1.84	0.39	1.77	6.18	0.02	2.17	0.73	100
<i>Andhra Pradesh</i>	70.61	3.49	1.07	2.79	19.01	0.55	2.17	0.30	100

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

It can be seen that in Andhra Pradesh 70% of the agricultural population is dependent on cultivation as a main source of their income. Thus, it makes it clear that in absence of income diversification, a farmer household in Andhra Pradesh is more susceptible to the crisis than farmers in other states. Even though population dependent on agriculture is higher in other poor states as well such as Bihar, Odisha but dependence on cultivation alone isn't a factor

leading to distress among farmers but it is one of the factors which when exist in addition to other factors such as lack of irrigation, excessive dependence on market and market oriented crops etc. compounds into a crisis.

From the above table it can be seen that the agricultural households depending on cultivation alone as a primary source of income is the highest in Telangana where 87 per cent of the total agricultural population is dependent on agriculture to sustain their income, followed by Rayalseema (64%). The dependence on cultivation as a principal source of income is lowest in Coastal Southern Andhra (53%) and most of the agricultural households depend on wages and salaried work as a principal source of income (33%). Therefore, excessive dependence of the population on cultivation for their income in Rayalseema and Telangana leads to the vulnerability of the households to agrarian crisis in the times of any agriculture related issue for example a bumper harvest, a poor monsoon or fluctuation in prices. On the other hand, farmers in Coastal Andhra are relatively better because they can supplement their incomes from alternative sources of income as well.

Table 4.2 Principal source of income according to size class of farmers across various regions (2012-13)									
	Cultivation	Livestock	Other Agricultural Activity	Non-agricultural enterprise	Wages	Pension	Remittance	Others	Total
<i>Marginal farmers</i>									
Coastal Northern Andhra	40.77	3.71	4.86	1.53	34.83	3.54	10.75	0.00	100
Coastal Southern Andhra	31.74	6.76	3.31	2.47	54.71	0.96	0.00	0.05	100
Rayalseema	50.11	2.61	0.00	3.25	44.00	0.00	0.03	0.00	100
Telangana	78.35	3.98	0.77	2.12	9.00	0.04	4.30	1.44	100
<i>Andhra Pradesh</i>	56.24	4.10	1.97	2.28	29.66	0.99	4.19	0.58	100
<i>Small farmers</i>									
Coastal Northern Andhra	95.19	0.66	0.15	1.80	2.20	1.09	0.00	1.09	100
Coastal Southern Andhra	76.37	16.86	0.00	0.74	6.04	0.00	0.00	0.00	100
Rayalseema	69.25	2.54	0.00	16.57	11.65	0.00	0.00	0.00	100
Telangana	92.84	0.01	0.02	2.66	4.47	0.00	0.00	0.00	100
<i>Andhra Pradesh</i>	84.25	3.54	0.03	5.88	6.29	0.16	0.00	0.16	100
<i>Semi-Medium farmers</i>									
Coastal Northern Andhra	85.31	7.86	0.00	0.70	4.64	0.00	0.00	1.48	100
Coastal Southern Andhra	78.26	8.46	0.00	5.64	7.63	0.00	0.00	0.00	100
Rayalseema	77.75	0.12	0.69	0.25	21.18	0.00	0.00	0.00	100
Telangana	97.79	0.00	0.00	0.14	2.07	0.00	0.00	0.00	100
<i>Andhra Pradesh</i>	88.14	2.25	0.19	0.92	8.29	0.00	0.00	0.23	100

<i>Medium and Large farmers</i>									
Coastal Northern Andhra	77.41	0.00	1.65	1.65	19.28	0.00	0.00	0.00	100
Coastal Southern Andhra	77.85	8.32	0.47	0.00	13.36	0.00	0.00	0.00	100
Rayalseema	85.01	1.69	0.00	0.00	13.30	0.00	0.00	0.00	100
Telangana	97.99	0.00	0.00	0.00	2.01	0.00	0.00	0.00	100
<i>Andhra Pradesh</i>	87.55	2.51	0.21	0.10	9.63	0.00	0.00	0.00	100

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

It can be seen that the dependence on cultivation as a principal source of income is higher among the medium and large farmers as compared to the marginal farmers in Andhra Pradesh. However, more than 78 per cent marginal farmers in Telangana region are dependent on agriculture as a main source of income. Therefore, lack of alternative income sources makes a marginal farmer in Telangana more prone to crisis than the marginal farmer in Coastal Northern Andhra. Also, in southern Coastal Andhra and Rayalseema more than 45% of the marginal farmers have wages and salaried work as a main source of income. Even though wage labour is also prone to fluctuate depending on the demand for work but at the same time it is very different from engagement in cultivation. This is so because a farmer has to bear a certain input cost as well in order to produce a crop but the investment required in undertaking wage labour is significantly lower or negligible in comparison to input cost related to agricultural activities. So there is relatively lesser risk associated with wage labour.

Among small farmers also, the dependence on agriculture is higher amongst farmers in Northern Coastal Andhra and Telangana as compared to Rayalseema and Southern Coastal Andhra. In fact, in Rayalseema region, a large percentage of farmer households have wages and non-farm enterprises as the major source of income. Thus, it can be said that due to excessive dependence of agriculture, small and marginal farmers in Telangana are the most vulnerable to any fluctuations related to agricultural output or price.

Also, it has to be mentioned that even though the dependence of medium and large farmers upon cultivation as a major source of income is the highest but still they are lesser vulnerable to the agrarian distress than small and marginal farmers because they work in very different institutional and infrastructural arrangement for an instance, the medium and large farmers have better access to institutional credit, market, Minimum Support Prices offered by government and also have greater bargaining power and political dominance.

Hence, from the above analysis of principal source of income, it can be argued that small and marginal farmers particularly in Telangana are more vulnerable to any externality upon the agricultural sector. Further, small and marginal farmers who depend entirely on cultivation are more vulnerable across all the regions. The NCRB statistics relating to farmers' suicides in Telangana and Andhra Pradesh also reveal the same since 65% of the suicides committed by people working in agricultural sector belong to the group of small and marginal farmers in Telangana and 45% in the case of Andhra Pradesh (constituting Coastal Andhra and Rayalseema).

Household Income and consumption: The annual average income per household is Rs. 73,011 in 2012-13. The highest annual income is Rs. 83205 in Coastal Southern Andhra followed by Rayalseema (Rs. 81033) and lowest in Coastal Northern Andhra (Rs. 47,642). According to the per capita income, Coastal Southern Andhra has the highest per capita income followed by Telangana and Rayalseema. Therefore, the income from all sources exhibits an inverse relationship between incomes of agricultural households and overall per capita income except for Coastal Southern Andhra which suggests that on an average, a farmer in relatively less developed region such as Rayalseema and Telangana is relatively better off in terms of average income than farmers in developed regions such as Coastal Northern Andhra.

Table 4.3 Average Annual Income per agricultural household from various sources across various regions in Andhra Pradesh (2012-13)					
<i>(NSS-Region)</i>	<i>Wages</i>	<i>Cultivation</i>	<i>Animal Husbandry</i>	<i>Non-farm income</i>	<i>Income from all sources</i>
<i>Coastal Northern Andhra</i>	23816 (49.99)	19146 (40.19)	2498 (5.24)	2182 (4.58)	47642 (100)
<i>Coastal Southern Andhra</i>	28637 (34.42)	25042 (30.10)	27250 (32.75)	2276 (2.74)	83205 (100)
<i>Rayalseema</i>	35129 (43.35)	27670 (34.15)	10416 (12.85)	7818 (9.65)	81033 (100)
<i>Telangana</i>	17396 (23.00)	50729 (67.06)	4421 (5.84)	3098 (4.10)	75644 (100)
<i>Andhra Pradesh</i>	24658 (33.77)	35218 (48.24)	9205 (12.61)	3931 (5.38)	73011 (100)

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The above table shows that 67 % of the annual income of the agricultural households in Telangana and 40% of it in Coastal Northern Andhra are obtained from cultivation. A marginal farmer household in Andhra Pradesh on an average earns Rs. 4, 511 per month from all sources of income including wages, cultivation, animal husbandry and other non-agricultural activities. Also, the monthly income increases across the size class of households. The monthly consumption expenditure for small farmer households is Rs. 5, 377 followed by marginal farmer household (Rs. 5, 440). It is also apparent from the table below that the consumption expenditure for a marginal household exceeds the monthly income of the household by Rs. 929. Therefore, a marginal farmer in Andhra Pradesh is the most vulnerable in terms of being unable even to bear the consumption expenditure of the household. Also, if the household is indebted this would lead to an aggravated situation of crisis since the household would not just be able to afford his day to day requirements but additionally is burdened to repay the loan.

On an average, a marginal farmer household earns Rs. 5,056 a month in Telangana followed by Coastal Southern Andhra (Rs. 4, 705), Rayalseema (Rs. 4, 585). A marginal farmer household earns only Rs. 3, 351 a month from all sources in Coastal Northern Andhra. Also, the consumption expenditure in Coastal Northern Andhra is the highest for marginal farmers amongst all the regions (Rs. 6, 611) and lowest in Telangana (Rs. 4, 709). Therefore, in coastal Northern Andhra, the consumption expenditure for a marginal farmer exceeds the income earned by the household from all the sources by Rs. 3, 260. Therefore, it shows a complex regional picture wherein the region of Northern Coastal Andhra which has the highest Gross District Domestic Product per capita amongst all the regions in Andhra Pradesh has the most impoverished farmer households who have the lowest monthly income but at the same time have a very high consumption expenditure. This gives a very contrasting picture wherein a farmer household living in a better off and relatively developed region both in terms of GDDP per capita and agricultural value of output per hectare is the one having the most vulnerable situation since the household is unable to meet the requirement of the household in terms of consumption requirements. Further, debt is another burden upon the farmer household.

Table 4.4 Monthly Income and Consumption Expenditure across various size classes of agricultural households (2012-13)

	Marginal	Small	Semi-Medium	Medium & Large
Monthly Income per agricultural household from all sources (Rs.)				
Coastal Northern Andhra	3351	3659	3379	27535
Coastal Southern Andhra	4705	6077	12770	13609
Rayalseema	4585	6557	6274	17878
Telangana	5056	6288	7668	12533
ANDHRA PRADESH	4511	5943	7246	15563
Monthly consumption expenditure per agricultural household (Rs.)				
Coastal Northern Andhra	6611	4904	6132	7670
Coastal Southern Andhra	6335	6526	6901	8761
Rayalseema	4840	5594	4868	6426
Telangana	4709	4961	5715	7035
ANDHRA PRADESH	5440	5377	5693	7263
Difference between monthly Income and consumption expenditure (Rs.)				
Coastal Northern Andhra	-3260	-1245	-2753	19866
Coastal Southern Andhra	-1631	-450	5869	4848
Rayalseema	-255	963	1405	11451
Telangana	347	1327	1953	5498
ANDHRA PRADESH	-929	566	1553	8299

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

4.2.2 Cost of cultivation and Profitability of farming: Cost of cultivation forms an important part of analysis of returns from cultivation and thereby the income earned by the farmer from cultivation. The input costs incurred by the farmers on material inputs such as seeds, fertilisers, pesticides and expenses on labour, maintenance and land rents are included in the paid out cost. The difference between the gross value of output per hectare and the paid out cost is referred to as the farm business income. The farm business income thus calculated gives a close approximation of the income from farming after deduction of the paid-out costs incurred by the farmers.

The cost of cultivation has been increasing exponentially ever since the 1980s. The cost of agricultural inputs, especially seed costs, cost of fertilisers and pesticides has risen drastically and it is impacting the small and marginal farmers more significantly because of their limited purchasing power (Kumar, 2006). Also, since the traditional agriculture is now replaced by modern agriculture which is characterised by use of Genetically Modified Seeds and Hybrid variety of seeds which are deliberately made as “terminator seeds”. These seeds therefore

obtained from previous produce cannot be used again by the farmer for the next agricultural season making them dependent on the market and the exorbitant prices asked by the input supplier.

It has been found that the cost of cultivation of major crops such as Paddy, cotton and groundnut have significantly increased in Andhra Pradesh in comparison to other States for an instance, the cost of cultivation for paddy is sixteen per cent higher in Andhra Pradesh than in Punjab, that for cotton is nearly 33% higher than that in Gujarat and 38% higher than Gujarat for cultivation of groundnut (Sridhar, 2006). Coupled with the fluctuating prices for these crops, the farmers are subjected to further vulnerabilities. Also, the procurement by the government has been found to be largely defunct.

While in the earlier scenario, it was relatively easier for the farmer to still bear the losses incurred by him on account of crop failure due to natural factors or other factors such as non-remunerative prices for the crop as in the case of bumper harvest or general fluctuation in the prices but this has also become a severe burden upon the farmer today. This is because earlier, a major part of the input cost was covered by farm-derived inputs and a large component of the family labour but now he is excessively dependent on the market for the input and also for labour. There is a general tendency of the labour to move out to the non-agricultural sector and also with the coming up of employment guarantee schemes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGA), the wage rate for agricultural labour has increased considerably. This has increased the cost of cultivation for the farmer. It is also a fact that in the traditional form of agriculture, a large part of the transaction for input as well as the output was done in kind but with its replacement with the modern form of agriculture, mostly the transactions are done in cash and therefore, it has led to a greater demand for cash. This has thus significantly impacted the dependence of farmer on landlord, input supplier and professional money-lenders in the absence of formal sources of credit.

The following analysis makes use of NSS data to analyse the cost of cultivation and profitability of cultivation across various regions in Andhra Pradesh. In the absence of disaggregated crop-wise data under the NSSO 70th round, the aggregate cost structure of all crops has been analysed here. While the NSSO 59th round provided a detailed account of crop wise input structure, the present situation assessment survey gives only crop-wise data for seeds and no other inputs. Therefore, in order to analyse the farm business income and net

returns from cultivation, aggregate costs on a per unit basis are useful. Also, the previous rounds collected the information on basis of seasons separately but the present round as no such seasonality maintained in the reporting of the data. However, since July-December corresponds largely to the period associated with sowing and harvesting of Kharif crops, the period from July, 2012- December 2013 (Visit -1) has been referred to here as the Kharif season while that from January 2013-June 2013 (Visit-2) has been referred to as the Rabi Season.

A. Kharif Season:

<i>Table 4.5 Cost of cultivation and returns from cultivation (Rs. per hectare)</i>				
	<i>Kharif</i>			
	<u><i>Coastal Northern Andhra</i></u>	<u><i>Coastal Southern Andhra</i></u>	<u><i>Rayalseema</i></u>	<u><i>Telangana</i></u>
<i>Seeds</i>	1674	3835	3832	3469
<i>Fertilisers</i>	6926	10316	4826	6523
<i>Manures</i>	325	1381	538	406
<i>Plant Protection Chemicals</i>	4109	6381	2261	2881
<i>Diesel</i>	610	812	204	145
<i>Electricity</i>	13	78	89	119
<i>Labour Human</i>	13228	13907	4142	5899
<i>Labour Animal</i>	285	1352	943	383
<i>Irrigation</i>	371	318	10	90
<i>Minor Repair and Maintenance</i>	174	203	263	233
<i>Interest</i>	1624	336	1425	690
<i>Cost of Hiring of machinery</i>	2233	4796	1751	2854
<i>Lease rent for land</i>	9849	13727	989	2029
<i>Other expenses</i>	1386	814	447	1002
<i>Value of main product</i>	46791	60519	34866	50285
<i>Value of by-product</i>	1192	2595	2806	1201
<i>Total Expenses</i>	42807	58256	21720	26722
<i>Gross Value of Output</i>	47983	63114	37685	51541
<i>TV-TC</i>	5176	4858	15964	24819
<i>TV/TC</i>	1.12	1.08	1.73	1.93
<i>Land under cultivation (0000 hectares)</i>	97.75	60.90	182.92	347.57

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

From the above table it can be seen that the average amount of input expenses during the Kharif season is the highest in Southern Coastal Andhra (Rs.58, 256 per hectare) followed by

Northern Coastal Andhra (Rs. 47, 983). The gross value of output per hectare is also the highest in the Southern Coastal Andhra region however; the returns from cultivation are the lowest in Coastal Southern Andhra and highest in Telangana. Even Rayalseema region having both a low gross value of output and input cost still earns Rs. 15, 964 from cultivation. The profit earned by selling the output covers merely 8% and 10% of the total input cost borne by the farmer in Coastal Northern Andhra and Coastal Southern Andhra whereas it is as high as 93% and 73% in the case of Telangana and Rayalseema suggesting that during a good harvest and favourable market conditions, a farmers in Telangana and Rayalseema earns almost double from the cultivation of market oriented crops such as groundnut and cotton. On the other hand, despite adequate irrigation, and a high value of gross output from cultivation, the profitability of cultivation is the lowest in Coastal Andhra region.

The policy-makers and researchers argue that the farmers belonging to the drier parts of Andhra Pradesh and Telangana are more prone to commit suicide especially in the Kharif Season (Business Standard, 13 Oct, 2015). In 2015, the rainfall deficit was almost 70 per cent in two districts of Telangana namely, Mahabubnagar and Nizamabad; Anantapur in Andhra Pradesh.

It is more problematic in Telangana because of the significant shift most of the districts have made towards the cultivation of cotton and therefore, districts such as Medak, Warangal, Karimnagar, Adilabad and Nalgonda having a very high percentage of area under cotton cultivation are more susceptible to face the crisis especially during the Kharif Season. Ananthapur district in Andhra Pradesh (Rayalseema) cultivating groundnut is also susceptible to the crisis because of predominantly un-irrigated area and also because it lies in the wind-ward side thus receiving very limited rainfall. The most interesting question that arises is that despite facing such adverse condition, why do not farmers undertake cultivation of different crops other than these cash intensive crops? The major reason for the same is the very prospect of getting good returns from these crops such as cotton, maize and groundnut while sorghum and ragi are more suited for these drier areas of Rayalseema and Telangana.

The analysis of returns from cultivation also points to this fact. 2012-13 was a relatively better monsoon year in Andhra Pradesh¹⁸ with only 6 and 3 districts out of 21 districts declared by the State Government as drought affected in 2012 and 2013 respectively.

¹⁸ Data for State-wise details of Districts declared by States drought affected is available at Farmers' Portal, Ministry of Agriculture and Farmers' Welfare, Government of India.

Therefore, even though the average returns from cultivation are higher during the present year under consideration but fluctuations in average returns is one of the factors that lead to uncertainties associated with cultivation in Rayalseema and Telangana. Nonetheless, the analysis also reveals that a farmer in coastal Andhra bears a high input cost because of high cost being incurred on fertilisers, human labour cost and the rent paid for leased in-land. There is a very high incidence of tenancy in coastal Andhra wherein 52% and 46% of the farmer households have leased in-land in Coastal Northern Andhra and Coastal Southern Andhra respectively (calculated from NSS 70th round, schedule 33) whereas the incidence of leasing in land is very low in case of Telangana and Rayalseema constituting only 14% and 15% of the total farmer households who have leased in land.

The incidence of leasing-in land amongst the marginal farmers is the highest in Coastal Northern Andhra where almost 50% of the marginal farmers have leased-in land. It is also interesting to note that as high as 85% of the semi-medium farmers and 61% of small farmers in Coastal Southern Andhra have leased-in land. The high rents borne by the farmers in these regions is therefore one of the reasons of low returns from cultivation wherein land rents alone constitutes almost 24% of the total input expenses incurred by the farmers in Coastal Northern and Coastal Southern Andhra. Further, human labour constitutes another 30% and 23% of the total input cost. The NSS survey doesn't clearly give the details about family labour or hired labour but under the category how procured, 92% of the farmers in Coastal Northern Andhra have reported as purchased against human labour which suggests that the hired labour shares a large percentage of the input cost as reported under human labour.

Additionally, the seed cost per hectare doesn't vary significantly between Coastal Southern Andhra, Rayalseema and Telangana. Even though a major limitation of the NSS survey 70th round is that there is no information on the quantity of the input used but the per hectare costs give some information about the average costs incurred by the farmers across different regions.

It is also to be noted that per hectare cost incurred on fertiliser and pesticide consumption is also the highest in Coastal Southern Andhra. Coastal Southern Andhra was one of the regions that were greatly benefitted by the green revolution and therefore the income of the farmer households increased significantly but the condition now can be seen as a general decline in the profitability of rice as is also apparent in the case of Punjab and Haryana.

The analysis below gives a detail about the share of different inputs in the overall cost structure across various regions in Andhra Pradesh.

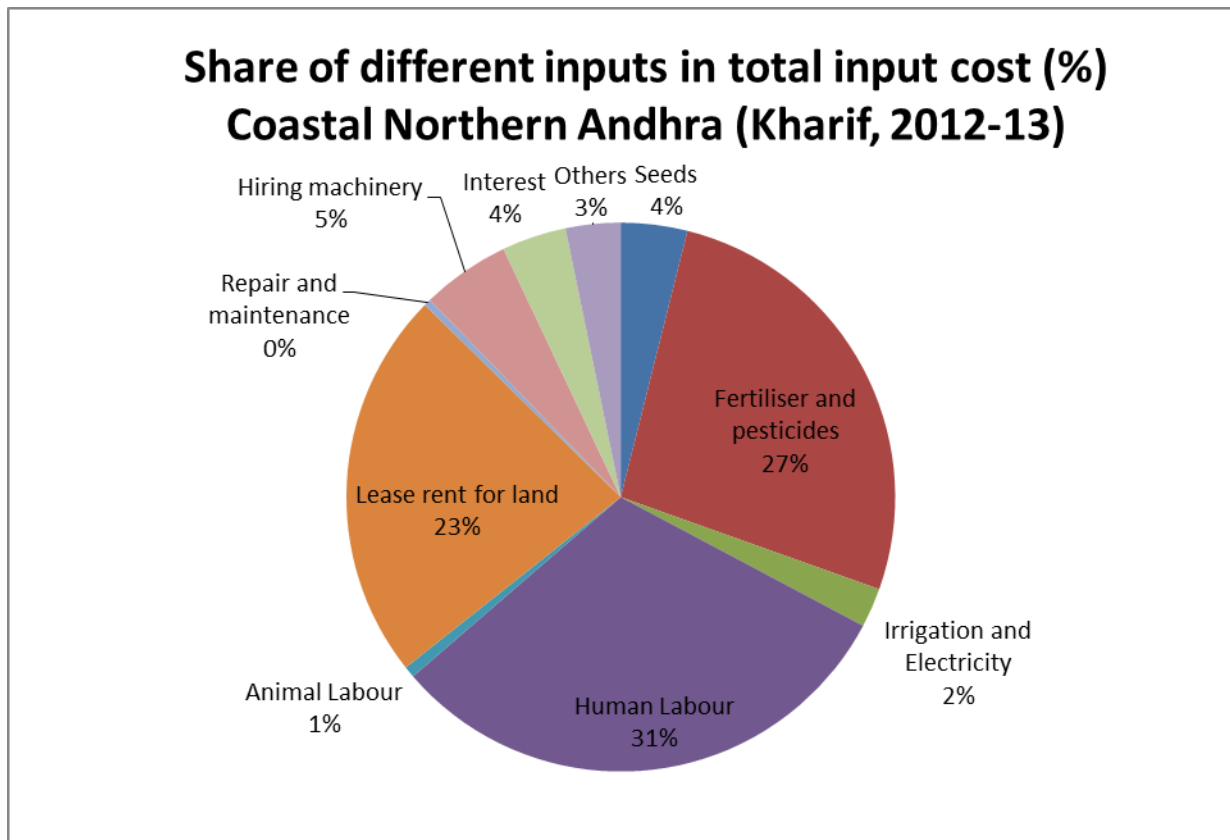


Figure. 4 (a) Share of different inputs in total input costs (%), Coastal Northern Andhra (Kharif Season)

**Share of different inputs in total input costs (%)
Coastal Southern Andhra (Kharif, 2012-13)**

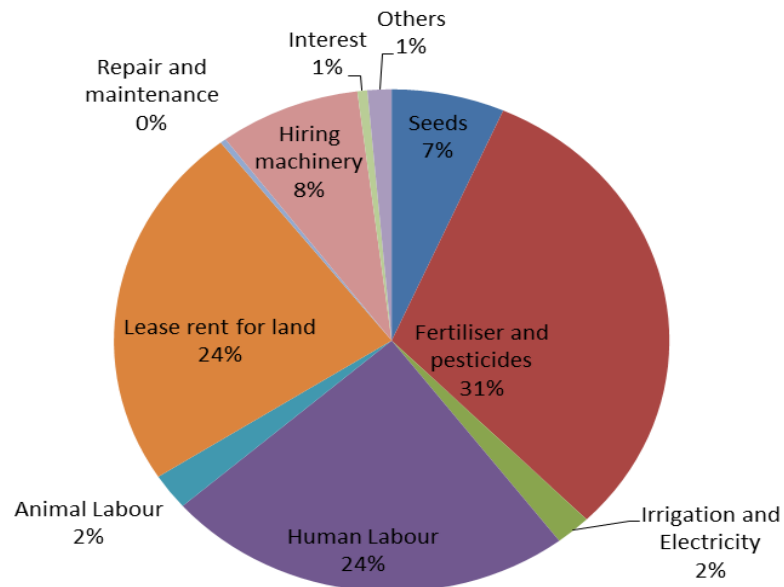


Figure. 4 (b) Share of different inputs in total input costs (%), Coastal Southern Andhra (Kharif Season)

**Share of different inputs in total input costs (%)
Rayalseema (Kharif, 2012-13)**

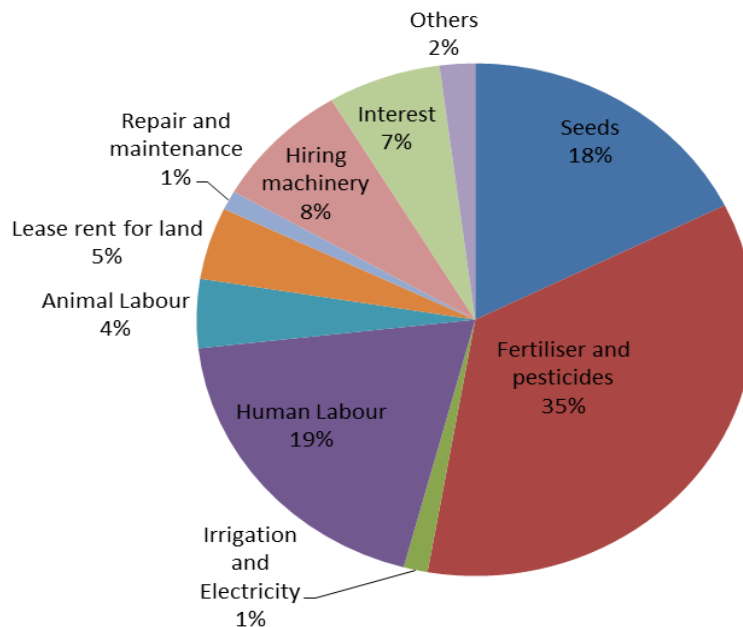


Figure. 4 (c) Share of different inputs in total input costs (%), Rayalseema (Kharif Season)

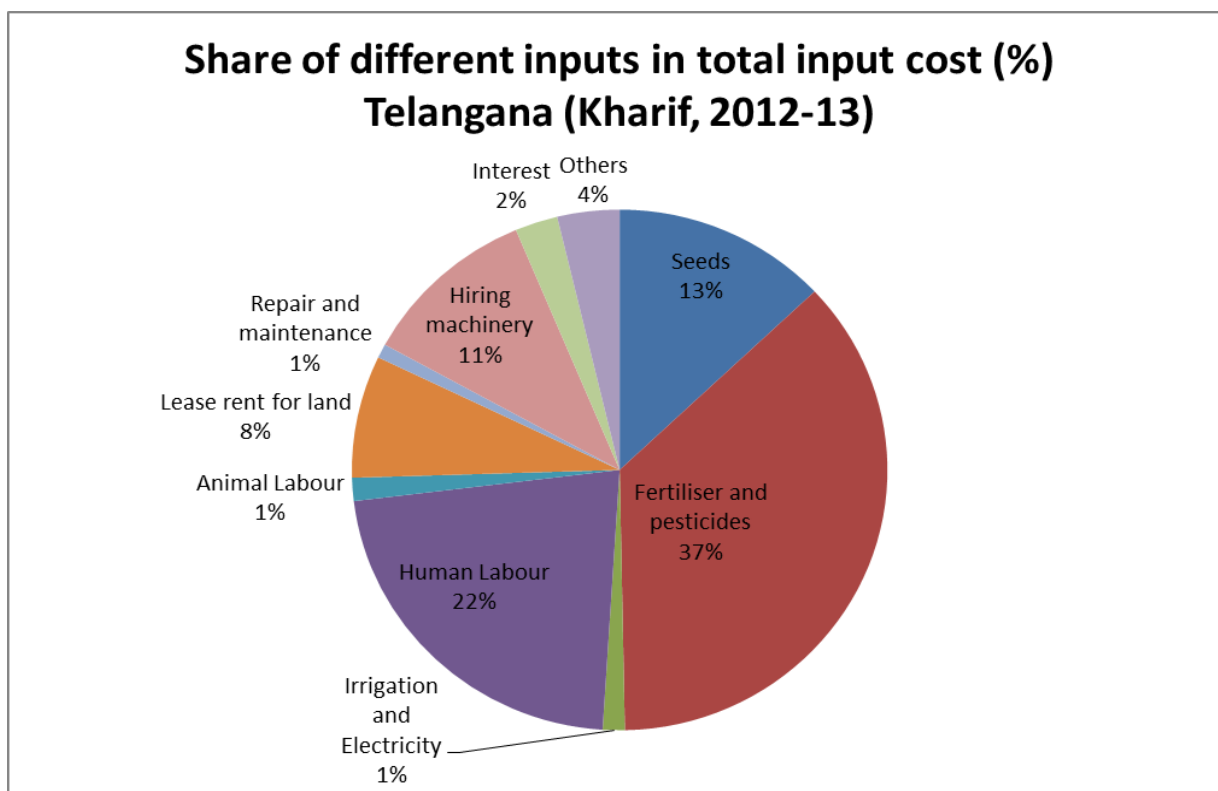


Figure. 4 (d) Share of different inputs in total input costs (%), Telangana (Kharif Season)

B. Rabi season: The returns from cultivation are higher in Coastal Southern Andhra and Coastal Northern Andhra during the rabi season. This can be attributed to two reasons, firstly, in rabi season larger area is brought under cultivation than the Kharif season and secondly, the southern coastal Andhra region receives considerable winter rainfall. With the divergence towards the pulses during the rabi season in addition to the cultivation of cotton and paddy, the returns are thus higher in coastal southern Andhra. Also, the returns per hectare are the highest in the case of Rayalseema. This is so because only a small percentage of area is kept under cultivation during the Rabi season as compared to the Kharif season and only a small percentage of population engages in cultivation during this period. Additionally, the farmers undertaking cultivation during this period undertake cultivation primarily under irrigated conditions (as discussed in the previous chapter).

<i>Table 4.6 Cost of cultivation and returns from cultivation (Rs. Per hectare) for various regions in Andhra Pradesh (Rabi), 2012-13</i>				
	<i>Coastal Northern Andhra</i>	<i>Coastal Southern Andhra</i>	<i>Rayalseema</i>	<i>Telangana</i>
Seeds	1925	3766	2677	2225
Fertilisers	8649	8781	5438	4805
Manures	156	1346	1191	400
Plant Protection Chemicals	5691	8767	2170	1872
Diesel	645	532	213	89
Electricity	7	51	151	106
Labour Human	14813	13200	4990	4176
Labour Animal	393	826	643	128
Irrigation	80	1346	15	51
Minor Repair and Maintenance	24	410	160	252
Interest	3192	938	489	140
Cost of Hiring of machinery	4293	3000	3812	2776
Lease rent for land	16579	10845	965	392
Other expenses	2230	1322	870	563
Total Expenses	58678	55131	23784	17974
Gross Value of Output	77082	76776	51616	41921
Value of main product	76168	76268	48244	40295
Value of by-product	896	477	1897	1626
TV-TC	18404	21645	27832	23946
TV/TC	1.31	1.39	2.17	2.33

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

C. Annual cost of cultivation: The analysis of annual returns from cultivation reveals that the cost of cultivation is the highest for coastal southern Andhra (Rs. 53, 640) followed by Coastal Northern Andhra (Rs.50, 360 per hectare) and lowest in Rayalseema (Rs. 22, 134). Also, the returns per hectare are the highest in case of Coastal Southern Andhra (Rs. 71, 643) and Coastal Northern Andhra (Rs. 61,874). While the farm business income (Gross value of output-paid-out cost) is the highest in the case of Telangana, followed by Rayalseema. It can be said that a farmer on an average earns Rs. 24, 480 per hectare from undertaking cultivation in Telangana followed by Rs. 18,000 per hectare from Rayalseema region. More developed regions of Andhra Pradesh namely Coastal Southern Andhra and Coastal Northern Andhra have high cost of cultivation but lower returns. Thus, to some extent the lower value of returns per hectare in these regions can be attributed to be the cause of farmer suicide and the distressed conditions particularly in Southern Coastal Andhra where a large number of suicides have been committed by

farmers in Guntur, Prakasam and Krishna district of Coastal southern Andhra. Therefore, a low value of output in cash intensive regions such as Rayalseema and Telangana due to monsoon or market fluctuations but in a general sense the developed regions of Andhra Pradesh harbour some of the most distressed farmers. They have to bear the prohibitive land rents, high cost on inputs such as fertilisers and plant protection chemicals. Also, the small and marginal farmers in southern coastal Andhra have reported negative returns from cultivation in districts like Guntur and Prakasam (calculated from NSS 70th round schedule 33).

<i>Table 4.7 Cost of cultivation and returns from cultivation (Rs. Per hectare) for various regions in Andhra Pradesh (Annual), 2012-13</i>				
	<u>Coastal Northern Andhra</u>	<u>Coastal Southern Andhra</u>	<u>Rayalseema</u>	<u>Telangana</u>
Seeds	1793	3791	3626	3046
Fertilisers	7747	9355	4948	5944
Manures	245	1357	652	404
Plant Protection Chemicals	4862	7877	2263	2538
Diesel	626	637	210	126
Electricity	10	61	100	114
Labour Human	13974	13479	4290	5311
Labour Animal	336	1023	882	295
Irrigation	232	961	11	75
Minor Repair and Maintenance	102	332	250	239
Interest	2372	713	1250	505
Cost of Hiring of machinery	3217	3668	2132	2827
Lease rent for land	13056	11954	994	1466
Other expenses	1788	1131	526	853
Total Expenses	50360	56340	22134	23743
Gross Value of Output	61874	71643	40301	48223
Value of main product	60815	70357	37382	46841
Value of by-product	1050	1267	2641	1346
TV-TC	11514	15302	18168	24480
TV/TC	1.23	1.27	1.82	2.03
Land under cultivation (lakh hectares)	18.77	16.25	22.45	52.61

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The profit from cultivation constitutes almost double of the input expenses in case of Telangana and almost 82% in the case of Rayalseema but it is as low as 27% and 23% in the case of Coastal Southern Andhra and Coastal Northern Andhra respectively. Thus, it can be ascertained that farmers in all the regions are more vulnerable to the agrarian distress than other states. A farmer in relatively developed region is equally susceptible to the crisis as a farmer in a least developed region like Rayalseema. The vulnerabilities are accentuated by the high cost of cultivation along with a lower return despite a high value of output from cultivation. While cash crop cultivation has often been blamed to be the cause behind the farmer suicides but if proper institutional arrangements are made, the cash crop cultivation can prove to be a major source to boost the farmers' income. This is apparent in the case of Telangana and Rayalseema for the current year in consideration since the farmers though cultivate in very constrained agro-ecological conditions but the returns are high especially in periods of good monsoon. Further, if provided with adequate institutional support in the form of better procurement of cash crops such as groundnut and cotton, better regulated prices of seeds and better access to institutional sources of credit, the agrarian vulnerability of the farmers in these regions can be reduced considerably.

D. Profitability of major crops cultivated in Andhra Pradesh: The cost C2 includes the actual cost borne by the farmers both in cash and kind on various inputs such as seeds, fertilisers and pesticides, along with the rent on leased-in land and imputed cost of family labour and interest paid on capital assets except land (Narayanamoorthy, 2013). Cost C3 includes cost C2 in addition to 10 per cent of the cost C2 for the managerial role played by the farmer. The profit calculated by using the cost C2 and cost C3 has been described as the supernormal value of profit. Cost C2 and C3 includes almost all the costs, both cash and in-kind and therefore it is appropriate to analyse the profitability of cultivation of various crops using the cost C2 and C3 (Narayanamoorthy, 2013).

Table 4.8 Cost of cultivation, Value of output and profit in major crops cultivated in Andhra Pradesh (1996-97 to 2013-14)

Paddy							
	Cost of cultivation (Rs./hectare)		Value of output (Rs.)	Profits (Rs./hectare)		Ratio	
Year	Cost C2	Cost C3	VOP	VOP-C2	VOP-C3	VOP/c2	VOP/C3
1996-97	20937.09	23030.799	20166.02	-771.07	-2864.779	0.96	0.88
2001-02	27043.45	29747.795	25407.92	-1635.53	-4339.875	0.94	0.85
2006-07	30491.52	33540.672	32024.22	1532.7	-1516.452	1.05	0.95
2011-12	58027.19	63829.909	59066.5	1039.31	-4763.409	1.02	0.93
2013-14	72086.93	79295.623	77224.94	5138.01	-2070.683	1.07	0.97
Groundnut							
Year	Cost C2	Cost C3	VOP	VOP-C2	VOP-c3	VOP/C2	VOP/c3
1996-97	12172.16	13389.376	10326.37	-1845.79	-3063.006	0.85	0.77
2001-02	14841.84	16326.024	10072.64	-4769.2	-6253.384	0.68	0.62
2006-07	20046.57	22051.227	15882.26	-4164.31	-6168.967	0.79	0.72
2011-12	65632.13	72195.343	71161.55	5529.42	-1033.793	1.08	0.99
2013-14	72129.3	79342.23	57583.36	-14545.94	-21758.87	0.80	0.73
Cotton							
Cotton	Cost C2	Cost C3	VOP	VOP-C2	VOP-c3	VOP/C2	VOP/c3
1996-97	23776	26154	22104	-1672	-4050	0.93	0.85
2001-02	23401	25741	24787	1386	-955	1.06	0.96
2006-07	34999	38499	42754	7755	4255	1.22	1.11
2011-12	61634	67797	66113	4479	-1684	1.07	0.98
2013-14	83492	91841	81715	-1776	-10125	0.98	0.89
Maize							
	Cost C2	Cost C3	VOP	VOP-C2	VOP-c3	VOP/C2	VOP/c3
1996-97	12524	13776	10137	-2387	-3640	0.81	0.74
2001-02	11983	13181	10506	-1477	-2675	0.88	0.80
2006-07	20674	22741	21186	512	-1556	1.02	0.93
2011-12	44038	48442	48211	4173	-231	1.09	1.00
2013-14	61973	68170	66280	4307	-1890	1.07	0.97

Source: Calculated from CACP (for various years)

The above table reveals that the profit earned by the farmers (VOP-C2) on cultivating rice has increased from 1996-97 to 2006-07 and 2013-14 wherein the profit earned by a farmer on cultivation is almost Rs.5000 per hectare in the year 2003-04. Rice has a relatively stable trend of returns with a coefficient of variation as only 4.65%. Groundnut has negative returns from cultivation in four out of five periods in consideration. This suggests that the farmer cultivating groundnut is more susceptible to the crisis due to the negative returns earned from groundnut cultivation. The coefficient of variation of VOP/C2 is the highest in the case of Groundnut for the period from 1996-97 to 2013-14 (Coefficient of variation=19.56%, as calculated using CACP data for Andhra Pradesh). Further, in case of cotton, the returns with respect to cost C2 are negative in two out of five periods in consideration and are negative in case of four out of five periods with respect to cost C3. Therefore, the returns from cotton cultivation also are susceptible to the fluctuations in value of output over the years (Coefficient of variation=10.57%). Further, maize has positive returns from cultivation with respect to cost C2 but the returns are not very uniform for example the returns from cultivation in the year 2006-07 was only Rs. 512 as against Rs.4173 in the year 2011-12 (coefficient of variation=12.85%).

Thus, looking at the general trend of profitability of various crops it becomes apparent that the returns from cultivation are prone to fluctuate and the variation in profits received from cultivation are the highest in the case of groundnut followed by maize and cotton. However, the returns from cultivation of paddy are relatively stable. Thus, a farmer in Coastal region cultivating paddy is far more resilient to witness a sharp fall in prices as compared to a groundnut farmer in Rayalseema or maize and cotton farmer in Telangana.

E. Cost of cultivation and returns from cultivation across size-classes of farmers: It is expected that the cost structures of small and large farmers would be significantly different from each other because the large farmers have the potential to make use of high value of inputs in production but the small and marginal farmers are credit constrained. Also, the small and marginal farmers make use of family based inputs at a larger scale in comparison to the large farmers.

An analysis of the cost of cultivation across various size classes of farmers in Andhra Pradesh (Appendix Table 1 to 4) reveals that the returns from cultivation are higher for the marginal farmer in Telangana and lowest in the case of Coastal Southern Andhra. Further, the cost of input expenses is interestingly higher for a marginal farmer in Telangana as compared to the

small and semi-medium farmers. This suggests that the marginal farmers are buying the inputs at a relatively higher rate than the farmers in the larger size category of farmers. A high dependence on the input dealer for the supply of inputs especially amongst the marginal farmers thus increase their overall cost involved in cultivation (the access to input procurement agencies has been done in the subsequent section). Rayalseema region also exhibits a similar pattern wherein the cost of cultivation per hectare decreases with the increasing size class of farmers but in developed regions of coastal northern and southern Andhra, the input expenses for the marginal and small farmers are the lowest in comparison to semi-medium and medium farmers. The access to input procurement agencies across various size classes of farmers is thus provided in the following part of the analysis to bring some clarity to this pattern of cost of cultivation across various regions in Andhra Pradesh.

F. Input procurement and market linkages:

a. Seeds: In terms of seeds, even though the subsidised seeds are provided by the government for crops like groundnut, soya bean and maize but still no such subsidised seeds are available for cotton and chilly which are cultivated in Telangana at a large scale. Even where the subsidised seeds are provided, their quantity isn't enough to support a farmer's total requirements and this exposes them to the vagaries of the private sector. Further, after the Structural adjustment programme of the World Bank (1998), India has opened its seed sector to monopolistic corporate giants such as Monsanto, Syngenta, Cargill, Pro Agro etc. (Kumar, 2006). These seeds are not only expensive but also require a high dose of other inputs such as fertilisers, pesticides and irrigation. The high cost of seeds is one of the reasons for growing indebtedness as well (Shiva, 2004; Kumar, 2006).

Additionally, this shift from cultivating one's farm saved seeds to those bought from the markets has also been characterised by a shift from the practise of multi-cropping to one based on mono-cropping. The suicide prone Warangal district for example saw a shift in the cropping pattern from that based on millets and oilseeds to the one based on cotton cultivation (Kumar, 2006). The Seed Replacement ratio has been fixed by the government at 100 per cent in case of hybrids and 5 per cent in case of pulses and oilseeds (Kumar, 2006).

The seed quality additionally has also deteriorated over the years for an instance; the seed germination rate which was 90 per cent has now become 65 per cent (Kumar, 2006). This suggests that if with the introduction of hybrid and genetically modified variety of seeds, 9 out of 10 seeds will germinate but now one third of the seeds used will not germinate at all. In

absence of any State certification of seeds, the problem of quality of seeds becomes more aggravated. This issue of spurious seeds leads to increased debt burden as well because the produce, if not exposed to risks by nature, still fails to generate enough output to repay the loans incurred.

The growing corporatisation of agriculture and the monopolisation of seed market have led to a further deterioration of the condition of the peasantry. Today, Monsanto functions as a monopolistic seed supplier of cotton controlling almost ninety five per cent of the seed supply of cotton in India. Shiva, 2016 has referred to the cotton seeds as “Seeds of suicide” and she has additionally remarked that when a corporate giant such as Monsanto controls the seeds, it is in a way controlling one of the most important links in the production process. Seeds are considered to be the progenitor of life and therefore control of seeds amounts to the control upon life of a farmer. Monsanto was able to make inroads in Indian Agriculture in 1988 when the World Bank asked the government to regulate the seed sector under the Seed policy (Shiva, 2016)¹⁹. This led to fundamental differences in how agriculture was done in the country. Firstly, the common property resource of a farmer was subjected to the intellectual property rights and thereby became a property of Monsanto. Secondly, earlier cotton was cultivated in addition to food crops but the introduction of Bt-cotton made it a mono-crop which happened to be susceptible to increased pest attack, climatic vulnerabilities leading to complete crop failure. Along with the high costs of these seeds, they are also “terminator” seeds and therefore have to be purchased each time the farmer chooses to grow the crop. As a consequence to this, it has been repeatedly reported that most of the distressed farmers are cotton growers and belong to the cotton growing belts of the country.

Table 4.9 Source of Input for farmers cultivating Cotton (Cotton Seeds) (%)						
	Own Farm	Local Trader	Input dealer	Coop	others	Total
Coastal Andhra	0.00	67.16	32.76	0.08	0.00	100.00
Telangana	0.03	42.00	55.37	2.56	0.04	100.00
Total	0.03	50.04	47.91	2.00	0.03	100.00

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

¹⁹ Shiva, Vandana (2016). “The Seeds of suicide: How Monsanto Destroys farming”, Asian Age and *Global Research*, March 09, 2016 available at <http://www.globalresearch.ca>

The above table shows that Coastal Southern Andhra and Telangana which are the major cotton producing regions in Andhra Pradesh are largely dependent on the private players for the cotton seeds. The State level picture depicts that 50% of the cotton seeds are procured by the local traders followed by input dealers accounting for another 48%. The presence of cooperatives and government agencies as a source of input in terms of cotton seeds is more than dismal therefore; the farmers are forced to depend on the input dealers and local traders for the supply of cotton seeds. Even though most of the farmers questioned in the survey conducted by NSS reported the seeds to be satisfactory but the incidence of spurious seeds being sold to farmers have been mentioned by many field based researchers wherein the poor quality of seed has been blamed to be one of the reasons for a failed harvest and thereby leading to severe indebtedness ending into a suicide (Vasavi, 2014). The input dealer is not only a supplier of seeds but also a supplier of credit and a buyer of input. Therefore, the kind of informal apparatus that comes into picture when a farmer buys his inputs from an input dealer is relatively more precarious as compared to a cooperative agency or a local dealer in a mandi. While the local dealers generally transacts in cash, an input dealer is more flexible in a sense that the input supplier gets into an informal contract with the farmer making the inputs available even in kind and in turn offers to buy the crop. However, it has also been found that the input dealer offers a lesser price as compared to the market price for the same crop but the farmer is trapped in this inter-linked market and he is compelled to sell the produce to the supplier. Thus a vicious trap is set in place where the farmer is caught in the cycle of input-output linkage.

Similarly, when we talk about paddy seeds which are being cultivated by the farmers in coastal Andhra and Telangana on a large scale, it can be seen that in case of Coastal Andhra, the dependence on private lenders and dealers is relatively lesser than Rayalseema and Telangana. Further, as defined by the NSSO, a local trader is still a relatively more regulated and controlled dealer as compared to an input dealer which is more informal in character. The high dependence of farmers on input dealers to buy the paddy seeds is also one of the factors that make a farmer in Telangana vulnerable. On the contrary, a paddy farmer in coastal Andhra has better access to local mandi and cooperatives for the seeds.

	Own Farm	Local Trader	Input dealer	Coop	Others	Total
Coastal Andhra	21.95	61.36	7.95	7.57	1.16	100.00
Rayalseema	5.42	86.27	4.14	3.69	0.47	100.00
Telangana	2.25	50.02	43.97	3.28	0.48	100.00
Total	10.68	57.21	26.25	5.09	0.77	100.00

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

In case of seeds for groundnut which is grown predominantly in Rayalseema, it is interesting to note that even though groundnut is also a cash crop but the farmers' vulnerability is reduced to some extent as almost 53% of the farmer households obtain the seeds from government agencies and cooperatives. Further, almost 12% of the farmers also use the seeds from their own farm in order to cultivate groundnut. Thus, a farmer in Rayalseema cultivating groundnut which is otherwise a very backward region is still better than a cotton or paddy farmer in Coastal Andhra or Telangana because the dominant presence of the government agencies saves the farmer to some extent from the clutches of the input dealers and other private suppliers. The quality is also expected to be relatively better than those provided by local dealer and input supplier. This to some extent shows that why a farmer household cultivating a cash crop in Rayalseema is better placed than a farmer in Telangana. Telangana which specialises in the cultivation of paddy and cotton has a high dependence on input dealers for both of these crops. Thus it can be also argued that the lack of institutional facilities to a farmer in Telangana is one of the major factors wherein a few farmers who are trapped are forced to end their lives out of their vulnerabilities and no hope of overcoming the trap.

	Own Farm	Local Trader	Input Dealer	Coop	Total
Rayalseema	11.51	34.94	0.40	53.15	100.00

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

Though it requires a detailed field survey in order to find the exact causes and consequences under which a farmer ended his life but the over dependence of farmers on the informal input market is one of the major reasons which shapes the vulnerability of a farmer. Also, it can be

argued that the population of farmers who are dependent on these informal and private sources of input even if constitutes a very miniscule section of the farmer population is far more vulnerable than the farmer population accessing inputs from regulated sources. The regions come into picture when we talk about the overall institutional and infrastructural facilities provided to the farmers. Therefore, the spatial connotation of the vulnerability is shaped by the mechanism by which the state supports the otherwise vulnerable section for an instance, since the farmer lobby in coastal Andhra has been more vocal and dominant in politics in comparison to the backward regions such as Rayalseema and Telangana, the farmers in coastal Andhra have been able to force the government to waive off their loans when such initiatives have not been so much successful for farmers in backward regions. Even when the loan waiver is announced for the states altogether it is selectively the rich and affluent farmers who are benefitted more than the small and marginal farmers who need the benefit more.

Further, when we talk about the average cost of seeds per hectare purchased from different agencies it becomes very clear that the prices offered by input dealers and local traders are far more incentivising for the farmer than the prices offered by the cooperatives or the government agencies.

<i>(NSS-Region)</i>	<i>Local Trader</i>	<i>Input Dealer</i>	<i>Cooperatives</i>	<i>Others</i>
Coastal Andhra	1750	1558	1666	486
Telangana	1671	1442	2241	1047
Andhra Pradesh	1792	1453	1895	708

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

For an instance, when we talk about the paddy seeds, the average cost per hectare offered by an input dealer is the lowest in comparison to the prices offered by cooperatives or the local traders in case of Coastal Andhra. This explains to some extent why the farmer especially the small and marginal farmers who have limited purchasing power are compelled to buy the seeds from an input dealer than the cooperative or the local trader both of which charge higher prices. The similar situation exists in Telangana as well wherein the prices asked by the cooperatives are Rs. 800 higher than those offered by the input dealer.

	Local Trader	Cooperatives & Government Agency
Rayalseema	7510	7823

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

For groundnut seeds, the expenses charged by the cooperatives & government agencies and local traders have a difference of almost Rs. 300.

(NSS-Region)	Local Trader	Input dealer	Cooperative
Coastal Andhra	6385	4879	4800*
Telangana	4782	6042	7145
Andhra Pradesh	5208	5929	7132

Source: Calculated from NSS 70th round, Schedule 33. *= sample size inadequate

Similarly, in the case of cotton seed where the input dealer and local trader are the major source of input, it is apparent that in Andhra Pradesh in general, the prices charged by the cooperatives are the highest followed by the input dealer. The higher prices offered by the Government agencies and cooperatives is one of the reasons for a higher dependence on private dealers and traders. Further, input dealer charges almost Rs. 1260 higher than the local trader but the greater ease of a farmer in accessing various inputs from an input dealer and not necessarily being constrained by the presence of cash in hand to undertake the transaction there may be a reason for greater dependence on the input dealer despite of charging higher prices.

b. Fertilisers and pesticides:

Andhra Pradesh is known for an excessively high use of fertilisers and pesticides. The Green Revolution technology that introduced the High Yielding Variety of seeds has been known to have increased the demand for fertilisers and pesticides. In addition to this, the Genetically Modified seeds also require high dose of these inputs. Thus the farmers cultivating the hybrid and genetically modified seeds are compelled to use high doses of chemicals and pesticides. The Extension services of the government which helped in the dissemination of technology has considerably seen a decline since the post-reform period and therefore, the farmers lack the requisite information about the amount of fertilisers and pesticides they should be using in their fields in order to boost their production. Also, the poor farmers believe that there exists

a direct relationship between the use of these inputs and productivity. Therefore, there has been an indiscriminate use of fertilisers and pesticides. This leads to dual problems for the farmer: firstly he has to bear the additional cost of these inputs and secondly, it leads to a decline in the productivity of the crop and fertility of the soil. Subrahmanyam, 2003 has highlighted that the cost of fertilisers has increased almost four times ever since 1992. Also, there have been increased instances of sale of adulterated fertilisers and pesticides.

It is informative to analyse the agency used for buying the fertilisers and pesticides. In coastal Andhra and Rayalseema, fertilisers are being purchased largely from local dealers whereas in Telangana input dealers are the major source of supply of fertilisers and pesticides.

Table 4.15 Source of input for fertiliser (%)					
	Local Dealer	Input dealer	Cooperatives	Other	Total
<i>Coastal Andhra</i>	82.04	14.11	2.95	0.89	100.00
<i>Rayalseema</i>	97.09	1.89	1.02	0.00	100.00
<i>Telangana</i>	46.06	50.95	1.61	1.38	100.00
<i>Andhra Pradesh</i>	68.96	28.34	1.81	0.89	100.00
Source of input for pesticides (%)					
	Local Trader	Input dealer	Cooperatives	Others	Total
<i>Coastal Andhra</i>	81.83	17.42	0.51	0.24	100.00
<i>Rayalseema</i>	95.63	0.68	3.53	0.16	100.00
<i>Telangana</i>	47.01	52.02	0.80	0.16	100.00
<i>Andhra Pradesh</i>	68.18	30.27	1.36	0.18	100.00

Kumar, 2006 has highlighted the crooked practise of the input dealers wherein they promote the use of fertilisers and pesticides among farmers telling them that with the increased use of these fertilisers and pesticides, they would be able to get higher yields of the crop. The farmers who are already motivated by the chances of increasing their yields thus fall in the trap of the input suppliers and invest heavily in fertilisers and pesticides considering that it would increase their yield and therefore the returns from cultivation manifolds. However, the excessive use of fertilisers and pesticides proves out to be counter-productive and therefore impacts the yield negatively.

Therefore, the role of region comes into picture when we try to see the impact of institutions in facilitating the interest of the farmers. Given the fact that almost 45% of the population engaged in agriculture and agricultural activities in Andhra Pradesh are illiterate (calculated from NSS 70th round, Schedule 33, it becomes important for the State to provide extension

services to the farmers. While the level of literacy across the regions doesn't vary much, the regional institutions play a defining role in providing the access of information to the farmer.

- c. **Irrigation costs:** There has been a growing shift towards the use of underground sources of irrigation in comparison to the traditional sources of irrigation namely canals and tanks. This has been analysed in the previous chapter. One of the most important reasons for this has been a decline in the public investment in agriculture following the adoption of Economic reforms of 1991. With the shift towards water-intensive crops, farmers have been undertaking the construction of tube-wells on a large scale. However, owing to the excessive dependence on groundwater by most of the farmers, the groundwater sources have been exceedingly exploited. As a result, the heavy investment in construction of tube-wells has proved to be counter-productive. This has trapped the farmers in what has been termed as a "Bore-well trap" (Kumar, 2006). Irrigation costs make a very miniscule portion of the input costs incurred by the farmer but the cost associated with digging a well isn't reflected in the cost of cultivation data as recorded by the NSS. Nonetheless, greater dependence on tube-wells especially in Telangana is one of the most leading causes of farmers' suicides and a very significant factor in aggravating the agrarian crisis.
- d. **Rents on the land:** It has been found that small and marginal farmers are particularly more vulnerable to the agrarian crisis (Sainath, 2007; Suri, 2006; Galab and Revathi, 2014). However, tenant cultivators are equally vulnerable due to the excessive land rents charged by the landlords for an instance, tenants in Coastal Andhra are made to pay almost half of the amount received from their agricultural produce to the absentee landlords (Deccan Chronicle, 2016). Land rents in Coastal Southern and Northern Andhra are exorbitantly high (Rs. 14,000 approximately as calculated from the NSS 70th round, schedule 33).

Table 4.16 Agricultural Households leasing-in land across various size classes of farmers in different regions of Andhra Pradesh (%)					
	Marginal	Small	Semi-medium	Medium & large	TOTAL
<i>Coastal Northern Andhra</i>	50.05	55.68	57.46	57.26	52.34
<i>Coastal Southern Andhra</i>	27.23	61.02	85.91	60.11	46.21
<i>Rayalseema</i>	4.84	14.65	27.60	44.87	15.78
<i>Telangana</i>	4.98	18.22	24.29	40.74	14.08

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

F. Market linkages for output: The market for output in Andhra Pradesh is marred with imperfections. The institutional arrangements for the sale of output are inadequate and there is a large presence of middle-men. It is also found that the small and marginal farmers are compelled to sell their produce immediately in order to pay back their loans. Also, due to inter-linkages prevalent in the input and credit market, these farmers often sell their produce to the supplier of credit in order to repay their loans. It has been found that in most cases they are paid less than the market price by these agents (Rao and Suri, 2006).

Rao and Suri, 2006 have highlighted that the procurement of commercial crops such as chillies, cotton and groundnut are very low in Andhra Pradesh. The Cotton Corporation of India purchases a very small amount of the cotton produce and therefore the farmers are bound to sell it to the middle-man or any other informal buyer. Also, it has been found that the MSP for Cotton, Groundnut and Chillies is significantly lower than the market price. It has been a major recommendation by the National Commission on Farmers (NCF), 2007 under the chairmanship of the “Norman Borlaug of India”, M.S Swaminathan that the MSP of various crops should be increased to about fifty per cent higher than the average cost involved in production but this has fallen on the deaf ears. The MSP altogether serve as a miniscule source of financial support to the farmer and doesn't cover the cost of production even (Gowri Shanker, 2017)²⁰.

Furthermore, out of the major crops grown in Andhra Pradesh and Telangana, Chillies are not at all covered by MSP. Therefore, farmers who took to cultivation of chilly in the period of good monsoon also suffered huge losses due to bumper crop for an instance, following the severe cycle of debt related deaths especially in the period from 2003-05, the farmers considered cultivating chillies. This led to some improvement in the prices received by the farmers. However, in 2016 characterised by a relatively better monsoon and low demand, the prices of chilly declined from rupees ten thousand per quintal in 2015 to merely rupees thousand to six thousand (Deccan Chronicle, May 13, 2017). This throws light on the plight of the farmers who are entirely dependent on the market forces for the sale of their crops. The farmers who are unaware about the MSP also face similar repercussions.

The following analysis deals with the agency used for disposition of major crops grown in the region. Paddy has been selected for Northern and Southern Coastal Andhra, Groundnut for Rayalseema and Cotton for southern coastal Andhra and Telangana.

²⁰ Shanker, Gowri (2017). “MSP offers little support to farmers”, *Deccan Chronicle*

Table 4.17 Agency for disposition of crops-Paddy (per 1000 households reporting sale of crop), A.P 2012-13

	<i>Local private</i>	<i>Mandi</i>	<i>Input dealer</i>	<i>Cooperatives</i>	<i>Processor</i>	<i>Others</i>	<i>Total</i>
<i>Northern Coastal Andhra</i>	751	5	219	0	19	5	1000
<i>Southern Coastal Andhra</i>	931	0	43	0	27	0	1000
<i>Telangana</i>	474	191	206	103	10	16	1000
<i>Andhra Pradesh</i>	632	111	176	57	13	10	1000

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

In case of paddy, the farmers in northern and southern coastal Andhra sell their paddy crop to the local private dealer but the sale to the input dealer is also found to be high in case of coastal Northern Andhra and Telangana. While 87% of the farmers reporting sale to local private dealers found the prices to be satisfactory, 78% of the farmers reporting sale to input dealers found the prices unsatisfactory and lower than the market price (Calculated from the NSS Schedule 33, Round 70th, 2012-13). Therefore, sale of input to the input dealer rather than more satisfactory outlets such as cooperatives or the mandi can be seen as a sign of distressed sale wherein a farmer who had undertaken loan from the input supplier is bound by the informal contract between them to sell his output order to pay back the loan. The low amount offered by the input supplier therefore helps the farmer to pay back only a part of his dues at the same time being trapped in the never ending cycle of taking fresh loans and growing the riskier crops to repay their loans. Also, even in case of developed regions like Northern and Southern Coastal Andhra, the presence of middle-man in the form of local private dealer limits the ability of the farmer to participate well in the market where the middle man offers very less amount to the farmer and he obtains higher prices from the market. This situation in the case of paddy is rather more alarming since MSP is offered for Paddy and still the presence of government procurement is dismal in almost all of the regions of Andhra Pradesh.

Table 4.18 Agency for disposition of crops-Cotton (per 1000 households reporting sale of crop), A.P 2012-13

	<i>Local private</i>	<i>Mandi</i>	<i>Input dealer</i>	<i>Cooperatives</i>	<i>Processor</i>	<i>Other</i>	<i>Total</i>
<i>Coastal Southern Andhra</i>	851	0	111	38	0	0	1000
<i>Telangana</i>	366	165	308	111	49	2	1000
<i>Andhra Pradesh</i>	452	158	259	91	39	1	1000

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

Further, in case of cotton, the farmers in Telangana are heavily dependent on the input dealer for the sale of cotton crop (308 out of 1000 farmers). While 111 out of 1000 agricultural households also sell their output to the cooperatives but the procurement by cooperatives is limited and the access to these cooperatives such as the Cotton Cooperative of India is high among the medium and large farmers. Also, 58% of the agricultural households selling their crop to the input dealer report that the prices offered by the input dealer were lower than the market prices.

Table 4.19 Agency for disposition of crops-Groundnut (per 1000 households reporting sale of crop), A.P 2012-13

	<i>Local private</i>	<i>Mandi</i>	<i>Input dealer</i>	<i>Cooperatives</i>	<i>Processor</i>	<i>Other</i>	<i>Total</i>
<i>Rayalseema</i>	657	265	0	0	0	78	1000

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

In Rayalseema however, there is a larger presence of local private individuals and mandi. A greater access to mandi by the farmers suggests that the farmer is less vulnerable to the debt trap of the input suppliers and the farmers report a satisfactory price being offered by the private dealer.

4.2.3 Availability of credit and indebtedness: “Credit constitutes life and blood of any economic activity” (Datta, 2013). In the initial stages of economic development especially in a developing economy, only credit has the ability to transform subsistence based agriculture to dynamic profit-making commercial enterprises. Therefore, credit becomes all the more important to the agricultural sector. Keeping this into the mind, Britishers introduced the

credit cooperatives in India as early as 1904. This was thought of as a major step not only in reducing poverty but also in order to protect the farmers from getting into the clutches of the landlords and money-lenders. Since Independence, it has been emphasised that flow of credit into the rural economy gives a fillip to the rural sector and helps in fighting poverty. There has been a wide consensus that an overwhelming proportion of poor is concentrated in the rural areas of the country. This led to a great effort by the government in order to penetrate the banking into the rural areas. The nationalisation of commercial banks in 1960s was a major step in ensuring the increased access of finance to the poor and additionally efforts were made in the 70's and 80's to expand the banking sector to cover rural areas. National Bank for Agriculture and Rural Development (NABARD) and Regional Rural Banks (RRB) were also started during this period. These initiatives were attached with the policies that made it compulsory for the banks to provide subsidised loans to the rural households. However, in the post-reform period, even though initially the regulations on interest rates were still being maintained but slowly and gradually, there was a deregulation of these interest rates. Along with the deregulation, there has been a greater reduction in the number of commercial banks operating in the rural areas, reduction of government's role in the commercial banks and an increased tendency of competition between banks. Nevertheless, given the political pressure upon the government, government still continues to be a major provider of institutional credit in the rural countryside (Basu, 2005).

Even though the rural credit system has fairly evolved in the past few decades but it is not completely inclusive in nature. Datta and Ghosh, 2013 have tried to examine the underlying causes behind the differential access to credit in the rural areas. Their analysis is focused to find out the primary cause behind the inability of few households to access credit from any of the sources. The results show that the demand side of access to credit is a function of various variables like household assets and familiarity with the powerful and influential people in the village influence the supply of credit. The study also highlights some significant factors that influence the demand for agricultural credit from formal sources. This includes the connectivity of the banks and other financial institutions, access to irrigation, education and awareness about formal sources of credit. It has been found that the areas that are well covered by irrigational facilities have a relatively lesser demand for agricultural credit in comparison to farms where irrigation is not adequate. Further, education of the household also influences the demand for credit, as the level of education increases, greater is the

probability of the household accessing formal sources rather than informal sources seeking a higher interest.

It has further been emphasized by Datta and Ghosh, 2013 that in order to strengthen the access to credit in rural areas, semi-formal institutions like Micro Finance Institutions need to be given more impetus as they operate on the very logic of market. Also MFI don't tend to necessarily favour the borrowers of large sum of money. Singh et al, 2014 have also noted that the inability of farmers in availing institutional credit is one of the major causes that drive the farmers into the clutches of the exploitative moneylenders and input dealers. They have also noted that the major source of credit in Punjab is commission agents known as *Arhiyas*. These are basically the middle-man for the sale and purchase of crops. They deduct the outstanding loan and then pay the farmers therefore the farmers are dependent on the middleman for their financial needs.

The most cause of the farmers not accessing the formal institutions even in the areas where these facilities are available is primarily due to the excess of formalities and paper-work associated with the same. Another factor is unavailability of non-collateral based loans which itself acts as a major hindrance for the landless and marginal farmers. They also have to incur a high transaction cost for the same. Other factors include corruption, non-availability of domestic loan, insufficient loan amount and bureaucratic behaviour of the banking officials. Others like Narayanmurthy and Ghosh, 2015 have also reported such evidences for the lack of access to institutional credit and a heavier dependence on non-institutional sources of credit.

As recorded by NCRB statistics, in 2015 indebtedness was the most important cause of farmers' suicides in India. Surprisingly, almost 39% of the farmers' suicides were due to indebtedness. It is the first time when indebtedness has been classified into indebtedness from formal and informal sources. One of the most exciting observations in the analysis has been the reporting of indebtedness from Formal Institutions and Micro-Finance Institutions as the major cause of suicides amongst the cultivators.

Indebtedness in the agricultural sector is not a new phenomenon. Traditionally too indebtedness has been very common amongst the agrarian households. However, the suicides committed by farmers due to the rising level of indebtedness are definitely a new phenomenon. Suri, 2006 has attributed the growing cost of cultivation and declining returns from agriculture as the major cause of this indebtedness induced suicide. The farmer who

incurs a loan is dependent on the income from cultivation for the repayment of the loans. However, if the sufficient amount is not received subsequently for over two to three years, it makes the farmer caught in a vicious “debt-trap” (Rao and Suri, 2006).

It has also been reported that Andhra Pradesh and Telangana have the highest percentage of indebted rural households. Almost 59% of farmer households in Telangana and 54% in Andhra Pradesh have been found to be indebted as against the national Average of 31.4% (calculated from NSS 70th round, Schedule 33, Ministry of Statistics and Programme implementation report, 2016). It has also been found that the reach of farmers to Institutional source of credit has been less than 50 per cent in both the states leaving the farmers vulnerable to the non-institutional sources of credit such as money-lenders, input dealers, landlords etc. who charge higher interest rates from the poor farmers. However, a recent NCRB statistics as studied by Tiwary, 2017 has shown that contrary to the popular belief that money-lenders are responsible for indebtedness related deaths, it was found that almost 80 per cent of deaths have been caused due to bankruptcy or debts as incurred from institutional source such as Micro-Finance Institutions, banks etc. (NCRB, 2015). Abhijit Sen, a former member of the Planning Commission has also highlighted that money-lenders though thought of as major culprits, are more flexible in comparison to the banks and microfinance institutions that are relatively less flexible. In fact, he points out that micro-finance institutions create more pressure upon the indebted farmer as they clearly state that even if one person doesn't repay the loan in time, the whole group will have to bear the brunt of it. This reduces the social capital of the distressed farmer and also makes his presence a burden not only for his family but also the group of farmers he share the credit burden with! Therefore, it merits our attention as to who the real culprits are: Institutional sources or Non-Institutional sources of credit. Since, indebtedness has been attributed as the main cause behind the farmers suicides, it needs to be analysed that how indebtedness has become the major reason for the agrarian distress. It is surprising that indebtedness has existed earlier also but then why this indebtedness has now come to be recognised with the distress in the country-side. Further, it is also a point to give attention regarding how indebtedness impacts different categories of farmers and how the farmers in different regions based on level of development are impacted by indebtedness.

Table 4.20 Source of credit across various regions in Andhra Pradesh (per 1000 agricultural households), 2012-13											
	Govt.	Co-Op.	Bank	Institutional sources	Landlord	Agri./Prof money lender	Shop keeper	Relatives	Others	Non-institutional sources	Total
<i>Coastal Northern Andhra</i>	54	97	294	446	11	482	9	50	2	554	1000
<i>Coastal Southern Andhra</i>	9	118	431	558	1	405	20	15	2	442	1000
<i>Rayalseema</i>	14	54	382	450	31	413	4	98	5	550	1000
<i>Telangana</i>	10	57	433	501	7	430	22	32	8	499	1000
<i>Andhra Pradesh</i>	19	75	394	488	13	431	15	49	5	512	1000

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The table above depicts that the access to institutional sources of credit is the highest in coastal southern Andhra wherein 558 farmers out of 1000 have access to institutional sources of credit followed by Telangana wherein 501 farmers out of 1000 access loans from formal sources of credit namely government agencies, banks and cooperatives. The access to institutional credit is the lowest for farmers in coastal northern Andhra which is one of the most developed regions in terms of economic indicators. Also, the dependence on agricultural or professional money lenders is the highest in coastal northern Andhra. This suggests that farmers in otherwise developed region are more prone to get into the clutches of informal markets as compared to farmers in relatively less developed regions such as Telangana. Further, it needs to be noted that in Rayalseema there is a relatively higher dependence on relatives as a source of credit, almost 100 out of 1000 agricultural households get access to credit from relatives. This source even though is an informal source of credit but is relatively least exploitative as compared to a loan from agricultural or professional money-lenders. This is so because the loans taken from relatives and friends are generally interest free or at most have negligible rate of interest, along with it there exist flexibility in paying back the loans. The presence of banks in Coastal Southern Andhra is the highest where almost 431 out of 1000 farmer households access to credit from banks.

Even though informal sources of credit have been blamed to be the biggest source of indebtedness related deaths, it is not very clear if formal source of credit are actually less vulnerable. As Datta, 2013 has highlighted, the problem with the informal institutions is that unlike the formal banking sector constituted by government banks or private sector banks (Scheduled commercial banks), cooperative banks and Regional Rural Banks (RRBs), the informal sources are not covered under the purview of RBI so they work unregulated. The interest rates charged by agricultural and professional money-lenders have been found to be the highest and they are often unregulated. Therefore formal sources of credit are considered to be less risky since the rates are regulated by the government. However, recent news reports also highlight the plight of farmers who undertook loans from institutional sources of credit such as banks and other Micro-finance institutions and the oppressive mechanisms adopted by the formal agencies to recover their loans. Non-performing assets problem and the bad loans are very common in the Indian economy today but these largely consist of loans that have been given out to big corporate giants and not to small and marginal farmers. Also, the agricultural and professional money-lenders have existed previously as well but at that point of time farmers suicides were not as common as they are today. Not denying the fact that the

cash requirement has changed manifolds with the changed agricultural scenario in the liberalised, privatised and globalised regime along with the banking reforms but the exact nature of formal and informal sources of credit has not been adequately analysed.

Given this limitation and a general understanding that indebtedness is a major cause of suicides amongst farmers it is more insightful to analyse the average amount of debt across various regions according to the sources.

Table 4.21 Average amount of debt amongst agricultural households (Rs.) across various regions in Andhra Pradesh (2012-13)		
<i>(NSS-Region)</i>	<i>Average amount of debt per household (Rs.)</i>	<i>Average amount of debt per indebted household (Rs.)</i>
Coastal Northern Andhra	106272	124541
Coastal Southern Andhra	173863	185697
Rayalseema	101933	103717
Telangana	93450	104851
Andhra Pradesh	110933	121426

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The average amount of debt per household is the highest in Coastal Southern Andhra followed by Coastal Northern Andhra and Rayalseema. If we talk about the average amount of debt per indebted household then also in more developed regions, the average amount of debt outstanding is the highest. The debt situation in Andhra Pradesh is altogether very alarming as compared to the national picture wherein Rs. 47000 is the average amount of debt per household as against Rs. 1, 10, 933 in Andhra Pradesh. There exists a very clear pattern of average amount of debt per indebted household and level of development within the region for an instance, the highest amount of debt per indebted household is Rs. 1, 85, 697 in Coastal Southern Andhra which is the most developed region in Andhra Pradesh followed very closely by another developed region namely Coastal Northern Andhra. It is the lowest in case of Rayalseema which is the most backward region of the State. However, when viewed along with the average annual income earned by the agricultural household from all the sources during the particular year in consideration (2012-13), it becomes apparent that the difference between the income earned by the household and the average amount of debt per household is the highest in Coastal Southern Andhra followed by Coastal Northern Andhra and Telangana. Therefore, it can be suggested that farmers in developed regions are more prone to indebtedness and the amount borrowed by the households far

exceeds the income earned by the agricultural households from all the sources. This point to an alarming situation where not only is the debt undertaken by the farmer high but the ability to pay back is also limited. It can thus be argued that debt related deaths though have been reported in a large number from some of the most backward regions, the underlying conditions may even be worse in the developed regions of the State. Further, the crop failure and bore-well failure may only be the immediate trigger to the farmer suicides in backward regions but the crisis situation seems to be existent even in the developed regions from where relatively lesser number of suicides has been reported from.

(NSS-Region)	Marginal	Small	Semi-Medium	Medium & Large
Coastal Northern Andhra	128374	91257	126066	260895
Coastal Southern Andhra	104800	151536	213104	650768
Rayalseema	62980	98887	174907	163815
Telangana	82891	123241	119022	174654
<i>Andhra Pradesh</i>	<i>91930</i>	<i>116765</i>	<i>147581</i>	<i>289841</i>

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The table above shows that the amount of loan outstanding in Andhra Pradesh increases with the increase in the size of the land-holding. Among marginal farmers, the loan undertaken by them is the highest in coastal Northern Andhra followed by Coastal Southern Andhra and Telangana. It is suggested that the amount of debt would be higher for large farmers and for developed regions because of the developed credit markets that exist in the region and also the ability of the farmer to offer the suitable collateral. However, the table above depicts the overall conditions in the region and is not limited to formal sources of credit. While the formal sources of credit may be based on collateral but this is not always the case in case of informal credit markets. The inter-linkages in the input-output market and the credit mechanism have already been discussed in the previous sections. Hence, given the similar requirements of the farmers in all the regions, it may be argued that a higher amount of debt is an indicator of crisis especially amongst the small and marginal farmers who are severely resource constrained and lack the suitable assets as is the case with medium and large farmers.

Additionally, when viewed together with the cropping pattern and cost of cultivation, it can be seen that the farmers in regions cultivating highly cash intensive crops are the ones having

higher amount of debt burden for example cotton cultivation is predominant in both coastal southern Andhra and Telangana and the debt burden is also the highest especially among the small farmers.

<i>(NSS-Region)</i>	<i>Co-Operative society</i>	<i>Bank</i>	<i>Agri./Prof money lender</i>
<i>Coastal Northern Andhra</i>	84513	42812	68114
<i>Coastal Southern Andhra</i>	57292	84958	103001
<i>Rayalseema</i>	38357	52958	62370
<i>Telangana</i>	34895	39036	78354

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The above table shows that the average amount of debt per indebted household for coastal Northern Andhra is the highest from Co-operative society (Rs. 84,513). The amount outstanding is the highest from agricultural and professional money-lenders in Coastal Southern Andhra, followed by Rayalseema and Telangana. If we try to superimpose the general pattern of farmers' suicides and the debt structure that emerges from the above analysis, it becomes clear that the most suicide prone regions namely Southern Coastal Andhra and Telangana have a high amount of debt outstanding with the agricultural and professional money-lender where the average amount of outstanding debt per indebted household is Rs. 1, 03, 001 in Coastal Southern Andhra and Rs. 78, 354 in Telangana.

<i>Marginal farmer Households</i>									
<i>(NSS-Region)</i>	<i>Govt.</i>	<i>Co-Op.</i>	<i>Bank</i>	<i>Landlord</i>	<i>Agri./Prof money lender</i>	<i>Shop keeper</i>	<i>Relatives</i>	<i>Others</i>	<i>Total</i>
<i>Coastal Northern Andhra</i>	69	103	269	15	483	12	48	1	1000
<i>Coastal Southern Andhra</i>	6	121	400	1	444	1	26	1	1000
<i>Rayalseema</i>	20	71	309	61	343	6	191	0	1000
<i>Telangana</i>	11	52	446	7	433	20	25	6	1000
<i>Andhra Pradesh</i>	27	80	366	19	429	12	64	3	1000
<i>Small farmer households</i>									
<i>Coastal Northern Andhra</i>	35	83	311	3	521	5	41	1	1000
<i>Coastal Southern Andhra</i>	7	129	436	0	361	53	10	3	1000
<i>Rayalseema</i>	12	27	445	25	424	2	63	1	1000
<i>Telangana</i>	15	67	403	4	415	29	52	15	1000
<i>Andhra Pradesh</i>	16	69	408	9	423	22	46	7	1000

Source: Calculated from unit level data-NSS 70th round, Schedule 33, (2012-13), Ministry of Statistics and Planning Implementation.

The above table depicts that there is a high dependence of both marginal and small farmers on agricultural and professional money-lenders, 483 out of 1000 marginal farmers and 521 out of 1000 small farmers in Coastal Northern Andhra access to credit from the informal credit. Generally speaking, there is a high dependence on informal credit institution among the marginal farmers and in fact, for marginal farmers the dependence on informal source of credit increases with the level of development in the region for an instance both Southern Coastal Andhra and Northern Coastal Andhra have maximum percentage of loans being taken from the informal market. The presence of banks is also very significant in the case of Coastal Southern Andhra and Telangana. Therefore, though it can't be generalised that farmers in which region are more vulnerable but it can be suggested that a farmer accessing informal credit from agricultural or professional money-lender is more vulnerable than a farmer accessing credit from a formal source of income and the access to formal institutional sources is higher in Coastal Southern Andhra and Telangana both for small and marginal farmers.

Table 4.25 Average amount of Debt and Average value of Asset (Rs.) for major size classes of farmers, Andhra Pradesh (2012-13)			
(NSS-Region)	Marginal	Small	Semi-Medium
<i>Average amount of Debt (AOD)</i>			
<i>Coastal Northern Andhra</i>	74215	84702	31952
<i>Coastal Southern Andhra</i>	46249	67866	210316
<i>Rayalseema</i>	34332	143489	90236
<i>Telangana</i>	52745	68621	78669
<i>Andhra Pradesh</i>	52221	98074	88387
<i>Average Value of Asset (Rs.)</i>			
<i>Coastal Northern Andhra</i>	607330	749075	257615
<i>Coastal Southern Andhra</i>	495612	988184	1427224
<i>Rayalseema</i>	367484	791862	977640
<i>Telangana</i>	576620	1171600	1500631
<i>Andhra Pradesh</i>	524801	962836	1173648
<i>Debt by Asset Ratio (%)</i>			
<i>Coastal Northern Andhra</i>	12.22	11.31	12.40
<i>Coastal Southern Andhra</i>	9.33	6.87	14.74
<i>Rayalseema</i>	9.34	18.12	9.23
<i>Telangana</i>	9.15	5.86	5.24
<i>Andhra Pradesh</i>	9.95	10.19	7.53

Source: Calculated from unit level data-NSS 70th round, Schedule 18.2, (2012-13), Ministry of Statistics and Planning Implementation.

A Debt by Asset ratio gives an idea about the risk in paying back the loan. While typically, we expect a higher debt by asset ratio for a medium and larger farmer due to their large loans along with a larger asset base but the higher value of the debt with lower value of assets makes it difficult to repay the loan. High value of debt with the higher value of asset thus makes the loan less risky for a medium or a large farmer as compared to a small and marginal farmer. This is because a small and marginal farmer neither owns the assets to repay his loans nor does he has any other means to repay the outstanding debt. This generally propels him to take more loans from different sources and it gets him into a “Debt trap”.

Generally speaking the debt-by asset ratio for all size classes of farmers in Andhra Pradesh is very high in comparison to the national figures but a high debt by asset ratio for a farmer in Coastal Northern Andhra points to the vulnerability faced by the farmer in terms of repaying the loan. Given the lower returns from cultivation and also lower annual income from all the sources it suggests that a marginal farmer in Coastal Northern Andhra is extremely vulnerable to distress. There is a general tendency among farmers to take additional loans in order to repay the previous loans. Therefore, a situation such as a suicide doesn't emerge in a singular period of time but is rather compounded over the years. Hence it is argued here that the kind of pattern of farmers' suicides we are witnessing today is an outcome of a prolonged period of time wherein farmers have incurred a high amount of debt over subsequent years and once the amount of debt has reached to a certain high level, the farmer has been propelled into committing suicide. These incidents of suicides may thus not be confined to the relatively backward regions and may be more prominently reported from rather developed regions as well.

Further, there are certain pockets in these regions which are having a very high debt by asset ratio for small and marginal farmers for example Cuddapah and Ananthapur district in Rayalseema region have a DAR of 18.84 and 14.49% as against the state figure of a DAR of 9.95% for the marginal farmers. The fact that maximum number of suicides in the Rayalseema region has been reported from Ananthapur and Cuddapah district also points to the fact a higher debt by asset is one of the factors leading to the precipitation of agrarian crisis and farmers' suicides. Also, amongst the small farmers, the East Godavari district in Coastal Northern Andhra and Guntur and Prakasam districts in Coastal Southern Andhra have a debt by asset ratio higher than the DAR for other districts. East Godavari, Guntur and Prakasam districts have also been the hot-spots of farmers' suicides in the recent years.

4.3 Summary:

This chapter therefore highlighted the nature of dependence of agricultural households on cultivation as a source of income. The analysis reveals that almost 70% of the agricultural households are entirely dependent on cultivation as a major source of income and therefore a farmer household in Andhra Pradesh is relatively more vulnerable to the crisis as compared to other States where income diversification has taken place. Also, it is found that the dependence of farmer households on cultivation is lesser in developed regions of the state namely coastal southern and northern Andhra where only 58% and 53% of the farmer households have cultivation as primary source of income as opposed to Telangana where as high as 86% of the households have cultivation as the major source of income. The risk and vulnerabilities related to farming thus have the potential to push the household in Telangana in distress far more severely than a farmer in relatively developed states. This may be one of the reasons that even the smallest deficit in rainfall and a fluctuation in market prices can trigger a series of suicides in backward regions such as Rayalseema and Telangana.

An analysis of cost of cultivation and returns from cultivation indicates that for the given period of analysis, the returns from cultivation are higher in backward regions such as Telangana and Rayalseema as compared to the developed regions of coastal Andhra. While the farmers in Telangana and Rayalseema are susceptible to market fluctuations, the farmers in developed regions of coastal Andhra are burdened by the prohibitive land rents, higher input expenses on fertilisers and pesticides, human labour and other material inputs. Thus the high cost of cultivation but low returns from cultivation makes the farmer in these developed pockets vulnerable to the crisis.

Expenses on inputs such as seeds and fertilisers constitute a major component of the total expenses incurred by the farmers. It was found that the major agency for sale of seeds both for cotton and paddy in Telangana was the input dealer whereas the local trader was the most important agency for both these crops in the Coastal northern and southern Andhra region. This suggests that the informal input markets are well pervasive in the backward region of Telangana while the farmers in relatively developed regions have better access to relatively more regulated input markets. The instances of selling spurious seeds and adulterated fertilisers and pesticides are far more in case of input suppliers than in the case of cooperatives and government institutions. Additionally, the inter-linkages of input and output market are more embedded with the nature of working of input dealers wherein they

trap a farmer in a vicious cycle of never ending debts. These input suppliers are the also the buyers of the output as has been shown by the analysis. In Telangana, both for paddy and cotton, the input dealers are the major buyers as well and farmers have reported that the prices offered by them are insufficient with respect to the prices offered by the market.

On analysing the nature and extent of indebtedness across various regions in Andhra Pradesh, it was found that a farmer in coastal Andhra has a higher average amount of debt outstanding as compared to a farmer in backward regions of Rayalseema and Telangana. This includes the amount outstanding both from institutional and non-institutional sources of credit. Given the higher consumption expenditure, lower income from all sources; higher cost of cultivation and lower returns; and predominant cultivation on marginal holdings, a farmer household is bound to be burdened by the higher amount of loan since his potential to repay is severely limited. Further, it has been found that there is a greater dependence on non-institutional sources of credit amongst the farmers in Coastal Northern Andhra. Also, the amount of outstanding debt from agricultural and professional money-lender is the highest in Coastal Southern Andhra. The debt by asset ratio for marginal farmers has been found to be the highest for the small and marginal farmers in Coastal regions of Andhra. This clearly suggests that the loans taken by small and marginal farmers are relatively more risky than the loans taken by a farmer in backward regions of Rayalseema and Telangana.

Thus, if we look at a composite picture it becomes clear that in the present year of analysis (2012-13), the farmer households in backward regions are relatively well placed than the farmers in otherwise developed regions in terms of net income from all sources, net returns from cultivation and the amount of loan outstanding. Nonetheless, the analysis also tried to shed light upon the underlying conditions in the backward regions such as a high dependence on cultivation for income, high dependence on input dealers both for input and credit and a greater dependence on the agricultural and professional money-lenders for credit in being the agents to act as a trigger to farmers' suicide with even the miniscule changes in the value of output received from cultivation. Hence, the factors leading to vulnerability of farmers are different in case of developed and developing regions and therefore this analysis tried to bring forth a clear picture of the factors leading to vulnerability of farmers across regions at varying levels of development.

Chapter-5

Conclusion

The agrarian crisis refers to the livelihood issues faced by the farmers and it is apparent in the form of protests by farmers, distressed migrations and on the top of it by the farmers' suicides. Therefore, the agrarian crisis is referred to as the crisis of the producer. The economic reforms of 1991 have often been blamed to be the cause of the agrarian distress. The liberalisation, privatisation and globalisation regime introduced under the economic reforms has been identified to mark not only opening the economy for swift import and export of commodities but it is characterised by a swift import of production systems from the developed countries to the developing countries. This marks the adoption of the market oriented and capital driven system of output generation and the agriculture sector hasn't been an exception to it.

The first chapter of the analysis provides the background for the agrarian distress in the country. The agrarian distress has become more pronounced in the post reform period however, the conditions for the distress were laid in the pre-reform period itself. The oppressive land revenue regime of the britishers leading to a growth in the number of landless and marginal farmers was followed only by half-hearted land reforms in the post-independence period. This didn't improve the welfare outcomes for the farmers even in the post-independence period. Further, with the introduction of the green revolution technology, the inter-personal and inter-regional inequalities have increased significantly. The green revolution was initially confined to the irrigated regions of Punjab, Haryana, western Uttar Pradesh and coastal southern Andhra and the arid and semi-arid regions were either bypassed or were late adopters. Also, the farmers in these relatively backward regions which didn't benefit much from the green revolution thus found the adoption of cash crops more incentivising in order to boost their incomes. However, the green revolution period is considerably different from the post-reform period because the success of green revolution was hinged on the active participation of the state for example in the development of irrigation systems, but the post-reform period is characterised by a withdrawal of the state.

The post-reform period saw a decline in the share of GDP in the agricultural sector but at the same time there wasn't a considerable decline in the population engaged in agriculture. The economic reforms have led to a considerable decline in the Gross Capital Formation in

agriculture. An increased cost of cultivation in terms of seeds and fertilisers is also an outcome of the economic reforms since the state has withdrawn from the regulation of prices for essential inputs. The price volatility has also increased and the prices for cotton have fallen after the relaxation of quantitative restrictions.

Additionally there are other sociological and cultural causes of the agrarian crisis in the present context such as growing individualisation of farmer, incongruity in the diffusion of agricultural knowledge and advanced marginalization of the rural. Also, ecological conditions aggravate the crisis faced but the farmer for an instance there has been a decline in soil fertility in otherwise productive areas such as Punjab; extensive irrigation using groundwater has increased the level of contamination in groundwater and there are increased instances of failed investment in digging wells and tube-wells.

However, the agrarian distress is not so pervasive in all the States as can be seen from one of the symptoms of the agrarian distress namely the suicides committed by farmers. It has generally been argued that the farmers in developed regions are more prone to committing suicides than farmers in the less developed states. Therefore, the next chapter examines the pattern of farmers' suicides across various states in India.

Most of the farmers suicides have been reported from the well-developed states such as Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh and not from the poorer states such as Bihar and Jharkhand; Chhattisgarh being an exception. It is also found that the States from where maximum suicides by Farmers have been reported are the states which have adopted the economic reforms in totality and the state itself promoted market oriented agriculture especially in the backward regions in order to take them to the path of economic development. Despite being the initiator of these market oriented reforms in the agricultural sector, the State at the same time withdrew from the support it offered to the agricultural sector and the welfare of the farmer household.

The study has tried to shed light on a significant question as to who a farmer as defined by the NCRB for collection of suicide statistics is. While the earlier researches recognised only a person having title to land as a farmer, the recent report by NCRB that gives disaggregated data for the suicide committed by cultivators and agricultural labourers, it has been found that over the years, the NCRB has not only recorded the suicides committed by cultivators alone but also the agricultural labourers. Thus, all the major analysis which took the population of only the main and marginal cultivators from the census has overestimated the rate of farmers

suicides in the respective states. While one of the researches by Basu, 2016 has also highlighted this discrepancy and has tried to analyse the rate of farmers suicides across various states in India by taking into account the total number of agricultural cultivators and labourers, both main and marginal, but while calculating the non-farmer suicide rates the age standardisation has not been done and therefore there is still an element of over-estimation in the rate of suicides among agricultural population and the general population. The study here tries to overcome both the earlier methodological discrepancies mentioned above and bring forth a clearer picture of the spatial and temporal pattern of the farmers suicides across various states in India.

The rate of farmers' suicides has been found to be the highest in case of Kerala followed by Karnataka, Maharashtra and Andhra Pradesh. While the rate of farmers suicides has decreased across all states from 2001 to 2011, there has been an increase in the rate of suicides committed by farmers in Andhra Pradesh. Thus Andhra Pradesh is one of the States that marks the distinction of being one of the states referred to as the big five or the suicide hot spots of the country. Andhra Pradesh exhibits several commonalities with the suicide prone States such as the presence of enclaves within otherwise developed state for example Rayalseema and Telangana in Andhra Pradesh which are relatively backward with respect to coastal northern Andhra. Further, Andhra Pradesh is one of the States that has been a staunch supporter of economic reforms and economic liberalization. In addition, the State exhibits a significant shift from cultivation of food grains to cash crops, a higher input cost and a higher incidence of indebtedness.

Thus Andhra Pradesh has been chosen as the study area since it exhibits commonalities with other farmer suicide prone regions and also exhibit different levels of development across major regions namely Coastal Southern Andhra, Coastal Northern Andhra and Rayalseema. It hence is a suitable example to study the vulnerabilities associated with farming and how levels of development help in shaping the vulnerability faced by farmers' households.

Coastal Southern Andhra has the highest level of per capita income, followed by Telangana (excluding Hyderabad) and Rayalseema. Various historical and agro-ecological conditions have interplayed in deciding the levels of development across these regions. While coastal southern Andhra was found to be benefitted greatly by the green revolution, the successes shared by backward regions namely Rayalseema and Telangana were limited. Further, it is interesting to note that maximum number of suicides have been reported from Telangana

region of Andhra Pradesh followed by Rayalseema and Coastal Southern Andhra. Ananthapur district in Rayalseema, Guntur and Krishna district in Coastal Southern Andhra, Warangal and Karimnagar district in Telangana have the highest number of suicides committed by farmers.

The four regions are significantly different in terms of rainfall conditions and cropping pattern as well. It has been reported from the analysis that the cropping pattern in Coastal Southern Andhra is very different from Coastal Northern Andhra. While the coastal northern Andhra specialises primarily in the cultivation of rice, coastal southern Andhra has a more diversified cropping pattern with a large percentage under cotton in addition to the cultivation of rice in the Kharif season. Rayalseema is primarily an oilseed cultivating region undertaking the cultivation of groundnut and castor seed during the Kharif season. Telangana region has the largest percentage of area under cotton cultivation followed by rice.

In the rabi season, the area under cultivation of crops declines in Rayalseema and Telangana region wherein the area under cultivation in case of Rayalseema accounts for only 29% of the area cultivated during the kharif season and 65% in the case of Telangana. Only in Coastal Southern Andhra, the area under cultivation increases during the Rabi season because of better rainfall during the north-eastern monsoon. Also, there is a larger share of land given to the cultivation of rice and pulses than cotton during the rabi season in Coastal Southern Andhra.

The aggregate yield (Rs. Per hectare) is the highest in Coastal Southern Andhra both during the Kharif and Rabi season. Also, the aggregate yield for both seasons combined is the lowest for Rayalseema followed by Telangana. This suggests that the gross returns from cultivation are higher in more developed regions which have better access to irrigation facilities and lower in case of un-irrigated areas such as Rayalseema. Therefore, a farmer in these backward regions is constrained by irrigation for increasing their yield. The fluctuations in rainfall add to the vulnerability of the farmer Rayalseema and Telangana.

It is believed that since coastal northern Andhra and Coastal Southern Andhra are well endowed with adequate sources of irrigation, the farmers in coastal regions would be cultivating under irrigated conditions but on analysing the crop wise area under irrigation it is revealed that a cotton farmer even in Coastal Southern Andhra is cultivating under un-irrigated conditions wherein 40% of the area under cotton cultivation is un-irrigated as against full area under irrigation for paddy. Similarly, other crops grown in Coastal Northern

Andhra such as maize and arhar cultivation in Coastal Southern Andhra are under un-irrigated conditions. Therefore farmers cultivating these crops even in the otherwise well irrigated area are exposed to the vagaries of the monsoon as much as a farmer in an under-developed region. Hence, crop specific vulnerabilities transcend the spatial vulnerabilities.

Further, on analysing the source of irrigation it is found that tube wells are the major source of irrigation in case of Rayalseema and Telangana. The investments undertaken by the farmers for digging of tube wells however are proving to be counter-productive and therefore the farmers in Telangana and Rayalseema are moving into a debt trap because of the heavy investments undertaken by farmers. The incidence of failure of wells has become more prominent in Telangana especially during the drought period because the recharge is also a function of the rainfall. Also, farmers in the coastal region are facing the challenges from deterioration of canal based sources of irrigation. The investment on digging of tube-wells therefore acts as a major reason for growing indebtedness amongst the farmers' households.

Thus the Chapter-3 highlights the vulnerability of farmer households living in regions with varying levels of development. It has been found that there is a greater dependence on cash crop cultivation in the backward regions as compared to the developed regions of Andhra Pradesh. It is observed that most of the area under cultivation of cash crops in backward regions of Rayalseema and Telangana is under un-irrigated conditions but the farmer cultivating cash crops even in developed regions is cultivating the crops in un-irrigated conditions. Therefore, vulnerabilities are crop specific as well and not just region specific.

Further, Chapter-4 highlights the nature of dependence of agricultural households on cultivation as a source of income. The analysis reveals that almost 70% of the agricultural households are entirely dependent on cultivation as a major source of income and therefore a farmer household in Andhra Pradesh is relatively more vulnerable to the crisis as compared to other States where income diversification has taken place. Also, it is found that the dependence of farmer households on cultivation is lesser in developed regions of the state namely coastal southern and northern Andhra where only 58% and 53% of the farmer households have cultivation as primary source of income as opposed to Telangana where as high as 86% of the households have cultivation as the major source of income. The risk and vulnerabilities related to farming thus have the potential to push the household in Telangana in distress far more severely than a farmer in relatively developed states. This may be one of

the reasons that even the smallest deficit in rainfall and a fluctuation in market prices can trigger a series of suicides in backward regions such as Rayalseema and Telangana.

An analysis of cost of cultivation and returns from cultivation indicates that for the given period of analysis, the returns from cultivation are higher in backward regions such as Telangana and Rayalseema as compared to the developed regions of coastal Andhra. While the farmers in Telangana and Rayalseema are susceptible to market fluctuations, the farmers in developed regions of coastal Andhra are burdened by the prohibitive land rents, higher input expenses on fertilisers and pesticides, human labour and other material inputs. Thus the high cost of cultivation but low returns from cultivation makes the farmer in these developed pockets vulnerable to the crisis.

Expenses on inputs such as seeds and fertilisers constitute a major component of the total expenses incurred by the farmers. It was found that the major agency for sale of seeds both for cotton and paddy in Telangana was the input dealer whereas the local trader was the most important agency for both these crops in the Coastal northern and southern Andhra region. This suggests that the informal input markets are well pervasive in the backward region of Telangana while the farmers in relatively developed regions have better access to relatively more regulated input markets. The instances of selling spurious seeds and adulterated fertilisers and pesticides are far more in case of input suppliers than in the case of cooperatives and government institutions. Additionally, the inter-linkages of input and output market are more embedded with the nature of working of input dealers wherein they trap a farmer in a vicious cycle of never ending debts. These input suppliers are the also the buyers of the output as has been shown by the analysis. In Telangana, both for paddy and cotton, the input dealers are the major buyers as well and farmers have reported that the prices offered by them are insufficient with respect to the prices offered by the market.

On analysing the nature and extent of indebtedness across various regions in Andhra Pradesh, it was found that a farmer in coastal Andhra has a higher average amount of debt outstanding as compared to a farmer in backward regions of Rayalseema and Telangana. This includes the amount outstanding both from institutional and non-institutional sources of credit. Given the higher consumption expenditure, lower income from all sources; higher cost of cultivation and lower returns; and predominant cultivation on marginal holdings, a farmer household is bound to be burdened by the higher amount of loan since his potential to repay is severely limited. Further, it has been found that there is a greater dependence on non-

institutional sources of credit amongst the farmers in Coastal Northern Andhra. Also, the amount of outstanding debt from agricultural and professional money-lender is the highest in Coastal Southern Andhra. The debt by asset ratio for marginal farmers has been found to be the highest for the small and marginal farmers in Coastal regions of Andhra. This clearly suggests that the loans taken by small and marginal farmers are relatively more risky than the loans taken by a farmer in backward regions of Rayalseema and Telangana.

Thus, if we look at a composite picture it becomes clear that in the present year of analysis (2012-13), the farmer households in backward regions are relatively well placed than the farmers in otherwise developed regions in terms of net income from all sources, net returns from cultivation and the amount of loan outstanding. Nonetheless, the analysis also tried to shed light upon the underlying conditions in the backward regions such as a high dependence on cultivation for income, high dependence on input dealers both for input and credit and a greater dependence on the agricultural and professional money-lenders for credit in being the agents to act as a trigger to farmers' suicide with even the miniscule changes in the value of output received from cultivation. Hence, the factors leading to vulnerability of farmers are different in case of developed and developing regions and therefore this analysis tried to bring forth a clear picture of the factors leading to vulnerability of farmers across regions at varying levels of development.

References

Agarwal, Bina.(1997) “Bargaining and Gender Relations: Within and Beyond the Household”, *Feminist Economics*, 3(1)

Aggrawal, Rimjhim (2006) “Resources for Poor Farmer in South India”: On The Margin of Frontier of Globalization” Research paper no. 2006/97. Tokyo: WIDER, United Nations University

Akram-Lodhi, A.Haroon and Christobal Kay(2009) Peasants and Globalization: Political Economy, Rural Transformation and the agrarian Question, London: Routledge

Akram-Lodhi, A.Haroon (2010) “Modernising Subordination? A south Asia Perspective on the World Development Report 2008: Agriculture for Development; *Journal of Peasant studies*

Arvind (2006) “In India’s Richest State, Suicides and Starvation Stalk the Countryside, People’s March 7, 2006.

Andre Gundre Frank (1969) 'Capitalism and underdevelopment in Latin America: A historical study of Chile and Brazil', New York, Penguin, p.31.

Blauner (undated) "Still the Big News: Racial Oppression in America", Philadelphia, Temple University Press.

Bardhan, Pranab (1984), The Political Economy of Development in India. New Delhi: Oxford University

Bhalla,G.S (2006), Condition of Indian Peasantry, New Delhi: National Book Trust

Centre for Environment and food security (2002) “Field Report on Farmers Suicide in Andhra Pradesh. Hyderabad: CEFS

Citizens Report (1998), Gathering Agrarian Crisis: Farmers suicide In Warangal (AP), Hyderabad: Citizens committee

Commission On Farmer’s Welfare (2005) “Report Submitted to the Government of Andhra Pradesh. Hyderabad: Commission for Farmer’s Welfare

Corbridge Stuart and John Harris (2000), *Reinventing Indian Liberalization, Hindu Nationalism And popular Democracy*, New Delhi: Oxford University Press.

Dandekar, ajet al (2005), *Causes of Farmer suicides in Maharashtra: An Enquiry*. Final Report Submitted to the Mumbai High Court. Tata Institute of Social Sciences: Mumbai.

Farmer`s Commission Of Experts and Vyavasayaranga Parikakshana 2002. Report of The Farmers`commission of Experts on Agriculture in Andhra Pradesh. Hyderabad: Navya Printers.

Galab, S.E Revathi and P.Prudhvikar reddy(2009). "Farmers' Suicides and Unfolding Agrarian Crisis in Andhra Pradesh, in *Agrarian Crisis in India*" eds.D.Narshimha Reddy and Srijit Mishra. New Delhi: Oxford University Press.

Ghosh, Jayati (2004) "The Rural Gloom", *Frontline*, December 3.

Government of India (2006) "National Policy for Farmers". New Delhi: Ministry of Agriculture.

Ghosh, J (2005). "The Political Economy of Farmers' Suicides in India". *Freedom from Hunger Lecture Series*, Delhi, pp. 2-26.

Jodhka, Surinder (2005) "Beyond Crises: Rethinking Contemporary Punjab Agriculture," Working Paper 4. GAPS Series, Hyderabad: Centre for the Economics and Social Science.

Mishra, Srijit (2006), *Suicide of Farmers in Maharashtra*, Mumbai: Indira Gandhi institute of Development Research.

Mohanty, B.B and Shroff. (2004). 'Farmers' Suicide in Maharashtra,' *Economic and Political Weekly*.

Nagaraj,K (2008), "Farmers' Suicide in India: Magnitude, Trends and Spatial Pattern"(MS) Chennai: Madras Institute of Development Studies.

National Crime Records Bureau (NCRB) (2008), *Accidental Deaths and Suicides in India:1997-2006*, New Delhi: Ministry of Home Affairs.

Patnaik, Utsa (2004). External Trade, Domestic Employment and Food Security: Recent outcomes of Neo-Liberal Economic Reforms”(MS) Paper Presented at the Conference on “The Question of Asia in the New Global Order,” Duke University .

Mishra, S and Reddy, N (2008) “Crisis in Agriculture and Rural distress in Post-reform India” India Development Report, pp. 40-53.

Mishra, S. (2007) “Agrarian Scenario in Post-reform India: A Story of Distress, Despair and Death” IGIDR, Mumbai, pp.3

Mishra, S. (2009) “Poverty and Agrarian distress in Orissa” IGIDR, Mumbai. Available at <http://www.igidr.ac.in/pdf/publication/WP-2009-006.pdf>.

Mohanty, B.B. (2005) “We are Like the Living Dead’: Farmer Suicides in Maharashtra, Western India”. *Journal of Peasant studies*, Vol.32, No.2, April 2005, pp.243–276.

Murthy, R.V. (2013) “Political Economy of Agrarian crisis and Subsistence under Neo-liberalism in India”, *The NEHU Journal*, Vol. XI, No. 1, January 2013, pp. 19-33.

Pillai, S.R (2007). “Agrarian Crisis and the Way Out”. *The Marxist*, Vol. XXIII, No. 3, July to September, 2007, pp. 1-18.

Posani, B. (2009) “Crisis in the countryside: Farmer suicides and The Political Economy of Agrarian Distress in India”, Development Studies Institute, London School of Economics and Political Science, London, pp.10.

Rao, C.H. Hanumantha (2005), Agriculture, Food Security, Poverty, and Environment: Essay on the Post- Reform India. New Delhi: Oxford University Press

Red, Narsimha D. and Mishra, Srijit (2008), “Crisis in agriculture and Rural Distress in Post-Reform India,”in India Development Report, 2008 ed. R.Radhakrishna. New Delhi: Oxford University Press

Reserve Bank of India (2006), Report of the Working Group to Suggested measures to Assist Distressed Farmers. Mumbai: Reserve Bank of India

Sainath, P(2007), “Striking a Note of Dissent,” The Hindu, January 27.

2007, "The farm Crisis: Why have Over One Lakh Farmers Killed Themselves in the Past Decades?" Speakers lecture Series: Parliament House, New Delhi. September 6.

Sarma, E.A.S. (2004), "Is Rural Economy Breaking Down? Farmers` Suicide in Andhra Pradesh," *Economic and Political Weekly*.

Sen, Abhijit and M.S Bhatia(2004), Cost of Cultivation and Farm Income. State of the Indian Farmer: A Millennium Study. New Delhi: Academic Foundation

Shiva, Vandana (1991), "The Violence of Green Revolution: Third World Agriculture", *Ecology and Politics. Malaysia: Third World Network*.

Singh, Sukhpal (2006), "Credit, Indebtedness and Farmer Suicide: Some Missing Links," *Economic and Political Weekly*, XLI.

Sriram, M.S (2008) Agrarian Distress and Rural Credit: Peeling the onion," in State of India`s Livelihoods: The 4P Report, ed. Shankar Datta and Vipin Sharma. New Delhi: Access Development

Suri, K.C (2006). "Political Economy of Agrarian Distress", *Economic and Political Weekly*, April 2006. 41(16): 1523-1529.

Singh K et. al (2009). "Agrarian crisis and depeasantisation in Punjab: Status of Small and Marginal Farmers who left agriculture". *Indian Journal of Agriculture Economics*, Vol. 64, No. 4, Oct.-Dec., 2009, pp.587-603.

Srinivasalu (2015) "Agrarian Crisis and Farmers' suicides: Reflecting on the Green Revolution model", Centre for multi-disciplinary Development research, Karnataka, pp. 1-19. Available at www.cmdr.ac.in.

Stone, G.D. (2007) "Agricultural deskilling and the spread of Genetically Modified Cotton in Warangal", *Current Anthropology*, Vol 48, No. 1. pp.77.

Vasavi, A.R. (2007), "Suicides and the making of India's Agrarian distress", p.p 1-17.

Vakulabharam, Vamsi(2005). "Growth and Distress in a South India Peasant Economy During The Era of Economic Liberalization, *The Journal of Development Studies*.

Vaidyanathan, A (2006), "Farmers Suicide and the agrarian Crisis" *Economic and political Weekly*.

Vasavi,A.R(1999). "Agrarian Distress in Bidar: Market,State and Suicides` *Economic and Political Weekly*.

Vyas, V.S. (2005) "Agrarian distress: Strategies to protect vulnerable sections" *The Indian Journal of Labour Economics*, Vol. 48, No. 1, 2005, pp. 19-28.

Appendix

Table 1. Cost of cultivation and returns from cultivation (Rs. Per hectare) in Coastal Northern Andhra across various size classes of farmers (2012-13)				
Coastal Northern Andhra	Marginal	Small	Semi-Medium	Medium & Large
Seeds	1892	1519	1747	2287
Fertilisers	8211	6920	7801	7579
Manures	252	295	204	217
Plant Protection Chemicals	4635	4317	5378	5721
Diesel	567	171	1012	812
Electricity	2	16	11	37
Labour Human	13509	11591	16742	12834
Labour Animal	283	635	200	242
Irrigation	262	116	304	139
Minor Repair and Maintenance	57	140	128	130
Interest	672	1945	5390	865
Cost of Hiring of machinery	4528	2913	1419	4225
Lease rent for land	11045	11932	16796	12506
Other expenses	1498	912	3057	1008
Total Expenses	47413	43421	60189	48604
Gross Value of Output	58088	57542	65068	82969
Value of main product	57262	56340	63708	82305
Value of by-product	827	1201	1355	574
TV-TC	10676	14121	4880	34365
TV/TC	1.23	1.33	1.08	1.71
Land under cultivation	7.53	4.30	5.55	1.39

Source: Calculated from NSS 70th round, Schedule 33 (2012-13)

Table 2. Cost of cultivation and returns from cultivation (Rs. Per hectare) in Coastal Southern Andhra across various size classes of farmers (2012-13)				
Coastal Southern Andhra	Marginal	Small	Semi-Medium	Medium & Large
Seeds	2615	3841	3170	4780
Fertilisers	8192	11475	9088	8791
Manures	1176	1348	764	1865
Plant Protection Chemicals	5615	12322	8623	5699
Diesel	293	158	750	1030
Electricity	120	28	54	58
Labour Human	8934	19595	14141	11450
Labour Animal	1623	704	1194	804
Irrigation	106	2561	995	361
Minor Repair and Maintenance	336	234	154	517
Interest	343	1548	496	526
Cost of Hiring of machinery	4958	3688	3448	3165
Lease rent for land	8877	13988	13589	11073
Other expenses	1199	1386	1661	568
Total Expenses	44387	72875	58129	50688
Gross Value of Output	51927	90638	71428	69716
Value of main product	50412	89069	70257	68642
Value of by-product	1516	1569	1172	1020
TV-TC	7540	17763	13299	19028
TV/TC	1.17	1.24	1.23	1.38
Land under cultivation	2.87	3.61	4.02	5.76

Source: Calculated from NSS 70th round, Schedule 33 (2012-13)

Table 3. Cost of cultivation and returns from cultivation (Rs. Per hectare) across various size classes of farmers in Rayalseema (2012-13)				
Rayalseema	Marginal	Small	Semi-Medium	Medium & Large
Seeds	3904	4041	3590	3254
Fertilisers	8657	4630	3778	4534
Manures	1796	720	359	348
Plant Protection Chemicals	2136	1961	1993	2791
Diesel	76	91	101	461
Electricity	305	114	61	31
Labour Human	7959	4291	4005	2803
Labour Animal	1799	1163	641	494
Irrigation	0	8	29	0
Minor Repair and Maintenance	315	152	111	422
Interest	1614	744	582	2073
Cost of Hiring of machinery	4251	2078	1789	1485
Lease rent for land	85	1154	1061	1260
Other expenses	1066	560	325	444
Total Expenses	33962	21706	18425	20400
Gross Value of Output	48730	40480	34888	41502
Value of main product	45164	37782	31470	39243
Value of by-product	3566	2579	2626	2249
TV-TC	14769	18774	16463	21102
TV/TC	1.43	1.86	1.89	2.03
Land under cultivation	3.45	4.73	7.12	7.16

Source: Calculated from NSS 70th round, Schedule 33 (2012-13)

Table 4. Cost of cultivation and returns from cultivation (Rs. Per hectare) across various size classes of farmers in Rayalseema (2012-13)				
Telangana	Marginal	Small	Semi-Medium	Medium & Large
Seeds	3076	2973	3361	2658
Fertilisers	6725	6290	5840	4951
Manures	492	492	347	306
Plant Protection Chemicals	2958	2552	2320	2396
Diesel	33	29	148	285
Electricity	153	112	86	116
Labour Human	7001	5410	4726	4293
Labour Animal	343	219	415	157
Irrigation	92	51	98	49
Minor Repair and Maintenance	163	308	211	286
Interest	754	339	435	511
Cost of Hiring of machinery	3576	3651	2474	1731
Lease rent for land	315	1705	1569	2259
Other expenses	1023	1015	764	642
Total Expenses	26704	25145	22794	20640
Gross Value of Output	60652	53395	43651	36716
Value of main product	57515	51947	42899	36325
Value of by-product	3137	1448	638	392
TV-TC	33948	28250	20857	16076
TV/TC	2.27	2.12	1.91	1.78
Land under cultivation	12.23	11.93	16.41	12.05

Source: Calculated from NSS 70th round, Schedule 33 (2012-13)