



# NABARD RESEARCH STUDY - 38

# Tenancy and Credit: Exploring Facts Below The Crust In Andhra Pradesh

# SRM University, Andhra Pradesh

# आर्थिक विश्लेषण एवं अनुसंधान विभाग

**Department of Economic Analysis & Research** 

# राष्ट्रीय कृषि और ग्रामीण विकास बैंक, मुंबई National Bank for Agriculture and Rural Development, Mumbai

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National Bank for Agriculture and Rural Development, Mumbai

# Supported by

- Dr Jagriti Jaiswal (Post-doctoral Fellow)
- Mr. Kadavat Suresh (Research Associate)

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### Tenancy and Credit: Exploring Facts Below The Crust In Andhra Pradesh About NABARD Research Study Series

The NABARD Research Study Series has been started to enable wider dissemination of research conducted/sponsored by NABARD on the thrust areas of Agriculture and Rural Development among researchers and stakeholders. The study titled 'Tenancy and Credit: Exploring Facts below the Crust in Andhra Pradesh' completed by SRM University is the thirty-eighth in the series. The list of studies in the series is given at the end of this report.

Land is one of the most indispensable factors of agricultural production. Fast declining land/man ratio due to population explosion and the accompanying need of higher food production has promoted temporary transfer of agricultural land via tenancy. Tenancy in rural areas is often characterised by an unequal balance of power and resources between landlords and tenant peasants due to lack of working capital, infrastructure and interplay of socio-economic factors. Another major impediment to agriculture is a lack of formal credit in agriculture. Given the fact that agriculture is predominantly a seasonal activity, credit is crucial in the agricultural sector to enhance the productivity of crops. In the absence of guaranteed farm produce, stable income and working capital, a farmer has to avail loans at exorbitant interest rates and in many cases, resort to distress sale.

The study aims to understand and analyse the credit and tenancy relationship in Guntur district of Andhra Pradesh. It also explores ground level reality of the challenges faced by farmers in acquiring formal agricultural credit and socio-economic determinants responsible for debt cycle.

Hope this report would make a good reading and help in generating debate on issues of policy relevance. Let us know your feedback.

Dr. K C Badatya Chief General Manager Department of Economic Analysis and Research

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#### List of Abbreviations

1- ADO	Agricultural Development Officer
2- AGDP	Agriculture Gross Domestic Product
3- AML	Anti-Money Laundering
4- ANOVA	Analysis of Variance
5- BC	Backward Caste
6- CCRC	Crop Cultivator Rights Card
7- CHC	Custom Hiring Centre
8- EFA	Exploratory Factor Analysis
9- FAO	Food and Agricultural Organization
10- FBI	Farm Bases Income
11- FGD	Focus Group Discussion
12- FGM	Focus Group Method
13- GDP	Gross Domestic Product
14- JLG	Joint Liability Group
15- KMO	Kaiser–Meyer–Olkin
16- LEC	Loan Eligibility Card
17- MGNREGA	Mahatma Gandhi National Rural Employment Guarantee
	Act
18- MLRA	Multinomial Logistic Regression Analysis
19- NABARD	National Bank for Agriculture and Rural development
20-NCF	National Commission on Farmers
21- NGOs	Non-Governmental Organizations
22-NITI	National Institution for Transforming India
23-NSSO	National Sample Survey Organisation
24-OLS	Ordinary Least Square Method
25-PCA	Principal Components Analysis
26-RBI	Reserve Bank of India
27- RBK	Rythu Bharosha Kendra
28-RCB	Rural Co-operative Bank
29-RMG	Rythu Mitra Group
30-RRB	Regional Rural Bank
31- SAT	Semi-arid Tropically
32-SC	Scheduled Caste
33-SCBs	Scheduled Commercial Banks
34-SGDP	State Gross Domestic Products
35-SHG	Self Help Group
36-ST	Scheduled Tribes
37-VAA	Village Agricultural Assistant
38-VRO	Village Revenue Officer

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#### **EXECUTIVE SUMMARY**

India's agriculture is going through a critical phase of the last three decades, particularly after economic reform. Two important reasons could be traced for this, one is the heavy pressure of the population on the land, and the second shrinking net farm incomes. The pressure of increasing population along with non-viability for the lower size of holding led to a decline in the size and structure of holdings. The process of marginalization, not only in ownership of land but in the economy of the household had set in. This was critical in rain-fed farming, which accounts for two-thirds of India's total cultivated area. The dwindling income due to low crop yields and the absence of non-farm opportunities are indicative of the greater socio-economic malady in rural India. Another fallout leading to severe agrarian crises was the dwindling net farm income flow due to rising input costs and lowering crop yields.

It is known that farming is a seasonal activity that requires working capital throughout the activity and yields income only after the completion of the season. In the absence of sufficient net farm income for survival and to provide working capital flow for the next season; a farmer had to avail of loans mainly for their basic needs and investment in agriculture. Therefore, credit became a major vehicle for agricultural growth, the logic that led to the establishment of the first Rural Credit Survey, ARDC in RBI, and finally NABARD. Another impediment noted has been on the land market in India that operates significantly through tenancy rather than through outright sale/purchase since ownership of land is considered to be one of the most important sources of security and social status by the cultivators. The strong prevalence of hidden tenancy, reverse tenancy, and regular tenancy was noted in many states, but among this Andhra Pradesh experience was noted by a state appointed committee under the chairmanship of Prof Jayati Ghosh. It is not just a coincidence that Andhra Pradesh was at the center of discussion for severe agrarian crisis and farmer suicides. The total number of farmers who committed suicide in Andhra Pradesh was 1,065 in 2021, 11.45% of whom farmed on rented land (ToI, 2022).

Andhra Pradesh is an agricultural state that produces mainly paddy, cotton, millets, corn and aqua harvests. It accounts for more than a quarter of the total SGDP, against 16% in India, and agriculture employs 62% of the workforce. According to the NSSO 77<sup>th</sup> round Situation Assessment Survey; among the major states, Andhra Pradesh had the highest share of indebted agricultural households in the country

(93.2%) followed by Telangana (91.7%) and Kerala (69.9%). Furthermore, about 50% of state farmers still depend on non-institutional sources of loans, the fourth most in the country, while the national average is 31%. Besides, the state has the highest proportion of tenants in the country. Tenant farmers are also estimated to account for 65-80% amongst paddy growers in coastal Andhra Pradesh. The centre and state governments have recently started a series of reforms aimed at economically empowering farmers through market reforms, fair prices, and cash transfers.

Against this background, it is attempted in this research to understand and analyze the credit and tenancy relationship in the Guntur district of Andhra Pradesh (AP). Along with credit function and tenancy farming, regional programs like *Rythu Bharosha*, SHG, and the mechanism of JLG are also evaluated. The strategy is based on extensive, magnitude, determinants of indebtedness, cascading effect, the role of institutions in a farmer's life, possibilities and constraints faced by tenant farmers' information collected from 240 farmers (120 from the tenant group and 120 from the owner) from the 8 villages of Guntur in AP.

Sampling procedure involved multi-stage sampling technique to select 240 sample households. All the Mandals of districts were arranged in descending order based on the density of tenant farmers and the amount of credit availed. From each of these two sets, two Mandals were randomly selected based on the highest and lowest credit distribution. Similarly, two Mandals were randomly selected on the basis of tenant farmers i.e., one of the highest tenancy and one of the lowest tenancy. Therefore, overall, 4 Mandals were selected, and from each Mandals two villages were randomly selected. One set of villages was selected from near Mandal headquarters, and another one far from it. Thus, overall, 8 villages were selected, and from each selected village 30 sampled randomly collected (15 from a tenant group and 15 from an owner of small farmers). We had taken NABARD's possible credit link plan for 2022-23 as a proxy of credit distribution, while CCRC distribution was a proxy of the tenancy.

#### **Summary of Findings**

 Paddy, the primary staple food crop, is largely cultivated under irrigated conditions in all districts of the state during both Kharif and Rabi seasons. Along with paddy, farmers also cultivate chili, cotton, and vegetables in the study area.

- 2. The findings of the study show that irrigated areas represent 49% for tenant farmers and 45% for owner farmers for 2021-2022. Approximately 40% of farmers in both groups had KCC cards.
- A large share of tenant cultivators was not educated. On an average, a tenant cultivator earns ₹ 42,128 per capita annually, which is almost equal to owner farmers.
- 4. Tenant farmers showed a per capita household deficit of ₹ 33,913 whereas, it was a per capita surplus of ₹ 3,467 for owner farmers. After food consumption expenditure, educational expenditure is another important item where both categories of farmers spend more.
- 5. Farm business income is the main source of income for the tenant farmer and that stood at ₹ 19,807 per capita per annum, while salary was the main source of income for owner cultivators which averaged ₹ 26,719 per capita per annum.
- 6. On an average, 88% of farmers were under debt in the study zone, while that was 90% among tenant farmers and 86% of the owner farmers. The average debt outstanding for tenant households was ₹ 2,07,444 and that for owner farmers was ₹ 76,306. The repayment of debt per indebted household was ₹ 1,53,111 for tenant farmers while ₹ 1,87,034 for owner farmers.
- 7. Almost, 48.5% of the loan was from formal institutions, while the rest 51.5% was availed from informal lenders. However, there are considerable differences between loans availed by a tenant farmer and an owner cultivators. Tenant farmers largely borrowed from informal agencies, and we noted that about 60% of the total loan taken by them were from informal agencies. However, it was only 40.6% for owner farmers. Among informal agencies, moneylenders play an important role in lending money to both groups of farmers. However, tenant farmers were more dependent on lenders than owner farmers.
- 8. It was noted that more than 90% of the borrowed amount was used for productive purposes by both tenant and owner farmers, and much of it was spent on farm inputs. Both categories of farmers also spend substantially on health care for non-productive purposes. However, the interest rate varies depending on the lending institution. It is noted that the average rate of interest varied between 7-30% of the informal agencies, and only 2.5-10% of the formal agencies. The maximum amount of the loan was taken at an interest rate between 20-30% by the tenant farmers while the maximum amount of the loan

was on below 10% of the owner farmers. Based on the results, it is also noted that utilization of loans from formal agencies was more as compared to informal agencies by both tenant and owner farmers in the study area.

- 9. Tenant farmers received loans from multiple sources (35.2%), which was higher than the owner farmers (22.3%). The loan amount was disbursed to 100% of the SHGs of the two classes of farmers. However, the proportion of loans paid to official or informal agencies by tenant farmers was lower than for owner farmers.
- 10. A major issue hindering access to institutional credit was insufficient collateral. Even then the tenant farmers borrowed about 31% and the owner farmers institutional loan stood at only 5%. The second most important constraint was the low amount of loan reported by farmers. Moreover, farmers also reported that at the same time, more than one reason hindered access to official credit. Transaction costs were too low in the study area and farmers indicated that this was not the primary reason for informal access to credit.
- 11. The farm debt cycle has increased over the past five years and was higher for tenant farmers than owner farmers. Over the past few years, the proportion of borrowing from informal agencies went up substantially. This is the main reason why farmers are deep into debt. It was reported that because of natural climate variables, their crops were affected, and due to that they were in debt trap. The lingering of the debt over the years due to shrinking net income flow, creates a cascading effect and the amount to be paid back to the lenders goes on burgeoning, this is termed as cascading effect.
- 12. Many farmers reported that crop damage caused by heavy rains last year was the main reason for the cascading effect. Another major issue was inappropriate government arrangements for procurement. Government procurement lasted only for a specific month and many farmers missed this opportunity because their crop was not ready. Other factors which were responsible for the cascading effect were low income due to falling crop prices, rising consumption due to inflation, procurement bottlenecks, unexpected health spending and high spending on education. The intensity of the cascade also supported these factors. As net income declines over the years, the farmer is left with a heavy debt load and has to borrow to repay even the old debt. That is the path through which a farmer is forced to go into debt trap.

- 13. The main socio-economic factors affecting the debt trap were the outstanding loans of the previous year, the lowest level of education and the mismatch between income and consumption. Crop damage at the end of the year due to unseasonal rains was another reason. Another important variable was the loan borrowed from informal agencies. However, the loan waiver was not available to all farmers because the relevant government authorities were not applying it effectively.
- 14. Crop Cultivator Rights Cards (CCRC) have been issued by the AP government to farmers. The number has increased almost twice since it was introduced in the state, as noted. However, changes and fluctuations may be observed in the district during the period. For the year 2021-2022, the highest number of *CCRC* was issued for the Prakasam District while it was the lowest in Chittoor District. The highest proportion of tenant farmers on the *CCRC* was in East Godavari (54.16%), followed by Guntur (48.70%), Krishna District (42.42%), and West Godavari (39.25%). However, the lowest proportion was in Chittoor (1.41%) followed by Ananthpur (5.11%) and Srikakulam (10.23%). Our field survey also indicates that 50% of the tenant farmers received CCRC in the Guntur district.
- 15. Many landowners are still not ready to sign the required documents for *CCRC* and that is the reason behind non receipt of the *CCRC* for tenant farmers in the study area. In many cases, the actual landowner was not in their native place/village and responsibilities were given to close relatives or friends; therefore, these relatives/friends are not authorised to sign on the behalf of landowners thus they are deprived of the *CCRC*.
- 16. Caste also plays an important role in signing the documents by the landowners to the tenants for *CCRC*.
- 17. Most of the tenant farmers (43%) reported that getting the owner's signature on the documents was the main barrier to obtaining the *CCRC*. The majority of landowners completely refused to sign the application when farmers approached them. In some cases, landlords also threaten tenants with no future leases. Interestingly, 32% of responding households within a tenant group did not apply for a CCRC. That was primarily due to past experiences or conflicts with landowners.
- 18. The *CCRC* is the first step in acknowledging that tenant farmers are eligible for inclusion in all government benefits. The field investigation shows that only

50% of farmers in the Guntur district received the *CCRC*. If the *CCRC* is not available to the farmers, the tenant farmer became ineligible for getting any Government Benefits. Government benefits included crop loans on leased land, group loans on leased land, *Rythu Bharosha* on leased land, crop insurance, crop loss compensation, marketing of crops, subsidies, electronic cultivation, and other benefits. All of this will be used by tenant farmers if they have *CCRC*. However, even none of them who received the *CCRC* said they had benefited from the e-market, subsidies, crop marketing, and other benefits.

- 19. In order to relax the restrictions on obtaining institutional loans and to reduce the role of the informal loan regime, *Rythu Bharosha* and JLGs programs operate under the supervision of a block representative.
- 20. The presence of community groups in villages such as JLG, SHGs, RMGs and CHC has a favorable influence on farmers' income by influencing input and supply. This also makes it easier for the tenant farmers in accessing loans and invest capital in agricultural activities. However, these organizations do not operate equally in all villages.
- 21. The study confirms the heterogeneity of the organisation and operation of JLGs in the different areas of the districts. In a certain part, it works perfectly, whereas at the same time another part of the district, it does not exist at all.
- 22. The study also endorses that in some villages the *Rythu Mitra Group* (RMG) operates perfectly. However, at a one-time either farmer can have a member of RMGs or JLGs but not together.
- 23. Only 34% of farmers were members of an organization, and 84% of them were benefits/services provided by governments. Therefore, it is evident that if farmers are members of a community organization such as a JLGs, SHGs, RMGs, or CHC, then almost all farmers are favorably impacted and make use of all amenities.
- 24. Interestingly, it was noted that SHGs may not be very effective for agricultural purposes. These have worked primarily for women's empowerment in rural areas. Therefore, only women members gave loans for domestic or individual purposes. In addition, SHGs loans are available on a short-term basis and members must repay within a couple of months. Unfortunately, farmers need huge amounts for agricultural operations, and they avoid taking loans in small installments from SHGs. The study found that only less than 2% of tenant

farmers had taken loans from SHGs. It was also clear from the focus group discussion that members take the loan for business purposes. Therefore, SHGs were not found to be very effective especially for farmers.

- 25. To identify the determinants of crucial variables the OLS regression model was used. This analysis helped in identifying the factors responsible for explaining the farm income variations across farmers. The results revealed the fact that tenant-farmers' income is influenced by several variables i.e., natural disasters, distance from head office, cultivated land, labor capital, pesticides and fertilizers, investments in technical equipment, productive and non-productive lending, and loan waiver policies. Among these, tenant farmers need to regulate their credit demand and expenses carefully because these have a stronger impact on farm income. However, owner farmers only have five significant variables influencing their flow of farm income which include: distance from headquarter, and farm input (cultivated land, labor capital, seeds, and fertilizers), natural disaster is also a major fact but not proven significantly. The analysis reveals that natural disasters are common in all categories that bring the attentions for policymakers'. In addition, agricultural inputs should also be developed and monitored regularly to improve the farm income of farmers.
- 26. Furthermore, few results from parametric and non-parametric statistical analyses showed that tenant and owner farmers have different levels of productivity, but the location of the farmers and their tenancy contract characteristics have no combined effect on farmers' productivity, or it can be easily inferred, and need not have very different productivity than the owner farmer across regions.
- 27. A few characteristics differ between the tenant and owner farmers, especially their borrowing behaviour, and the results indicated that farmer borrowers and non-borrowing farmers from various locations have varied productivity. Borrower farmers have lower productivity than non-borrower farmers, and their productivity varies by Mandal.
- 28.A multinomial regression model has been applied to identify the factors responsible for tenancy in the study area and the results indicate that eight variables out of the 15 that represent the ratio of the likelihood of preferring the tenant farm category to the chance of selecting the non-tenant farm category. The age of the head of household, the caste is a stronger determinant in the pure

tenant group than the non-tenant group. Similarly, in the pure tenant category, the operated land is higher. However, if farmers have a high income it leads to the low possibility of being in the pure tenant category. In contrast, farmers with high consumption rates are more likely to be categorized as pure renters than non-renters. Similarly, a significant share of irrigated land moves farmers to non-tenancy or partial tenancy but not the pure tenant.

- 29. The Tobit regression model was applied to determine indebtedness, suggesting that several factors are responsible for the indebtedness. The level of indebtedness is higher among tenant farmers who use loans for unproductive purposes, irrigation, and interest rates, with a consequent increase in farmer indebtedness. While natural disasters, crop insurance, land tenure, and location have reduced the debt burden on tenant farmers. However, levels of education, interest rates, use of loans for unproductive purposes, irrigation have increased the indebtedness of the non-resident farmers in the study area.
- 30. Principle Component Analysis (PCA) was used to extract common factors for interpreting the cascading effect of indebtedness. The PCA results indicate that marketing of inputs followed by the lack of skill to adopt technology, inadequate storage facilities, payment uncertainty from traders, poor quality of pesticides, failed second crop germination, sales of gold to repay the old loan, inferior quality of subsidy on inputs, lack of price making skills, low yield, overdue loan, livestock diseases, costly capital and unproductive use of loan were the main reasons for cascading for tenant farmers in the study area.

#### POLICY FOCUS AND SOLUTIONS

The most important part of this research is to focus on how to expand institutional lending, creating a situation to discourage informal lending, particularly to lenders. The government should relax the strictness of the collateral to facilitate farmers' access to loans. In addition, it should provide by RBK in the villages to guide them in obtaining formal credit. This center should be an integral part of the bank to explain all plans and affiliates for the community rather than the village representative. In addition, the bank should also consider providing credit to meet farmers' needs with proper and appropriate provisions so that the potential default can be avoided. Furthermore, informal lending should also be regulated except for friends or relative sources. As a result, this debt trap could be avoided for the tenant farmers. The study found that the availability of credit has a positive impact on farmers' income, though it is not significant. Therefore, to make this credit offer meaningful should be monitored and reviewed periodically by the authorities according to the needs and demands of farmers. So that debt trap can be avoided, but a fund should provide in time for timely agricultural production. Moreover, the study also revealed that the unproductive use of loans has a positive impact on indebtedness among farmers. There is a need for policy to limit the increase in credit supply in line with an unproductive target.

In order to avoid the cascading effect and resulting harassment, the cases of defaulters should be studied by the concerned bank officers along with the data on all the borrowings by the farmer. The officers can suggest steps to avoid the debt trap. It is necessary to have a policy prohibiting the underground marketing of inputs and tools. All inputs and tools should be supervised by a responsible agent to avoid substandard input or tools and exorbitant prices. Moreover, to save the second germination, Krishi Vigyan Kendra should organize a camp to test seeds, pesticides, water and fertilizers. Though several schemes already exist, but farmers revealed that these camps are not regular therefore, they face failed crop germination.

Despite the government's efforts, there are a lot of ambiguities that reverse the impact of group facilities through JLG or SHG. Consequently, farmers have requested a thorough revamping of the group system. JLG and SHG asked for the loan limit to be extended so that they should not go to informal sources for additional loans. In addition, they suggested enhancing support for micro-entrepreneurship to manage the link of agriculture. Then these require integration with the other functional group to get other benefits like the *Rythu Mitra Group* or the CHC group. In JLG, farmers insisted on individual loans without each other's liability. In addition, in JLG, mainly tenant farmers are members, owner farmers' participation is very small. Therefore, the expansion of members with the vibrant farmers' community is suggested led by the Village Agriculture Assistant (VAA) in the group discussion. The share of agricultural loan must be fixed in SHGs loan dispersal which can be specially given to tenant farmers. This will lead to improving the condition of tenant farmers in the state.

Apart from the above suggestion, it is quintessential that the Government must increase the duration of procurement of farm produce from the current 1 to 3 months so that they can be saved from private traders and loss. The government would have to buy the crops from RBK. In addition, they added that the amount of the subsidiary

provided under the *Rythu Bharosha Scheme* should be broken down according to the area under cultivation.

In addition, tenant farmers who did not obtain the landowner's signature on the application form find it difficult to obtain a CCRC. This requirement could be either done away with the affidavit of the tenant should suffice. This will make the use CCRC services smooth and effective. A few farmers do not know the benefits of CCRC. Thus, the local authority must organize camps for disseminating the know-how and to ensure that all farmers are informed about the whole scheme of agriculture and related sectors. So that they can anticipate their livelihood according to the card's benefits. The loan waiver under this scheme positively provided benefits to improve their livelihoods. The Government must therefore manage this system a little longer to ensure income equality among farmers. We found from the field survey that there are a lot of issues related to cash benefits; therefore, agricultural policy has to be redefined. It should be in kind of cash.

Last but not least, the present study reveals that RBK could be a game changer for farmers in Andhra Pradesh if it works properly, effectively, and through follow-up. Consequently, greater attention should be paid to the proper functioning of the RBK.

#### **CHAPTER-1**

#### INTRODUCTION

Agrarian distress is a traditional experience of Indian farmers, but that culminating into spates of suicides is a relatively new phenomenon. Many academicians have analysed this critical issue across regions in India and myriad reasons have been offered to explain why farmers committed suicides in India, including floods, drought, use of GM seeds, public health, use of lower quantity pesticides to less investment producing a decreased yield (Reddy, 1998; Deshpande, 2002; Singh et al., 2008; Bharti, 2011; Sainath, 2013). There could not have been any consensus on what the main causes might be, but many studies show suicides victim are motivated due to multiple causes, however, invariably the analysts agree that one of the major reasons is the inability to repay borrowed money. It is intriguing to note that the scenario of debt burden is different for tenant farmers as against owner farmers. This study is provoked by observing the plight of tenant farmers in this situation of distress as this group is constrained on three fronts. First, they are the real cultivators without any decision-making authority about crops, inputs etc. Hence, the loss is usually blamed on them. Second, it is difficult for the tenant to operate as a farmer as the owner is different and usually a powerful person in the village. Third, there are no separate safety nets for the tenant and the entire work is full of risk. Keeping these things in mind, the present study tried to identify major issues with tenant farmers as compared to owner cultivators.

#### 1. The Canvass

Over the past three decades, India's agriculture has been in crisis, particularly following the economic reform that bypassed agriculture. One of the root causes of the agrarian crisis is the heavy density of the cultivators of the cultivated land and therefore resultant fragmentation leads to severe decline in average size of holding. Population pressure has caused the lowering of per capita land: the cultivated area comes below 0.2 hectares per inhabitant of the rural population. Today without exception Indian states have density of small and marginal farmers more than 85% of the total holdings. Therefore, the story of the Indian farmer is the story of this class of marginal and small farmer households who account for more than 85% of rural households having less than 2 hectares of land. Their small plots of land can no longer support entire families, especially in rain-fed farming, which accounts for two-thirds of India's total cultivated area. The decline in income due to low crop yields and the absence of non-farm opportunities are indicative of the greater socio-economic malaise in rural India. This coupled with changed consumption standards and inflated aspirations, demonstrated by ostentatious expenditure on celebrations, which have been increasing the debt of various sections of the peasants (Sidhu and Gill, 2006). Thus, it is widely accepted that the transformation of agriculture in the medium and long term also requires revisiting to land reforms.

The second major reason for agrarian crises is the lack of purchasing power caused by the differential growth rates between input and output prices. While input prices are growing at a faster rate the prices of produce are not in pace with it. The gap between the two rates of growth is widening and causing distress. Landless, marginal, or small farmers lack the resources to either buy or lease more land or invest in farm infrastructure—irrigation, power, farm machinery, etc., to offset the scarcity of land. This is truer about the tenants, and they are in the worst position. With this process operating in a systematic manner agriculture is increasingly becoming a less sustainable source of livelihood.

Credit is a major vehicle for agricultural growth (Pandey et al. 2022). However, small & marginal farmers and especially tenant farmers need outside monetary support for their farming and family expenditure due to lower savings and, ironically, this group has restricted access to credit (Satyasai and Tiwari, 2021). An adequate supply of credit to the agricultural sector can attract more direct investment. Given that agricultural yields are seasonal, the financial needs of agriculture are typically met by accepting cash loans. As a result, any loss of harvest or reduced prices would put farmers in a distressful situation. Second, since many farmers rely only on one crop for a living, the situation becomes dire if that crop fails or if they do not get a fair price for their product, as they have nothing else to fall back on. If that continues for two or three years, farmers will definitely fall into a debt trap. This trap means that the farmer borrows only to pay back interest on past loans. Even then the farmer is able to repay a only portion of his debt provided he has a decent harvest and an acceptable price for the product. Since these requirements are seldom met, lending and interest increases over time. When a farmer cannot settle all existing debts even if he gives up everything that is produced, presuming a healthy harvest is feasible, he must continue to borrow

to fulfil agricultural and family needs year after year. This condition leads the farmer to a "cascading effect" in the credit market, inflating debts beyond the capacity. Farmers often sell either a small piece of land or at times lose the full land in repaying their debts when they lose confidence in their ability to fulfil their obligations after harvest. For the past several years, the agricultural sector has been caught in this "cascading effect of debt".

Farmers, in particular small farmers, have suffered a great deal from the economic policies of the 1990s. On the one hand, their net agricultural income fell in real and nominal terms, while the costs of cultivation increased significantly. This has led to a greater individualization (Vasavi, 1999; Mohanty, 2005). This further leads to an increase the farmer suicides in the many states in the country which has been widely documented (Reddy, 1998; Assadi, 1998; Deshpande, 2002; Gill, 2005; Satish, 2006; Singh et al., 2008; Bharti, 2011; Sainath, 2013).

A tenancy is an institution that has evolved in different ways as a result of historical and socio-economic conditions over the years in various parts of India (Ranganathan and Pandey, 2017). Right after independence, India inherited a semifeudal agrarian structure and agrarian reforms were necessary in the country. During the British raj tenancy was usurious and there were a large number of landed intermediaries. The Kumarappa commission appointed in 1949 recommended various measures to free the tenants from the exploitation. Part of the land reforms implemented concerned land tenancy, which was either abolished or strictly regulated. These reforms were implemented in the 1960s and 1970s and renting is legally forbidden or very restricted in many states of the country. Although these reforms have benefited some farmers in the country, some of the results of these laws have been counter-productive (Hanstad and Haque, 2008). Three externalities emerged out of the implementation of these laws -i) the presence of concealed tenancy and the tenants do not get benefits related to formal credit and insurance; ii) Land is leased out for shorter periods as laws in some states indicate that farmers who are tenants over a specified period have the right to be not evicted and/or purchase land; and iii) Land is being left fallow instead of being leased out to other farmers if the farmer is not able to cultivate the land due to some reasons (NITI Aayog., 2016). A tenancy is certainly helpful to reduce the land left fallow (Ranganathan and Pandey, 2018).

When farmers are dealing with the twin issues of drought and flood, the tenant farmers stand as most vulnerable and marginalized group certainly bypassed by any of the safety net. It is rare for this group to receive bank loans or subsidies. Money lenders exploit their weak position as they stand with no access to institutional financing and therefore cannot give up a non-institutional debt. Majority of suicides were reported by farmers across the country. A tenancy is expected to increase as India's economy matures and advanced as the better-off farmer/cultivators choose to shift to better vocation keeping their land ownership rights intact. As these farmers do not prefer the drudgery of cultivation, they search for landless labourers or marginal weak links in the village as tenants. This is a phenomenon known as "white collared farmers' and many of them have chosen political entry as their new destination. In terms of ambitions and business mentality, urbanization has achieved significant breakthroughs in rural areas.

#### 1.2 Why Andhra Pradesh?

Andhra Pradesh is an agricultural state that produces a great deal of rice, corn and aqua shrimp. It accounts for more than a quarter of the total SGDP, against 15 per cent in India, and agriculture employs 62 per cent of the workforce. Paddy, the largest basic food crop, is mainly irrigated and grown in all districts of the state during the Kharif and Rabi seasons. Although features such as modernization of the agrarian economy, a shift to commercial crops, a decline in reciprocal cooperation in agricultural operations, and increased cash inputs in farming have been major irritants in Andhra Pradesh for decades, the changes since the 1980s have been significant in several ways (Rao and Suri, 2006). They also reported that Andhra Pradesh has a dubious distinction of being one among the states with highest farmer indebtedness and suicides. Government of Andhra Pradesh commission report on farmers' welfare states the condition of the tenants "The immediate priority is to record and register actual cultivators including tenants and women cultivators, and provide passbooks to them, to ensure that they gain access to institutional credit and other inputs. There should be a systematic official drive over three months. In such registration, the onus should not be on the tenant to prove his/her tenancy, but on the landlord to disprove it". (Govt of Andhra Pradesh, 2005 page II)

According to the NSSO 77th round situation assessment survey; among the major states, Andhra Pradesh had the highest share of indebted agricultural households in the country (93.2%) followed by Telangana (91.7%) and Kerala (69.9%). Furthermore, about 50% of state farmers still depend on non-institutional sources of loans, the fourth most in the country, while the national average is just around 31 percent. Moreover, the state has the highest proportion of farmer renters in the country (NSSO, 2019). Andhra Pradesh has one of the highest number of tenants among the states of India and it amounts to more than 3% of the total tenants in the country according to Agricultural Census. Tenant farmers are also estimated to account for 65-80 percent of the paddy crop in coastal areas. Therefore, they cannot be ignored since they play a larger role. Tenant farmers are commonly called as "Koulu Raitu" in Telegu. Incredulously, land rental is an informal and limited activity, it is often used, leaving the tenant vulnerable to landowner abuse and exploitation. Furthermore, Andhra Pradesh held third place in agricultural suicides in the country. The total number of farmers who committed suicide in Andhra Pradesh was 1,065 in 2021, 11.45% of whom farmed on rented land (ToI, 2022). Farmers who farm these farms sometimes lack formal rental contracts because small farms are either split within the family or rented informally by large landlords. The absence of such a record prevents tenant farmers from obtaining an official credit or from being eligible for government grants (Revathi, 2014). Due to these obstacles, informal tenants often have no access to institutional sources for credit. In view of this, the present study is an effort to analyze the difficulties with the objectives set by considering previous research in this area.

#### **1.3 Literature Review:**

The review of available literature is presented in chronological order to understand the intensity of the topic at a given time. Moreover, literature is categorised based on defined variables like indebtedness of farmers, tenancy act and its implication, role of the formal and informal institution in credit disbursement, cascading of loan, government intervention in policy formulation and its implications, consequences of indebtedness like switching from farming, declining the investment in agriculture and farmers' suicide, etc.

#### Importance of agricultural credit

Agricultural credit is important to infuse investment in the farm activity, hence here many literatures are reviewed to understand and assess the past studies about agricultural credit and related groups.

Naidu et al., (2013) concluded that agricultural credit and other factors such as seed quality, minimum support prices, precipitation, irrigation, and environmental conditions were also considered important for the improvement of agricultural productivity.

After an elaborate analysis, Satyasai (2008) also suggested that substantial changes in the rural credit system would help eliminate constraints on rural credit.

Satish (2007) appraised agricultural credit in India in the post reform period. Moreover, Deb and Rajeev (2007) studied farmers' reliance on informal sources of credit in rural West Bengal. Before going on to farm credit, research connected to agricultural concerns and resources is investigated.

Datey (1978) through a case study revealed that the cost of agricultural credit includes direct and indirect cost imposed by the lender in providing credit to farmers the author noted that the average direct cost of institutional credit ranged from 16% to 20% of the loan amount but the calculation of overhead cost was difficult.

#### Land reform & tenancy and requirement of credit

Bhatia (2021) explored a few interesting facts. The land use sub-sector in the states has been able to reform more frequently than the land rental subsector. Although these states relied on the three levels of government for change, executive action was most often employed. A little research has addressed to exploring the factors which affect the loan borrowing pattern.

According to Missiame and Irungu (2021), the key characteristics influencing farmers' propensity to take out, RCB loans include the gender of the head of the household, access to extension services, involvement in farmer organisations, and proximity to the bank. Farmers who got RCB credit had much higher technical efficiencies on average than farmers who did not get RCB credit, demonstrating that RCB credit had a positive impact on smallholder technical efficiency.

With their quantitative analysis in the Bihar, Khanna and Majumdar (2020) discovered that, despite identical borrowing objectives, Scheduled Castes (SCs) are less likely to borrow within their family network and experience higher interest rates for lesser principal amounts. According to the findings of the survey and qualitative interviews, market interdependence and increasing administrative costs associated with processing small loans are not plausible factors.

Prasad et al. (2012A) with data from Andhra Pradesh thoroughly examined the concerns of tenant farmers, as well as how landlords misled them. Furthermore, they emphasised that the issues encountered by farmers could only be remedied by effectively executing regulations and reforms in the land market.

Rajput and Verma (1998) found that the average crop intensity was higher on the borrower's farm than on the borrower's farm. Borrower businesses also had greater inputs, production, cost-benefit ratio, and net income per hectare. This argument goes parallel to land size and productivity debate.

In this regard, Taslim (1988) conducted a study of the literature pertaining to this issue and tried empirical verification in the context of agriculture in Bangladesh. Its investigation uncovered significant links between Bangladesh's rural marketplaces. Furthermore, he investigated the presence of certain very strong or wealthy landlords who may lawfully utilise coercive control over their tenants. These landowners have been demonstrated to be rare in Bangladesh's rural regions. This was hardly unexpected considering landlords' general aversion to leasing land to pure renters.

Rao (1987) created a model of sharecropping that assumes tenant autonomy, landlord and worker competition, and endogenously determined pay and share rental rates. He discovered that sharecropping operates as a barrier to direct control over the labour process. Its occurrence has been shown to rise in the setting of subsistence wage unemployment.

#### Credit market structure and its function

Rehman et al. (2017) investigated the relationship between agricultural gross domestic product (AGDP) and total food production, ZTBL (regional financial institution) loans, and total loan disbursed by different organisations. He found that all these variables have a positive and significant effect on AGDP, whereas cropped area and cooperative loans had a negative but negligible effect on AGDP. Agriculture GDP and credit association highlight the need of linking other topics such as land reforms and borrowing characteristics.

According to Narayanan (2016), credit serves two functions: (1) conserving productivity via automation and (2) contributing to AgGDP development through the purchase of variable inputs. Furthermore, Sidhu et al. (2008 used a simultaneous four-equation model to evaluate agricultural growth. These two studies bring out the quintessence of seeking credit.

Kumar et al. (2015) discovered that the credit market's structure has changed significantly over time beginning with the liberalisation in the early nineties, with institutional lending accounting for a growing percentage. The government's programmes were a success, and the flow of institutional credit to rural regions expanded dramatically, even in real terms.

#### Institutional credit structure

Sahu and Rajasekhar (2005) investigated the influence of banking sector changes on the agriculture sector's proportion of net bank credit. They concluded that the agriculture sector receives its due share but disproportionately across regions.

While much attention has been dedicated to agricultural loans, Gill (2004) looked into private lenders' grip over rural life has remained strong. Credit was offered to farmers by Commission officials in exchange for crop sales guarantees. According to Shetty (2004), there is a need for intense initiatives to build the institutional credit structure in rural areas, as well as the development of a better loan delivery system.

Ghosh (1976) investigated the connections between usurious money lending, share tenancy, and the incentives for the adoption of new technology by semi-feudal landowners who often combine the roles of landowner and moneylender vis-à-vis tenants. Surprisingly, they demonstrated that, in a labour-intensive economy, 'tenant indebtedness' is unlikely to impede technological advancement of its own.

#### Impact of institutional credit

Many studies expressed failure of institutional credit to protect tenant farmers, among them Atibudhi (2005) examined the credit situation in the state and found variables impacting the flow of agricultural credit in the state. Ghate (1992) looked into the interplay between emerging institutional and noninstitutional financial sectors. According to the author, policy formation for the development of long-term institutional finance is essential. Furthermore, the availability of substantial institutional finance has influenced the efficacy of monetary and credit policy for stability objectives.

WHO (1990) investigated, the official and informal credit systems in rural India. The author discovered that the lender is still a key source of loans for farmers after doing extensive investigation. He then investigated the limited link between the official and informal sectors. On the basis of loan contract assumptions and the competitive structure of the informal sector, the author created an interaction model between the lender and the institutional sector.

#### Expansion of institutional credit

Kumar and Sinha (2010) found that institutional financing to agriculture was expanding steadily, yet lenders were the primary source of credit in agriculture. It is also shown that agricultural, institutional funding has grown significantly during the last four decades. Commercial banks have largely replaced community banks as the primary source of institutional lending, and sociodemographic characteristics such as family size, caste, gender, profession, and education have all affected the use of institutional credit.

According to Abate et al. (2003), the amount of per capita bank's deposit, the farmer's land holding, the term loan, the availability of bank credit, and the degree of fertiliser utilised all impact flow of the institutional credit.

Puhazhendhi and Mohandoss (1998) discovered that the institutional credit system has grown significantly during the last two decades. Credit has enabled farmers to get the resources that they need to produce.

#### Benefits of institutional credit

Pandey et al. (2022) studied the significant influence of institutional financing for agricultural development in India after the green revolution. Overall agricultural, institutional credit expanded at an alarming rate of 8.74 percent. Credit from RRBs, on the other hand, increased at the quickest rate in the last 50 years, at over 14%. Scheduled Commercial Banks have emerged as the largest supplier of agricultural credit in India, according to the data. In contrast, the proportion of total loans held by commercial banks declined over the period. Total agricultural, institutional credit and other institutional sources of agricultural credit (cooperatives, RRBs, and SCBs) were also statistically significant for overall agricultural output growth in India, according to the regression model.

Kumar et al. (2020) discovered that access to credit increases the economic well-being of rural families; credit helps the rural households with no borrowers the most. Credit has a range of ramifications of beneficiaries; therefore, credit policy should be adaptable for different categories of rural households. Further, he discovered that access to credit is closely related to the socioeconomic and demographic features of rural families. Furthermore, access to credit improves the economic well-being of rural families; access to credit would help rural non-borrowing households the most.

Saqib et al. (2017) investigated the variables influencing farmers' access to agricultural loans in Pakistan's flood-prone and disaster-prone area. According to the findings of this study, socioeconomic variables have a substantial impact on farmers' access to agricultural financing in flood-affected regions of Pakistan. As a result, a credit strategy is required to meet the concerns of farmers living in high-risk areas. Furthermore, the existing loan policy might be changed to safeguard the interests of tenant farmers who do not have security.

Many researchers pointed out to the benefits of institutional credit. Kumar et al. (2017) discovered a beneficial influence on agricultural loan flows in their research. According to Kumar et al. (2010) "While institutional lending to agriculture has continuously expanded, lenders have remained the primary source of agricultural financing. Izhar, and Masood (2009) investigated the influence of institutional lending to agricultural productivity in India. Despite the fact that institutional lending to agriculture has been steadily increasing, private lenders have remained the primary source of credit to agriculture, according to Cole (2009), government-owned banks give agricultural loans at a 5-10% rise during election years. Fan et al. (2008) created a methodology to assess the effect of government subsidies and investments on agricultural development and poverty alleviation. Khan and colleagues (2007) investigated the impact of institutional credit flows on liberalisation.

#### Commercial bank and its function

Commercial banks dominate the agricultural financing among institutional lenders. Ramkumar and Chavan (2007) investigated agricultural, commercial bank loans and found greater influence. Shah and Shankar (2007) investigated the nationalisation of commercial banks and its implications on rural lending and, as a result, agricultural growth. Golait (2007) determined that commercial banks' agricultural loan delivery was insufficient because banks were hesitant to lend to small and marginal farmers.

Narayana (1992) looked into the role of commercial banks support to small and marginal farmers from the poorest parts of the society. He examined the effectiveness of institutional credit systems for rural development. The author also discussed financial institutions' attempts to boost debt recovery via group lending schemes. He concluded that risk mismanagement is caused by fear in the credit system and concludes about risk aversion.

#### Short-term loan and risk reduction

According to Golait and Pradhan (2005), credit institutions are interested and preferred to issue short-term lending since it has less credit risk, reduced supervision, cheaper monitoring expenses, and better asset liability management.

Karmakar (1999) investigated the issues of credit re-use. The author discussed the necessity for a microfinance sector and the construction of an appropriate credit distribution mechanism in emerging nations such as India. In this context, Subbarao (1980) investigated the nature of co-operatives' short-term loan demand in eastern Uttar Pradesh, India. He observed that the region's agroclimatic factors do not control the region's short-term institutional credit. This is owing to the low adoption rate of high-yielding seed types and smallholder farmers' restricted agricultural investment. Other causes were major farmers' capacity to fulfil agricultural expenditures with their own finances, unpredictable production circumstances, the availability of cash when needed, rely on other sources such as moneylenders, the lack of secure irrigation, and the small size of farms.

#### Scarcity of institutional financing and informal market structure

Kochar (1997) discovered that borrowers who rented in the land or farm did not have access to formal credit. Basu (1997) investigated the reason behind hesitative approach of institutional credit firms to lend to disadvantaged farmers. Financial institutions were at risk of lending to impoverished farmers. According to Gupta and Chaudhari (1996), the delay in the institutional credit distribution system is the primary cause for the acceptability of the informal loan market in agriculture. Many times, the delay has been done on purpose by public workers for the purpose of corruption.

Sarap (1987) researched rural credit market activities in western Orissa. He discovered that impoverished farmers valued informal loans more than formal loans, but wealthier farmers had easy access to credit from both institutional and informal sources at lower interest rates. This has exacerbated discrepancies in credit access. Similarly, Pany (1985) examined the scarcity of institutional financing for agriculture in his book. It investigated issues such as institutional credit supply, distribution, usage, and repayment, as well as the structure, operations, and difficulties of credit institutions. According to the author, a growth in the number of credit institutions does not ensure a sufficient credit supply.

#### Recovery and repayment of loan

According to Haggblade et al. (2007), the recovery performance of cooperatives improved over the study period, whereas that of commercial banks did not. Recently, Rao and Singh (2005) discovered low payback of an institutional agricultural loan. As a result, it deemed it important to forecast the expansion of institutional credit as well as the repayment performance of current borrowers.

#### Constraint of institutional credit

Pandey, G K (2016) concluded that around 50% of farmers were in debt, and that access to institutional credit agencies for impoverished rural farmers and the weaker sectors of society remained restricted, and that they continue to seek noninstitutional agencies in the state of Bihar.

According to Wenner (1995), there are negative effects for small farmers owing to a lack of knowledge, changes in the finance system, and uneven income distribution. Finally, he argued that group loans may improve the flow of knowledge.
Ghosh (1976) investigated the connections between usurious money lending, share tenancy, and the incentives for the adoption of new technology by semi-feudal landowners who often combine the roles of landowner and moneylender vis-à-vis tenants. They demonstrated that, in a labour-intensive economy, 'tenant indebtedness' is unlikely to impede technological advancement of its own.

# Farmers' indebtedness and its reverse effects

Farmers' suicides, tenure patterns, and unpaid debt have all been linked by Dandekar and Bhattacharya (2017). Poor farming methods, increasing input costs, aggressive consumption, and a lack of non-agricultural income choices are among them.

According to Merriott (2017), farmer suicides are caused by socioeconomic factors rather than mental health difficulties, with mounting debt having the largest influence. The author has recently seen a rising tendency to a higher level as a result of an agricultural crisis impacting the most vulnerable farmers.

Some issues related to Tenancy in India

# 1.4 Consequences of Tenancy Law (Mandal, 2019):

- 1- The informal tenancy is, in practice, and tenants do not receive the benefits related to formal credit and insurance.
- 2- The land is leased out for shorter periods because laws in some states indicate that farmers who are tenants for over a specified period have the right to not be evicted and/or purchase land.
- **3-** The land is left fallow rather than being leased out to other farmers if the farmer is unable to cultivate the land for some reason.

# 1.5 Important policy implications of the tenancy Act<sup>1</sup>(NITI Ayog, 2016)-

NITI ayog in its report highlights that "(i) To promote agricultural productivity, social equality and poverty alleviation, land leasing is offered as legal in many states. Moreover, this will contribute to the long-awaited improvement of agricultural production, as well as to the mobility of employment for the general population and the rapid transformation of rural areas.

<sup>&</sup>lt;sup>1</sup> Report of the expert committee and model law on agriculture land leasing, NITI AYOG, report 2016

(ii) It Makes the leasing of land legal in all places so that the proprietors are completely protected in their rights and renters are protected in their tenure for the duration of the lease term that was agreed upon.

(iii) The section in the land laws of the several states that allows for the adverse possession of the property should be removed since it prevents the market for land leases from operating freely.

(iv) Permit the automatic resumption of land after the agreed-upon lease time, without the need that a certain minimum amount of land be left by the tenant even after the end of the tenancy, as the laws of certain states demand.

(v) Permit the terms and conditions of the lease to be mutually determined by the landowner and the tenant without any fear on the part of the landowner of losing land right or any undue expectation on the part of the tenant of acquiring occupancy right for continuous possession of leased land for any fixed period. This eliminates the danger of conflict between the parties.

vi) It facilitates access by all tenants, including sharecroppers, to bank credit and bank credit in exchange for securing the planned production.

(vii) Provide tenants with an incentive to make investments in land improvement and the right to receive the unused value of those investments when their lease expires to encourage investment in land development". GIVE HERE THE PAGE NUMBER AND REFERENCE)

# 1.6 Agriculture and tenancy:

The relation between agriculture and farm tenancy is not new in the Indian agricultural system. Tenant farmers are contributing a huge proportion to Indian agricultural production, but their condition is getting worse day by day (Singh, 2021). Previous studies conducted many experimental and analytical studies and revealed that to make the agriculture sector efficient all sections of the farmers should be offered facilities and policy benefits as per their needs. Hence, to improve agriculture, the first tenancy needs to be understood (World bank, 2012).

It is Indian semi-arid tropics in the 1970s and early 1980s in southern India a good number of studies were carried out on credit and financial dependence of the tenant farmers. There are a few special characteristics of SAT like erratic rain, persistent drought, and below-average fertile soil associated with a high risk of production (Deb et.al.,2016). These are not the only reason, but others like uneven land allocation among landless and big landowning farmers are responsible for widespread tenancy in dryland agriculture in the 1970s and early 1980s. Most of the prevalent knowledge regarding the South Asian land market in the 1970s and 1980s originated from the views and experiences in irrigated agriculture, notably in the Indo Gangetic Plain encompassing north-western and north-eastern India (FAO, 2011). Another situation in which tenancy has occurred when large landowners get more land than they can adequately manage and maximize the value of the available land (Mohan Kumar, 2014). In the next part of the introduction, many other links between renting and agriculture will be explored in this way.

## 1.7 Tenancy scenario:

Right after independence, efforts are being undertaken to redistributive agrarian reform. However, from the point of view of the rural poor, the legislation on agrarian reform 'abolition of intermediaries, land security and land limitation' has not had the intended impact (Kumarappa Committee 1949). The poorest continued to have limited access to land (Lipton, 2009). As land reform is in the State list under the Indian Constitution. Indian states have used numerous agrarian reform laws to achieve land redistribution. In the 1960s and 1970s, all states passed leasing laws to increase tenure security and regulate future leases (Swain, 1992). Tenancy regulation varies throughout Indian states, with West Bengal having formalized tenancy and Kerala has a forbidden tenancy statutorily restricting landlord-tenant organization of production. However, the results of tenure reform bills were inefficient and often prejudicial. Tenants have obtained property rights to about 8% of all rural families and approximately 4% of India's agricultural land under the law. It has also seen far more tenants evicted from their farmland (Revathi, 2014).

The tenancy has been increasing since the 1990s, after economic liberalization. It was also thought that opening up the land leasing market would have helped to establish equality and efficiency by transparent lease transactions into the open A compelling argument has been made for the legalization of land leasing to enhance rural poor access to land and their occupational mobility (NCF, 2006). It is suggested that the removal of land lease limits would lead to greater land and labour use as concerns about land loss through leasing will be alleviated. There would be more

interest in agriculture if the landowner's land security and the tenant's land security were secured (Banerjee, 2002).

# 1.8 Reasons for tenancy

Usha Patnaik (2000) in the study of tenancy and accumulation explored the various reasons for tenancy. These reasons are examined by reference to the relationship between the lease and the tenant, she wrote as outlined below:

"If the small farmers are leasing in, then the followings are the reasons for tenancy

- a) Lack of adequate cultivated area.
- b) To manage the subsistence for the household consumption
- c) Low level of employability".

# Consequences:

- a) "Reproduction of the same level of production.
- b) The use of advanced technology or better organisation of production does not occur.
- 1- When rich farmers rent in then the following reasons are rented:
  - a) Expanding the scale of production
  - b) Market surplus is increasing.
  - c) Maximizing profit."

# Consequences:

- a) "The use of advanced technology or better organization of production through better utilization of technology increases productivity per unit.
- b) Development of factors of production and orientation to higher stages of production.
- 2- When a big landowner leases out the land, the followings are the reasons for tenancy
  - a) To save capital and the interest on it.
  - b) Savings or rent plus interest.
  - c) Net income from farming can be less than total interest on capital invested in farming and rent income. "

Consequences:

- a) "Discourage long-term agricultural investment.
- b) If they are leased to small farmers from the family workforce, the surplus has not produced enough to allow the reinvestment of stagnation loans in agriculture".
- 3- "Small farmer leasing out, then the following reasons are for tenancy.
- a) Insufficient capital for investment.
- b) To earn more income by hiring the labor force.
- c) To utilize the inherited land located in an inconvenient location that is uneconomic in size."

Consequences:

a) "Disincentive to long-term investment and stagnation in agriculture." (REFERENCE HERE).

All these points out to the fact that tenant farmers continue to remain under economic and livelihood stress and that can have severe long-term impact on the poor farmers.

# 1.9 Issues in Agriculture tenancy:

Tenancy — informal, insecure, exploitative, and often unfree and inter-locking arrangements for leasing land that have been both growth-retarding and unfair — has been essential to India's agricultural crisis (Deo, 2019). Over the previous several decades, there have been major changes in the scope of usage of tenancy, the class composition of tenants and lessors, and the structure of tenancy contracts, in addition to an unequal and distorted penetration of capitalist relations in the Indian rural. Because the state has been hesitant to execute comprehensive land reforms in most regions of India, tenancy relations have remained informal, exploitative, and rooted in socioeconomic power relations (Prasad et.al., 2012).

The Indian state has been more opposed to the use of land reforms to promote progressive agricultural development during the previous three decades (Bandyopadhyay, 1993). Further, she added that the state had not only abandoned the aim of redistributive land reforms and tenancy management under a neoliberal system, but the emphasis of state policy had switched to guaranteeing the open and unrestrained operation of land markets. Contemporary neoclassical viewpoints on tenancy vary from seeing tenancy (and hence tenancy reforms) as a negligible component of land relations to viewing stateled tenancy reforms as a source of the predominance of insecure tenancy (Besley et.al., 2011). The Haque Committee has proposed that tenancy markets be deregulated by the state (Haque Committee, 2016). The committee said that land rental limits have led to inefficient land use, to the detriment of the interests of small landowners. He argued that by opening up rental markets, owners of small, uneconomic properties could lose their land to large landlords and engage in other activities. Making it easier for small and marginal farmers to quit agriculture by promoting reverse tenancy and thereby reducing the amount of agricultural labor is also a key component of the current government's effort to double farmers' income.

# 1.10 Relationship between tenant and landowner:

Buechel (1925) compared the owner-tenant relationship with the master-slave or lordservant relationship, which is more analogous to a medieval economic structure than a contemporary economy of competing free companies. The only logical inferences from this point of view are that the relationship between landlord and tenant can produce nothing good or healthy and that the only solution is to eliminate rental.

Many farmers rely on leased in land for large-scale, profitable operations. In this context, strong and sustainable relationships with owners is the keys to their success (Kahan, 2008). Insensitivity to the values, objectives and frustrations of their owners cannot be remedied through proper production management and marketing. Many landlords, on the other hand, rely on their rent for financial stability. They also wish to maintain strong, trouble-free relationships with their tenants (Moss and Ervin, 2001).

Over time, as land became rare besides the new generation members who inculcated entrepreneurial skills but are deprived of the inherited property migrated to other places where agricultural land ownership can be easily obtained (Kahan, 2008). Similarly, the nominal crude soil rot, which prohibited the higher value of land sales in older areas, made land ownership simple and secure. In rural areas, farm ownership by the farmer is considered prestigious, and rental is abnormal. Many individuals have expressed "concern" about the development of tenancy, and there has been a propensity to assign indiscriminately to tenancy institutions practically all of the economic and social evils that reveal themselves in the rural community (Robb, 1997).

## 1.11 Agricultural Credit and tenancy issues:

Credit is a critical input for agricultural development, but many studies noted that access to institutional credit agencies for poor rural farmers and the weaker sections of society remains limited and that they continue to seek credit from moneylenders and non-institutional agencies at usurious rates (Pandey, 2016). This smaller portion mostly belongs to the group of tenant farmers, as they do not have enough land to meet family needs and expenses. As a result, some government interventions have been made such as contract farming, rental laws, farmland rentals, etc. to ensure the adequate distribution of land, but tenant farmers do not receive expected incentives (Bhowmik it. al., 2003).

Landless farmers who have become tenants are the unfortunate as they cannot access cheap financing or subsidized inputs. Their only option is to have these benefits channelled via landlords, who may or may not pass it on to the tenant (Bidisha et.al., 2017). Many institutional bodies have developed a structure and credit policy for the benefit of tenant farmers. But lack of supportive infrastructure fails these policies to fill the objective mission (Ever et.al., 2005). In the context of credit to tenant farmers, it is revealed that even after the introduction of Kisan Credit Cards (KCC) and JLGs (Joint liability groups — 'Bhoomi Heen Kisan,' tenant farmers obtained just 3% of total agricultural credit, a bit higher than the official data in NSSO.

Loan moratorium has not benefited tenant farmers. Tenant farmers received little in 2014, out of the total loan waivers of ₹ 59,000 crores declared by Andhra Pradesh and Telangana, since landowners obtain a major percentage of crop loans even though they are not the real growers. Tenant farmers who do not have documented evidence are no longer entitled to crop insurance under the *PM Faisal Bima Yojana*. Farm insurance should be separated from farm lending. Farmers' assets – agriculture, livestock, poultry, horticulture and family assets – must be insured, both owned and leased, to protect farmers against the debt (Raju, 2019).

#### 1.12 Tenancy and land ownership act in Andhra Pradesh

Andhra Pradesh was founded in 1956 by combining the Telugu parts of the former state of Hyderabad with those of the states of Andhra. Due to their different

administrative backgrounds, both regions had an independent land right that was integrated and enforced. The state changes, like those in the rest of the nation, may be roughly classed as the eradication of intermediaries, tenancy reforms, ceiling laws, and other government measures in land distribution and market acquisition of private property for distribution. With respect to the Rent Act, the Hyderabad Tenancy and Agricultural Lands Act was enacted in Andhra Pradesh (Telangana) in 1950 (Rao, 1977). As a result, more than 6 lakh tenants who owned more than 75 lakh acres of land, representing 33% of the total cultivated area, were protected (Srinivasulu 2002). This was considered to be one of the most progressive laws of the state. The AP (Andhra Area) Tenancy Act 1956 was created to ensure tenants were not displaced from their properties unless required to do so by law. This regulation already has mixed results, often forcing tenants underground (Prasad et.al., 2012).

The 1950 law pertaining to tenancy the AP (Telangana region) allows minors, single women and military personnel rend up to a certain degree. It also requires that all leases are in writing and that the owner submits a copy of the lease to Tehsildar (Prasad et al., 2012). However, there is no mechanism for registering tenants' names in the Registry of Rights (RoR). The minimum lease period was fixed as five years, and personal cultivation is allowed with limitations. The protected tenancy was made transferable. If a tenant cultivates a piece of land consistently for 6 years, he is considered a 'Protected tenant,' and as such, he automatically acquires the right to acquire the property from the landowner (NITIAyog, 2016). In addition, the rent payment is also limited to 3 to 5 times the land, income or 1/5th to 1/4th of the total production. The lease should be 33% of irrigated land and 24% of rainfall agriculture (Revathi 2014).

According to the document presented by Land cell<sup>2</sup> in tenancy act, "Tenancy is legal in Andhra Pradesh, but it must fulfil severe conditions for length, rates, and renewal, which offer eligible tenants' significant privileges". Although renting is not illegal in Andhra Pradesh, under the Andhra Pradesh Tenancy Act of 1956 (amended in 1974 and in force since July 1980), most rentals are oral possibly due to the fear that the tenant may alienate the land after a few years. Sections 4 and 10 of the 1956 Act stipulated that the tenancy would continue Issue to the landlord's right to the resumption of up to two-thirds of the ceiling area and that the tenant would be left

<sup>&</sup>lt;sup>2</sup> Tenancy Act (1956) by Land cell

with at least one-half of the area maintained by his previous to resumption. The law does not permit the transfer of property rights to tenants other than the exercise of the right to purchase if the owner wishes to sell the property. However, section 10(1) of the Act stipulates that each lease must be in writing and in perpetuity, with a minimum term of six years. The rent corresponds to 25 to 30% of the gross production. According to the Land Committee, leasing laws do not control leasing in the state, and legal provisions have provided space for informal leasing.

According to the discussion paper of Ramachandraiah and Venkateswarlu (2014), the Andhra Pradesh Land Reforms (Ceiling on Agricultural Holdings) Act of 1973 came into force on 1 January 1975. The unit of application of the ceiling consisted of up to five members. A person, his spouse, their unmarried boys and unmarried minor daughters, major sons and daughters, married and widowed daughters, mother, father, brothers, and sisters are not included in the family unit as defined in the Act. Depending on the category and type of ownership, the maximum restriction ranged from 10 to 54 acres. Exemptions have been granted for government-owned property, religious, educational and charitable trusts, plantation lands, and so on. About 6 lakh acres of excess land were scattered across a total of 8 lakh acres. Due to legal proceedings, the balance allocation is in abeyance.

#### 1.13 Research Gaps:

Based on the above review a few issues crop up. First, even though agriculture is a matter of concern for economic and development of all the government's tenancy, the tenant indebtedness and usurious practices have not received sufficient attention on the policy front. After the economic reforms of 1991 and the post-WTO period, major research was focused on trade, profitability, gross agricultural production and farmer income. Moreover, after 2010, the indirect impact and financial support were also assessed at the macroeconomic level with little attention to most precarious issues. A few studies were conducted at the state level based on primary data to get a better idea of the agricultural stakes. After 2011, the issues pertaining to the Act on Leasing, Leasing, Market and Bank Support to Farmers' Finance were taking shape in the macro-photographs of agriculture. Studies have been carried out to assess the impact of modernization on these policy implications. But there was hardly any focused research on a tenancy and indebtedness from a policy perspective especially in the hotspots of agrarian distress with reliable and comprehensive studies. There is a need

for a micro vision with a comprehensive approach to assess the real issues of the laws and regulations implemented to achieve the desired results.

Therefore, this attempt at the micro level of a comprehensive study of the Guntur district of Andhra Pradesh to explore the tenancy markets and bearing challenges by the farmers after the implementation of the tenancy law in the region. This report focuses on leasing legislation and other related regulations to cover all aspects of its content and defined purpose. Moreover, this report looks into the obstacle and challenges to implementing the CCRC (Crop Cultivator Rights Card) and LEC (Loan Eligibility Card) distribution and making available its benefits to the farmers. This present study investigates this issue in the Guntur district to look into the micro as well as micro issues like challenges and obstacles faced by tenant farmers, and smallholder farmers like, accessing basic facilities in their respective areas, a cascading and vicious cycle of debt, and its consequences.

Our review suggested that getting at the nuances of tenancy market and operations is quite a difficult as most of the tenancy contracts are oral and unrecorded. Therefore, the estimation of transaction cost of credit (from all sources) and the conditions of living (lifestyle) under which the tenant cultivator operates are not well documented. The role of the village community and those self-help groups operating in the region is also quite hazy. In addition, to get a better sense of the "Cascading Effect, this study conducts small case studies in the fields and focus group discussions in place of the farmer. The policy framework has also not been attempted. Through this study and with the help of the qualitative and quantitative analyses, we attempt to seek some of the answers as precise as possible so as to aid policy formulation.

## 1.14 Objective of the present study

Against this background, the purpose of this study is to examine the following objectives:

1. To examine the extent, magnitude, and transaction cost of credit (formal and informal) provided to farming households and to examine the economic conditions of the tenant farmers.

2. To estimate the role of a self-help group, microfinance, loan waiver, and money lenders on tenant farmers.

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3. To examine the "Cascading Effect" of loans for tenant farmers and determinants of the aggravating conditions of distress.

4. To study the improvement in the life of tenants due to the adoption of 'The Model Tenancy Act' and provide feedback on the Tenancy Certificate introduced in AP for enabling farmers to access bank/formal credit.

5. To study whether the formation of JLGs has led to an increase in credit availability to tenants.

6. To examine the constraints, possibilities, and supports required for a credit to the farmers

# 1.15 Organisation of the report

The remainder of this report has the following structure. Chapter 2 includes elaboration on the data, sampling techniques and methodology. Chapter 3 contains the extent and scale of the study and the effects of GHS/JLG on farmers' livelihoods are given in chapter 4. In order to ascertain the determinants of the key variables, a regression analysis was provided in chapter 5. The final Chapter concludes the conclusions of the study and the strategic recommendations.

#### CHAPTER-2

#### DATA, SAMPLING AND METHODOLOGY

The prime difficulty confronted in this study was the availability of a list of tenants and both landowners as also the tenants accepting the existence of the tenancy contract. Therefore, we needed to fine tune the methodology for the study and could not follow a scientific sampling approach. Any methodology is recognized as an important parameter of an empirical study in the exploration of the different issues it sought to address. However, it should be noted that each empirical research effort involved their own methodology. This chapter aims to examine the systematic flow of the whole design of the research process to justify the objective of the study.

#### 2.1 Description of the study area

The present study empirically analyses the credit and tenancy issues, the factors behind the tenancy and issues related to finance for tenant farmers in the Guntur district of Andhra Pradesh for the year 2021-2022. Guntur District has been selected for this study as knowledgeable sources connected with the agricultural department of Andhra Pradesh indicated a strong prevalence of tenancy in this district. As most of the tenant contracts are unrecorded, this was the best way to select the study region. The sample selection process was a multi-step process. At the early stage, all the mandals of Guntur district were organized according to Crop Cultivator Rights Card (CCRC) issued by the government and the potential credit plan by National Bank of Agriculture and Rural Development (NABARD report 2022) during 2021. In the next step two mandals were selected as per as the above criteria from the district, selection of villages and household sample have also been through the similar procedure.

#### 2.1.1 Overview of study area

Guntur is an important and prosperous agricultural district and one of nine coastal districts in Andhra Pradesh. The district has a gross cropped area of 8.18 lakh ha, a net sown area of 6.39 lakh ha, and a net irrigated area of 4.34 lakh ha, with a total geographical area of 11.39 lakh ha. Paddy, cotton, chili, pulses, maize, turmeric and other key crops are cultivated. Dairy production is also a common activity. The regional cultivation intensity is 128 per cent. There are 3.90 lakh cultivators altogether, in which approximately 82% belong to small and marginal categories. However, the total number of farm workers amounts to 10.73 lakh. Local mineral resources include limestone, Napa slabs, copper and lead, lime kankar, etc.



Figure 1: Guntur district map of Andhra Pradesh

## 2.1.2 Final Selection of Mandal and Villages

Given the fact that the condition of the tenant cultivators is quite pitiful, we chose to speak and have personal interviews. The current research is focused on conducting a main survey for data collection, in addition to analysing mandalas and the global district and predicting tenancy and farm credit. In accordance with the new creation of the district of Andhra Pradesh 2022, Guntur having a total of 17 *Mandals*. We arranged all the mandals in descending order on the basis of credit supply and tenancy. Therefore, total four mandals were selected from whole the districts. The Crop Cultivator Rights Card (CCRC) data was collected as a proxy for the number of tenant farmers for each *Mandal* from the Agricultural Development Officer (*ADO*), the Department of Agriculture, Guntur and arranged it in descending order for all the mandals. At the second stage two *Mandals* were randomly selected i.e., *Tenali* (the largest number of CCRC issued by the government during 2021) and *Thullur* 

(minimum CCRC issued by the government during 2021). Moreover, the remaining two mandals were chosen on the basis of the credit distribution in each mandals. The differential criteria used was to probe into the details of the two different interventions one with just the CCRC and another the relation of the CCRC to intensive distribution of credit. As in this research issue, there was no defined sample frame. Like a list of all the tenants or all the farmers who are tenants and have borrowed bank funds; it was necessary to go with "Snow balling" technique and use the field intelligence to reach correct sample units<sup>3</sup>.

Another important issue is about selecting tenants and borrowers from all sizes of holding. The field conditions are such that the large or medium landowners as tenants is rare and given their clout, they neither face the issues confronted by the small and marginal farmers nor are ready to give information on tenancy as that is largely hidden tenancy. For example, a small or marginal farmer migrating out of the village to Hyderabad or Vishakhapatnam, leave their land for cultivation purposes with the bigger land holders and the entire operation is oral.

As far as credit distribution is concerned, then we had taken potential credit link plan for the year 2022-23 published by NABARD as a proxy of credit distribution in each mandals for Guntur district. We insured according to the potential utilization of credit to distribute as well. Therefore, based on this criterion, we selected *Mangalagiri* (most potential credit plan for the year 2021) and *Punnur* (lowest potential credit plan for 2021). So, all in all, we selected four Mandal, which represent the entire Guntur district. The next step involved selecting the villages for each of the selected Mondays. In this way, we randomly selected two villages of each selected Mandal. One village was chosen within the radiation of two kilometres from the headquarters of mandals and the second village was chosen that was 10 km away from the headquarter of the Mandal.

## 2.1.3 Method of Sampling.

The present study is primarily based on the survey undertaken with personal interviews, due to the mild hesitation of the part tenant cultivators in revealing the process of contracts which were mostly oral in nature. Details on households, cropping

<sup>&</sup>lt;sup>3</sup> Thanks are due to the anonymous referee who asked us to clarify this point as well as the next issue on sampling. But for this suggestion the reader would have remained unaware about the process.

patterns, yield, credit sources, level of indebtedness, and transaction costs was gathered by a field survey from July 2022 to October 2022, using 2020-21 as the reference year. A first pilot survey was conducted to validate the objective of the study and verify the responses. Following the pilot survey, the questionnaire was modified and corrected for the purpose of the study. In addition, a total of 240 agricultural households were interviewed. In the sample of these farmers, two groups are distinct, one is a controlled group (120 owner cultivators) and another is a target group (120 tenant farmers).

At the final stage we selected 30 farmers from each village in those 15 farmers from the target group (tenant farmer will own less than or equal to 5 acres of land) and 15 farmers from the control group (will own less than or equal to 5 acres of lands). To make the study comparable and informality, we selected only small farmers with their own 5 acres of land ownership both the groups i.e., tenant and owner cultivator. A total of 240 cultivators were interviewed in this study, 120 from each target and control group.



Flow Chart of sampling design for the present study

Figure 1: Sample selection

#### 2.1.4 Approach to study

Initially, an effort was made to identify several potential sources of credit for farm households in the field of research, followed by a macroeconomic examination of the effects. An important component of this analysis is the role of self-help groups and microfinance in agriculture and livelihoods. The transaction cost, cascading effect and impact of the loan waiver are calculated for various types of tenant and landlord farmers, as well as for social groups. All potential sources of income and constraints affecting farms versus owner-farmers were examined. This study was useful in obtaining various unique facts about farmers' indebtedness.

## 2.2 Research Methods

In this study have used both quantitative and qualitative research approaches. Data were collected from the field survey with the help of the structured questionnaire. In addition to the household survey, we have also used the Focus Group Discussion method (FGD) to investigate several limitations and issues faced by farmers when trying to obtain formal loans. The reason that focus-groups have become popular in recent years is partly because they are seen as the method which can provide results quickly which was used in disability research (Kroll et al. 2007). Group talks with a carefully chosen focussed respondent, with trained field workers was held to investigate people's thinking, comprehension, and perception of the topics being investigated in detail, and include both group interviews and group engagement (Morgan, 1988). FGD offers various advantages over individual interviews, including the ability to collect different information on a given topic, while saving time and money (Morgan, 1988). Advanced econometric approach is used to consider all geographical and temporal characteristics for quantitative analysis. While analysing the data we have taken due care of econometric problems such as endogeneity, heteroscedasticity, autocorrelation, and corrected wherever necessary.

#### 2.2.1 Data Collection:

Two separate questionnaires were prepared to gather the information i) household-based questionnaire which included detailed questions on select indicators along with household-based characteristics for tenant and owner cultivators and ii) village-based questionnaires for focused group discussion (FGDs) in order to gather information about the community, various groups, microfinance and the associated problems. After finalising the questionnaires, an intensive primary survey has been conducted for four mandals in Guntur. The questionnaires were pre-tested, and a pilot round was conducted in two villages, and farmer responses (focus group and carefully selected control group) were evaluated for the final survey. In addition, the pilot survey responses were incorporated into the primary response.

# 2.2.2 Questionnaire design:

The interview questionnaire was designed with the help of material published in high quality journals. Additionally, after obtaining the first draft of the questionnaire, it was reviewed and sent for an expert review. Expert feedback helped to make useful modifications to the overall questions to finalize it. Both categories of issues were included in the timeline. Close ended were designed on the scale like nominal, and ordinal for qualitative response and open-ended questions were included to get the information about quantitative response measured on a continuous and ratio scale.

# 2.2.3 Method of collecting primary data:

A face-to-face interview took place. The survey provided a variety of types of information about the financial situation of the household, including.

- (i) Demographic information.
- (ii) Socio-economic
- (iii) Land particular
- (iv) Input subsidy and Training program information
- (v) Details on borrowings and debts.
- (vi) Credit restrictions on access to credit for formal and informal institutions.
- (vii) Transactional cost of institutional credit.
- (viii) Reasons for cascading effect
- (ix) Expenditure and revenue from cultivation.
- (x) Family and financial conditions.
- (xi) Credit card eligibility and benefits.

A team of investigators was tasked with collecting secondary and primary data for analysis. Data from the NSSO, Census, Agricultural Statistics Reports, District Agricultural Profile Reports and NABARD Reports were considered to assess secondary information. Detailed data were provided by eight Guntur villages. The above pie chart illustrates the village and Mandal details chosen for the primary survey.

## 2.3 Statistical Approach

Here, we have used statistical tools to investigate the objective-oriented hypothesis. Descriptive and inferential statistics are used for the analysis of information received from the primary survey. The descriptive analysis included measuring the central tendencies of the respondents with its other parameters such as standard deviation and data range. Proceeding to examine the hypothesis number of tests of significance is applied like a z test and ANOVA to compare the means and variance between the group and within the group of borrower and non-borrower with their tenancy and non-tenancy farming<sup>4</sup> (Bevans, 2022). Moreover, inferential statistics were also used to draw inferences about the relationships. As the data has limits for exogenous and endogenous variables, an alternative form of regression is used.

## 2.3.1: Basic Statistical Tools

In accordance with the objective, we have to apply five statistical models as well as the mean comparison test and the association test. First, the rental determinant is identified and investigated using multinomial logistic regression (Shivakar & Maske, 2011) to obtain the most important variable. Furthermore, the determinants of agricultural income are analysed using the Dummy OLS regression model. Next, efforts are evaluated to make yield better by using the various categories of Input factors including expenditure on fertilizer, Pesticide, Technological investment, and irrigated facility (which is measured by proportion of land irrigated in an acre) (Schwab, 2002).

#### 2.3.2: Multinomial Logistic Regression

Logistic regressions do not assume normality, linearity or homoscedasticity, therefore multinomial logistic regression is generally regarded as an appropriate approach (Grason, 2011). The assumption assumes that the choice or membership of a category is not related to the choice or membership of another category. With the Hausman-McFadden test, the independent hypothesis could be tested. Multinomial

<sup>&</sup>lt;sup>4</sup> Bevans, R. (October 3, 2022). Two-Way ANOVA | Examples & When To Use It. Scribbr. Retrieved October 29, 2022, from https://www.scribbr.com/statistics/two-way-anova/

logistic regression is a direct expansion of binary logistic regression that enables more than two categories for the dependent or outcome variable (Vittinghoff, 2005). Multinomial logistic regression, like binary logistic regression, uses the maximum likelihood estimate to determine the likelihood of category membership.

## 2.3.3: OLS Regression Model

Where regressors are exogenous and there is no multicollinearity, the OLS estimator is coherent. It is also the best in the class of unbiased linear estimators where errors are homoscedastic and not serial correlated (Stewart, 2016). When these requirements are met, the OLS technique produces a medium unbiased estimator with the smallest possible variance, even if the error variances are finished (Eisenhauer 2003). OLS is the method that gives the highest probability estimate when the additional assumption is made that errors have a normal distribution (Johnson, 1995).

#### 2.3.4: Tobit Model

The Tobit model is one of the main classes of models with separate and continuous outcomes. In this model, rather than simply observing the borrower's decision, it is also detailed with the actual amount of the borrowing. This model is also referred to as the censored regression model because it is possible to see the problem, where the observation from y\* to zero or below zero is censored (Johnston and Dionardo 1997). Tobit analysis is used for data that are censored, meaning that dependent variables have multiple observations clustered at a lower or upper bound value. The Tobit analysis includes all observations, including those at the edge, for estimating the regression parameters. This analysis corrects for omitted variable bias and accounts for the fact that the expected values of the errors are changing.

## 2.3.5: Principal Component Analysis

Principal component analysis (PCA) is a method of dimensionality reduction that is frequently used to reduce the dimensionality of large data sets (Jolliffe, & Cadima, 2016). This is accomplished by transforming a large set of variables into a smaller set of variables that still retains most of the information that was contained in the large set<sup>5</sup> (Candès, 2011). In this there are five steps involve to complete PCA analysis, the very first step is to perform standardization before PCA. The reason that

<sup>&</sup>lt;sup>5</sup> Candès EJ, Li X, Ma Y, Wright J. 2011 Robust principal component analysis? J. ACM 58, 11:1-11:37.

standardization is so important before PCA is that PCA is very sensitive to variations in the original variables.

#### **CHAPTER-3**

## EXTENT, MAGNITUDE AND TRANSACTION COST OF BORROWING

The socio-economic background is subjective and varies across farmers. It has also played a significant role in determining the standard of living of the population. The level of income, consumption, extent of debt, the level of poverty, access to formal loan, debt trap all these are different for tenant and owner cultivators. In the following analyses we shall be focussing on these issues between tenant farmers and owner cultivators.

#### 3.1 Sample characteristics

Descriptive statistics help us to understand, better "who are the tenants and what are the features". The socio-economic characteristics of tenant (target) and owner cultivator (control) farmers are presented in Table 3.1. The table shows that both tenant and owner cultivators have family members of the same size. Tenant farmers are younger, but they receive slightly less annual income per capita than the owner cultivators. However, the level of education of the household-heads, total per capita annual consumption expenditure, average amount of debt, average operated land, a proportional share of irrigated area and gross input cost per acre have higher values for the tenant farming households. However, the gross value of output per acre was higher for owner cultivator than for tenant farmers. Furthermore, among tenant farmers, only 2% of households are headed by women, while among the owner cultivators' group, 7% of farm families are headed by women. The average dependency ratio in the tenant farmer household is 2.0 and among owner cultivator owner families it is 2.23. In addition, 39% of tenant farmers reported receiving a KCC card while this was 43% for owner cultivators. As far as the MGNREGA card is concerned, only 3% of the farmers in the tenant group and 7% of the owner cultivator said they had the job cards.

		Tenant farmers			Owner cultivators				
	Name of the variable	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
1	Age of the household-head (in year)	49.91	12.92	18.00	90.00	55.7	12.67	28.0 0	85
2	Household size (nos.)	3.80	1.37	1.00	8.00	3.9	1.47	1.00	8
3	Female head of household (%)	2		0	1	7		0	1
4	Households with five or more members (%)	27.5				30.8			
5	Dependency ratio (ratio)	2.05	1.42	0.00	5.00	2.23	1.63	0.00	2.05
6	Sex Ratio per 1000 (no.)	1040				940			
7	Education of household head (years)	6	5	0	14	6	5	0	15
8	HH head with 10 year or more education (%)	79				79			
9	Total per capita annual income (Rs.)	42128	37650	0.00	236250	42291	41970.33	0.00	240000
10	Total per capita annual consumption (Rs.)	76040	102753	1000	770000	38825	35795	1250	197500
11	Average amount of debt (Rs.)	257792	384850	0	2500000	190933	387668	0	370000 0
12	Land owned (acres)	0.69	1.17	0.00	5.00	2.75	1.60	0.50	5.00
13	The average land operated (acre)	7.01	7.15	0.50	40.00	2.63	1.52	0.50	5.00
14	Proportion of the irrigated land (%)	49	50	0	100	45	50	0	100
15	Gross value of crop output per acre (₹.)	62433	33474	0.00	189600	69257	38970	0.00	184800
16	Gross input per acre (₹.)	44494	16961	2608	79633	43531	19823	400	119000
17	Having KCC card (%)	39				43			
18	Having MGNREGA card (%)	3				7			
19	Accessibility of electricity (%)	99				96			

# 3.1 Socio-economic characteristics of households

Source: Authors' calculation based on a field survey.

The expenditure of tenant farmers is higher than income as they have to buy most of the consumption goods from markets as large share & better part of the farm produce goes to the landowner. The owner cultivator irrespective of borrowing status has a higher gross value of output per acre compared to tenant farmers. However, borrowers from the tenant group have a more gross value of output than non-borrowers from the same group, which clearly indicates the positive impact of credit on per acre output (Appendix 7). As far as the net value of output per acre is concerned, it was high for owner cultivator as compared to tenant farmers and it was also true for borrowers as compared to non-borrowers for both the groups (Appendix 8). We interviewed 120 farmers from the tenant group who were pure tenants or partial tenant cultivators. Details of the type of tenancy that can be found in Appendix 6. The result indicated that 62.5% of the total farmers were pure tenants and the rest are partial tenants. Furthermore, overall, 80.8% of leases were on a fixed cash basis, 17.5% were on a cropsharing basis and only 1.7% were on a mixed basis (cash and crop-sharing).

#### 3.2 Per capita income and consumption expenditure

Since the family size varies between the farm households in the sample, it becomes relevant to look at per capita income and per capita consumption levels from this perspective. Table 3.2 includes the information regarding per capita income and per capita consumption expenditure annually for both categories of farmers. On an average tenant farmer earns ₹ 42,128 per capita annually which is slightly less than owner cultivator. But the sources of income vary considerably. The relative share of different sources of income for both the groups comes from farm businesses income and salary. The Farm Business Income (FBI) is a major source of income for tenant farmers that contributes 47% of the total income while salary (63.2%) is a major source of income for owner cultivator. The third most important source of income is wage labour for both the tenant and owner cultivator groups. However, it is slightly higher for tenants than for those who are owner cultivators. It could be possible with a low level of education and unavailability of employment for them.

It was observed that tenants are more vulnerable to fluctuations in income than the owner cultivator. They are usually in the income deficit because their per capita income is less than per capita consumption expenditure. Tenant farmers are spending more on each item i.e., expenses related to food, health, education and social ceremonies as compared to owner cultivator. This is due to their involvement more in wage labour, due to less awareness which puts them at the risk of more health issues, since they are not employed in regular services, they are spending money for education for their children so they can get better job and condition would improve in future. It was observed from the field survey that the FBI is only ₹ 19807 for tenant farmers while operating land is much larger than the owner cultivators. This is due to high cost of inputs i.e., irrigation and rent of land as well as last year their crop was also affected through the unseasonable rain. That is the reason for less receipts from crops and high input cost which leads to reduce their FBI.

	Tenant Farmers (Target	Owner cultivators	All sampled household
	group)	(Control group)	All sampled household
Sources of Income		Per capita income in ₹	
Salary Based HH income	18055	26719	22387
Salary Dased IIII meenie	(42.9)	(63.2)	(53.0)
Farm Business Income	19807	12462	16134
Farm Dusiness filcome	(47.0)	(29.5)	(38.2)
Wage Labour	2992	2095	2544
Wage Labour	(7.1)	(5.0)	(6.0)
Non grop Farm Incomo	191	3	97
Non-crop Farm meome	(0.5)	(0.0)	(0.2)
Non form Business Income	250	4	127
Non-tarm Busiless filcome	(0.6)	(0.0)	(0.3)
Other Sources	833	1008	921
Other Sources	(2.0) (2.4)		(2.2)
Total Incomo	42128	42292	42210
Total Income	(100)	(100)	(100)
Items of Consumption	Per cap	ita consumption expenditu	ure in ₹
Food consumption	33651	20710	27181
rood consumption	(44.3)	(53.3)	(47.3)
Health Expanditure	13238	10721	11980
Health Experience	(17.4)	(27.6)	(20.9)
Even diture on Education	22238	5443	13841
Expenditure on Education	(29.2)	(14.0)	(24.1)
Social Expanditure	7553	1951	4752
Social Experience	(9.9)	(5.0)	(8.3)
Total household owner diture	(76041)	38825	57433
rotai nousenoia expenditure	(100)	(100)	(100)

# Table 3.2: Per capita annual income and consumption (in ₹)

Source: Author's own calculation based on primary data

Note: Figures in bracket are in percentage

# 3.3 Extent of debt among the farmers

The extent of indebtedness among farmers is given in Table-3.3. Overall, 88% of the farmers are under the debt as revealed in the survey. Almost 90% of tenants and 86% for owner cultivators accessed credit from the various formal and informal sources. The average amount of indebted farming household is ₹ 1,43,429 in Guntur district, while the average amount, loan per sampled household is ₹ 1,26,098. Among tenant the average outstanding debt was reported at ₹ 2,07,444 per indebted household and ₹ 186700 per sampled household. However, it is ₹ 76,306 and ₹ 65,496 respectively, for owner cultivator. The overall average outstanding loan was reported to ₹ 1,43,429 per indebted household and ₹ 1,26,098 for per sampled households.

The overall average debt was ₹1, 30,544 per acre owned and ₹ 56,149 per acre farmed. The average amount of indebtedness has been estimated at ₹ 3,73,520 per owned acre and ₹ 36,581 per operated acre for the tenant farmers; but this was ₹ 69,502 per own acre and ₹ 75,717 per operated acre for the owner cultivator. It can be seen from the data presented here that the repayment capacity was lower among the tenant farmers (₹ 1,53,111) than the owner cultivator (₹ 1,87,034).

		Tenant Farmer	Owner cultivator	Total
Number of sampled households		120	120	240
No. of indebted ho	ousehold	108	103	211
Percentage of inde	ebted households	90%	86%	88%
Average amount	Per indebted household	207444	76306	143429
debt	Per sampled household	186700	65496	126098
Average amount	Total debt per owned acre	373520	69502	130544
(borrowing)	Total debt per operated acre	36581	75717	56149
Average amount	Per indebted household	153111	187034	169671
of repaid debt	Per sampled household	137800	160537	149167

Table 3.3:	Extend and	magnitude	of indebted	lness among	farmers (	(In	₹)
1 abic 3.3.	L'Atenu and	magnitude	or muchice	mess among	aimers		· · /

Source: Author's own calculation based on primary data

## 3.4 Sources of credit for indebtedness

In the rural credit market in India, institutional lenders extend formal credit readily to the large farmers, as they are considered credit worthy on the basis of their capacity to pay and land ownership but the access of poor marginal and small farmers to institutional credit is quite limited (Rao, 1980; Basu, 1983; Swain, 1986; Sarap, 1991; Jodhka, 1995, Pandey, 2016). At the district level, less than 50% of credit is supplied to indebted households from formal sources and the rest from informal sources i.e., 51.5% (Table 3.4).

This proportion is conversely associated with that of tenants and owner cultivators. Institutional sources constitute the primary source of credit for owner cultivators. Whereas tenant farmers were still at the mercy of non-institutional sources (mostly money lenders) in the study areas. Owner cultivators borrow heavily from institutional sources because their asset position is better, whereas tenant farmers, who does not have collateral's value, rely mainly on non-institutional sources. Due to lack of available credit, farmers borrow money from moneylenders at exorbitant rates of interest and have less agricultural products left for family consumption after repayment of their loans.

S. No.	Source of debt	Tenant	Owner	All sampled		
		farmer	cultivator	households		
			Owner			
			cultivator			
A Formal Agencies						
1	Co-operative societies	3.9	10.8	6.9		
2	Commercial banks	26.6	40.6	32.5		
3	Private banks	9.5	4.9	7.6		
4	RRB (Grameen bank)	0.2	3.1	1.4		
5	SHGs	0.2	0.0	0.1		
	Sub-total	40.4	59.4	48.5		
В	Infe	ormal Agenc	eies			
1	Landlords/large farmers	0.9	0.0	0.5		
2	Money lenders	49.2	33.0	42.3		
3	Friends and relatives	2.9	1.7	2.4		
4	Agri. traders	3.8	2.8	3.4		
5	Others	2.9	3.1	3.0		
	Sub-total	59.6	40.6	51.5		
	Aggregate	100.0	100.0	100.0		
~			-			

 Table 3.4: Source-wise proportion of the amount borrowed by farmers

Source: Author's own calculation based on primary data

Among institutional sources of credit to farmers, commercial banks play a major role (32.5 %) and it is high for the owner cultivator as compared to tenant farmers. Owner cultivators can easily access most of their loans from this source. The traditional sources of credit (informal source) are still widely prevalent in the study area, and the incidence is particularly high for tenant farmers who are generally unable to repay their debts. The owner cultivator received about 11% of their debt from cooperative societies, which was only about 4% for tenant farmers. It shows that the cooperative credit structure is not supported farmers as is made out by many. It was also observed during the field survey that only few farmers could take a loan from a SHG for agricultural purpose, although government programmes make loans available for the upliftment of the poorest of the poor. As a result, when they need it, rural poor people borrow from private lenders, most of whom are their employers, landlords or merchants. The field survey also revealed that this often leads to debt enslavement due to their current consumption, extravagant social spending and health problems.

Moneylenders are the largest source of loans for a typical farm household, accounting for 42.3% of total loans. This proportion is higher among tenant farmers (49.2%) than owner cultivator (33%). These farm households take loans during times of hardship because access is easy and availability is on demand, even though the average value of loans from these sources may be higher. Among informal agencies, agricultural traders are one of the major lenders which represent about 4% and 3% for tenant and tenant farmers respectively.

## 3.5 Purpose of loan

From a detailed distribution of the average amount of debt utilised for different purposes (Table 3.5), it may be observed that the usage of loan for income generation is quite high, i.e., about 93% of all the income generating activities. This proportion is higher for tenant farmers than owner cultivator. It clearly shows that there is positive relationship between the size of the loan and productive purposes. However, only 7% of the total borrowed amount is used for non-productive purposes. The highest proportion of the loan was used for the expenditure on farm input (88%) by the tenant farmers while it is slightly less (84%) for owner cultivators. It is clear from the survey that farmers, they are taking a loan for purchasing the inputs as factor cost is increasing day by day. This argument is supported by many economists that agriculture becomes more expensive, especially after Green Revolution. When it comes to non-productive spending, the data shows that farmers in both categories spent money on education and dwelling houses.

S. No.	Purpose of Debt	Tenant	Owner	All sampled
	-	Farmer	cultivator	household
А	Produc	tive loan		
1	Expenditure on farm inventory	3.1	8.1	5.2
2	Expenditure on farm Input	88.0	84.0	86.3
3	Expenditure on education	2.3	0.0	1.3
4	Purchase of land	0.0	0.0	0.0
5	Purchase of animal	0.0	0.0	0.0
	Sub Total	93.3	92.1	92.8
В	Non-prod	uctive loa	n	
1	House construction	1.6	0.0	0.9
2	Purchase of durable goods	0.0	0.0	0.0
3	Purchase of consumer goods	0.3	0.0	0.2
4	Expenditure on health	4.8	3.3	4.1
5	Social and religious ceremony	0.0	3.5	1.5
6	Redemption of old debt	0.0	1.1	0.5
7	Redemption of old mortgage			
	property	0.0	0.0	0.0
8	Other	0.0	0.0	0.0
	Sub Total	6.7	7.9	7.2
	Total	100.0	100.0	100.0

Table 3.5: Purpose-wise percent distribution of amount borrowed (In %)

Source: Author's own calculation based on primary data

# 3.6 Rate of interest

The data on interest rates charged by informal agencies were much higher than those charged by the formal agencies for outstanding debt (Table 3.6). It is revealed from the data that the interest rate at which loans were contracted with farmers. The majority of loans (36.8%) taken at an interest rate between 0 and 10. This proportion is higher for tenant farmers as compared to owner cultivator. Another substantial share of total loans was ranging between 20 to 30% and around 42% of the total loan was taken by tenant farmers as compared to 27% of owner cultivator which completely show the dependency on an informal institution by tenant farmers. We found out that poor farmers paid more interest than rich farmers. In general, the moneylenders require an interest rate of 2 to 2.5 per cent per month, which comes to around 24 to 30% annually. While the formal agencies of the rate of interest were between 8 to 10% (Figure 3.1). Recently, it has been propounded that a zero-interest loan does not imply an absence of usury, since there may be some implicit or hidden interest charges in the form of a lower wage payment or in the purchase of crops at less than the ruling market price from the borrower.

S. No.	Rate of interest	Tenant	Owner	All sampled
	(% per annum)	larmer	cultivator	nousenoids
1	Nil	2.5	5.2	3.6
2	0-10	35.1	43.4	38.6
3	10-20	12.9	21.7	16.6
4	20-30	41.7	27.4	35.6
5	30-40	7.8	2.4	5.5
6	>40	0.0	0.0	0.0
	Total	100.0	100.0	100.0

Table 3.6: Proportionate amount of loan borrowed by rate of interest (In %)

Source: Author's own calculation based on primary data





Source: Author's own calculation based on primary data



Figure 3.2: Average interest rate of informal agencies (In % per annum)

Source: Author's own calculation based on primary data

# 3.7 Multiple borrowing

Farmers borrow from more than one sources to spend for various purposes. The proportional share of the average amount of loan from more than one source have presented in Table 3.7. The results study clearly indicates that 29% of overall farmers having multiple source loans; however, it was 35.2% of tenant farmers and 22.3% for owner cultivator. Moreover, 9.5% of the total farmers had taken loans from formal institutions like if one had loaned from cooperative then he/she will take other loan from RRB or commercial bank or vice versa. However, this figure is 19.4% of informal sources. Out of this 24%, farmers were belonging to tenant group and 14.6% of the owner cultivator group. No farmer has reported multiple SHG loans. Therefore, SHG was only considered for a single loan.

S.	Extent & magnitude of multiple borrowing	Tenant	Owner	All
No.		farmer	cultivator	sampled
				househol
				ds
1	Proportion of loan from multiple sources	35.2	22.3	29
2	Proportion of loan from institutional sources	11	7.8	9.5
3	Proportion of loan from non-institutional	24	14.6	19.4
	sources			
4	Proportion of loan from SHG	0	0	0
~		1		

# Table 3.7: Proportion of amount borrowed from the multiple sources (In

%)

Source: Author's own calculation based on primary data

## 3.8 Sources-wise utilisation of loan

The utilisation of loan for each sources taken has been presented in Table 3.8. The table clearly indicates that overall, 97% of the formal loans were utilised by the sampled households and 71.5% of informal lending. It is also clear from the table that tenant farmers utilised slightly less proportion compared to owner cultivator in Guntur district. It has been found from our survey that mainly funds borrowed from informal agencies are not used for the same purpose for which was taken especially by tenant farmers. This might be the reason for non-availability of sufficient income for the consumption purposes by the tenant farmers. Moreover, informal lenders never ask about the purpose of loan from the farmers. These organizations lend money for all purposes, anytime, without any collateral or formalities, and it is not time consuming. However, formal loans are basically utilised for productive purposes as they can't neglect and have to repay to avoid becoming a defaulter otherwise, they will not be eligible for fresh loan in the next year.

Table 3.8: Sources wise use of the proportional amount borrowed byfarmers (In %)

	Name of the	Tenant	Owner	All sampled		
S. No	institution	farmer	cultivator	households		
		Formal l	oan			
1	Co-operative banks	63.70	100	88		
2	Commercial bank	99.60	100	99.80		
3	Private banks	100	100	100		
	RRB (Grameen					
4	bank)	100	57.70	60.50		
5	SHG	100	No loan	100		
	Sub Total	96.20	97.80	97		
	Informal loan					

1	Landowner	100	No loan	100
2	Money lender	79.60	44.40	68
3	Friends/Relatives	43.50	100	61
4	Agri. traders	100	100	100
5	Other	88.80	100	93.70
_	Sub Total	79.90	54.80	71.50
	Total	81.10	85.80	84

Source: Author's own calculation based on primary data

# 3.9 Repayment of debt

The repayment capacity basically depends on the level of income generated by the households from the professional activities carried out, attitude and motivation of persons towards repayment, monitoring by the agencies which provide loans etc. The proportion of loans repaid to the different agencies is shown in Table 3.9. It is seen that, by and large, 66.5% of the loan was repaid by the sample households. However, it was only 53.5% of the tenant farmers and 84.1% of the owner cultivators. It has been observed that the proportion of loans taken out by farmers was repaid more to formal agencies than to informal agencies. This is due to daring the actions taken by these agencies and avoid becoming a defaulter. However, this proportion is different for the tenant and owner cultivator. The proportional share of the institutional sources was 89.8% of the owner cultivator as compared to tenant farmers (39.1%). Loan from the informal sources was paid in good proportion i.e., 77.5% of the loan repaid by farmers in the overall sample, of which 74.7% was repaid by the tenant and 80.2% of owner cultivator. One can also observe that 100% of the loan was repaid by the whole agricultural group for the SHG loan taken.

Table 3.9: Proportion of amount borrowed repaid to different sources(IN %)

S. No	The percentage of loans Repaid	Tenant Farmer	Owner cultivator	All sampled households
1	Formal institution loan (including SHG)	39. 1	89.8	56.1
2	In-formal institution loan	74.7	80.2	77.5
3	From SHG source	100	100	100
4	Overall repaid loan (formal +informal)	53.5	84.1	66.5

Source: Author's own calculation based on primary data

# 3.10: Constraints faced by farmers to access the loans

Constraints confronted during increasing the financial inclusion could be categorized according to demand, supply and regulation (RBZ, 2016). RBZ (2016) further elaborates that the constraints include: under demand- low income levels, failure to meet minimum account opening requirements, inadequate information on financial services and products, lack of confidence in the financial system, financial illiteracy and inflexible implementation of Anti Money Laundering (AML) measures; Under the supply side – absence of a robust credit information system, poor infrastructure in rural areas leading to financial institutions reluctant to establish branches and lack of skills to understand the dynamics of projects of those at the bottom of the pyramid; Regulatory – absence of coordinated national policy and strategy on financial inclusion, weak consumer protection regulatory framework and capacity and resource constraints. Local smallholders face significant levels of credit rationing in a different way. Demand for credit exceeds supply at a variety of interest rates. The results also showed that farmers specially tenant farmers in Guntur district of Andhra Pradesh are distant from the formal financial markets have less access to credit facilities.

S.no.	Reason for not receiving institutional credit	Tenant farmer	Owner cultivator	All sampled households
1	No constraint	28.3	52.5	40.4
2	The interest rate is high	4.2	7.5	5.8
3	Rejection of application	1.7	1.7	1.7
4	Complex and lengthy procedure	3.3	5.0	4.2
5	Corruption <sup>6</sup>	0.0	0.0	0.0
6	Do not like to pay interest	0.8	0.0	0.4
7	Group lending	0.0	0.0	0.0
8	Insufficient collateral	30.8	5.0	17.9
9	Lack of information	2.5	5.8	4.2
10	Low amount	7.5	11.7	9.6
11	Revenue form formalities	0.8	0.0	0.4
12	Religious matter	0.0	0.0	0.0
13	Short repayment time	0.0	0.8	0.4
14	Too many formalities	4.2	2.5	3.3
15	More than two reasons to create constraint in accessing institutional loan	15.8	7.5	11.7

# Table 3.10: Constraint faced by farmers to access institutionalcredit (in %)

Source: Author's own calculation based on primary data

Table 3.10 depicts the constraints faced by farmers in Guntur district when accessing the institutional loan. Overall, 40.4% of farmers said they had no issues accessing the formal loan. Of these, 28.3% belonged to tenant farmers and 52.5% of owner cultivator. The majority of farmers (94.2%) reported that the rate of interest rate is not high from the formal sources. Only a few respondents from both groups expressed about the rejection of their loan application. However, about 18% of all farmers reported not having enough collateral to qualify for the institutional loan. Out of this

<sup>&</sup>lt;sup>6</sup> Corruption was not reported by the respondents due to fear. It can be taken as negligible or "Not Reported"

30.8% belong to tenant farmers and only 5% of owner cultivator groups. No farmer felt religious faith as a constraint on lending. However, only 0.8% of owner cultivator reported a shorter repayment period, a barrier to accessing the institutional loan. In addition, 3.3% of all sampled farmers mentioned that too many formalities in institutional loans are the bottleneck to access the loan and these formalities were more documented for tenant farmers.

# 3.11 Transaction costs

The transaction cost is playing an important role in the process of obtaining loan from the informal sources. If it is high in the institutional agencies, then farmers usually move to informal lenders for loans. Table-3.11 represents the details of transaction cost and a comparison between tenant and owner cultivators' transaction cost spent in accessing formal loan. The table clearly indicates that they make only 1 to 3 rounds to visit the bank for loan purpose for taking a loan of 1 lakh. However, they did not pay any cost for the application, and commission to any agent or service provider. Moreover, Owner cultivators also did not pay any legal fees, collective clearance fees or any other fees to access the loan. It is clear therefore that the transaction cost is not much for both the groups. Since, the average amount of loan is too high, thus farmers reported that transaction cost was very comparatively low. Interestingly, we found that transaction cost was not the reason for not taking a loan from the formal sources. Farmers are used to take loan from informal sources as they used to be due to lack of collateral. Informal sources are very easy for them without any formalities or anything else.

		Spent on per 1000/Rs. borrowed from institutional credit		
S. No.	Name of the variable	Tenant Farmer	Owner cultivator	All sampled households
1	Frequency of bank visit/year (no)	0.01	0.01	0.01
2	Application cost	0.00	0.00	0.00
3	Transportation (in ₹)	0.25	0.07	0.17
4	Documentation fees (in $\mathbf{E}$ )	0.45	0.86	0.63
5	Commission (in ₹)	0.00	0.00	0.00

Table 3.11: Transaction cost of institutional credit (in ₹)

6	Opportunity cost (in ₹)	1.27	2.20	1.67
7	Legal (in ₹)	0.06	0.00	0.04
8	Cost for collective clearance certificate (in ₹)	0.03	0.00	0.01
9	Other (in ₹)	0.08	0.00	0.05

Source: Author's own calculation based on primary data

## 3.12 Debt cycle

The cumulative debt cycle of farmers over the last five years is shown in table 3.12. It can be seen that the calculation of the accumulated outstanding loan is quite high. Although about 43% of all farmers were in debt during last one-year recent years out of this 45% of them were from tenant farmer category while 41% of them were from owner cultivators. The average value of the loan was ₹ 183650 for tenants, whereas ₹ 14,9475 for owner cultivator in the last year of the loan. Moreover, 9.2% of them were from tenant and 7% of farmers were from owner cultivator on debt during the last two years and the average debt was Rs. 91017 and Rs. 78717 respectively. As well, 13.35% of all farmers were in debt over the past five years with an average amount of the loan was Rs. 46,417. Out of these 17% belonged to tenant farmers with an average of debt Rs. 46,833 and 10% were from owner cultivators with an average amount of debt Rs. 4,600.

Outstanding loan from last five years					
	Tenant	Owner			
	farmers	cultivator	All sampled		
	Mean value	Mean value	Mean value		
Debt cycle duration	(₹)	(₹)	(₹)		
Last year	183650	149475	166563		
Two year's back	91017	78717	84867		
Three year's back	76642	56833	66738		
Four year's back	54542	49750	52146		
Five year's back	46833	46000	46417		
	Outstanding Debt cycle duration Last year Two year's back Three year's back Four year's back Five year's back	Outstanding loan from last fTenant farmersfarmersMean valueDebt cycle duration(₹)Last year183650Two year's back91017Three year's back76642Four year's back54542Five year's back46833	Outstanding loan from last five yearsTenantOwnerfarmerscultivatorMean valueMean valueDebt cycle duration $(₹)$ Last year183650Two year's back91017Three year's back76642Four year's back54542Five year's back46833		

Table 3.12 Debt cycle of the farmers

Source: Author's own calculation based on primary data

# 3.13 Proportion of farmers facing "Cascading Effect".

The damage caused by last year's rains has hit farmers badly, the worst is the situation of those who are already under the debt load of the past few years. Public procurement was also not 100%, which is why crops are sold to intermediaries at the very low price, which reduces their income as well. Low incomes, climate change, rising consumption,
unexpected health spending, high spending on education and falling crop prices have all had a ripple effect on farm debt. Table 3.13 presents the proportion of farmers confronted with the cascade effect. In the very first reason of the cascading natural calamity was reported as a major reason. 99% of the surveyed farmers reported that they were affected by unseasonable rain which further cause damage the crop. About 83% of farmers from both groups were confronted with the failed germination of the second harvest. Further uncertainty confronted in the market also leads to "Cascading effect". About 88.3% of farm households interviewed, reported about the facing payment uncertainty, from among the tenants 92% and from among the owner cultivators 85% showed "cascading Effect" and accumulated loan. In addition, the low price of production was another important reason. Furthermore, 60% of all farmers reported that black marketing of inputs was another big issue for them. However, the impact was stronger on tenant farmers (62.5%) than the owner cultivator (57.5%).

Adulterated and duplicate inputs were also blamed for very high for cascading effects. Out of the tenants 97% and all the owner cultivator reported this. The introduction of high-cost capital is also a reason for the debt trap for farmers. 98% of all farmers face this issue, in which 97.5% belong to the tenant group and 99% belongs to the owner cultivator group. Sometimes the bank lending facility has also led to loan repayment failure. However, 67% of all farmers reported that the loan was in default and of these 73% belongs to a tenant and 60% belongs to the owner cultivator group. The least cost benefit of loan faced by 97% of both categories of the farmers. Selling of gold assets also led to them for future scarcity, overall, 58% of farmers were reported about it and among these 59% belongs to tenant and 57% belongs to the owner cultivator group. Overall, 92% of farmers experienced frequent crop failure, and among them 93% belongs to tenant and 90% belongs to the owner cultivator group. Livestock diseases were another important factor which dragged them into debt as well. Overall, 68% reported about this problem and out of this 65% were from tenant and 71% were from an owner cultivator group. Interestingly, we found that overall, 92% of farmers faced low crop yields due to unseasonable rain, and this figure is more (91%) for tenant group compared to owner cultivator (93%). Another important component was lack of competence among the farmers, which limits their income opportunities. 93% of tenant farmers reported that they were unable to decide on the price of the product. However, the results show that around 72% of farmers from both groups didn't adopt new agricultural technologies. Also, 41% of overall farmers were

not able to use the loan for productive activities and among them 49% belongs to the tenant and only 33% belong to an owner cultivator group. It was reported that unseasonable rains, expensive fixed assets, very high and unreasonable input costs, and negative loan performance were the main drivers of the cascading effect and loan trap.

## Table 3.13 Proportion of farmers facing cascading of different factors (In

%)
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S. No	Variable	Proportion of t (%)	he farmers fac	cing the problem						
		Tenant farmers	Owner cultivators	All sampled household						
		A. Natural ca	uses							
1	Affecting unseasonal rain	99.1	99.2	99.2						
2	Failure of second crop	83.4	82.5	82.9						
	B. Market uncertainty									
1	Uncertainty of payment	85	91.7	88.3						
2	Low price of output	94.1	100	97.1						
3	Black marketing of input	62.5	57.5	60						
	C. Production factors									
1	Very high Input price	96.6	100	98.3						
2	Usage of low-quality	78.3	75.9	77.1						
9	Input Improper storage	81.6	86 7	84.2						
3 4	Costly capital setup for	97.5	99.1	98.3						
	farm									
	D. Bank loar	n mechanism and	d repayment is	sues						
1	High transaction cost	75.9	78.4	77.1						
2	Existence of loan over dues	73.3	60.1	66.7						
3	Less loan cost benefit	97.5	96.6	97.1						
4	Sale of gold for payment of loan	59.1	56.7	57.9						
	E.	Farm and output	ut issues							
1	Frequent crop failure	93.3	89.9	91.7						
2	Livestock diseases	65	70.8	67.9						
3	Low yield	90.9	93.3	92.1						
		F. Lack of sk	ills							
1	Lake in price decision	93.3	92.5	92.9						
2	Fail to adopt new farm technology	71.6	73.3	72.5						
3	Usage of loan for unproductive activities	49.2	33.4	41.2						

Source: Author's own calculation based on primary data

#### 3.14 Reasons for the "Cascading Effect"

Table 3.14 represents the intensity of the cascading effect among tenant and owner cultivator. Getting to affect by unseasonable rain is very common in agriculture. Therefore, 75.8% of the tenant farmers reported very high intensity, another 10.8% each of reported for high and medium affect whereas only 1.7% and 0.8% reported to low and very low affect respectively. The same kind of result can be observed for the owner cultivator. Among owner cultivator 72.9% reported very high intensity, 11.75% reported with high intensity, 12.1% reported a moderate intensity, 2.5% reported low intensity, and only 0.8% reported very low intensity of unseasonable rain. Another important factor was the uncertainty of the payment. Hence, 30% of tenant asserted that they had faced it at a very high rate, 21.7% stated that it happened at high intensity, 22.5% reported the moderate effects, 10.8% reported low in intensity and 15% said it has very low impact on them. However, it was 26.7%, 30%, 20.8%, 14.2% and 8.3% for owner cultivator respectively. Low price output always affects farmers' reinvestment plans. Almost 71% of the tenant farmers asserted that they face very low price of their output, 5.8% low receive at very high frequency, 15.8% reported in high in frequency, 5% reported to moderate, 2.5% reported as low, and 5.8% reported to very low. However, the proportion was 70.8%, 14.2%, 10% and 5% respectively for the owner cultivator group.

We observed in the study area, due to black marketing, input supply was affected. Tenant farmer more vulnerable due to black marketing of inputs as compared to owner cultivator. As much as 15.8% tenant farmers reported this problem with very high intensity, 11.7% reported to high, 18.3 % reported to moderate level, 16.7% reported in low but 37.5 asserted that it happened very rarely (very low rate). However, it was 17.5%, 11.7%, 20.8%, 7.5% and 42.5% respectively for the owner cultivator group. Very high input price, make farmers incapable to utilize their land resources. Therefore, 78.3% of tenant farmers reported it to very high intensity, 16.7% reported to high rate 0.8% reported to moderate, another 0.8% claimed to low rate and rest of 3.3% reported to very low rate. However, it amounted to 73.3%, 16.7%, 5.8% and 4.2% respectively for the owner cultivator group.

The use of poor-quality of seeds directly results in poor yield. It was observed from the field survey that poor quality of seeds was not a big issue. The majority of farmers, they were getting good quality of seeds from the input suppliers. The field survey revealed that as much as 7.5% tenant farmers reported to bad seed quality, 15% reported to the high intensity of that, 40.8% reported to moderate, 15% reported to low intensity rate, and the rest of 21.7% reported to very low intensity. But this proportion was 12.5%, 24.2%, 32.5%, 6.7% and 24.2% respectively for owner cultivator. This was more common for owner cultivator than for tenants. Costly capital also reduces the income and economies of scale operate among the farmers. Among the tenant farmers 31.7% they reported to very high rate, 40% to high rate, 15.8% of moderates, 10% to low rate and 2.5% in very low rate. But it was 31.7%, 38.3%, 18.3%, 10.8% and 0.8% respectively for owner cultivator owner cultivators. Again, the control group had this situation more frequent than target group.

High transaction costs dissuade farmers from taking advantage of the best loan facilities. Unfortunately, our respondents indicated that this is not a major problem for them. The table 3.14 also confirms that the transaction cost is very low for both categories of farmers. The tenant farmers, they reported to that only 1.7% of very high, 5% reported to high. However, it was 14.2% and 35% respectively for the owner. Owner cultivator faced higher transaction costs than the tenant group. Although the calculation shows that the owner cultivator group paid more transaction costs for a loan. But the tenant group thinks these costs are relatively high which they face while accessing the loan.

Overdue loans reduce the potential for investment opportunity. This has a huge impact on tenant farmers compared to owner cultivators. Overall, 8.3% of tenant farmers reported to very huge burden of overdue, 10% have reported huge burden, 39.2% have reported moderate level, 15.8% had low levels, and 26.7% had a very low burden. However, it was 5%, 6.7%, 31.7%, and 40% respectively for the owner cultivator group. The data also depict that the tenant group has a higher burden of the loan than the owner cultivator. Negative or negligible returns to borrowed funds reduces the farmers' repayment capability. Among the tenant group, 6.7% of them reported that it was very high intensity, 35.8% reported to high intensity, 39.2% of moderates, 15.8% to very low level, and rest 2.5% to very low intensity rate. Also, the same sort of pattern that we can see for owner cultivator from the table. The figures for owner cultivators were 10.8%, 32.5%, 37.5%, 15.8% and 3.3%, respectively. The two groups have about the same situation getting returned to their borrowed funds in their performance.

It has been observed the field survey that to repay the loan farmers were compelled to sell gold and other assets. As much as 7.5% tenant farmers reported to a very high rate, 15% to high rates, 28.3% to moderate levels, 8.3% to low level, and the rest 40.8% reported to very rarely. Whereas owner cultivator reported 3.3%, 9.2%, 27.5%, 16.7% and 43.3% respectively for the same. Crop failure was another major reason for accumulation of dues among the farmers. About 48% of tenant farmers reported very high intensity, 18.3% reported high intensity, 16.7% reported moderate intensity, 10% reported occasional intensity and 6.7% reported infrequent intensity. However, it was 35%, 25.8%, 23.3%, 5.8% and 10% respectively.

Livestock diseases disrupt their farm activities. It required a huge amount for the treatment for their cattle's. From the tenant group, 1.7% of them reported it as a very high intensity, 7.5% at high intensity, 42.5% reported to moderate level, 13.3% reported to low level, and 35% reported to rarely face this situation. Furthermore, this proportion was 8.3%, 11.7%, 37.5%, 13.3% and 29.2% respectively for the owner cultivators' group. As far as adopting the new technology is concerned, then 20.8% farmers reported about lacking this skill at a very high level, 25% at high level, 10% at moderate levels, 15.8% at low level and 28.3% at very low level of the tenant group. Nevertheless, it was 13.3%, 50%, 3.3%, 6.7% and 26.7% respectively for owner cultivator. We also found that the utilization of loans for productive purposes was higher among tenant farmers compared to other groups. As much as 4.2% farmers were reported that mostly failed to use in a productive way, 1.7% admitted to frequently failing, 15% admitted to moderately failing, 28.3% admitted failing sometimes, and 50.8% admitted to rarely failing to use the loan in productive purpose from the tenant group. However, this proportion was 3.3%, 1.7%, 11.7%, 16.7% and 66.7% respectively, reported from the owner cultivator group.

		Proportion of the farmers facing the problem (%)									
S. No	Variables		Ten	ant farmers g	group			0	wner cultiva	tor	
		Very low	Low	Moderate	High	Very high	Very low	Low	Moderate	High	Very high
Natura	l Cause	•									
1	Affecting Unseasonal rain	0.8	1.7	10.8	10.8	75.8	0.8	2.5	12.1	11.7	72.9
2	Failure of second crop germination	16.7	19.2	24.2	31.7	8.3	17.5	8.3	12.5	50	11.7
Marke	et uncertainty										
1	Uncertainty of payment	15	10.8	22.5	21.7	30	8.3	14.2	20.8	30	26.7
2	Low price of output	5.8	2.5	5	15.8	70.8	0	5	10	14.2	70.8
3	Black marketing of input	37.5	16.7	18.3	11.7	15.8	42.5	7.5	20.8	11.7	17.5
Produ	Production factors										
1	Very high input price	3.3	0.8	0.8	16.7	78.3	0	4.2	5.8	16.7	73.3
2	Usage of low-quality input	21.7	15	40.8	15	7.5	24.2	6.7	32.5	24.2	12.5
3	Improper storage	18.3	7.5	7.5	33.3	33.3	13.3	6.7	8.3	45	26.7
4	Costly capital setup for farm	2.5	10	15.8	40	31.7	0.8	10.8	18.3	38.3	31.7
Bank	loan mechanism and repayment issue	es									
1	High transaction Cost	24.2	24.2	45	5	1.7	21.7	29.2	35	14.2	0
2	Existence of loan over dues	26.7	15.8	39.2	10	8.3	40	16.7	31.7	6.7	5
3	Less loan cost benefit	2.5	15.8	39.2	35.8	6.7	3.3	15.8	37.5	32.5	10.8
4	Sale of gold for payment of loan	40.8	8.3	28.3	15	7.5	43.3	16.7	27.5	9.2	3.3
Farm	and output issues										
1	Frequent crop failure	6.7	10	16.7	18.3	48.3	10	5.8	23.3	25.8	35
2	Livestock diseases	35	13.3	42.5	7.5	1.7	29.2	13.3	37.5	11.7	8.3
3	Low yield	9.2	6.7	4.2	25.8	54.2	6.7	5.8	9.2	30	48.3
Lack	of skills										
1	Lake in price decision	6.7	9.2	8.3	27.5	48.3	7.5	12.5	9.2	38.3	32.5
2	Fail to adopt new farm technology	28.3	15.8	10	25	20.8	26.7	6.7	3.3	50	13.3
3	Usage of loan for unproductive activities	50.8	28.3	15	1.7	4.2	66.7	16.7	11.7	1.7	3.3

# Table 3.14 Intensity and identification of the principle factors affecting farmers' cascading.

Source: Author's own calculation based on primary data

Table 3.15 presents the socio-economic and policy failure factors in terms of the cascading effect of farmer's debt. Overall, 33.3% farmers were having overdue on the loan, and it was 42.5% of tenant farmers and 24% for owner cultivator. As far as repayment of overdue is concerned, then it shows that 20% of overall farmers paid their partial overdue loan in which 24% were to tenant and 7% were from owner cultivators' group. In addition, 13% of all farmers have not repaid their loans, of which 18% were from tenant and 7.5% from the owner cultivator group. The reason behind is not to understand the debt trap by farmers who are less educated 37% of the farmers are below metric education) and they had very less information and knowledge about the market and loan. The results show that, overall, 44% of farmers have a deficit income (the negative gap between income and consumption). However, this proportion was 54% and 33% for tenants and owner cultivator respectively. In addition, overall, around 30% of farmers expenses were spent on social ceremonies among who have not paid their loans and this proportion was 56.7% for tenant farmers and only 3% for owner cultivator groups. That clearly brings out the duality among these groups and disadvantage for the tenants.

Further, the assessment of policy bottlenecks was made to understand the incapability of the farmers to pay the loan indirectly. The overall 46% of land was irrigated in the Guntur district. However, this proportion is slightly different for these two groups under study. It was 47% for tenant group and 44% for belong to the owner cultivator group. Overall, 91% of farmers were affected by crop damage due to inadequate disaster risk management. The field investigation found that the majority of farmers (48.3%) rely on informal agencies for credit and from this 36.7% rely entirely on money lenders. However, 64.16% of farmers in a group of tenants are dependent on informal agencies, and from this 47.5% are entirely dependent on money lenders. Nevertheless, overall, 32.5% of owner cultivator cultivators had loans from informal agencies, and of these, 26% relied on money lenders. It is clear from the field survey, that still Many farmers rely on the moneylender, that indirectly indicts the banking system and makes it less effective Only 33% of all farmers received a loan waiver, of which 28% were from tenant farmers and 38% were from owner cultivator. Also, only 9% of all farmers received farm visits and training programs over the years, of which 12.5% were tenant farmers and 5% were owner cultivator. It was noticed that quality testing of inputs was very rare for farmers by government regulators. This shows a complete failure as no farmer of any category has not done testing for

fertilizer, pesticide or other input for years. In addition, only 2.5% of tenant farmers said that their water was tested. In terms of soil testing, only 18% of all farmers benefited, 20% of tenants and 16% of owner cultivator groups.

# Table 3.15: Socio-economic and policy factors affecting the debt trap ofthe farmers.

			Proportion of the farmers facing the issues (%)			
<b>S</b> .	Variables		Target	Control	All sampled	
No.			group	group	households	
Socio-	economic factors					
1-	Farmers having overdue of the	Farmers' having overdue	42.53	24.16	33.3	
	loan (out of sampled HH)	Farmers' paid loan partially	24.1	16.6	20.4	
		Farmers did not pay at all	18.3	7.5	12.9	
2-	Farmers having education (respondent)	below 5 <sup>th</sup> class	9.2	14.2	11.7	
		10 <sup>th</sup> class	36.7	36.7	36.7	
3-	Farmers having earning and cons	mismatching between sumption (per capita)	54.16	33.3	43.8	
4-	Proportionate expenditure on social	Average proportion of all sampled HH	3.6	2.2	3.65	
	total expenditure (%) among farmers who did not pay loan.	Average proportion who spent on social ceremony	56.7	2.8	29.75	
Policy	failure factors		•			
1-	Farmers operati land (Water polic	ng complete irrigated cies)	47.5	44.2	45.8	
2-	Farmers facing of of the year management pol	rop damage at the end (Failure of disaster icies)	90.8	91.7	91.3	
3-	Farmers'	Landowner	2.5	0	1.25	
	towards private	Money lender	47.5	25.8	36.7	
	money lenders	Relatives	5.8	2.5	4	
	sources with	Agri-traders	5	2.5	3.75	
	High Int rates (Failure of credit policies)	Others	3.33	1.66	2.5	
4-	Farmers receive (Loan waiving po	the loan waiver benefit blicies)	28.3	38.3	33.3	

5-	Farmers get pr related instituti programs (Tra program)	ovided with agricultural onal visits and training and awareness	12.5	5	8.8
6-	Farmers get tested for soil	Soil	20	15.8	17.9
	quality and other input	Water	2.5	0	1.3
	(Technological	Fertilizer	0	0	0
	policies)	Insecticides/Pesticides	0	0	0
		Other Inputs	0	0	0

Author's estimates

## **Chapter 4**

# Role of Government for Improving Livelihoods of Tenant Farmers

The Government (Central and State) have undertaken many initiatives to improve the livelihood of farmers since independence. These include loans through SHG, microfinance, loan relief, Raythu Bharosa Scheme, Rythu Mitra, Custom Hiring Scheme, Crop Cultivator Rights Card (CCRC) etc. Therefore, here we intend to analyse the role of the government's in improving tenant farmers' livelihoods in Andhra Pradesh which is based on the household survey and focus group discussion from the field during the study period.

#### **4.1 Tenant Farmers in AP**

Andhra Pradesh is one of the states with the highest tenancy infested states in India. Thus, we cannot ignore the role of tenant farmers in the agricultural development of the State. The estimates of the district-wise number of tenant farmers of the revenue department in 2015 and by the agriculture department in 2021 (Rytho Report, 2022) are given in the table below. The total estimated number around 16 lakhs is significantly below 24.25 lakhs according to the Radhakrishna Commission report (GIVE YEAR OF PUBLICATION). It is important to note that the targets represent only a fraction of the departmental estimates of tenant farmers.

District	Year 2015	Year 2021
Srikakulam	64,000	65,199
Vijayanagaram	62,000	63,453
Visakhapatnam	40,000	31,802
East Godavari	2,50,000	2,43,742
West Godavari	3,20,000	3,55,716
Krishna	2,00,000	1,96,372
Guntur	2,30,000	1,61,338
Prakasam	1,20,000	1,20,146
SPS Nellore	90,000	1,09,643
Chittoor	40,000	1,37,761
YSR Kadapa	50,000	17,348
Anantapur	40,000	54,941
Kurnool	1,19,000	43,022
Total	16,25,000	16,00,483

Table 4.1: Govt. estimates of tenant farmers (Numbers)

Sources: Rytho Report, 2022

#### 4.2 Crop Cultivated Right Act 2019

To overcome all the challenges facing by the tenant farmers, Andhra Pradesh Government has introduced an act named as Crop Cultivator Right Act, 2019 by the newly elected A.P. government led by Chief Minister YS Jaganmohan Reddy in 2019 thereby repealing the AP Land Licensed Cultivators Act 2011. This Act as one of the priority points to issue "Crop Cultivator Rights Card (*CCRC*) to tenant farmers. *CCRC* is an agreement executed between the landowner and the cultivator for the period of eleven months countersigned by the Village Revenue Officer in the village secretary with the condition specified under Section 3(3) of the Act. The main objective of this Act is to digitise and monitor the CCRC for the respective VRO (Village Revenue Officer) in the village who are responsible for issuing the CCRC for the farmers after thorough verification of the farmer details and qualifications. This was one of the best policy steps taken by the government in favour of the tenants.

#### P\$ 204; 000000142 (ເຫັນອານວ່າ: ແມ່ນ ອຣິສ ໃນອັດໃນ ສັກ ເປັນຮັດໃຫ້ ບໍ່ມີມຣູ ຈີນັ້ນ) රෙසදා(බැදෙවළ එළා අත් යායුරු ලබස් වන පරේ විසිටුරු පර ( එරෙක එස් බෝස් විනා මූන ) යා පෙන මැතිවරයාන a opo dob 1055 myships adeb moto tr chaldt w tells is a fight its distinct for Androdificatio 0753 2010/01/01/01/01/01 (75.4) 2.4700 ð <u>Antil Jusing</u>leingð slei <mark>fri pó</mark> Glavsler <u>1. í besk slei værstenderum hersin</u> <u>tempogatern</u> för stædarföl Jusiska i <mark>Ó Textesk Chrapter</mark> Ve Sill Textesk sociality son on the deal to have set on the nga ayata prioretta ny system analatan y anyah day 5) Otomin <u>1,045 integration Kalendohelarood</u> (har) 5 intu ju (artaine) Auch (<u>adalitate</u>) 3-56 K. minu mobilis 600 3 (2) elyeadata and a local presetation and a color 600012-000240 anno pranattary ta Batana a worthing the reliance which are not been and 2000 1000 010354542 riors seasants souther an Fad A stan son side Dofo: MA here: 12 and resten only based withinks at the able satisficant in the L & POIN BOOM OF BODY WORLD COULD BELL SPORT DEST A dotal hit motors and addition a equiption and STRACTOR DRUG DRUG STRACTOR BAN 24: NON NAME WARPHIN 222501. 4.45 615 a de staniel de på wolsened blid is staniel for på duty wohrs adda aught add in Band for \$500 mights كىمۇركى بەرە مەرەك بەرەك بەرەك بەرەك بەرەك بەرەك 010753 10850 0004 1001 CONST 20,424005 checks cublics practs

# In CCRC card generation , we capture data related to District, Mandal Name, Village Name, Khata Number, Land Owner Aadhar, Land Owner Address, Land Owner Mobile, Extent of Cultivation (Acres), Land Enrolment Date, Land Enrolment Period, Tenant Aadhar Number, Name of the Tenant Farmer, Tenant Mobile Number, Tenant Gender, Tenant Caste, Tenant Father, Tenant Address, Tenant Photo etc. While generating a CCRC cards there are multiple conditions that have to be met before issuing a card to a particular tenant farmer.

#### Figure 4.1: Sample Copy of CCRC

The following benefits are available to tenant farmers through the CCRC:

- 1. The cultivator shall be entitled to obtain a crop loan on the land under agreement from the State or Central or Agricultural Cooperative Society or Scheduled Bank or any other financial institution owned and controlled by the State or Central Government.
- 2. The farmer is also entitled to crop insurance, input subsidies, crop damages, or any other benefits or facilities provided to farmers by the government.
- 3. The SC, ST, BC and Minority Cultivators will also be entitled to the "*Rythu Bharosa*" Scheme in addition to the landowner as per as guidelines of the scheme.
- 4. Rules shall be applied to the cultivator who belong to local Scheduled Tribes only notified with the Schedule area of the state of AP.
- 5. There is an appeal provision to the person aggrieved by the decision of the Village Secretary either granting or refusing to grant CCRC before the Tahsildar of concerned Mandal and the Tehsildar shall dispose of the same by summary inquiry within the seven days by giving an opportunity to both the parties". (Govt. of AP)

# 4.3 Actual number of CCRCs issued to tenant farmers in the last three years.

The district wise CCRC issued by the government for the last three years i.e., 2019-20, 2020-21 and 2021 obtained from the Government Revenue Department. However, for the district, the estimated number of farmers has been obtained from the report published by the *Rythu Swarajya Vedika* (2022). Table 4.2 clearly indicates that the CCRC has almost increased twice since it was created. However, variations and fluctuations may be noted across districts over the period. For the year 2021-2022, the highest number of CCRC issued for the Parkasam district while it is lower in Chittoor district. The last column of the table indicates the proportion of tenant farmers who used the CCRC in fiscal year 2021-22. The highest proportion of tenant farmers on the CCRC was in East Godavari (54.16%), followed by Guntur (48.70%), Krishna district (42.42%) and West Godavari (39.25%). However, the lowest

proportion was in Chittoor (1.41%) followed by Ananthpur (5.11%) and Srikakulam (10.23%).

				CCRC	CCRC		
				Cards	Cards		CCRC %
				issued	issued	Tenants	of
			CCRC Cards	for FY	for FY	(departmental	estimated
		Total	issued for FY	2020-	2021-	estimates-	tenant
S. No.	Districts	Villages	2019-20	21	22	2021)	(in %)
1	Srikakulam	1679	10,412	3721	6664	65119	10.23
2	Vizianagaram	944	10158	10728	12241	63453	19.29
3	Vishakhapatnam	1013	4534	5801	4253	31802	13.37
4	East Godavari	727	76593	111045	132010	243742	54.16
5	West Godavari	1056	66160	108527	139620	355716	39.25
6	Krishna	920	31706	76840	83302	196372	42.42
7	Guntur	1564	28884	53101	78570	161338	48.70
8	Prakasam	1233	11 207	18136	25240	120146	21.01
9	SPS Nellore	1868	50082	5297	15058	109643	13.73
10	Chittoor	3136	1192	1344	1944	137761	1.41
11	YSR Kadapa	947	5965	2424	4897	17348	28.23
12	Anantapur	982	3290	1073	2810	54941	5.11
13	Kurnool	1590	17496	16758	16074	43022	37.36
	Total	17,649	272679	414795	522683	1600483	32.66

Table 4.2: Number of CCRC issued compared to estimated tenant.(Numbers)

Sources: https://exhibition.skoch.in/beacon-of-hope/chief-commissioner-of-landadministration-revenue-department-andhra-pradesh-3/

#### 4.4 The proportion of tenant farmers that receive the CCRC.

The field survey conducted for the study shows that out of 120 tenant farmers, only 60 farmers received *CCRC* i.e., 50%. Yet there are a lot of conflicts between landowners and renters which is the reason why not 100% tenant farmers received the card. Tenant farmers revealed that many landowners are still not ready to sign the documents and that is the main reason for them to not receive the *CCRC*. However, few respondents also said that the actual landowner was not in their native place and responsibilities were given to close relatives or friends; therefore, these intermediates cannot do sign on the behalf of landowners thus they are deprived of *CCRC*.

The reasons for tenant farmers did not receive a *CCRC* is shown in Figure 4.3. Many tenant farmers (43%) indicated that "obtaining the owner's signature was the " primary barrier" in obtaining the *CCRC*. The majority of landowners completely **refused to sign** the application when they were approached by tenant farmers. In some cases, landlords also threaten tenants with no future leaseholds. Interestingly, we found that 32% of respondent households belonging to a tenant group had not even requested a *CCRC* to avoid conflict. It was mainly because of past experiences or conflicts with landowners. However, 10% of tenant farmers said they had submitted an application but did not receive CCRC. They were unsure of the exact reasons behind the same thing. In addition, the same percentage of farmers was not aware of the *CCRC*. Many of them said that they knew about the tenant's certificate, but they depicted ignorance about the *CCRC*. They were not fully aware of this because of many reasons and the low level of education among them was one. Approximately 5% of tenant farmers also reported not receiving a *CCRC* for more than one reason.



Figure 4.3: Reasons for not receiving CCRC by tenant farmers (In %)

#### 4.5 Benefits received by the tenant farmers.

The purpose of the current government's introduction of the CCRC into the AP is to provide farmers with all kinds of benefits. Therefore, tenant farmers are supposed to get the benefits from the government only through the CCRC. If the CCRC is not issued to certain farmers, they will not have any government benefit. Benefits included

Author's estimates

crop loan on leased land, group loan on leased land, *Rythu Bharosha* on leased land, crop insurance, crop loss compensation, marketing of crops, subsidies, electronic cultivation, and other benefits. All these benefits will be availed by tenant farmers if they have CCRC.

The CCRC is the essential first step in recognizing tenant farmers as eligible for inclusion in all benefits granted by government. The field survey shows that only 50% of farmers in the Guntur district received the CCRC. However, 50% still excluded from receiving CCRC. Further, even among those who have received the CCRC, many were excluded from the many benefits. It is seen from the figure 4.4 that 67% of the tenant farmers benefited more than one benefits followed by *Rythu Bharosha* (22%), crop insurance (3%), loan on leased (3%), group loan on leased (3%) and crop loss compensation (2%) respectively from those who had received CCRC. However, even none of them who received the CCRC said they had benefited for E-market, subsidies, crop marketing and other benefits.



Figure 4.4: Benefits received by tenant farmers through CCRC

Author's estimates

*Raythu Bharosa* project initiated by the AP government like *PM KISAN* and *Rythu Bandhu* from Telagana state. There is the provision of direct cash transfer ₹.

13,500 for each tenant farmer. But again, CCRC needs to be there for farmers. The survey clearly indicates that of those 50% with a CCRC, 22% received government support from *Rythu Bharosa*. Many studies show that the lack of access to credit from formal agencies is the main cause of stress, indebtedness and suicides of farmers. Only 3% of farmers received an individual or collective loan for leased land from formal credit agencies using the CCRC. The field survey also reveals that majority of farmers loss their crop last year due to bad weather i.e., unseasonal rain. Although only 2% of tenant farmers were compensated for the loss. This leads to distress and compels farmers to depend on informal agencies for the loan. Where they have been charged the usurious interest rate. (Give references)

# 4.6 Working and problems of institutional mechanisms for tenant farmers in AP

Our focus group discussion shows that there are several issues associated with the ongoing institutional mechanism on the government side. In the section that follows, we will discuss all these issues one by one.

#### **Issues with Crop Cultivated Rights Card**

The discussion in our focus group raises these following questions:

- 1. Tenant farmers reported that there exists caste discrimination by landowners when they sign the document required for CCRC.
- 2. Most large owner cultivators have said they could lose the land as it happened earlier.
- 3. Large farmers were not consenting to sign on the document for a CCRC because they felt that if tenant farmers would not be able to repay the bank loan on time; they must bear the loan amount for repayment.
- 4. Every month, the bank updates their loan entries for landlords and tenant farmers. In this case, the landowner is also concerned about the amount of the loan taken by the tenant farmers.
- 5. The CCRC is mandatory for *Rythu Barosa Kendram* for tenant farmers to update the following fields: e-crop, *Rythu Barosa*, Damaged crop.
- 6. Another major problem is that some landowners do not stay in their own village, they lived in another country/place. It is, therefore, not possible for tenants to get their landlord's signature for the loan. Between the two, the

intermediaries look after the owner's property, taking advantage of tenant farmers.

- 7. If tenant farmers fail to repay the loan to the institution, then in that case the landowner hesitates to lease out land to the same tenant farmers in the next year.
- 8. The majority of the tenant farmers complained about the limit of the loan amount from the formal credit agencies. Therefore, they can't utilise limited funds for cultivation and investment in agriculture. Thus, they can't think to expand their investment in cultivating land on time without depending on informal agencies for loans.
- 9. Due to landlord interference, tenant farmers are not directly benefiting from institutions. Somehow, landowners availed these benefits.

#### 4.7 Rythu Bharosha Program

RBK is designed as one-stop solution for all the grievance of the farmers. It is intended to provide all possible help, from seed to fertilizer, to grain purchases and crop insurance. It is established to enhance the confidence and faith (Bharosha) of the farmer in the state apparatus to seek all help needed. The purpose of establishing RBK to see that no farmer needed to go out of his village for any assistance. RBK is also responsible for reviewing seed quality and removing uncertified seed and harmful pesticides from the marketplace. This is a system that's especially helps tenant farmers, but we found that even a few owners cultivator has also taken benefit by registering their crops on the cropping system portal. It helps them to claim crop insurance for damaged crops as well. Based on our data, due to the non-consent of the landowner, many tenant farmers are denied the benefits of the CCRC.

*Rythu Bharosha* is also linked to the CCRC map, as tenant farmers can obtain the full benefits on their leased lands through this scheme on the CCRC map. Moreover, the distribution of grants (non-repayable amount) of  $\exists$ . 13,500 is made government through RBK (*Rythu Bharosha Kendra*) in the villages of AP irrespective to the cropped land of tenant farmers. Each farmer gets this amount as money to invest in input expenses. Our field investigation indicates only 44% (including multiple benefits) of tenant farmers received the benefits with the help of CCRC and that leaves out 56% of the tenants out of the network for various reasons.

### 4.8 Working of Self-Help Group (SHGs)

NABARD has played a critical development role in the Indian microfinance sector. It has been helping in organizing and sponsoring several training programmes and exposure

Visits for the benefit of bank officials, Non-Governmental Organizations (NGOs), and Self-help Groups (SHGs), which in turn has enhanced their effectiveness in the field of Microfinance. NABARD also supports capacity building, exposure, and outreach to NGOs and SHGs. "*Dwarka Group*" is another name for SHGs in AP. Some of the very interesting findings, we have received from the FGDs during the field survey in the study area.

These are:

- SHGs in rural areas are mainly concerned with women's empowerment. Their emphasis is on improving their living conditions of the household through women's participation.
- We have received mixed responses from the FGD regarding help through SHGs to the tenants. Some of the tenant farmers revealed that it has had a positive impact on the livelihood in certain sectors. Almost all the survey farmers, reported that they were taking loans from SHGs for their personal expenses for a very short duration and they usually repaid it within a couple of months. Hardly, they have loaned for agriculture purpose. To repay this loan, they were to paying monthly instalments with the interest rate on due time.
- Farmers explained that the living conditions improved due SHG members in the family, but only for those having a small business. It provides an unsecured loan with conditions determined by the group at market rates and the group member can create jobs for the members and the family without being dependent on the government.
- Further, it was observed that women were repaying the loan on time, and they were good at managing the family's personal expenses and savings. If any member fails to repay the loan on the due date with interest, that member was banned from availing any further loan amount as other members of the group are eligible. Thus, it is very clear that the clearance of the amount is important in SHG unlike other lending sources.

The majority of people said that there is a limitation on loan from SHGs. It was ranging between ₹ 40,000 to ₹ 60,000.

#### 4.9 Working of Joint Liabilities Group (JLG)

JLGs are established as informal groups comprising preferably 4 to 10 individuals engaged in similar economic activities like crop production and allied activities. The members come together for the purpose of availing bank loan either individually or through the group mechanism against the mutual guarantee. The JLG members would offer the bank a joint venture and collateral that would enable them to receive loans. The management of the JLG is kept simple with little or no financial administration within the group. The objectives of Financing Joint Liability Groups of tenant farmers (JLG) were established to augment the flow of credit to tenant farmers cultivating land either as oral lessees or sharecroppers and small farmers who do not have proper title of their land holding through the formation and financing of JLGs, got benefitted. We found that the JLGs operate better and according to the expectations of the members. As a feature of JLG, farmers said that any given group has a maximum of 5 members, including all categories of farmers using a bank loan against groups collateral. It clearly refers that if any farmer from the group cannot pay, then the whole group member has to bear the dues. It is observed from the discussion that, in most of the group, there is at least one member who defaults and does not repay the amount. Therefore, this phenomenon limits that person's membership to any JLG group in the future in the village. The occurrence of such cases restricts JLG to provide membership of JLG to the defaulter in future.

However, tenant farmers argued in favour of independent individual lending. Therefore, in the name of the defaulter, the other member would not be required to bear the amount of the loan. In addition, they added that the JLG group extends the repayment duration of the loan with an extended amount limit. Table 4.3 presents the details of total group formed and the number of functioning groups in the selected villages in the Guntur district of AP.

				JLG	RMG	
			Total No of		Total	No of
			Group	functioning	Group	functioning
S.	Mandals	Villages		group		group
No						
1	Mangalagiri	Atmakur	22	2	12	2
		Pedavadlapudi	23	18	0	0
2	Thullur	Peddaperimi	5	0	3	0
		Vaddamanu	0	0	5	0
3	Tenali	Kolakaluru	17	16	19	15
		Kattevaram	35	35	0	0
4	Ponnuru	Brahmankodur	3	0	23	18
		Dandamudi	2	0	0	0

Table – 4.3: Details of JLG and RMG working in the villages (Numbers)

Source: Author's own calculation based on primary data

From the above table, within the *Atmakur* village of *Mangalagiri* Mandal on the 22 JLG group, only two groups were functioning due to various reasons. In this village JLG performance is very low due to the inability to repay the farm loan. And another reason is that the majority of tenant farmers are not interested in taking a loan as a group due to the flaw in tenant farmers' history with the group. During the discussion, it emerged that tenant farmers are interested in obtaining an individual farm loan. Interestingly, we have not found a single JLG group in the selected villages of *Ponnuru* Mandal. However, the Village Agriculture Assistant (VAA) indicated that many JLG groups are being formed and have not yet met the guidelines. But in that village, *Rytu Bharosha Mitra* operates at its optimum capacity and provides benefits to tenant farmers which may be restricting the spread of JLGs. Therefore, due the presence of *Rytu Bharosha* farmers have not felt the needs of the JLG group in the village.

Our field observations revealed that farmers have given the preference to banks for an individual loan rather than the joint loan for the crop or group. They do not want to be responsible for others defaulting. However, within *Bramakoduru*, **the** village Agriculture Secretary stated that five members of the village went to bank for opening JLG, but the bank manager rejected the form as five members were not having civil score and security against the loan. With such kind of reasons JLG in that village stayed sub-optimal in their functioning. The same experience was noted in *Thullur* Mandal in the two selected villages. Our field investigation revealed that there were 5 *Rythu Mitra Group* working in *Peddaperimi*, but because of the increased membership and defaulters those were not functioning. There is a provision that farmers who are Rythu Mitra (RM) members can't become JLG members is also one of the bottlenecks and beneficiaries compare the benefits offered in the two schemes. Naturally, *Rytu Bharosha and RM score better*. In addition, an equal proportion of tenants and owner cultivators can be members of JLG, but within JLG the majority of farmers belong to the tenant group.

It is also clear from the field survey that in a few villages there is good coordination and trust among farmers and that JLG is more efficient. For example, in Tenali Mandal, 35 JLG groups worked in *Kattevaram* and 16 out of 17 groups worked in *Kolakaluru*. In these villages, better coordination between the coordinator, the coordinatizer and the VAS improves the efficiency of the JLG. Likewise, out of 23 JLG only 18 worked for the well-being of tenant farmers.

#### 4.10 About Rythu Mitra

This is a group of people who have access to that group's loan. It also contains both a sort of tenant and owner cultivator. There are generally ten group people to disburse the funds. It's somewhat like the JLG and different from the SHG. Unlike the SHG, it does not focus solely on the empowerment of women, it has included all farmers. And likewise, JLG is focused on all farmers regardless of gender, but in JLG only tenant farmers take loans on their cultivated land.

Table 4.2 shows the information on the *Rythu Mitra Group*, in the *Mangalagiri* Mandal, RMG is active only in the ATAMAKUR village not in *Pedavadlapudi*. In *Atmakur* village, a total of 12 groups is formed, but only 2 RMG group is working. In Thullur Mandal the two villages *Peddaperimi*, and *Vaddamanu* has 3 and 5 RMG respectively, but these have no active group in the villages. In Tenali groups are vibrant as this has JLG and RMG both categories in a village in functional form. *Kolakaluru* has an RMG group on these 19 groups worked correctly. However, in *Kattevaram* only JLGs are functioning, no RMGs are found in *Kattevaram*.

Furthermore, in *Ponnuru* Mandal, *Brahmankodu*r does have 23 groups, among them 18 are in working RMG but in *Dandamudi* do not have any RMG and neither of these have any functioning JLGs.

#### 4.11 Custom Hiring Centre (CHC)

A Custom Hiring Centre, often known as a CHC, is essentially a unit that is comprised of a collection of agricultural machinery, implements, and other equipment that is intended to hire farmers. The main mission of the Central Helping Center is to provide small, marginal and low-income farmers with discounted rates for renting farm implements. This enables marginal farmers and small farmers to start their agricultural activities on time.

The FGD brought out that the CHCs are functional and explored how it works across the eight villages. FGD also revealed that CHC scheme is ongoing and but not fully activated in the Mandal villages. There are five members in the group, and they are responsible for all tools bought from the grants received. They also revealed that from each group will get to avail 15 lakh loan amounts of government for 34 months at 40% subsidy for buying implements. In addition, this group operates on group leaders' authority and guidelines.

#### 4.12 Benefits from the Community Group

During the field survey, we asked the question to the farmers about their membership in any group of the community including JLG, SHG, and CHC etc. In table 4.3 we have provided the details that 34% of the total surveyed farmers are the members of the groups and among them 84% are availing all the provided facilities. However, overall, 66% of sample farmers, were not even a member of any group. As far as membership of tenant farmers is concerned, then 21% of them reported that they are members of the communities. Moreover, among them 88% farmers were getting all kinds of benefits, nevertheless, 47% of the owner cultivator also had taken the membership of community group among them 82% are getting benefits.

	Farmers mer	nbership in Gr	oups (SHGs/JLC	Gs)	
	Proportion of the farmer members of SHGs/JLGs	Proportion of the farmers Aided (from member farmers)	Proportion of the farmers, non-aided (from member farmers)	Proportion of the farmers, non-member of SHGs/JLGs	Total farmers
Tenant	25	22	3	95	120
Farmers	(21%)	(88%)	(12%)	(79%)	
Owner	56	46	10	64	120
cultivators	(47%)	(82%)	(18%)	(53 %)	
All Sampled	81	68	13	159	240
Farmers	(34 %)	(84%)	(16%)	(66%)	

Table 4.3- Share of farmers being member of any group in the Guntur district in sample village (Numbers and share is in the parentheses)

Source: Author's own calculation based on primary data

Therefore, it is clear, if every farmer takes membership of the group of the community like JLG, SHG or CHC, then more than 80% of them may benefit and can avail all the facilities. Though, tenant farmers need to be motivated to participate in the community group like JLG, SHG and CHC as they were showing less interest.

Sometimes, outcome cannot be measured in quantitative way, qualitative methods to record the response is better idea. Therefore, in this study, to assess the impact of JLG or SHG in the villages open ended query was designed and floated among the farmers.

#### Figure 4.3: Natural language processing indicating the impact of membership



Moreover, to analyse those responses, 'natural language processing'<sup>7</sup> is applied to extract the major impact. This analysis is a completely open response from the farmers' group among tenant and owner cultivator. In the figure, the loan is appeared in relatively large and bold letter, which implies that if a farmer is a member of any community group, he gets easy availability of the loan. They have easy procedure that directly impacts their farming decisions. However, fertilizer distribution is the second largest font of the word, that indicates that after joining a group they get better fertilizer for their crop cultivation. And it is also clear from the OLS model (chapter 5) that the fertilizer significantly affects the farm income in a positive direction. Therefore, being in the group farmers get easiness on capital investment by the motivation of the group and money. Lastly, group member also lends farm implements at subsidised rate it also enhances the farm income significantly (OLS Model Chapter 5).

\*\*\*\*\*\*\*\*\*\*\*\*

<sup>&</sup>lt;sup>7</sup> Cui w., Wu Y., Liu S., Wei F., Zhow, Mx, Qu, Huamin (2010). Preserving Dynamic Word Cloud Visualization. IEEE Computer Society. 42-53

#### CHAPTER 5

#### **TENANCY AND INDEBTEDNESS: ANALYTICAL EXERCISE**

Our observation called for rigorous testing of the empirical data for meeting the objectives and also to test the working hypotheses indicated in the initial chapters. We undertook in-depth econometric analyses to test key research questions in our study. In particular, the factors influencing the probability of household accepting a tenancy are determined using multi-nominal logistic regression (Shivakar & Moske, 2011) to obtain the most significant variable. In addition, we identified key "income drivers" for tenant farmers using OLS regression. Farmers' next efforts are made to make yield better by using the various categories of input factors, including expenditure on fertilizer, pesticide, technological investment, and irrigation facility (which is measured by proportion of land irrigated in the cultivated land) (Schwab, 2002). In addition, we analysed the cascading effect with the Likert scale, where Principal Component Analysis (PCA) analysis was utilised to extract important the "Principal Component" affecting farmers' indebtedness and the Cascading Effect. The determinants of the level of debt among farmers were analysed using the Tobit regression. In order to examine the hypothesis, a number of tests of significance are utilised such as two-way ANOVA to compare the means and variance between the group and within the group of borrower and non-borrower with their tenancy and nontenancy. Moreover, the  $\chi^2$ Chi-square test was used to check the association between the training programs conducted in different region's facilities.

#### 5.1 Determinants of Tenancy: A Multinomial Regression Analysis

Multinomial logistic regression is usually considered as an effective approach as it does not presuppose normality, linearity, or homoscedasticity (Grason, 2011). This hypothesis tested here refers to the proposition that "choosing or belonging to one category has nothing to do with choosing or belonging to another category". With the Hausman-McFadden test, the assumption of independence may be examined. Multinomial logistic regression is simply an expansion of binary logistic regression that allows more than two categories for the dependent or outcome variable (Vittinghoff, 2005). Multinomial logistic regression, such as binary logistic regression, uses maximum likelihood estimation to determine the probability of belonging to a category.

	Dependent variable: Tenancy of the farmers (pure tenant, Partial tenant, owner cultivator)									
S.	Name of the variables	Description		Tenant		Part	tial-Tenant			
No.					-					
			RRR	Coefficients	P value	RRR	Coefficient	P value		
1	Age of the farmer	In years	.9306	0719	0.00***	1.0059	0.0059	0.78		
2	SC cast	Dummy	1.8217	·5997	0.00***	1.7031	0.5325	0.00***		
3	Level of education of	In years	1.0598	.0581	0.34			0.33		
	head		_	_		0.9399	-0.0620	_		
4	Household size	Number	.8422	17178	0.30	0.9957	-0.0044	0.98		
5	Dependency ratio	Ratio	.8319	18409	0.24	0.9049	-0.0999	0.58		
6	Subsidiary occupation	Dummy	2.0912	.7378	0.22	0.4829	-0.7279	0.23		
7	Operated land	In acre	2.0562	.7208	0.00***	2.2541	0.8128	0.00***		
8	Total income	In ₹	.9999	-0.0001	0.10*	1.0000	0.00001	0.10*		
9	Total consumption	In ₹	1.0000	.0002	0.02**	1.0000	0.00001	0.04**		
10	Total input	In ₹	.9999	0003	0.04**	1.0000	0.00001	0.07*		
11	Irrigated land	In acre	.8870	11997	0.23	1.0136	0.0135	0.89		
12	Credit accessibility	In ₹	.9999	0002	0.04**	1.0000	0.00001	0.32		
13	Outstanding loan	In ₹	1.0000	0.0001	0.04**	1.0000	0.00001	0.71		
14	Occurrence of natural	Dummy	1.7021	.5319	0.40			0.57		
	disaster				_	0.6809	-0.3843			
15	Cascading effect	Proportion	.9950	0051	0.82	0.9762	-0.0241	0.36		
16	Constant		3.4730	1.2450	0.58	0.6387	-0.4483	0.86		

# Table 5.1: Estimates of the Multinomial regression Explaining tenancy.

Author's estimates

Note: \*=@ 10% significance level, \*\*=@ 5% significance level, \*\*\*=@ 1% significance level, chi square -83.56 p=0.000

Table 5.1 shows the analytical output for multinomial logistic regression since the dependent variable has three categories of farming, i.e. pure tenancy, partial tenancy, and no tenancy among the farmers of Guntur district. The chi-square likelihood ratio has a p-value of 0.00 indicates that our model fits in better than an empty model. The output is divided into two sections, each labelled with the categories of the outcome variable farming group. One is tenant over owner cultivator, and the other is partial tenant over non- tenants. Consequently, both outcomes will be considered separately.

In table 5.1, column 4 it comes out that the age of the head of the household is statistically significant with a negative sign. This means that with age, the probability of partial tenant is in relative decline compared to owner cultivators. But it does not matter to pure tenant to owner cultivator. Age is therefore recognized as the decisive factor in tenancy decision. This may be due to the fact that the new generation does not see the benefits of agriculture by leasing land and prefers migration to further work. Likewise, SC's people are positively associated with the tenant group significantly with any increase in the odd relative log of being in the tenant group vs. owner cultivator group. The tenant farmers belong to SC have positive associations with partial tenants vs. owner cultivators. The field survey also confirms that most tenant farmers came from the SC group.

Moreover, a few variables like highest education in the family, subsidiary occupation, and occurrence of natural disaster are positively associated with the relative log odds of being a tenant farmer vs. owner cultivator, but do not emerge statistically significant. Similarly, a few variables are negatively related to the relative logarithmic odds of being a tenant farmer vs. owner cultivator i.e., like size of household, dependency ratio, irrigated land, and cascading effects. However, a number of important variables are identified to demonstrate how the tenancy is affected by demographic and socio-economic variables. The land under cultivation as expected emerges with positive sign and is statistically significant. But if farmers do have higher household income, he will not be in pure tenancy. Similarly, high consumption pushes them to pure tenancy. But a high input factor (excluding rent) per acre reduces the association of pure tenant. Similarly, credit availability is negatively associated with pure tenant farmer vs. owner cultivator. Another explanatory variable i.e., the outstanding loan shows a positive association with the pure tenancy group. However, overall, five explanatory variables are important to show the result of the relative log probability of being in partial tenant farmer vs. owner cultivator. With the SC caste, cultivated land shows a positive association with a group of partial tenants and a group. Moreover, the other explanatory variables i.e., total income, household consumption and input expenditure on the holding (excluding rent) to be in partial tenant vs. owner cultivator. Moreover, the determinants of partial tenancy are somewhat less important.

Consequently, it comes out from ongoing analyses that the Caste (especially belonging to SC) is a direct determinant of being a tenants or partially tenants in the study area. Size of land holding also decide that farmers will belong to a pure tenant or a partial tenant. The highest income group can be a partial tenant or an owner cultivator because the marginal RRP rate is not very high. But strong household consumption guarantees that farmers will opt for pure and partial tenancy. Farmers expending good on fertilizers and input are from owner cultivator or partial tenant group, but pure tenant farmers are not into high input expenditure as they must pay land rent too. Generally, partial tenants spent more on inputs as compared to pure tenants. Farmers with higher outstanding loans belong to a pure tenant compared to owner cultivator.

#### 5.2 Determinants of Quantum of Indebtedness: Tobit Model

Any limited variable model can be used to investigate the magnitude for censoring data (Madala, 1983). It is a unique case where the conventional linear regression model is not suitable. In our study, not every farmer was indebted. Therefore, in this case the dependent variable has a zero value. To estimate the determinants of indebtedness, we must exclude non-indebted households and estimate the model using only indebted households. This leads to the major problem of reducing the sample size and hence non-randomity in the rest of the household sample, causing serious economic problems (Madala, 1983). Nevertheless, the Tobit model, which is a limited dependent variable model, solves this problem. Therefore, we have used a regression model to study debt determinants.

The result of the Tobit regression model of the determinants of quantum of outstanding debt is presented in table 5.2. Contrary to our expectations, none of the

coefficients of households except age of the head turned out to be statistically significant. This suggests that other things being the same the extent of indebtedness among the farmers is significantly impacted by the age of household head with a positive sign.

	Dependent variable: total outstanding loan								
S. No.	Name of the variables	Description	Coefficients	P value	Coefficients	P value	Coefficients	P value	
1	Age of household head	In years	15168.58	0.01***	-4359.80	0.61	7646.72	$0.10^{*}$	
2	SC cast	Dummy	-17175.66	0.73	54412.890	0.58	-10043.85	0.83	
3	Higher education of head	In years	-21612.40	0.27	52494.93	$0.07^{*}$	-182.26	0.99	
4	Dependency ratio	Ratio	46159.50	0.38	1010.57	0.98	20938.18	0.60	
5	Subsidiary occupation	Dummy	35374.70	0.83	59198.74	0.80	-55152.99	0.68	
6	Own land	In acre	-178096.20	0.01***	-3805.61	0.95	-36721.65	0.29	
7	Total income	In ₹	-0.10	0.88	-4.47	0.01***	-0.97	$0.10^{*}$	
8	Yield	In ₹	-2.62	0.32	1.20	0.604	-0.58	0.73	
9	Rate of interest	In percentage	41883.89	$0.02^{**}$	69542.34	0.00***	58283.92	$0.00^{***}$	
10	Unproductive purpose	Dummy	320828.50	0.09*	831271.40	0.00***	480334.30	$0.00^{***}$	
11	Distance from the district headquarter	In km	48295.81	0.06*	37581.44	0.32	27663.85	0.10**	
12	Natural disaster	Dummy	-596901.10	0.00***	56414.18	0.84	-224594.30	0.20	
13	Crop insurance	Dummy	-147191.500	0.10*	15522.76	0.88	-29777.53	0.65	
14	CCRC	Dummy	46278.57	0.75	27626.06	0.89	74032.05	0.54	
15	Irrigation	In acre	46159.59	0.00***	158107.90	0.00***	50719.89	0.00***	
16	Location, 1 (Mangalagiri)	Dummy	-414195.40	$0.10^{*}$	213471.10	0.43	-341943.70	$0.07^{*}$	
17	Location, 2 (Tenali)	Dummy	-488081.40	$0.02^{**}$	53271.13	0.85	-366233.70	0.03**	
18	Location, 3 (Punuru)	Dummy	-131091.10	0.50	108191.80	0.69	-189051.30	0.247	
19	Constant	In years	1231927.00	0.15	2131032.00	$0.10^{*}$	63917.12	0.929	

# Table 5.2: Estimates of Tobit regression for household indebtedness.

Source: Authors' Estimation

Note: \*=@ 10% significance level, \*\*=@ 5% significance level, \*\*\*=@ 1% significance level

Like age of the household's head, other factors i.e., the rate of interest, irrigation, loan for unproductive purposes, distance from the district headquarters turned to be statistically significant with positive sign, which shows that quantum of indebtedness is likely to increase as these factors increases for the overall farmers. However, the quantum of indebtedness is inversely related to the location, as the estimated coefficient location 1 means Mangalagiri and location 2 (Tenali) variables turned out to be statistically significant. It indicates that if farmers belong to Mangalagiri and Tenali Mandal that reduce the quantum of indebtedness by ₹ 341944 and ₹ 366233 respectively.

As far as the determinants of indebtedness of tenant farmers are concerned, the table indicates that the age of the household head, rate of interest, loan use for unproductive purposes, distance from the district headquarters and irrigation turned out to be statistically significant with a positive sign. In fact, loan for unproductive purposes has a very complex relationship with outstanding debt. This is because many farmers had taken loan for their children's education as they don't want to do farming from the upcoming generation due to very hard physical work and less profit and used it for that purpose. However, the other variables like size of land, natural calamities, crop insurance and locational dummy turned out to be statistically significant with a negative sign. This showed that with the increase in these variability, the quantum of indebtedness is decreasing for tenant farmers in Guntur district of AP. The pattern reduces just like for overall farmers if the tenant farmers belong to Mangalagiri and Tenali Mandal then it the quantum of indebtedness by ₹ 414195 and ₹ 488081 respectively.

#### 5.3 Determinants of Farm Income: OLS Regression Model

In order to investigate into the determinants of household income, OLS is used to estimate the influence coefficients within a linear regression model. The objective was to minimize the differences between the observations collected in certain arbitrary data sets and the responses predicted by the linear approximation of the data. When the regressive values are exogenous and there is no multicollinearity, the OLS estimator is coherent. This is also the best of the class of unbiased linear estimators when errors are homoscedastic and not serially correlated (Stewart, 2016). When these requirements are met, the OLS technique produces a medium unbiased estimator with the smallest possible variance, even if the error variances are finished (Eisenhauer 2003).

The important variables and their respective coefficients of the farm income for both tenant and owner cultivator are presented in table 5.3. The coefficients of estimators represented the influence of the various factors on total farm income. We sieved the significant results, out of 22 explanatory variables and only 9 were found to be statistically significant. Among them demographic factors are not observed very significant whereas other socio-economic factors were found significant like natural disaster factors, distance of village from district headquarter, cultivated land, working labour in the farm, expenditure on input like pesticide, fertilizer and technical equipment, productive use of loan and loan waiving policy. However, for discussion purposes, the result in the table shows all variables, irrespective of their level of significance i.e., age of the household head, household headed by females, and the SC category is not statistically significant at all. Which means these variables were not affected the farm income. Moreover, this is same for level of education of household head, CCRC benefit, dependency ratio, credit accessibility, irrigated land, and seed expenditure Thus, their relationships are not very reliable for predicting the agricultural income of farmers.

However, the occurrence of a disaster variable in the village as can be expected, negatively affects the farmers' income with a high marginal rate of ₹ 1,25,961.4. Loan used for unproductive purpose by tenant farmers also reduced their farm income by ₹ 1,69,157.2, this is the most significant reason that causes the reduction in the farm income. In addition, as the area under cultivation, labour, pesticides and expenditure on technology and technology have a significant positive impact on agricultural income. These inputs are the most important determinants of predicting the income of tenant farmers.

As far as agricultural income of tenant farmers is concerned, then the above said variables respond in a different manner. The explanatory variables like cultivated land, labour capital, expenditure on fertilisers and pesticides, expenditure on technology, loan waiver scheme by the government had positively associated and statistically significant for farm income. Which means increase in these explanatory variables leads to increase in the farm income of tenant farmers in the Guntur district of AP. Thus, it can be said that in the sample of large farmers, irrespective of their tenant and owner cultivator, credit has a significant positive impact on farm income. An increase in cultivated and irrigated land will increase agricultural income by increasing productivity.

	Dependent variable $Y_i$ = Total Farm Income of the Owner cultivators							
			Tenar	nt	Owner cul	tivator	All farr	ners
S. No.	Variables	Description	Coefficients	P value	Coefficients	P value	Coefficients	P value
1	Age of household head	In years	-556.43	0.70	317.01	0.69	-652.36	0.45
2	Female headed household	Dummy	-128050.80	0.37	23433.46	0.56	-7524.88	0.89
3	SC Cast	Dummy	-8428.37	0.50	-10064.64	0.34	-8104.78	0.34
4	Level of education of head	In years	964.51	0.81	-357.70	0.87	1669.37	0.49
6	Climate effect	Dummy	-125961.40	0.03**	-18912.87	0.55	-61107.05	0.07*
8	CCRC benefit	Dummy	29957.03	0.42	-21048.35	0.32	7032.40	0.75
9	Dependency ratio	Ratio	11245.80	0.42	-3292.71	0.62	-556.21	0.94
10	Credit accessibility	In ₹	0.45	0.32	0.05	0.49	0.15	$0.10^{*}$
13	Distance from the district headquarter	In Km	-13958.40	0.03**	-7159.63	0.04**	-6690.46	0.07*
14	Cultivated land	In acre	45590.78	$0.00^{***}$	66311.03	0.00***	48391.50	0.0***
15	Irrigated land	In acre	3653.95	0.35	-1442.02	0.80	5172.74	0.08*
16	Labour capital	In ₹	9.38	$0.00^{***}$	2.72	0.04**	3.25	0.03**
17	Seed expenditure	In ₹	0.37	0.96	12.19	$0.00^{***}$	5.35	0.21
18	Expenditure on pesticides	In ₹	11.28	0.00***	-2.72	0.19	2.22	0.32
19	Expenditure fertilisers	In ₹	9.59	$0.02^{**}$	5.65	$0.00^{***}$	7.21	$0.00^{***}$
20	Expenditure on technology and its operations	In ₹	7.34	0.07*	0.18	0.92	3.40	0.10*
21	Unproductive purpose of loan	Dummy	-169157.20	0.00***	3308.73	0.95	-89066.89	0.00***
22	Loan waive	Dummy	52918.28	0.04**	-9591.23	0.49	41251.49	0.00***
21	Constant		179199.00	0.395	154674.80	0.215	99204.12	0.425
			R <sup>2</sup> =0.	83	$\mathbf{R}^2 = 0$	.63	R <sup>2</sup> =0	•74

# Table 5.3: Drivers of Farm Income (OLS)

Author's estimates

Note: \*=@ 10% significance level, \*\*=@ 5% significance level, \*\*\*=@ 1% significance level

It is clear from the table that natural calamities played an important role, and it is statistically significant with negative sign which directly reduces the agricultural income of tenant farmers. Birthal et al., 2022 also found that natural calamities are one of the main causes of low agricultural productivity. Further, the table also shows that that with an increase in the calamities on an average amount of ₹ 1,25, 961 reduce the farm income of tenant farmers. Secondly, the distance between the farmers' village and the district headquarters shows a significant negative impact on agricultural income with a marginal rate of ₹ 13,958. This result indicates that due to market accessibility, demand and infrastructure availability near their place leads to increase the farm income of the tenant farmers. If farmers spend their loan outside of agriculture, this also has a significant negative impact on farm income.

It is understood from the OLS estimators, that tenants-farmers get affected by nine significant variables, including natural calamities, distance from headquarter, cultivated land, labour, capital, pesticides & fertilizers, investment on technical equipment, loan for productive and unproductive purpose, and loan waiving policies. Among these, tenant farmers need to regulate their loan expenditures (and not spend on unrelated purposes) more carefully because they have high value of the coefficient.

#### 5.4: Understanding the factors behind cascading

Principal Components analysis (PCA) is a normal statistical tool for crosssectional data analysis. It is regarded as one of the invaluable outcomes of functional linear algebra having a dimensionality reduction technique. PCA is a simple, nonparametric way of extracting relevant information from unclear data sets. It provides a roadmap to reduce the multifaceted dataset to a smaller dimension to reveal the actual impact and help identify linkage factors for specific events. In the PCA, interrelated indicators are represented in the form of a linear combination of weighted clean vectors called clean faces. These eigenvectors come from the covariance matrix of the selected uni-directional variables. Weights are determined by selecting a set of most relevant eigenvalues<sup>8</sup>.

Five steps need to follow to complete as a procedure in PCA analysis, the very first step is to carry out standardization of the variables to be included to avoid scale

<sup>&</sup>lt;sup>8</sup> Candès EJ, Li X, Ma Y, Wright J. 2011 Robust principal component analysis? J. ACM 58, 11:1-11:37.

bias. The reason that standardization is so important before PCA is that it is very sensitive to variances of the original variables. That is, if there are huge variations in the ranges of initial variables, those with greater ranges will dominate over those with small ranges (for example, a variable ranging from 0 to 100 would dominate over a variable ranging from 0 to 1), resulting in biased results<sup>9</sup>.

### 5.4.1- Exploring Cascading Factors

Principal component analysis is performed for extracting the common factors causing "Cascading Effect" of farmers. After applying PCA, number of parameters are appearing for confirming the extracted factors. Like KMO test for sample adequacy for the PCA, communality table for ranking factors' preference. Furthermore, the rotation of the component is presented to get the final factors. The result of KMO test and Bartlett test are presented in table 5.4. The table shows that the value of KMO is 0.68 which indicates that the sample is adequate to run the PCA analysis and can be processed for further factor extraction.

Kaiser-Meyer-Olkin Measure o	f Sampling Adequacy.	.683
Bartlett's Test of Sphericity	Approx. Chi-Square Degree of freedom Sig.	1164.590 171 .000
A .T ?		

Table 5.4: KMO and Bartlett's Test

Author's estimates

Variation explained by factors in the model 65%					
Variables	Initial	Extraction	Rankin		
			g		
Black marketing of input	2.292	2.029	1		
adoption Inadequate storage facility for I/P	2.277	1.92	2		
and O/P Payment uncertainty from the	1.939	1.285	3		
traders	1.773	1.488	4		
Poor quality of pesticide	1.653	1.104	5		
Failed second crop germination	1.619	1.007	6		
Sale of gold to repay loan Inferior quality of subsidy on	1.609	0.739	7		
inputs	1.598	1.078	8		

#### Table 5.5: Communality of variables

<sup>&</sup>lt;sup>9</sup> Jolliffe IT, Cadima J. 2016 Principal component analysis: a review and recent developments. Phil. Trans. R. Soc. A 374:20150202.http://dx.doi.org/10.1098/rsta.2015.0202
Lack of price making skills	1.556	1.083	9
Low yield	1.541	1.158	10
Loan overdue	1.477	0.953	11
Livestock diseases	1.383	0.732	12
Costly capital	1.046	0.454	13
Unproductive Usage of loan	1.034	0.452	14
Low price of final crop	0.978	0.606	15
Transaction Cost to get the loan	0.941	0.517	16
Less economic value of credit	0.88	0.304	17
Unseasonal rain in the area	0.744	0.222	18
High inflation rate in Input of farm	0.654	0.285	19
Author's estimates			

The above factors shown in table 5.5 can be represented by the graphical locator in the following way.





#### Estimates of Our Exercise

Generally, communalities of factor reveal that how much of the total variation in each variable has been explained. Communalities from the outset estimates of the total variation in each variable that can be attributed to the relevant sources. In general, a value close to 1 indicates a good contribution of factor to the variations. Therefore, values greater than 0.73 were considered a better indication of factors explaining the objectives. Table 5.5 and Figure 5.1 show the ranking of factors that are responsible for the "Cascading Effect" on the tenant and owner cultivator. Black marketing of inputs is the one of the reasons to deprive farmers to get a pace for their farming, though farmers are not very much aware about this as from the table 3.13 (in the earlier chapter) that 60% of the farmers agreed for black market of Inputs. Furthermore, the lack of skills to adopt technology that has left farmers unable to meet market demands, which has affected their profitability and ability to repay their loans.

In addition, without storage, they cannot take advantage of the market's potential and possibilities. As a result, poor storage has led to lower sales and consequently lower income. Then they face payment delays for their payment which has cycled them for subsequent investment in the farm and stranded crops due to lack of suitable investment. Poor quality and spurious pesticides also failed to protect their crop, which led to the failure of the second germination of their crop. These were the top five factors affecting farmers' debt cycle. The remaining factors also have their impact, but their internal variation is too small and has almost similar rate of influence (figure 5.1). The other significant factors contain variables like selling gold of households make them the inadequacy of asset, inferior subsidy of inputs, lack of price-making skills, the low yield, overdue loan, and livestock diseases.

#### 5.4.2-Factorization of the components:

Though based on farmers' responses we explained a dynamic picture of "Cascading Factors", but here based on varimax rotation and correlation given in figure 5.2, total six factors are extracted mentioned in Appendix 10, which are based on intercorrelation among 19 variables and explored into six major causes. These factors are named based on their common characteristics.

Figure 5.2: Varimax Rotation of Components in PCA



**Component Plot in Rotated Space** 

Table 5.6:	Factor	extracted	explaining	Cascading	Effect
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S. No.	Name of the factor	Variables
	Mishandling of loan	Inferior subsidy
	and inferior subsidy	Transaction cost to get the loan
1.	facility	Loan over-dues from previous year
		Unproductive usage of loan
	Factor of production	Unseasonal rain in the area
0	and unseasonal rain	Low yield of land
2.	issue	Low price of final crop
		High inflation rate in Input of farm
		Livestock diseases
3.	Non-farm factors	Lack of skill for technology adoption
		Sale of gold to repay loan
		Lack of price making skills
4.	Payment and pricing	Payment uncertainty from the traders
	issues	Black marketing of input
	Non-supporting	Failed second crop germination (seed failure)
5.	infrastructure for seeds	Inadequate storage facility for I/P and O/P
	and pesticide	Bad quality of pesticide
6	Mismanagement of	Costly capital
0.	capital and credits	Less economic value of credit

Author's estimates

The factors presented in Table 5.6 are just as important in determining the "Cascading Effect" on farm debt. These factors are presented as a function of responses and relative scores. The high correlated responses merged into one and produced one factor like factor one got named as mishandling of loan and inferior quality of subsidy produced from the rotation of the variety of inferior quality of subsidy, transaction cost to get the loan, loan overdue, and unproductive usage of the loan. It suggested that one factor is associated with these activities, of the farmers.

First, right from accessing loan with high transaction cost to contact the loan officer (though in findings most of the farmers are not facing high transaction cost) indicating towards less awareness about loan mechanism and mostly unproductive loan contains high transaction cost because farm purpose loan is distributed by govt agencies at very low transaction cost. However, due to unproductive usage of loan taken, farmers failed to pay and get piled of loan in five years and stuck in the debt cycle, moreover lower subsidy also associated with these factors. As the level of awareness was very low, the farmers have led them to make the policies less profitable and the lack of knowledge pushes him toward lower agricultural subsidies.

Second, the variables are interlinked as non-seasonal rains tend to reduce yield and consequently income causing misery. Furthermore, farmers cannot get a good price and they have faced with a high rate of inflation of input prices. These combined variables collectively force farmers into a debt trap. However, few non-farm issues also make them unlikely to pay loans back like their livestock diseases and absences on technological skills, limit them to excel the farm activity to cover up the loan forced them to sell gold assets. They end up stuck in the debt cycle.

In addition to the above, prices and associated factors also contribute enormously to their perpetuation of indebtedness. Farmers are not very good at managing prices, so they can't get the right price for their products. Moreover, they could not get their own payment at the right moment of traders. In addition, poor storage of inputs has negatively impacted the quality of pesticides and seeds. This again pointed to a damaged crops and lower productivity.

Mismanagement of capital and credit also forced them to remain glued in the vicious circle of debt like having costly capital setup and not optimizing credit and paying more interest than its actual cost dragged farmers into debt trap. Therefore,

based on correlation matrix, mishandling of loan and inferior input subsidy facility, factor of production and unseasonable rain issues, non-farm factors, payment and pricing issues, non-supporting infrastructure for seeds and pesticides, and mismanagement of capital and credit are the major factors identified as the reasons of cascading effects of farmers.

#### 5.5: Analysis of Variance (two-way analysis):

ANOVA is a statistical technique that evaluates potential differences within a scaledependent variable by a nominal level variable with two or more categories. Normality, equal variance and independent error are typical hypotheses to apply this model (Patel, 2015). The experimental design (drivers) is balanced if the number of replicates per treatment is equal. In this scenario, the design is also orthogonal, allowing for a complete separation of the effects of the two components.

Source of variation	Partial SS	DF	MS	F value	P value	Renmark
Model	4.9118e+10	7	7.0169e+09	6.08	.00	Significant
Productivity variations among location	4.3510e+10	3	1.4503e+10	12.57	.00	Null hypothesis rejected
Productivity variations among tenancy	2.6253e+09	1	2.6253e+09	2.3	.10	Null hypothesis rejected @10%
Productivity variation in location and tenancy	2.9709e+09	3	0.9903e+09	0.86	.46	Null hypothesis accepted

5.7: Two-way ANOVA for examining differences in productivity across the region and for tenants and owner cultivators

Author's estimates

The two-way ANOVA analysis results are presented in table 5.7, that helps in examining the hypothesis of interaction between farmers' location and their tenancy characteristics on their productivity. It is clear from the table (P value and F value) that there is a significant difference of farmers' productivity between the four different Mandals under the study area as p-value is less than 0.05. Therefore, we can accept the hypothesis that location plays an important role in the productivity due to several factors i.e., temperature, soil quality, irrigation systems, market access for inputs, etc. Nevertheless, tenant and owner cultivator are also having different productivity, but the location of the farmers and their tenancy characteristics does not have any

combined effect on farmers' productivity, or it can't be claimed that there is a similar productivity of tenant farmers from one location to another location.

Source of	Partial SS	DF	MS	F value	P value	Renmark
variation						
Model	2.0996e+12	7	2.9994e+11	2.1	.04	Significant
Debt variations	4.6650e+11	3	1.5550e+11	1.09	.35	Null hypothesis
in location						accepted
Debt variations	8.9119e+11	1	8.9119e+11	6.25	.01	Null hypothesis
in tenancy group						rejected
Debt variations	7.5096e+11	3	2.5032e+11	1.80	.15	Null hypothesis
in location and						accepted
debt						

Table 5.8: Two-way ANOVA for examining differences in indebtednessacross the region and tenant and owner cultivator.

Author's estimates

 $H\mu$ 1: Tenant farmers of different Mandal have different levels of indebtedness.

 $H\mu$ 2: Borrower and non-borrower farmers do have different level of productivity in different region.

Nature and magnitude of Indebtedness have been determined in the previous chapter. The two-way ANOVA is used here for examining the differences between indebtedness of tenants group and the group of owner cultivator with respect to their location. By observing the P-value, tenant farmers of different Mandals do not have any significance evidence as they are different in their indebtedness. However, both tenants and owner cultivator do have a different indebtedness pattern though there are no significant differences with respect to their location. Thus, it is clear from the analysis that all the farmers are alike in the entire district. This might be due to high input cost, low price received from the seller and insufficient income for investment in agriculture.

Table 5.9: Two-way ANOVA for examining differences in productivityacross the region among borrowers and non-borrowers.

Querra efermistica	Dential 00	DE	MO	Б	Develope	Dammarl
Source of variation	Partial SS	DF	MS	F	P value	кептагк
				value		
Model	5.2563e+10	7	7.5089e+09	6.59	.00	Significant
Productivity variation among	6.3403e+09	1	6.3403e+09	5.57	.01	Null
borrower & non-borrower						hypothesis
						rejected
Productivity variations	8.6114e+09	3	2.8705e+09	2.53	.05	Null
among location						hypothesis
						rejected

Productivity variations in	7.0992e+09	3	2.3664e+09	2.10	.10	Null
locations and borrower &						hypothesis
non-borrower						rejected
						@10%

Author's estimates

The results of two-way analysis of the comparison between borrowers and nonborrowers in various locations are shown in the table 5.9. Since the p-value of borrowers and non-borrowers from different locations has a p-value 0.10 which indicates a significant result at the 10% level. Therefore, we can accept the alternative hypothesis that borrowers' farmers and non-borrower from different places have different productivity. Nevertheless, the borrower farmers significantly differ from non-borrower farmers in the terms of productivity, and they have different productivity in the different mandals as well.

 $H\mu$ 3: Institutional assistance to the farmers for training and other Input testing depends on the location or region.

Institutional		L	ocations		
assistance					
	Tenali	Mangalagiri	Thullur	Punuru	Total
No assistance	24	17	24	15	80
	(0.8)	(0.5)	(0.8)	(0.3)	(3.3)
With assistance	35	43	36	45	160
	(0.4)	(0.2)	(0.4)	(0.6)	1.6
Total	60	60	60	60	240
	(1.2)	(0.7)	(1.2)	(1.9)	5.0

Table 5.10: Chi square table for examining dependency betweenInstitutional assistance and regions.

Author's estimates

The Chi square test for dependency between institutional assistance and locational dependency and results indicated that the value of chi square = 5 @, DF =3 with a p value = 0.175; therefore, we accept the null hypothesis. There is no significant dependency between institutional assistance to farmers in terms of different location in the study area. Moreover, Chi-square analysis by observing and estimating institutional aid values differed by location. At level 3 degrees of freedom analysis give the value 0.175 which is greater than 0.05 at the 5% of the significance level. Therefore, we accepted the null hypothesis that there is no significant dependency between institutional assistance to the farmers in terms of different locations.

#### **CHAPTER 6**

#### **CONCLUSIONS AND POLICY SUGGESTIONS**

Tenancy is an inseparable part of Indian agriculture, and it plays an important role in agricultural development. But unfortunately, tenant farmers remain deprived, vulnerable and constitute the poor section of the rural society. This is historically true and has been highlighted in the literature since the colonial period. They confront strong economic constraints while cultivating and leasing in land from landowners. Credit is one of such importance, a necessary evil in the cultivation profession and farmers' lives. Keeping these things in mind in the present study, we examined the relationship between the tenancy and the credit as well as the income level in the Guntur district of Andhra Pradesh. Moreover, we also touched upon various tenant related issues like CCRC, JLG, loan waiver scheme and SHG model. For this purpose, primary and secondary data were collected and an intensive fieldwork was undertaken even with a few Focus Group Discussions. This study was conducted as a comparative study of tenant and owner cultivator. In addition, a number of parameters are included to examine the determinants of debt. The hypothesis was also verified statistically to confirm the findings and objectives of the study. The result is based on the primary data collected from 240 farming households from the Guntur district of Andhra Pradesh. One of the major limitations confronted in tenancy studies relates to the data availability on tenants. A hidden unrecorded tenancy is the most prevalent way of tenants. Due to the fear of land alienation, the landowner nor the tenant would like to get on record and hence usual sampling methods could not be used. We used the information available from the sources of the Government of Andhra Pradesh and from the Guntur District agricultural office about the dense tenanted pockets and selected villages as well as the sample farmers purposively.

The outcome of the study highlights a number of key issues. There are no major differences in demographic characteristics and educational level for both tenants and owner cultivator in the study area. The dependency ratio was equally high and similar across the two groups. But sometimes they opt for crop insurance that covers their losses during the catastrophe. Over 50% of farmers reported crop damage from drought, unusual rainfall and hail. Tenant farmers are more aware of crop insurance than owner cultivator that's why tenant farmers have a negative impact of disaster on indebtedness as they get all the claim of damages. Disasters positively impact

indebtedness as farmers have less crop insurance coverage. Loan waiver policies have proven to be an important tool to improve tenant farmers compared to owner cultivator.

On an average tenant farmer earns ₹ 42,128 per capita annually (not net of the rent paid), which is somehow equal to owner cultivator. It must be noted that tenant farmers also get wages through working in the field of other cultivators. Tenant farmers show an income per capita deficit of ₹ 33,913 compared to the household consumption, whereas it is per capita surplus of ₹ 3,467 for owner cultivator. After food consumption expenditure, education expenditure is another important item in which the two categories of farmers spend more. Farm income is the most important source of income at ₹ 19,807 per capita annually for tenant farmers while salary was the main source of income for owner cultivator at ₹ 26,719 per capita annually.

The study further highlights that 88% of farmers are in debt in the rural areas of Guntur in AP. However, there are variations across both groups of farmers. The percentage of indebted households is highest in the tenant group (90%), while it is 86% among owner cultivator groups. On average, tenant farmers had a higher loan outstanding than owner cultivator. While the proportion of loan repayments from owner cultivator is higher than that of tenant farmers. The main source of credit is informal agencies for tenant farmers while formal agencies for owner cultivator. The average amount of outstanding loan per indebted household is ₹ 2,07,444 for tenant farmers and ₹ 76,306 for owner cultivator. The amount of debt is highest for tenant farmers because these poor and needy farmers required loan for non-productive purposes such as consumption expenditure, treatment of illness, expenditure on education for their children and expenditure on social and religious ceremonies as well due to lack of security and difficult procedure they are compelled to take a loan from money lenders at exorbitant rate of interest which resulted to fall them in debt trap. Sometimes, these farmers are directly or indirectly compelled to sell their produce to these money lenders at lower prices than the market price because they are the last resort for obtaining loans during odd hours as well as for unproductive purposes in the study area. Because of several obligations and constraints leads to limited formal access and forced to rely on informal agencies. Commercial banks emerged as the biggest formal lender of formal credit while money lenders were biggest among the informal agencies for agricultural credit in the study area for both tenant as well as owner cultivator. Despite relatively low transaction costs, 51.5% of all farmers were granted loans from informal agencies.

Overall, 35.2% of the farmers under the study area availed institutional or private finance from more than one source. The collateral is the main obstacle to access to the official loan for both groups of farmers, but higher for tenant farmers. Therefore, these concerns should be taken into account by the authorities to facilitate institutional lending. Furthermore, the study shows that most loans are made for productive purposes by both tenant and owner cultivator and that more than 60% of them use them for crop inputs. However, the interest rate varied from farmer to farmer, and it was high for informal agencies as compared to formal agencies. Major part of loan access by the tenant farmers was between 20-30% of the rate of interest, while it was less than 10% for owner cultivator. In other words, tenant farmers receive loans at higher interest rates than tenant farmers from all informal organizations, including lenders, friends and family, and agri-retailers.

To remove the restrictions on informal loans and relieve the stress on informal loans for tenant farmers; the government has launched several schemes such as a CCRC, Rythu Bharosha and JLG. Our investigation revealed that only 50% of tenant farmers have access to the CCRC. In addition, those farmers who do not have a CCRC stated that they did not request one even though they were aware of the initiative. Most tenant farmers did not get the consent form of the landlord to get the card. Farmers who had the card reported receiving a variety of benefits, including Rythu Bharosha benefits, crop loss compensation, and subsidies, etc. The study clearly indicates that SHGs are not helpful to reduce the burden of debt for tenant farmers as only a very small amount, loan use to take for opening a shop or other small businesses in the rural area. Moreover, the time constraints for repayment and the limitation of the amount were other reasons for not having access to this institution's loan. However, JLG is showing better results in accessing the loan, but may farmers denied due to certain limitations i.e., the loan liability for each member, if any, of the members who fail to repay, so they will be unable to access the loan in the future. Farmers were more interested in joining the group if the above issue is taken over by the bank.

The study further reveals that the operational ease of *CCRC* had a significant challenge in the study area. Some farmers argue that the owners of the higher castes have discriminated against the lower caste farmers. Landowners are worried about the

alienation of land property to the tenant farmers, if the tenant is unable to pay off their bank loans on time. As a result, they believed that they will be in a position to pay down the debt if cultivate themselves. For tenant farmers, a *CCRC* is linked to *Rythu Barossa* Kendra in order to update the information like: *Rythu Barossa*, e-crop, damaged crops due to a shortage of institutional bank loans. Due to a lack of loans from official organizations, most tenant farmers obtain loans from non-institutional sources at exorbitant interest rates.

Another problem is that tenant farmers do not receive any direct institutional benefits because of the landlord's intervention. Landowners see these benefits will be given a tenant upper hand. Furthermore, when it comes to *Rythu Bharosha*, it allows them to obtain crop insurance against the damaged crop from the government. According to our data, observations, many tenant farmers are deprived of the full benefit of the *CCRC* due to non-availability of owner consent. The *Rythu Bharosha* program is also linked to the *CCRC* as tenant farmers can receive all benefits on their leased land through this system on the *CCRC*.

Farmers expressed a few points regarding the advantages and disadvantages associated with SHGs while discussing the issue of SHGs. The FGD with farmers and the village secretary, it was discovered that SHGs in villages are primarily concerned with women's empowerment. It is aimed at improving their economic position. Some members of the organization use the loan for agricultural purposes and others use the money for their own expenses. This takes place as they borrow money for personal expenditures other than family consumption. They must pay monthly instalments with an interest rate set aside to repay this debt.

Farmers have indicated that the Joint Liability Group policy is doing better than expected. It is found that if one farmer in the group is unable to pay, the whole group bears to the required amount. It should be noted that most of the group has one defaulter who does not settle the borrowed amount. As a result, his future participation in any JLG organized gets restricted. As such, JLG's repayment rate is higher than that of any other lending institution spare money lenders. Farmers, for their part, have said they should get separate loans on their own to facilitate this lending process. As a result, the other members will not have to bear the amount of the loan in the name of the defaulter. But such arrangement will fail the very purpose of JLG. Additionally, the JLG organization extends the loan repayment time with an increased amount restriction. These JLG groups in the villages are not functioning at full efficiency. It was also found that many JLG groups are in the process and have not yet been executed in accordance with the guidelines. Furthermore, farmers said that individual loans are preferable to group loans for agricultural production. They don't want to be held accountable for somebody else's failures.

In the focus group discussions, two important issues were identified: first is that JLG and RMG are interconnected and hence when one scheme is participated the other is not preferred. A person who is a member of RMG cannot also be a member of JLG. Another issue pertains to RMG is that both the tenant farmers and owner cultivator can participate and hence these are not mutually exclusive for the two groups. The JLG is mainly for tenant farmers and most of the tenant farmers are the members of the group. However, in some areas, the collaboration and trust of farmers are quite high. JLG seems to be functioning quite smoothly. Rythu Mitra group is also operating successfully in some of the study villages because it comprises of an equal proportion of tenant and owner cultivator, and this is based on their trust in regular loan repayments. Other important facilities are provided by the government include Custom Hiring Centres (CHC), which are basically a collection of agricultural machinery, instruments, and other equipment available on rent to farmers. The study indicates that CHC is being implemented, but it is not yet fully operational in Mandal communities. They also informed that each member group would be able to get 15 lakh loan amounts from the government at a subsidised rate of interest of 40% for 34 months in order to purchase implements. Further, this organization operates under the authority and direction of a group leader and that may create some political issue in the future.

Our analyses confirm that if tenant farmers are members of a community-based organization, 88% benefited of the ongoing schemes. Tenant farmers, on the other hand, need to be encouraged to engage with the groups such as JLG, SHG, and CCH. It was observed that if a farmer is in any of these the groups, he will have ready access to loans. The group approach follows straightforward procedures that directly impact their agricultural choices. Furthermore, fertiliser distribution is for the second biggest benefit that they derive. It was noted that after joining the group, they get better fertiliser for agricultural operations, and timely availability of fertilisers has a huge beneficial impact on farm revenue. In addition, participation in the group makes it easier for the farmers to invest capital through collective incentives and cash.

The negative net agricultural income as the household expenditure exceeds the net farm business income, farmers are pushed into the "Cascading Effect" and finally get into a serious debt trap. Tenant farmers having unpaid loans pending for more than five years, as compared to owner cultivators are worst placed financially. This situation arises as they are unable to repay loans due to many unavoidable reasons such as unseasonable rain, very high input price, costly capital setup for farm, low output price, and less loan cost benefit. However, the exact issues are expressed by critical evaluation through Principal Component Analysis, and the results showed that: mishandling of loan and inadequate subsidy facility, for the factor of production and unseasonable rains, non-farm factors, payment and pricing issues, nonsupporting infrastructure for seeds and pesticides, and mismanagement of capital and credit; are the major factors identified as the causes of farmers' confronting Cascading Effect. Furthermore, by addressing other subjective factors such as socioeconomic factors and policy failure, more interesting results such as a negative gap between income and consumption (which is greater among owner cultivator) and policy failure related to input testing and training programmes are revealed.

In-depth analysis of the data showed that through the OLS regression model we could identify the factors responsible for variations in farmers' farm business income. The results revealed the fact that the income of tenants-farmers get affected by several variables like natural disasters, distance from headquarters, cropland, labour, capital, pesticides and fertilizers, investments in technical equipment, productive and non-performing loans, and loan relief policies. Of these, tenant farmers must regulate their cultivating expenses more carefully as these have a greater and higher impact on farm income. However, owner cultivators only have five significant factors that affect their potential farm income, which include: distance from headquarter, and farm input (cultivated land, labour capitals, seeds, and fertilizers), natural disaster also a major fact but not proven significantly. Our analyses reveal that natural disasters are common across all categories that need to get the attention of policymakers. In addition, agricultural inputs should also be developed and monitored on a regular basis to improve the farm income of farmers.

The results from parametric and non-parametric statistical analysis showed that tenant and owner cultivator have different levels of productivity, but location of the farmers and their tenancy contract characteristics should have no combined effect on farmers' productivity, or it can be claimed that no tenant farmers have any significant proof that he will have different productivity from one region to another regions. A few characteristics differ from their borrowing behaviour, and the results show that farm borrowers and non-borrowers in various locations have variable productivity. It is also clear that borrower farmers have higher productivity than nonborrower farmers (Appendix 7), and their productivity varies across mandals. Which clearly indicates that credit has positive impacts on agricultural productivity of farmers in the study area.

The multinomial regression model helped to identify the factors responsible for tenancy in the study area. Our results indicated eight variables out of the 15 variables that explain the ratio of the likelihood of preferring the tenancy category to the chance of selecting the owner cultivator farm category. The age of the head of household, the caste is more likely to be within the pure tenant group than the owner cultivator group. Similarly, in the pure tenant category the operated land is higher. However, if farmers have a high income which leads to low possibilities of being the pure tenant category. Conversely, farmers with high household consumption are more likely to be pure renters than non-residents. Similarly, a significant availability of assured irrigation moves farmers to non-tenancy or partial tenancy but not the pure tenant.

The Tobit regression model was applied to determine the drivers of indebtedness, comes out with a few important factors as responsible for the indebtedness. The level of debt is higher among tenant farmers who use put it to unproductive use, irrigation, and interest rates lead to increase in farm debt. While natural disasters, crop insurance, land tenure and *Mangalagiri* location have reduced the debt burden of tenant farmers. However, levels of education, interest rates, use of loans for unproductive purposes, irrigation have increased the debt of the owner farmers in the study area.

#### POLICY FOCUS AND SOLUTIONS

This study was undertaken with an intention to understand the constraints in institutional lending, locating problem areas and creating a situation for discouraging

informal lending especially from usurious moneylenders. The government should relax the sternness in the collateral to facilitate tenant farmers' access to loans. In addition, it will be good to provide through RBK in the villages to guide them for obtaining formal credit. This new centre could be integrated with the concerned bank to explain all plans and affiliates for the community rather than the village representative.

In order to reduce the prevalence of informal lending, it should be regulated legally. The borrowing from friends or relatives cannot be included if it is an only oral assurance. Quite a few states including Andhra Pradesh Money Lenders Act, 2000, but it is made ineffective as only the licensed money lenders (section 4) come under the purview of this act. It is essential to extend the implementation of this act to the Money lenders who create any document of lending even if they do not come under the licensed Money lenders. Using this framework, this debt trap could be avoided for the tenant farmers. It was noted that the availability of credit has a positive impact on farmers' incomes, though it is not significant. Therefore, to make this credit offer meaningful it should be monitored and reviewed periodically by the authorities according to the needs and demands of farmers. This will facilitate farmer getting into the debt trap and that could be avoided. Moreover, our study also revealed that unproductive use of loan has a direct connection to increasing indebtedness among the farmers. There is a need for policy to limit the increase in credit supply in line with an unproductive target.

In order to avoid the "Cascading Effect" and resulting harassment, the cases of defaulters should be studied case by case by the concerned bank officers along with the data on all the borrowings by the farmer. There should be a dashboard that depicts the line's performance in repayment and counselling must be undertaken by an expert bank officer to advise the farmer to fall in the discipline of credit. The officer can suggest steps to avoid the debt trap. It is necessary to have a policy prohibiting the underground marketing of spurious inputs and tools. There are stringent laws for arresting these practices, but the implementing agencies are lethargic. All inputs and tools should be supervised by a responsible officer, to avoid substandard input or tools and exorbitant prices. Moreover, to save the second germination, Krishi Vigyan Kendra should organize a camp to test seeds, pesticides, water and fertilizers. Though

a number of schemes are already existed, but farmers revealed that these camps are not regular therefore, they face failed crop germination.

Despite the efforts by the state government, there are a lot of ambiguities which reverse the impact of group facilities through JLG or SHG. Consequently, farmers have requested thorough revamping of the group system. As in JLG and SHG, the loan limit needs to be extended so that farmers in the group be weaned away from informal sources for additional loans. In addition, enhancing the support for microentrepreneurship to manage the link with agriculture is suggested as a policy step. Then these require integration with the other functional group to get other benefits like the *Rythu Mitra Group* or the CHC group. In JLG, farmers insisted on individual loan without each other's liability. In addition, in JLGs, mainly tenant farmers are members, owner cultivator's participation is limited. Therefore, increasing the members with the vibrant Famers community is suggested, and the group could be led by the Village Secretary of Agriculture (VAS). It is essential that the share of agricultural loan be fixed in SHGs loan dispersal which can be specially given to tenant farmers. This will definitely lead to improve the condition of tenant farmers in the state.

Apart from the above policy suggestions, it is essential that the government must increase the duration of procurement of farm produce from currently existing 1 month to 3 months. This will help the farmer to get out of the usual interlinking of product and credit market making it compulsory for the farmers to sell their produce only to a fixed individual who has provided the farmer some advance at the time of need. Avoiding of this vicious linkage will save the farmers from private traders and consequent squeezing net income. The government would have to buy the crops from RBK. In addition, they added that the amount of the subsidiary provided under the *Rythu Bharosha Scheme* should be broken down according to the area under cultivation.

In addition, tenant farmers without a CCRC have difficulties in obtaining landowner's signature on the application form. This requirement could be either done away with or should be replaced by an affidavit from the tenant. This will make the use CCRC services smooth and effective. A few farmers do not know the benefits of CCRC. Thus, it is the duty of the local authority to organize camps for disseminating the knowhow and to ensure that all tenant farmers are informed about this scheme of agriculture and related sectors. This will help to sharpen their decision making and they can anticipate better livelihood according to the card's benefits. The loan waiver under this scheme provided benefits is a positive step to improve their livelihoods, but successive loan waivers will break the banking discipline and funds will be misused. Therefore, government must manage this system a little carefully to ensure income equality among farmers. Last but not least, the present study reveals that RBK would prove to be a game changer for tenant farmers in Andhra Pradesh, if and only if it works systematically, effectively and a periodical follow-up is undertaken on the dashboard software.

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## APPENDIX

State/Group of NE States/ Group of UTs	Average amount (Rs.) of outstanding loan per agricultural household	Percentage of indebted agricultural households
Andhra Pradesh	2,45,554	93.2
Arunachal Pradesh	3,581	12.5
Assam	16,407	31.0
Bihar	23,534	39.7
Chhattisgarh	21,443	31.2
Gujarat	56,568	42.5
Haryana	1,82,922	47.5
Himachal Pradesh	85,825	29.2
Jammu & Kashmir	30,435	31.9
Jharkhand	8,415	25.3
Karnataka	1,26,240	67.6
Kerala	2,42,482	69.9
Madhya Pradesh	74,420	48.4
Maharashtra	82,085	54.0
Manipur	5,551	20.6
Meghalaya	2,237	9.1
Mizoram	23,485	8.0
Nagaland	1,750	6.0
Odisha	32,721	61.2
Punjab	2,03,249	54.4
Rajasthan	1,13,865	60.3
Sikkim	32,185	10.6
Tamil Nadu	1,06,553	65.1
Telangana	1,52,113	91.7
Tripura	23,944	47.7
Uttarakhand	48,338	46.6
Uttar Pradesh	51,107	41.9
West Bengal	26,452	50.8
Group of N E States	10,034	19.2
Group of UTs	25,629	27.5
All India	74.121	50.2

# Appendix 1: Proportion of farmers under debt and average amount of outstanding in India

Sources: NSSO 77<sup>th</sup> Round Situation Assessment Report 2019.

States			Institution	al sources		Non-institutional sources					
	scheduled commercial bank	regional rural bank	co- operative society	co- operative bank	SHG	Other institutional agencies*	Agricultural money lender	Professional money lender	Relatives and friends	Other non- institutional agencies#	
Andhra	34.1	6.9	2.1	0.8	5.1	0.6	31.1	15.4	1.1	2.5	100
Pradesh					<u> </u>			0		10.0	100
Pradesh	52.0	7.1	0.0	0.0	2.8	0.0	0.3	1.0	23.5	12.0	100
Assam	52.1	8.4	0.3	0.4	20.8	6.1	0.8	1.9	3.6	5.4	100
Bihar	30.9	9.0	1.2	0.3	13.0	4.7	3.4	13.2	14.3	9.9	100
Chhattisgarh	25.5	8.0	14.9	19.3	1.6	5.3	0.0	13.4	5.8	6.2	100
Gujarat	53.9	9.0	15.6	4.6	0.3	1.6	0.2	5.8	6.0	3.0	100
Haryana	49.8	12.4	2.7	0.5	0.2	2.3	6.4	13.9	5.7	6.0	100
Himachal	80.1	0.4	6.7	7.7	0.0	0.9	0.0	0.0	3.9	0.3	100
Pradesh	(					. –				- 0	100
Jammu & Kashmir	62.0	0.4	0.0	0.0	0.2	0.7	0.0	0.0	32.8	3.8	100
Jharkhand	28.9	8.8	1.1	0.0	4.8	0.6	1.8	23.1	24.0	6.8	100
Karnataka	37.3	11.0	13.6	3.7	5.1	2.7	6.3	7.2	8.1	4.9	100
Kerala	48.7	4.2	6.6	24.1	2.8	4.5	0.1	1.3	6.3	1.4	100
Madhya	51.9	5.9	6.2	2.0	1.7	2.8	6.3	15.7	2.2	5.4	100
Pradesh	_	_			_						100
Maharashtra	41.8	6.9	18.6	9.1	1.8	6.8	1.4	5.3	6.6	1.7	100
Manıpur	13.9	0.3	0.0	0.1	4.0	2.2	0.1	25.3	33.6	20.7	100
Meghalaya	38.7	44.9	0.0	0.1	0.0	0.0	0.5	0.0	7.3	8.5	100
Mizoram	59.1	38.5	0.0	0.0	0.4	0.0	0.0	0.0	0.8	1.2	100
Nagaland	30.1	0.0	0.0	10.3	12.2	0.0	0.0	20.4	24.9	2.1	100
Odisha	18.8	3.8	21.2	1.8	11.5	5.4	0.6	21.3	9.8	5.8	100
Punjab	65.1	1.6	6.9	3.3	0.1	1.7	6.7	2.1	3.0	9.4	100
Rajasthan	50.7	7.6	1.6	1.5	0.9	2.9	1.9	24.5	2.3	6.2	100
Sikkim	32.3	65.2	0.0	0.0	0.7	1.0	0.1	0.0	0.6	0.0	100
Tamil Nadu	48.6	1.0	10.4	1.8	2.3	5.2	0.9	24.7	2.8	2.3	100
Telangana	24.8	8.2	0.5	3.2	4.6	1.2	9.1	41.3	1.4	5.8	100
Tripura	41.5	9.5	1.3	4.8	1.7	34.2	2.7	0.1	2.8	1.5	100
Uttarakhand	71.5	4.5	7.8	6.1	0.6	0.6	0.0	1.4	6.3	1.1	100
Uttar Pradesh	47.3	16.4	2.4	0.1	1.0	2.7	2.8	11.6	12.1	3.6	100
West Bengal	42.7	2.8	9.4	5.7	12.4	5.6	0.8	7.5	7.7	5.6	100
N E States	<b>39.</b> 7	22.6	0.6	<b>2.</b> 7	1.8	17.4	1.4	3.0	6.8	3.8	100
Group of	64.8	0.2	0.1	6.6	1.0	3.0	0.0	16.0	6.4	2.0	100
All India	44.5	8.1	<b>6.</b> 7	3.9	3.2	3.2	6.5	14.0	<b>5.</b> 7	4.5	100

Appendix 2: Percentage distribution of amount of outstanding loans by sources of loan taken for different States/Group of UTs/ Group of North-Eastern States

Sources: NSSO 77<sup>th</sup> Round Situation Assessment Report 2019.

	The proportion	of tenants,	The proportion of	of leased area in		
	among cultivator	houses India	total operated land			
	Andhra Pradesh	India	Andhra	India		
			Pradesh			
1991-92	21.2	12.8	14.2	8.7		
2002-03	20.8	11.4	16.9	6.7		
2012-13	42.8	15.0	41.5	11.1		
2018-19	42.4	17.3	36.4	13.0		

## Appendix 3: Proportion of tenant farmers in total

Source: Various reports of NSSO agriculture land reports.

#### Appendix 4: Details of indebtedness in Andhra Pradesh

				AVA	A, AOD,	AODL	, IOI, a ca	tional holds							
G /II			Cultivat or				Non	-cultivat	or				All		
State/U T	AV <sup>10</sup> A (000' Rs.)	AOD 11 (000' Rs.)	AODL <sup>12</sup> (000' Rs.)	IOI <sup>13</sup> (%)	DAR 14 (%)	AVA (00 0' Rs.)	AO D (00 0' Rs.)	AOD L (000' Rs.)	IO I (% )	DA R (%)	AVA (000 ' Rs.)	AO D (00 o' Rs.)	AOD L (000' Rs.)	IOI (%)	DA R (%)
Andhra Prades h	2,38 4	207	275	75.1	8.7	86 55-	3 .9	83 9.6		149	1,40 8	12'	7 203	62. 8	9.1
India	<b>2,20</b> 7	74	185	40.3	3.4	78 28	5 .2	40 5.2		144	1,59 2	60	0 171	35. 0	3.8

Source: NSSO 77<sup>th</sup> round 2019

<sup>&</sup>lt;sup>10</sup> AVA= Average Value of Assets (AVA) per household
<sup>11</sup> AOD= Average amount of Debt (AOD) per household
<sup>12</sup> AODL= Average amount of Debt per indebted household (AODL)

<sup>&</sup>lt;sup>13</sup> IOI= Incidence of Indebtedness (IOI)

<sup>&</sup>lt;sup>14</sup> DAR= Debt-Asset Ratio (DAR)

S									
N o	Mandal	Village	No of HH	Popula tion	Child (0-6)	Literac y %	Total Workers	Main Worker	Marginal Worker
1	Tenali	Kattevaram	3,554	13,209	1,384	71.52	5,750	4,513	1,237
		Kolakalluru	4,408	15,607	1,500	70.89	7,445	6,035	1,410
2	Mangalagiri	Peddavadlapudi	3,655	13,076	1,090	71.63	6,025	4,972	1,053
		Atmakur	734	2,797	353	49.67	1,737	1,502	235
3	Thullur	Peddaperimi	1906	6887	646	66.61	4145	3748	397
		Vaddamanu	783	2,716	258	65.62	1,797	1,468	329
4	Ponnuru	Brahmankodur	967	3,447	275	65.01	1,630	1,524	106
		Dandamudi	885	3,337	330	65.15	1,848	1,736	112

## Appendix 5: Profile of selected Mandal and Village in Guntur district

Source: District handbook 2022.

# Appendix 6: Nature of tenancy

S. No.	Particular	Proportion of the farmers
1	Proportion of pure tenant farmers	75 (62.5%)
2	Rent payment by cash	97 (80.8%)
3	Rent payment by crop sharing	21 (17.5%)
4.	Rent payment in both mode	2 (1.7%)
5	Total tenant	120 (100%)

Author's estimates

# Appendix 7: Average yield per acre in rupees (gross value)

S.	Farmers' group	Tenant farmers	Non-tenant Farmers	All sampled		
No.						
1	Borrowers	63000	71483	67141		
2	Non-Borrowers	57333	55775	56420		
3	Total	62433	69258	65845		

Author's estimates

S. No.	Farmers' group	Tenant farmers	Non-tenant	All sampled
			farmers	
1	Borrowers	18559	26877	22619
2	Non-Borrowers	12355	18777	16120
3	Total	17938	25726	21832

# Appendix 8: Average yield per acre in rupees (Net value)

Author's estimates

Appendix 9: PCA factors' v	variation in the model
----------------------------	------------------------

				Total V	arian	ce Explain	ed					
	Component	]	Initial Eiger	values	Extra	action Sums	of Squared	Rotation Sums of Squared				
						Loadin	gs		Loadin	gs		
		Total	% of	Cumulative	Total	% of	Cumulative	Total	% of	Cumulative		
			Variance	%		Variance	%		Variance	%		
	1	5.966	22.102	22.102	5.966	22.102	22.102	3.213	11.901	11.901		
	2	3.260	12.076	34.178	3.260	12.076	34.178	2.357	8.730	20.631		
	3	2.799	10.367	44.545	2.799	10.367	44.545	3.575	13.244	33.876		
	4	1.936	7.173	51.718	1.936	7.173	51.718	3.162	11.715	45.590		
Raw	5	1.838	6.807	58.525	1.838	6.807	58.525	3.106	11.506	57.096		
	6	1.617	5.989	64.514	1.617	5.989	64.514	2.002	7.418	64.514		
	7	1.389	5.145	69.659								
	8	1.168	4.328	73.987								
	9	1.116	4.135	78.122								
Raw	10	.917	3.397	81.519								
Raw	11	.826	3.061	84.580								
	12	.804	2.978	87.558								
	13	.618	2.290	89.848								
	14	.559	2.070	91.918								
	15	.539	1.995	93.913								
	16	.489	1.813	95.726								
	17	.464	1.719	97.445								
	18	.396	1.468	98.914								
	19	.293	1.086	100.000								
Extra	action Method	l: Princi	pal Compor	ent Analysis.								

a. When analysing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution. Source: Authors' estimates from primary data

	Raw								
			Compo	nent					
	1	2	3	4	5	6			
Unseasonal rain		.406							
Failed germination					.740	.394			
Lack of pricing Skill				.978					
Payment uncertainty				1.166					
Black marketing of inputs	.625		947	.713					
Skill lagging to adopt tech.	.738		1.121						
Inferior quality of subsidies on inputs	.989								
Inadequate storage			.449		.969				
Transaction cost	.436		.339			391			
Loan overdue	.614	.437				570			
Less economic value of credit						.533			
Costly capital						.638			
Unproductive usage of loan	.589								
pesticide					.930				
Livestock diseases			.745						
Low yield		.922				.420			
Low price of crops		.737							
High-rate input price		.429							
Gold sale			.574		.408	478			

# Appendix 10: Correlation among the variables of six factors

Author's estimates

S.	Farmer's	Seeds	Seeds Pest		Fertilizer Irrigation		Operating Land rent		Hired labour								
No.	category	/Insect							cost				Regular		Casual		
		Own	From loan	Own	From loan	Own	From loan	Own	From loan	Own	From loan	Own	From loan	Own	From loan	Own	From loan
1	Tenant farmers	1,043	2,116	1,998	6,193	2,072	6,554	92	413	1497	2940	4,845	4029	1,965	4,893	633	1,389
2	Non-tenant farmers	1473.0	2295.5	3023.6	6645.5	2056.0	7105.8	313.1	227.2	1765	4937	0.0	0.0	2170	6382	1119.2	1430.7
	All sampled farmer	1258.3	2205.8	2510.8	6419.4	2063.9	6829.7	202.8	320.0	1631	3938	2422	2015	2068.0	5637	876.1	1407.7

# Appendix 11: Farm input expenditure from loan (In mean value in $\overline{\mathbf{x}}/ac$ )

Source: Author's estimates

	Appendix 12. Input-Output relationship (average value per nectare in KS)												
S.	Farmers'				Output	(In Rupees)							
No	category	Seeds	Pesticide	Fertilizer	Irrigation	Operating	Rent	Labour	Plantation	Total	Output	Surplus	
												/Deficit	
1	Tenant farmers	3,160	8,191	8,625	505	4437	8873	8875	1828	44495	62,433	17938	
2	Non-tenant	3768.5	9669.1	9161.8	540.3	6702	0.0	11102	2584	43532	69258	25726	
	farmers												
	All sampled	3464.1	8930.2	8893.5	522.8	5570		9987	2206	44013	65845	21832	
	farmers												
Course	aumon. Authon's actimates												

Appendix 12: Input-Output relationship (average value per hectare in Rs)

Source: Author's estimates



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