STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH

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B.Sc. (Ag.)

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(AGRICULTURAL ECONOMICS)

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STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRAPRADESH

By

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B.Sc. (Ag.)

THESIS SUBMITTED TO THE
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DECLARATION

I, **YIRRI JHANSI**, hereby declare that the thesis entitled **"STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH"** submitted to the **Acharya N.G. Ranga Agricultural University** for the degree of **Master of Science in Agriculture** is the result of original research work done by me. I also declare that no material contained in the thesis has been published earlier in any manner.

Place: Bapatla

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Date:

CERTIFICATE

Ms.YIRRI JHANSI has satisfactorily pursued the course of research and that thesis entitled **"STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH"** submitted is the result of original research work and is of sufficiently high standard to warrant its presentation to the examination. I also certify that neither the thesis nor its part thereof has been previously submitted by her for a degree of any University.

Date:

(Dr. N. SUNANDA)
Chairperson

CERTIFICATE

This is to certify that the thesis entitled **"STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH"** submitted in partial fulfilment of the requirements for the degree of '**Master of Science in Agriculture'** of the Acharya N. G. Ranga Agricultural University, Lam, Guntur is a record of the bonafide original research work carried out by **Ms. YIRRI JHANSI** under our guidance and supervision.

No part of the thesis has been submitted by the student for any other degree or diploma. The published part and all assistance received during the course of the investigations have been duly acknowledged by the author of the thesis.

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"Gratitude is the most exquisite form of memory"

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Place: Bapatla

Date: ***(Yirri Jhansi)***

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LIST OF SYMBOLS AND ABBREVIATIONS

A.P	:	Andhra Pradesh
et. al.	:	And other workers
etc.	:	Etcetra
Fig.	:	Figure
>	:	Greater than
Ha	:	Hectare
i.e.,	:	That is
<	:	Less than
LEC	:	Loan Eligibility cards
No.	:	Number
%	:	Per cent
q/ha	:	quintal per hectare
Rs.	:	Rupees
Rs. /ha	:	Rupees per hectare
viz.,	:	Namely
SES	:	Socioeconomic survey
Kg	:	Kilogram
GCA	:	Gross Cropped area
NSSO	:	National Sample Survey Organisation
CPO	:	Chief Planning Office

ABSTRACT

Name of the Author	:	**Y. JHANSI**
Title of the thesis	:	**STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRA PRADESH**
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Indian agriculture is predominantly characterized by small and marginal farmers, growing incidence of tenancy, landlessness, high degree of fragmentation and distribution of operated holdings, which have direct impact on farm production and rural household income. The high dependence of the population on agriculture is one of the main reasons for low size of land holding and for low per-capita income as well as high incidence of poverty among agricultural workers. Though all farmers had suffered because of this unprecedented calamity, tenant farmers faced an additional burden of very expensive interest component. They get no insurance cover too because they can submit no land document or other supporting evidence to become eligible for insurance. All these problems fully or partly affect the viability of tenant farmers in agriculture.

The research study entitled “Study on Economic Viability of Tenant farmers in Srikakulam district of Andhra Pradesh” was taken up with the following objectives.

1. to examine the existing pattern of tenancy in Srikakulam district
2. to analyze the resource use efficiency of tenant farming
3. to study the economic viability and factors affecting the viability of tenant farming and tenant farm households and
4. to identify the constraints faced by the tenant farmers.

Srikakulam district was purposively selected for the research study due to the availability of more number of small and marginal farmers. A total of 120 tenant farmers from 12 villages in six mandals of the district were selected based on the

maximum concentration of tenant farmers in the study area. Data on various aspects of tenant farmers of 2016-17 agricultural year was collected through personal interview method. The secondary data on agro economic features of the district were collected from Chief planning Office, Department of agriculture and other agencies.

For Rice the average cost of cultivation per ha was Rs.58,292, in case of Rice fallow pulses was Rs.21,333. For *Rabi* sesamum the cost of cultivation was Rs.29,660. For Maize the total cost of cultivation was Rs. 59,273**.** Rice, pulses, sesamum, maize are the major crops grown in the study area in that sesamum and maize are the most profitable crops among them.

Fixed rent is the most prevailing tenancy pattern followed by fixed produce, share cropping and input sharing.

In Rice all the resources used in cultivation i.e, machine labour, human labour, irrigation and manures, chemical fertilizers and plant protection chemicals were positively influencing and significant. Seed was the only non significant factor.In Rice fallow pulses seed was the only significant factor because it is major input for cultivation. Human labour, irrigation, plant protection chemicals and farm size were non significant. All the factors were positively influencing the returns except irrigation and plant protection chemicals.

In Sesamum all the variables were positively signed except irrigation cost and seed cost which were negatively influencing the gross returns. Machine labour, farm size, irrigation were significant factors. In maize all the variables were positively signed except labour charges and plant protection chemicals. Labour charges, irrigation, chemical fertilizers are significant factors. Seed and plant protection chemicals were nonsignificant .

In the sample of 120 farmers, there are 37 viable farmers and 83 non-viable farmers, the classification is based on the Tendulkar committee criteria i.e, if the annual farm income of the farmers is below Rs.51600 is considered for the classification of farmers above or below poverty line. The farmers whose income is below Rs.51600 were come under non viable class and above is taken as viable farmers.The average net income of the 120 tenant farmers is Rs.6607 which is very low. Without the off farm income i.e. from dairy and wages the net income is negative (-24434).Offfarm income, farm expenditure, farm size and domestic expenditure were the major significant factors effecting the viability of tenant farmers and tenant farm households.

The major constrains faced by the respondents are LEC fail to serve the purpose of credit, Beneficiaries of the Government are the actual owners not tenant farmers, indebtedness, small size of the holding, timely unavailiability of the inputs.

For ensuring viability of tenant farmers, creation of job opportunities in rural areas along with suitable policy support for development of livestock sector and other allied activities. Indebtedness is the major problem prevailing, as LEC cards are not accepted to provide the credit to the tenant farmers, the suitability of LEC cards for credit is only upto reports, but not in official gazette manner, which has to be amended by the Government. The benefits from the government are not reaching the tenant farmers, so there is a need for providing crop insurance schemes to the tenant farmers also.

Chapter – I

Introduction

Chapter - I

INTRODUCTION

Indian agriculture is predominantly characterized by small and marginal farmers, growing incidence of tenancy, landlessness, high degree of fragmentation and distribution of operated holdings, which have direct impact on farm production and rural household income. The high dependence of the population on agriculture is one of the main reasons for low size of land holding and for low per-capita income as well as high incidence of poverty among agricultural workers. The rural poor would maximize their family income by way of farming on lease, along with access to other farm, off-farm and non-farm employment opportunities. Improved access to land on lease by the poor would help reduce their poverty and enhance economic and social status.

The NITI Aayog has proposed a Model Land Leasing Law to provide for the legalization of land leasing. This would ensure that land owners have the security of ownership rights, and land tenants are secure in their tenancy. Legalization of land tenancy would also ensure that farmers get access to formal credit, insurance, and inputs such as fertilizers. This will help the marginal and small farmers to be better off leasing out their land to more viable farmers for rent, while seeking paid employment within or outside agriculture. This would help them to maximize incomes by way of rentals as well as wage incomes. Land owners who are otherwise forced to operate small uneconomic holdings will have the opportunity to legally lease out land to other farmers with the assurance of being able to resume possession at the end of agreed lease period (NITI Aayog 2016).

Of the total agricultural area under operation, 10 per cent of land has been given out on agricultural leases, Andhra Pradesh has highest percentage of leased land i.e., 34 per cent and the leased land area increased from 1970 to 2003 is 6.2 per cent to 9.0 per cent. Micro studies have shown that the extent of tenancy has increased during 1991 to 2001. Both proportion of tenants and area under tenancy has increased by 2001 over 1991. Form of tenancy has shifted from share cropping to fixed rent and fixed produce, short term leases have increased over the years (Tanvi Deshpande, 2017).

1.1 PROBLEM STATEMENT

Tenancy is more prevalent in coastal Andhra region compared to other regions of Andhra Pradesh. The number of marginal land holdings (less than one hectare) increased from 36 million in 1971 to 93 million in 2011. Since smaller land holdings are either fragments of larger holdings which have been passed on within the family or have been informally leased by a large holder, farmers who cultivate these holdings often do not have a formal lease agreement. The absence of such land records does not allow these farmers to access formal credit or be eligible for government benefits like input subsidies or crop insurance schemes (Revathi 2014).

Informal tenants generally fail to access institutional credit and other benefits such as insurance, input subsidies etc. In 2011, the State of Andhra Pradesh in Southern India passed the Andhra Pradesh Licensed Cultivators Act which provided for issuance of loan eligibility cards (LEC) to all the tenant cultivators, thereby entitling them to access bank loans, input subsidies and crop insurance. The Act has the potential to improve the socio-economic condition of the tenants as well as farm productivity, but there is a need for a legal amendment, to insert a special clause removing the various apprehensions of the landowners and deleting the 'adverse possession' clause in the existing law. It is estimated that there are 2.5 million tenant households operating 20 per cent of the total 12.0 million holdings in the state (GoAP 2012). The physical target fixed by Chief Commissioner for Land Administration (CCLA), the nodal agency for implementation of the Act, for the year 2012-13 was to issue 1.25 million cards and financial target was to disburse 20000 million rupees. For the year 2013-14 the number of LEC issued were 4,39,394 of which freshly issued cards constituted only a small number in Andhra Pradesh.

Table 1.1 LEC cards issued during the period 2011 - 2016

S.No.	LEC cards issued	2011-12	2013-14	2015-16
1	Andhra Pradesh	5,06,891	4,39,394	4,52,027
2	Srikakulam	32,342	27,882	15,490

Source: Kisan Swaraj Blog - ASHA

The State level bankers committee, subcommittee on "Tenant farmers & suicides'' has resolved that the banks can extend the finance to "Certificate of Cultivator'' (CoC) up to Rs. 1.00 lakh on hypothecation of crop and without insisting on collateral security as per the existing norms, basing on the certificate of cultivators details provided by the Agriculture Department. It will facilitate more number of tenant farmers in getting bank loans. The Certificate of Cultivation details will be issued by the Agriculture Department. The Sub Committee members, NABARD, SLBC and Major Banks have discussed the modalities for issue of Certificate of Cultivators" on 13.6.2016 and finalized the modalities for issue of Certificate of Cultivators. During 2017-18, it is proposed to issue 7, 39,427 CoCs to tenant farmers who have not been issued Loan Eligibility Cards (LEC) by the Revenue Department (Agricultural credit 2017-18).

In Srikakulam district, approximately 64,000 tenant farmers were there based on records related to sanction of loan eligibility cards in 2015-2016. A total 1,840 Grama sabhas were conducted for the issue of 15,490 loan eligibility cards in 2015-2016 (ASHA september 21st 2015). According to socioeconomic survey of Andhra Pradesh, the average size of holding in the district was 0.66 ha and out of 5.26 holdings, 4.27 holdings are of marginal farmers so there is likely to be chance of more tenancy in Srikakulam district.

In this context, with the increase in proportion of landless tenants, marginal owner cum tenants and small farmers, tenant households are facing various problems related to institutional finance and other problems associated with agriculture. Hence the research study entitled "STUDY ON ECONOMIC VIABILITY OF TENANT FARMERS IN SRIKAKULAM DISTRICT OF ANDHRAPRADESH" will be taken up with the following objectives.

1.2 OBJECTIVES OF THE STUDY

1. to examine the existing pattern of tenancy in Srikakulam district
2. to analyze the resource use efficiency of tenant farming
3. to study the economic viability and factors affecting the viability of tenant farming and tenant farm households and
4. to identify the constraints faced by the tenant farmers

1.3 SCOPE OF THE STUDY

The results of the research study are useful to the tenant farmers of srikakulam district in particular. This study helps to understand the socio-economic conditions of the tenant farmers along with their investment pattern, profitability of enterprises, resource use efficiency of crops grown by the tenant farmers and also studying about the factors that are influencing the viability of tenant farm households and also the major outcome of the study is to know the various constraints faced by the tenant farmers in relation to access to credit, indebtedness and other problems in farming.

1.4 LIMITATIONS OF THE STUDY

The present study had the limitation of time and resources availability because it is a micro study of six mandals of one district. The study is mainly based on primary data collected from the tenant farmers of Srikakulam district and the secondary data is collected based on the LEC card holders data because there is no legal recorded data related to the number of tenant farmers in the district. The collection of data from the small farmers is totally based on recall memory. So, there may be a scope for bias in obtaining requisite information from the sample farmers. The results of the study are confined to the study area only.

1.5 ORGANIZATION OF THE THESIS

The study is organized into six chapters.

Chapter-I : Introduction, problem statement, objectives, scope and limitations of the study

Chapter-II : Review of literature pertaining to present study.

Chapter-III: Materials and methods used in the study.

Chapter-IV: Agro-economic details of Srikakulam district.

Chapter-V: Results and discussion of the study.

Chapter-VI: Summary, conclusions and suggested policy implications from the study.

Chapter – II

Review of Literature

Chapter - II

REVIEW OF LITERATURE

Reviewing the existing literature on any proposed research is very important for any researcher to have a clear-cut idea on the selected research problem and it is very useful in analyzing and interpreting the data for drawing some meaningful conclusions. Review of literature also helps the researcher in getting better ideas in a full pledged way of approach during the preparation of structured schedule and selection of sampling design and various statistical tools to obtain the solution to the research problem. Hence the related literature for the present study is furnished under the following sub headings:

2.1 Studies on various tenancy patterns, tenancy system and rental systems

2.2 Studies on resource use efficiency

2.3 Studies on factors effecting the viability of farmers

2.4 Studies on constraints faced by the farmers

2.1 STUDIES ON VARIOUS TENANCY PATTERNS, TENANCY SYSTEM AND RENTAL SYSTEMS

Hosaena and stein (2014) in their study on Reverse share tenancy and Agricultural efficiency show how the tenants strategic response to the varying economic and tenure-security status of the landlords helps explain sharecroppers productivity differentials. The results show that sharecroppers' yields are significantly lower on plots leased from landlords who are non-kin, who are female, who have lower off-farm income-generating capacity and who are believed to be tenure insecure than on plots leased from landlords with the opposite characteristics.

Cornelius *et al* (2012) studied land rights and rental systems. They revealed that access to land for tenants would enhance their participation in Sawah and increase the chances of increasing their income and emerging from poverty. Therefore, tenants and landless people need more secure access to land to provide them with opportunities to manage their Sawah plots so that they will have higher yields.

Phan and Akimi (2012) studied land tenure and tenancy conditions in relation to rice production in three villages in Red River Delta, Vietnam. The main findings are the tenurial status changes with the age of the farmers, indicating the influence of life-cycle on farmers economic behaviour. The production function analysis revealed that the increased use of land, labour, seed and fertilizer could lead to a higher rice production. The average rental value of tenancy appeared to be equal to the marginal product of land.

Liang *et al* (2011) studied land tenancy and economic efficiency for selection of ownership structure of agricultural land on pre–modern China states that yeomanry(type of tenancy system is the most efficient and equitable land tenure system while tenancy system not only causes landlord to exploit tenant farmers but also leads to low production efficiency. Quantitative analysis showed that in pre-modern China, tenancy economy showed its advantage in many aspects, such as production scale and profits.

Sonalbhatt (2008) in his study on nature of agricultural land lease contracts concluded that reasons for leasing in and leasing out of land are based on non-economic factors rather than economic ones, Irrigated land through canal flow has higher rent than land irrigated by canal lift and Ground water. Rent on annual land lease contracts are preferred more and rent was higher than those with a lease period longer than a year. In the study area sharecropping contract ¾ th of the output accures to the landlord and ¼ th accrues to the sharecropper, with labour being contributed by the sharecropper and alla other input costs borne by the landlord. In this type of contract the land owner is more benefited, seven times compared to sharecropper.

Mohana kumar (2006) in his study tenancy relations in India revealed that tenant cultivation is preferred to peasant agriculture as the tenant organises production in capitalistic mode leading to further advancement of productive forces in agriculture. Leased land cultivation or tenant cultivation does not always lead to capitalistic farming as wage labourers are rather forced to enter into tenant cultivation to compensate for the loss in wage income. Marginal and small farmers lease in land to supplement farm income for subsistence. Important factors influencing tenant cultivation from demand side are decline in wage income due to fall in area under labour intensive crops like rice and inadequate area under possession for subsistence income. He concluded that there is a positive association between area leased in and amount borrowed by tenants indicating that peasants and wage labour are subjected to multiple forms of exploitation under hunger leasing.

2.2 STUDIES ON RESOURCE USE EFFICIENCY

Abdu *et al* (2015) study examined the resource use efficiency in onion production among participating and non participating farmers in Hadejia Valley Irrigation Project. The variables included in the Cobb-Douglas production function model, only farm size and fertilizer showed significance for participating farmers. Both were significant at ($P< 0.001$) for non-participating farmers. Fertilizers and labour were used below economic optimum level while seeds and chemicals were used above economic optimum level by participating farmer. Seed, fertilizers and labour were underutilized while farm size was used above economic optimum level by the non-participating farmers. Resource adjustment was therefore recommended among both group of farmers.

Ochi *et al* (2015) examined the resource use efficiency in cassava production in Nasarawa State. Data collected were analyzed using descriptive statistics, cob-Douglas stochastic frontier production function and marginal analysis model. They revealed that farmers were inefficient in the use of resources. The technical efficiency of the farmers varied from 0.342 to 0.971 with mean value of 0.873. The quantity of fertilizer applied, labour used and cassava cuttings were over utilized while land and herbicides used were under utilized. The results showed that appropriate adjustment is required for optimum allocation of resources to the cultivation of cassava.

Onubuogu *et al* (2014) in their study assessed resource use efficiency of smallholder cassava farm in Oweri Agricultural Zone and revealed that farm size (6.410), fertilizer (3.913), stem cutting (3.812), capital (2.589) and labour (2.017) were found to be the production factors influencing Cassava output and the relationships were statistically significant at 1% and 5% levels of probability respectively. The inefficiency model, education (4.511), farming experience (5.578), farm income (3.837), household size (-5.578) and extension contact (2.456) and membership of cooperatives (2.011) were found to be statistically significant atone per cent level of probability.

Prakash *et al* (2013) studied input use and production pattern of paddy cultivation under leased-in land in Tungabhadra project area. The study revealed that there was no significant difference in input use and production pattern between owners cultivated land and leased-in land. But, total cost of cultivation (Rs 28832/acre) and net

returns (Rs 5735/acre) of leased-in farmers were significantly different than total cost of cultivation (Rs18319/acre) and net returns (Rs15579/acre) of owner farmers resulting in higher gross returns (1.85) per rupee of cost in owner cultivated land as against leased-in land.

Karthick *et al* (2013) in their study on resource use efficiency and technical efficiency of turmeric production revealed that planting material, nitrogen, potash, harvesting and curing cost, machine hours and irrigation have a positive and significant influence on turmeric yield. Economic efficiency of these variables except harvesting and curing cost, is more than one, indicating that these resources are being used at sub-optimum levels and there exists the possibility of enhancing the yield of turmeric by increasing their use. The technical efficiency of about 69 per cent of sample farmers has been found more than 80 per cent it indicating that adoption of better technology leads to increase in turmeric yield and technical efficiency is influenced by education level and farming experience.

Arindam and Pravat (2011) studied the measurement of allocative efficiency in agriculture and its determinants. The choice of tenurial contracts had a significant role in influencing resource allocation of inputs. The determinants that have significant role in allocative efficiency were education level of the head of the household, operated land, interlinkage of factor markets and availability of credit to the rural household.

Ebong *et al* (2011) studied resource use efficiency of land owners and tenants in cassava based farms in Akwa Ibom (Nigeria) and revealed that the coefficient of farm size and labour were not only positive but significantly related to the resource use by the landowners while farm size, labour and capital became significant variables to tenants in their use of farm resources. For the inefficiency model, variation in the level of resource use efficiency was significantly influenced by household head educational level, sex and farming experience. All the farmers in both farm categories were producing below the maximum efficiency frontier, although tenant famers tend to be more efficient in their use of resources than their landowners.

Chapke *et al.* (2011) examined the resource use efficiency in sorghum production in coastal region of Andhra Pradesh. They found that seeds and irrigation water were over used, while fertilizers, labour and agro chemicals were underutilized.

Sairam (2011) employed Cobb-Douglas production function to examine the resource-use efficiency in paddy seed production. He revealed that the regression coefficient of human labour, machine power, manures and fertilizers were positively significant at 5 per cent, 1 per cent and 10 per cent levels. This means that 1 per cent increase in human labour, machinery power, manures and fertilizers over their geometric mean levels, keeping other factors at constant would result in an increase of 0.2369, 0.2189, 0.0381, and 0.5009 per cent respectively in the yields on paddy seed farms.

Dodamani *et al.* (2009) revealed that land, seed, farm yard manure and human labour would improve gross returns if their use was further augmented. Similarly, bio pesticides and trichocards would also improve returns but their estimation was not statistically significant.

Rajendran *et al*. (2008) studied the efficiency of crop production on temple tenants and owner farms in Tirunelveli district of Tamil Nadu. The study revealed that there was an ample scope to increase the productivity of the temple tenants and owner farmers by adopting appropriate technologies as well as the optimum allocation of the available resources. Efficiency of the farmers could be supported by technical efficiency, the results of which had indicated that owner farmers were more efficient than the temple tenants.

Suresh and Keshava (2006) in their study on resource use efficiency of paddy cultivation in Peechi command area revealed the average return Rs.28999/ha with BC Ratio of 1.34. Human labour and farm yard manure have accounted for the highest share in the total cost of cultivation of Rs 21,603/ha (63.47 and 11.67% respectively). The elasticity coefficients for area under Paddy cultivation, human labour, fertilizer and supplementary irrigation provided are 0.65, 0.55, 0.17 and 0.24 respectively. The allocative efficiency analysis has indicated that an additional one rupee spent on fertilizer, pant protection chemicals and human labour would enhance the total returns by Rs 2.83, Rs 1.57 and Rs 1.17 respectively.They suggested the equitable distribution of canal water and enhanced extension services for resource management in that area.

Haque (2006) in his study on resource use efficiency in Indian agriculture identified the resources both qualitatively and quantitatively and managerial efficiency of different farmers vary widely. The net returns per unit of inputs used also vary significantly from farm to farm. Also a farmers access to technology, credit, market and other infrastructure and other policy support, coupled with risk perception and risk management capacity under erratic weather and price situation to determine his farm efficiency.

Mahendra reddy (2002) in his study examined the productivity and efficiency differentials between leased farms and owner operated farms. Tenant operated farms have a substantially lower efficiency and productivity than owner operated farms and the reasons are lack of security which inhibits any long term investments on farm by farmers operating on leased land. It is recommended that the land market in Fiji are subjected to gradual deregulation if the agricultural sector is required to play a significant role in growth and development of the Fijian economy

2.3 STUDIES ON FACTORS EFFECTING THE VIABILITY OF FARMERS

Raphael and Hannah (2016) studied effects of tenancy status on the productivity of rice farmers in Abia (Nigeria) and revealed that majority (71.67%) of the rice farmers in the study area rented land for their farming activities and that 53.33% of the respondents had a productivity range of 2.1 – 3.0, with a mean productivity of 2.2. The significant variables influencing the productivity of the farmers were age of the farmer, farming experience, labour, capital, tenancy status, farm size, planting materials and fertilizer and agrochemicals. The major constraints faced by the rice farmers were inadequate capital, high cost of inputs, poor extension/advisory series, pest attack, and limited and high cost of land.

Kanyua *et al* (2015) revealed that gender, farming experience, farm tools, farm size, credit, hired labour, fertilizer and manure applied are the significant determinants.

Ohen and Ajah (2015) revealed that small scale rice production in the area was profitable; age of the farmer, farm size, education and cost of seed were the significant factors that affected rice production in the study area.

Nagaraj *et al* (2014) revealed that the viability of the small farmer holdings is at stake due to uneconomical size of holding. The study assessing the economic viability of smallholders farming considering the average incomes generated from different sources in typical semi-arid villages of peninsular India. The farmers have been categorized into viable and non-viable based on economic surplus generated for the past 3 years after accounting domestic and production costs of farm enterprises.

Anand R.K. (2014) studied on Viability of tenant farming in Rayalaseema region of Andhra Pradesh and revealed that productivity was relatively higher on tenant farms for all the crops. Plant protection chemicals, human labour and manures were the factors which exhibited relatively higher potential for increased output on tenant farms. The cropping intensity was higher on tenant farms compared to owned farms. Net returns per quintal of output were higher on tenant farms over owned farms. All measures of income were higher on tenant farms over owned farms. The returns per rupee of investment were estimated to be higher on tenant farms compared to owned farms.

Islam *et al* (2014) studied the profitability of crop cultivation under different land tenurial arrangements in some selected sites of Bangladesh. The BCR in leased land was higher than in share cropped land. The regression analysis revealed that the impact of socio-economic variables on gross revenues of the share cropped land for owner cum tenant farmers; weedicide, age, education, occupation, off farm income including farm size had significant positive impact on gross revenues.

Venkataramanamma (2013) studied on viability of tenant farmers in Prakasam district of Andhra Pradesh and revealed that level of net income of sample farmers was negative and concluded that tenant farming is not profitable enterprise and not viable in the long run if the trend of negative net returns continue though the farm income are positive. The unviable nature of tenant farm households who are living below poverty line with family living expenditure of 53 per cent and below the world bank norms of Rs1.25/ day percapita, ultimately resulting in agrarian and social crisis leading to suicide deaths of tenants and small and marginal farmers.

Mahendra singh (2012) in his study on challenges and oppurtunities for sustainable viability of small and marginal farmers and the results showed that marginal farmers with less than 0.01 ha. of land were allocated highest share of land (68.81per

cent) to dairy activity, followed by crop cultivation(14.25 per cent), farming of goat and sheep (9.98 per cent) and farming of other animals (1.94 per cent) and received maximum income from dairy (77.60 per cent) followed by crop cultivation (10.04 per cent), farming of goat and sheep (5.33 per cent) and farming of other animals (5.01 per cent). This study suggests that for ensuring sustainable viability of marginal and small farmers, the creation of job opportunities in rural areas along with suitable policy support for development of livestock sector and other allied activities especially dairy, goat and sheep farming would be panacea for resource-poor farming community in the future.

Parvin and Akteruzzaman (2012) revealed that family size and farm size had a significant positive effect on farm income and non-farm income had a significant negative effect on farm income. On the other hand, family size had a positive and significant effect on non-farm income and farm income had a negative and significant effect on non-farm income.

Chandra (2001) reported that small farms are not viable unless they are supported with some supplementary income.

Subrata (2011) studied tenancy efficiency in paddy cultivation in West Bengal. This analysis shows and reported that the small-sized farms belonging to both owner and tenant categories were more efficient than others.

Ibekwe *et al* (2010) showed that farm size, age, education, occupation and hours spent on farm are important explanatory variables that influenced both farm and off farm incomes.

Mandeep singh *et* al (2009) in factors influencing economic viability of marginal and small farmers in punjab and concluded from their study that the intensity of various factors in demarcating the farmers into viable and non-viable ones differ across regions and farming categories. Net income from dairy, offfarm income, value productivity of crops and farm size are the factors discriminating between the two populations. Dairy play a positive role to the financial viability of these farming families if remunerative price avails. They suggested that rationalizations of household expenditure and farm investment are also a source of enhancing thepossibilities of financial viability of both the categories of farming families.Remunerative prices and up-scaling of the marketing and input supply facilities are the need to promote dairying and other allied activities among these small and marginal farmers.

Sidhu and Bhullar (2004) observed that growth in dairy incomes was more perceptible on marginal and small farms. The growth in income from dairy was 5.68 per cent against 0.81 per cent from crops on marginal farms and 4.70 per cent against 1.67 per cent on small farms from 1987-90 to 2000-03.

Kaur (2001) conveyed that optimum combination of dairying along with the existing cereal based production system has the potential to enhance the income of the small farmers.

2.4 STUDIES ON CONSTRAINTS FACED BY THE FARMERS

Marup Hossain *et al.* (2016) in their study on Impact assessment of credit program for Tenant farmers in Bangladesh revealed that access to credit increases adoption of modern seed varieties, productivity, and farming income in the treatment group. They find that impacts are heterogeneous over households headship, tenancy status, and farm size and impact of the credit are mostly concentrated in the upper tail of the distributions.

Ananth (2015) in his study found that from the recently held National Sample Survey Organisation (NSSO) survey that close to 60 per cent of rural households are dependent on agriculture for their livelihood. More than half of them are at risk of defaulting on their debts with either banks or informal moneylenders. Many reports have pointed towards the debt burden and its resulting vulnerability at the household level as the primary factor for farmer suicides.

Ohen and Ajah (2015) revealed that Farmers in the study area are faced with constraints such as lack of access to finance, poor storage facilities and high cost of agro-chemicals.

Kumar *et al* (2013) suggested that improving information access on climate risk management, access of institutional credit on soil and water conservation practices, and capacity building programs strengthens the famers' adaptation capacity under changing climate.

Pal and Singh (2012) concluded that more income from the subsidiary sources and the higher level of education help to lessen the magnitude of indebtedness. It has also been observed that households having larger size of the family, larger ratio of

credit from the non-institutional sources to that from the institutional sources, more expenditure on unproductive purposes and larger the size of the farm are causes of high burden of indebtedness.

Prasad *et al* (2012) in their study on problems faced by Tenant farmers and suggestions to overcome the problems of Tenant farmers and suggest that proper implementation of laws and reforms only the problems faced by tenant farmers will be reduced. Agricultural practices should be modernized, mechanization should be allowed and financing to tenant farmers should be done without delay. There should be a good relationship between land owner and tenant.

Jalal-Ud-Din (2011) revealed that the studies too showed that majority of the respondents were tenants and owner-cum-tenants and therefore were not prone to take any risk. The study also revealed that lack of latest information as well as non-availability of credit facilities were the main problems of the small farmers of the study area.

In 2011, the State of Andhra Pradesh in Southern India passed the Andhra Pradesh Licensed Cultivators' Act which provided for Issuance of loan eligibility cards (LEC) to all the tenant cultivators, thereby entitling them to access bank loans, input subsidies and crop insurance. Andhra Pradesh Licensed Cultivators Act, 2011 which primarily aims at removing some of the constraints of informal tenant cultivators, by issuing them loan eligibility cards (LECs), based on which the tenants can access bank credit, insurance, subsidies etc. A tenant who holds an LEC is a 'Licensed Cultivator' in the sense that the card establishes the tenants' right to access those benefits.

Ahuja *et al* (2009) finds that with respect to production constraints pests are causing maximum yield loss in oilseeds and pulses. The study observes that small size of farm, lack of technical knowledge how and shortage of capital are also major constraints that should be addressed on a priority basis.

Kumar (2006) revealed that in the absence of formal financial institutional support, small and marginal farmers have resorted to private money lenders. Failure of monsoons, poor yield, failures of agricultural markets have resulted in high rate of indebtedness among small and marginal farmers.

Thanh and Singh (2006) found that lack of water and small land holdings, plant protection constraints, high cost of input, credit problems, low price, inadequate inputs, lack of helpfulness from local authorities/government are the major constrains faced by farmers.

Ranjana (2005) in his study on the Constraints facing Indian Agriculture revealed that tenant farmers contributed to the demand by leasing-in land primarily due to the reasons of subsistence and absence of alternative sources of living. The share of land-poor lessees forms a large proportion among the lessees, leasing-in most of the land. Tenancy cultivation is generally characterized by low level of capital investment, inferior quality of land, scattered and fragmented land plots, monocrop cultivation, absence of crop diversification, lower use of improved technology, and lower access to institutional credit.

Bina Agarwal in twelth plan working group on disadvantaged farmers, including women identified constrains faced by disadvantaged and wowen farmers are poor land access, poor credit access, poor access to critical inputs i.e water, power, seeds, fertilizers, manures, neglect by extension services and crop research, High production risk and little insurance coverage and limited market access and they suggested some recommendations i.e tenancy should be legalized, to provide security to the tenant, public land bank, Group farming, collective crop planning, non pesticidal management, low cost irrigation technologies, promoting farm mechanization, Integrated approaches for credit delivery, Loan Eligibility cards, kisan credit cards for women farmers, extension services like resource centres, ATMA's, soil health cards scheme, Risk mitigation, MSP should be strengthened.

According to Report of the Commission on Farmers' Welfare Land relations in Andhra Pradesh are extremely complicated and this complexity has contributed significantly to the problems facing actual cultivators in the state. Unregistered cultivators, tenants, and tribal cultivators all face difficulties in accessing institutional credit and other facilities available to farmers with land titles. 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.

Chapter – III

Material and Methods

Chapter III

MATERIALS AND METHODS

An attempt has been made in this chapter to describe the methodology adopted, sampling procedure for selection of district, mandals, villages and respondents, method of data collection and analytical tools employed in analyzing the data to arrive at the objectives of the study are also presented.

3.1 SAMPLING DESIGN

Multi stage sampling technique was employed for selection of sample at different levels (district ,mandals, villages) in the present study.

3.1.1 Selection of District

Srikakulam district of Andhra Pradesh was selected purposively. In Andhra Pradesh, Srikakulam district was purposively selected for the research study because the average size of holding is 0.66 ha and out of 5.26 holdings 4.27 holdings are of marginal farmers (Socio Economic Survey 2015-2016). Out of total dry land area in 172674.4 ha, 89173.35 ha out of total wet land area in ha 198023.16, 93320.79 ha (village action plan-www.agris.net) is cultivated by marginal farmers, so there is likely to be chance of more tenancy in Srikakulam district.

3.1.2 Selection of Mandals

Six Mandals of Srikakulam *viz* Narsannapeta(1,266), Tekkali(670), Rajam(656), Saravakota(449), Srikakulam(562), Palasa(539) were selected based on highest number of tenant farmers identified by LEC cards and taking land for lease.

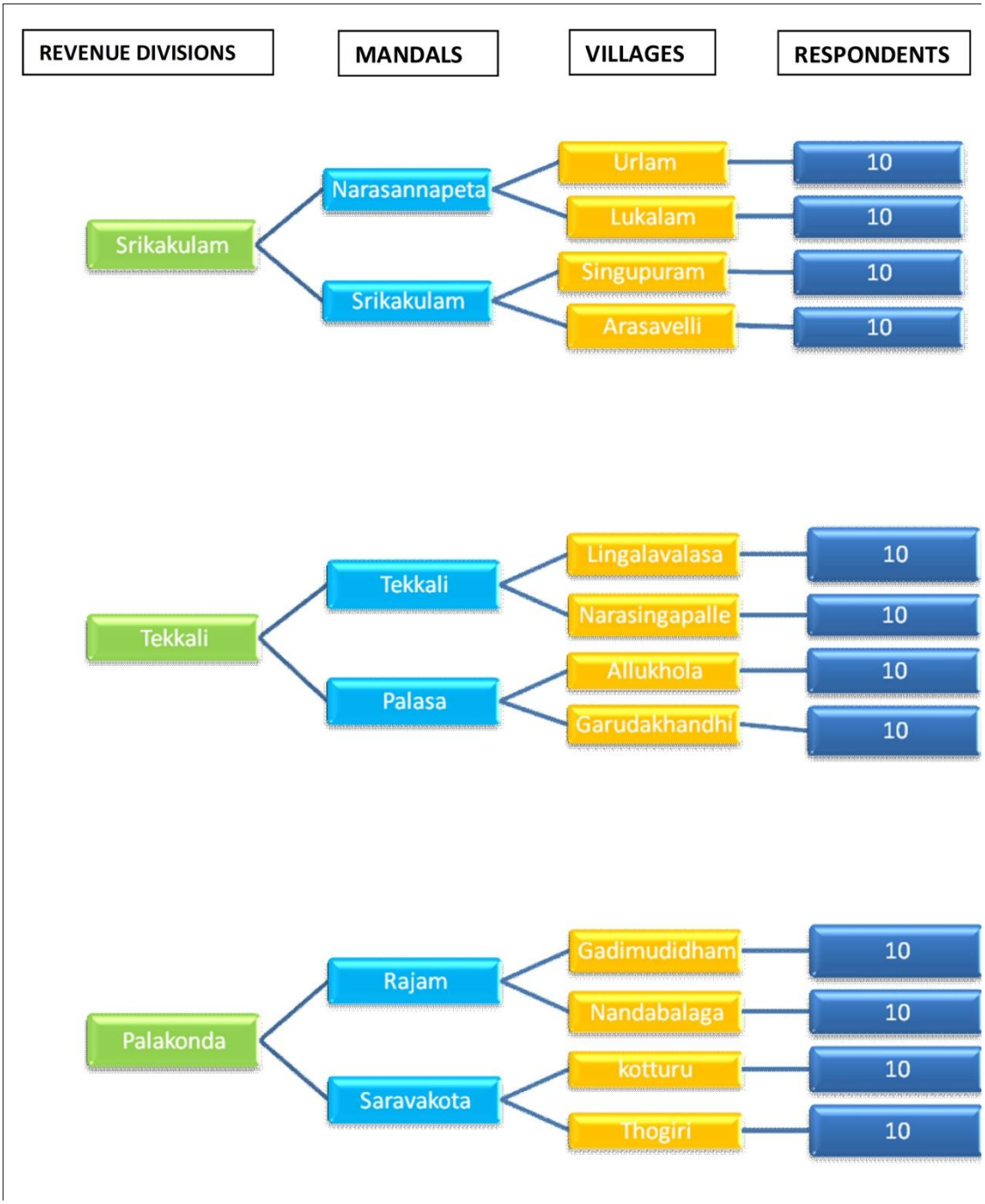

Figure 3.1: Sampling Design

Table 3.1 List of different mandals, villages and number of farmers selected in the study

S. No.	Revenue division	Mandals selected	Villages selected	No. of farmers selected
1	Srikakulam	Narasannapeta	Urlam	10
			Lukalam	10
		Srikakulam	Arasavelli	10
			Singupuram	10
2	Tekkali	Tekkali	Lingalavalasa	10
			Narsingapalle	10
		Palasa	Allukhola	10
			Garudakhandi	10
3	Palakonda	Saravakota	Kotturu	10
			Thogiri	10
		Rajam	Gadimudidam	10
			Nandabalaga	10
Total	3	6	12	120

3.1.3 Selection of Villages

Twelve villages were selected based on highest number of tenant farmers identified by LEC cards in the selected Mandals. In Narasannapeta mandal out of (1,266), Lukalam(130) ,Urlam (72) were having highest number of LECs among the villages. In Tekkali mandal out of (670), Lingalavalasa (49) and Narsingapalle (39) were having highest number of LECs. In Rajam out of (656), Gadimudidam(57) and Nandabalaga(53) were having highest number of LECs. In Saravakota out of (449), Kotturu (44) and Thogiri(50) were having highest number of LECs. In Srikakulam out of (562), Arasavelli (65) and Singupuram(71) were having highest number of LECs. In Palasa(539) out of Garudakhandi(68) and Allukhola(45) were having highest number of LECs. (www. AP agris.net. com).

3.1.4 Selection of Respondents

A total of ten tenant farmers were selected randomly from each of the selected twelve villages. Thus a final sample of 120 tenant farmers were selected for the present study. The final sample of tenant farmers were selected randomly based on Loan Eligibility Cards issued by Mandal officer in the respective mandals.

3.2 DATA COLLECTION

3.2.1 Primary Data

The present study is based on primary data collected from all selected sample of farmers through a pre-tested questionnaire developed as per the objectives.

The data regarding tenancy pattern, resource use, costs and returns, factors influencing viability and problems faced by the tenant farmers were collected from sample farmers.

3.2.2 Secondary data

The secondary data pertaining to the land utilization particulars, socio economic characteristics of the study area were collected from Chief Planning Office (CPO) of Srikakulam. The data pertains to the year 2015-16.

3.3 DATA ANALYSIS

The collected data was analyzed based on the objectives using suitable conventional and statistical tools for getting the results and to draw the conclusions of the study.

3.3.1 Tabular Analysis

To compute the profile of farmers, cost of cultivation, cost concepts were computed to estimate income measures, problems faced by tenant farmers and tenant farm households, etc., the general tabular analysis was used.

Simple arithmetic averages and percentages were worked out in order to find out costs, returns and farm efficiency measures.

3.3.2 Cost concepts

Cost concepts were used to estimate the cost of cultivation and derive the measures of efficiency *viz.,* farm business income, family labour income, net income and farm investment income. The cost concepts *viz.,* cost A1, cost A2, cost B1, B2 and cost C1, C2, C3 were used in the present study and they are derived as follows.

Cost A1

This cost includes value of hired human labour, owned and hired bullock labour, owned and hired tractor services, seeds, fertilizers, farmyard manure, plant protection chemicals, transportation charges, depreciation, land revenue and interest on working capital.

Cost A_2: Cost A_1 + Rent paid for the leased-in land.

Cost B_1: Cost A_2+ Interest on fixed assets (excluding land)

Cost B_2: Cost B_1 + Rental value of the owned land

Cost C_1: Cost B_1 + Imputed value of family labour.

Cost C_2: Cost B_2 + Imputed value of family labour

Cost C_3: Cost C_2+ 10% of Cost C_2

Farm income measures

Gross Income: Value of output

Farm Business Income: Gross Income – Cost A_2

Family Labour Income: Gross Income – Cost B_2

Net Income: Gross Income – Cost C_3

Farm Investment Income: Farm business income - Family labour wages

Net Benefit- Cost ratio: Net Returns / Total cost of cultivation (Cost C_2)

3.3.3 Resource use Efficiency

Value of output that is generated per unit of input is termed as Efficiency. The higher the value it implies the most efficient use of the resource. The sign of the parameter estimates of the variables in the equation is considered as measure of the efficiency of resource used. The sign of the variable reveals the direction of the efficiency of resource use in the farms. A positive signed coefficient indicates the efficiency toward the larger integer of the coded variables, whereas a negative coefficient suggests the tendency of efficiency to the lower integer.

Cobb-Douglas Production Function

The Cobb-Douglas production function was found to be more appropriate and best fit to estimate the Resource use efficiency. This function is a power function and linear in logarithms. Production elasticities of resources can be obtained directly and the sum of elasticities of production provides the estimates of Returns to scale.

The Cobb-Douglas production function is specified in the following power form as

$$Y= aX_1^{b1} . X_2^{b2}. X_3^{b3}.X_4^{b4}.X_5^{b5}.X_6^{b6}.X_7^{b}.X_8^{b8} ….e$$

It can be presented in logarithmic form as

$$\ln Y = \ln a+b_1\ln X_1 + b_2\ln X_2 + b_3\ln X_3 + b_4\ln X_4 + b_5\ln X_5+ b_6\ln X_6 + b_7\ln X_7+ b_8 \ln X_8+\mu$$

Y = Yield in rupees

X_1 = Human labour charges in rupees

X_2 = Machine power charges in rupees

X_3 = Seed cost in rupees

X_4 = Manures cost in rupees

X_5 = Fertilizers cost in rupees

X_6 = Plant protection chemicals in rupees

X_7 = Irrigation charges in rupees

X_8 = Farm size in ha

a = Intercept

μ = Stochastic disturbance term

e = Napier base

b_1 - b_8 are the coefficients of resources X_1 to X_8 to be estimated, that respectively measured be relationship between the inputs and output in the production process, for the selected inputs.

U_i was the stochastic disturbance term which is assumed to be normally distributed with mean zero and constant variance.

ln was the natural logarithm of the respective variables included in the equation. The essence of the log transformation of the resources transforms the error to normal distribution without any change in its relationship pattern.

3.3.4 Multiple Regression Analysis

The following multiple regression model was employed to analyze the factors determining the viability of farmers in the study area

$Y = \beta_0 + \beta_i X_i + \ldots\ldots + \beta_n X_n + e$ where i =1 to n variables

The specific form of multiple regression function including the identified variables is fitted as follows

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e_t$$

X_1 = Farm size in (ha)
X_2 = Family size in (number)
X_3 = Farming experience (years)
X_4 = Education (years)
X_5 = Off farm income (rupees)
X_6 = Domestic expenditure (rupees)
X_7 = Farm expenditure (rupees)
X_8= Access to credit (Dummy variable-0,1)
X_9 = Debt outstanding (rupees)
e_t = Error term
β_i = Regression coefficients to be estimated (i = 0, 1……..9)
n = 1,2,3,….4,5 representing number of farmers.

3.3.5 Garrett's ranking technique

Constraints faced by the tenant farmers were ranked using Garrett's ranking technique. Major prevailing constraints were highlighted during the survey and the order of the merit was given in ascending order and converted into ranks by using the formula.

$$\text{Percent position} = \frac{(R_{ij} - 0.50)*100}{N_j}$$

Where R_{ij} = Rank given for i_{th} item by j_{th} farmer

N_j = Number of items ranked by j_{th} farmer

The per cent position of each rank was converted to scores by referring to tables given by Garrett and Woodworth (1969). Then for each factor, the scores of individual farmers were summed up and divided by the total number of the farmers for whom scores will be gathered. The mean scores for all the factors were ranked according to their values, which indicates that the top ranks are tha major constraints.

3.3.6. Viability of Tenant farmers

To test the viability in the study area viability was calculated by deducting domestic expenditure and debt outstanding from the total income i.e. from crops, dairy, wages, other income from business of the sample farmers.

3.4 TERMS AND CONCEPTS USED IN THE STUDY

The following are the terms and concepts used in the present study.

3.4.1 Tenant

The farmer without having any owned land but cultivating only leased in land is called a tenant.

3.4.2 Lease

It is defined as a contract between the land owner and cultivator, who uses the land owner's land for agriculture and allied activities for a mutually agreed specified period.

3.4.3 Land lease agreement

The lease period and lease amount will be based on mutual agreement based on location and area of leased out land, duration of lease, lease amount and due date by which it has to be paid , terms and conditions for the renewal or extension of lease.

3.4.4 Farm

Farm is a piece of land where crops and livestock enterprises are taken up under common management and has specific boundaries.

3.4.5 Human labour

Human labour can be categorized as family labour, permanent labour and casual labour. The family labour is imputed at the general wage rate prevailing for the casual labours in the locality. In case of permanent labour, payments were made in different kinds like grain, meals and the other pre-requisites, which were evaluated at market rates. Besides that payments were also made in money. For casual labour, the daily wage rate had been taken into consideration.

3.4.6 Machine labour

In the case of owners, the net maintenance cost per hour was considered, however, in the case of hiring, the hire rate was considered according to the owners of the machine.

3.4.7 Operational holding

It refers to the total land area held under single management for the purpose of cultivation.

3.4.8 Cropping pattern

The yearly sequence and spatial arrangement of crops and fallow on a given area.

3.4.9 Man Day

It refers to the work accomplished by a normal healthy human being in a day of 8 hours.

3.4.10 Cattle Pair Day

It refers to the work turned out by a pair of bullocks in a day of 8 hours.

3.4.11Farm Assets

The physical property that has value owned by the farm business. Land, farm buildings, machinery, livestock, implements were included under farm assets.

3.4.12 Seeds

The amount actually paid for purchasing seeds were charged at the prevailing rates.

3.4.13 Farm Yard Manure

The cost of Farmyard manure per tonnes was calculated on the basis of prevailing market price both for purchased and owned quantities.

3.4.14 Fertilizers and plant protection chemicals

The cost of fertilizers and plant protection chemicals was estimated at prevailing market price.

3.4.15 Transportation cost

The amount spent on transporting the material inputs from house to the farm and produce from farm to home was considered as transportation cost. It varied according to distance and mode of transportation.

3.4.16 Cost of cultivation

Cost of various resources and resource services incurred for raising a crop on a unit area.

3.4.17 Variable Costs

The variable costs included costs of inputs (imputed and hired) mainly seed, manures, fertilizers, wages of human labour and bullock and machine power, plant protection chemicals, irrigation charges and interest on working capital.

3.4.18 Fixed Costs

These include rental value of land (leased or owned), depreciation, interest on fixed capital and land revenue paid to the Government.

3.4.19 Total Cost of Cultivation

It is the sum of total variable costs and total fixed costs.

3.4.20 Interest on Working Capital

The interest on working capital is computed at the rate of interest 7 per cent per annum considering the tenant farmer have taken loan from an institutional agency.

3.4.21 Interest on Fixed Capital

Interest on fixed capital is taken as ten per cent per annum .

3.4.22 Land revenue

Actual land revenue paid by the tenant farmers to the government is zero it is paid by the actual land owner

3.4.23 Depreciation Charges

Depreciation of the implements owned by the tenant farmers was computed by using the straight line method.

$$\text{Annual depreciation} = \frac{\text{Original value} - \text{Junk value}}{\text{Economic life of the Asset}}$$

3.4.24 Rent Paid on Leased in Land

The actual rent paid on leased in land by the tenant farmers in the study area.

3.4.25 Rental Value of Owned Land

Rental value of owned land is valued at the current market price i.e., as rent in the study area. The study pertains to the tenant farmer and hence computation of rental value of owned land is not considered.

3.4.26 Marginal Farmer

A farmer cultivating (as an owner or tenant) agricultural land up to one hectare of dry land and half hectare of wet land (2.5 acres).

3.4.27 Paid out costs (Explicit costs)

These include payments made on the purchase or hiring of resources and resource services used in the production of crops by the farmer.

3.4.28 Imputed costs (Implicit costs)

These include costs of self-owned and self-employed resources and resource services, interest on owned fixed capital, wages to farmer's own labour and management charges were considered as implicit costs.

3.4.29 Gross returns

They are monetary values of total output multiplied with their corresponding prices.

3.4.30 Net returns

They are arrived at by subtracting total costs incurred deducted from gross returns indicates the Net returns.

Chapter – IV

Agro Economic Features

Chapter IV

AGRO ECONOMIC FEATURES

The success of any agricultural economy mainly depends upon the agro climatic and socio-economic conditions of that region such as climate, rainfall, soil type, irrigation facilities, land utilization pattern, credit facilities, etc. since the present study is confined to srikakulam district and its mandals, general view of agro-climatic features are presented in brief with the objective of providing necessary background information for understanding district profile, problem formulation and results of the study.

AGRO ECONOMIC FEATURES OF SRIKAKULAM DISTRICT

4.1 HISTORICAL BACKGROUND

Srikakulam district is the extreme north eastern district of Andhra Pradesh in India.

4.1.1 Boundaries

Srikakulam district is situated within the geographic co-ordinates of 18°-2'-00" to 19°-10-00" of northern latitude and 83°-50-00" of eastern longitude. The district has a seacoast of 193 kms. It is skirted to a distance by kandivalasagedda, vamsadhara and bahuda at certain stretchers of their courses, while a line of heights of the Great Eastern Ghats run from North East.

4.1.2 Administrative set up

Srikakulam district comprises of three revenue divisions with headquarters at srikakulam, palakonda and tekkali respectively. The district consists of 38 revenue mandals, 1,865 revenue villages and 1,099 gram panchayats. There are 11 urban units in srikakulam district. Out of these four are municipality's *viz.*, srikakulam amudalavalasa, Ichapuram and Palasa-kasibugga; two are nagar panchayats *viz.*, Rajam and palakonda; three are notified panchayats *viz.*, sompeta, tekkali and narasannapeta; and the remaining two are urban areas *viz.*, Ponduru and Hiramandalam.

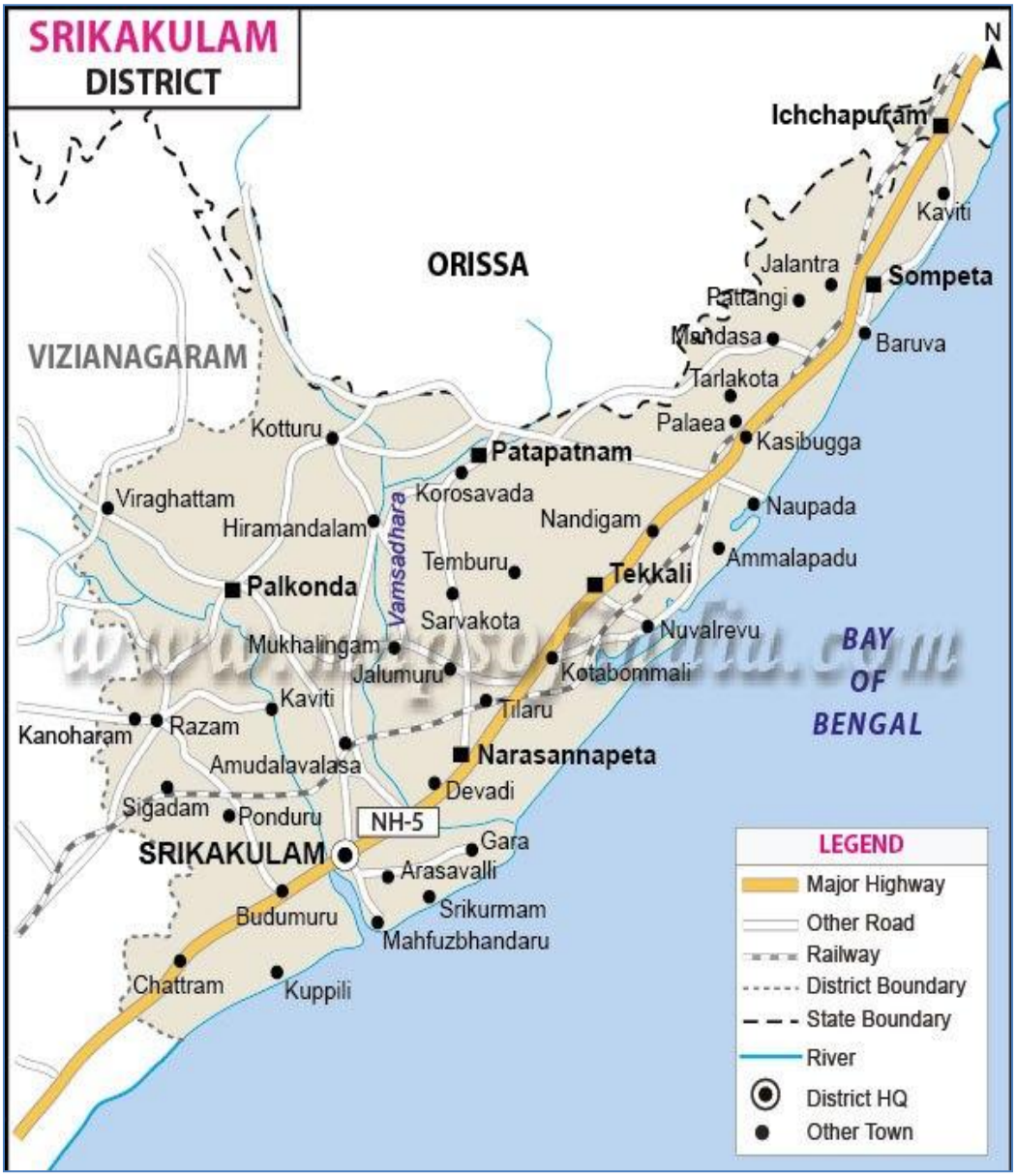

Figure 4.1 Map showing Srikakulam District

Table 4.1 Administrative divisions of Srikakulam district

S.No.	Revenue Division	No. of Mandals	No. of Villages	No. of Gram Panchayats	
				Notified	Unnotified
1.	Tekkali	12	666	365	0
2.	Palakonda	13	635	379	0
3.	Srikakulam	13	562	355	0
	Total	38	1863	1099	0

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.3 Demographic particulars

As per 2011 census the population of srikakulam district is 27,03,114 the male population is 13,41,738 while the female population is 13,61,376. The decennial growth rate from 2001 to 2011 is 6.50 percent for the district as against 9.21 percent of the state, and it is significantly higher than the state average regarding sex-ratio in the state. The density of population for the district is 463 persons per sq.km as against the state average of 308. The scheduled caste and scheduled tribe population of the district is 2,55,664 and 1,66,118 respectively this forms 9.46 percent and 6.14 percent respectively in the total population of the district as per 2011 census. There are 8, 57,824 male literates and 6, 37,557 female literates. The literacy rate is 71.61 percent among males, 52.08 percent among females and 61.74 percent among total population of the district. The urban population in the district is 4, 36,703 which works to 16.15 percent of total population as against 29.58 percent of the state.

Table 4.2 Demographic particulars of Srikakulam district (2011 census)

S.No.	Item	Unit	Population
1	Total population	Lakhs	27.03
2	Male population	Lakhs	13.41
3	Female population	Lakhs	13.61
4	Density of population	Per sq km	463
5	Females per thousand males	No	1,015
6	Rural population	Lakhs	22.66
7	Percent of rural population to total population	Percentage	83.80
8	Urban population	Lakhs	4.36
9	Percent of urban population of total population	Lakhs	16.20
10	Literates	Lakhs	
	a) Total literates	Lakhs	14.95
	b) Males	Lakhs	8.57
	c) Females	Lakhs	6.37
11	Cultivators	Lakhs	1.65
12	Agricultural labour	Lakhs	7

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.4 Agro-climatic Conditions

4.1.4.1 Climate

Rainfall particulars of Srikakulam district in 2015-16 are presented in the table 4.3.The Table4.3 depicted the actual, normal and the deviation between actual and normal rainfall. It is observed that actual and normal rainfall of the Srikakulam district was 1034.8 mm and 1161.5 mm, respectively. Excess rainfall of 6.4 per cent was observed during South-West Monsoon, 66.8 was observed during North-East monsoon, 21.2 was observed during hot weather period

Table 4.3 Rainfall distribution of Srikakulam district during the year 2015-2016

S.No.	Season	Rainfall (mm)		Percent deviation
		Actual (in mm)	Normal (in mm)	
1.	South-WestMonsoon (June- September)	751.0	705.7	6.4
2.	North – East Monsoon (October – December)	91.5	276.0	66.8
3.	Winter period (January – February)	5.8	25.9	-77.6
4.	Hot weather period (March- May)	186.5	153.9	21.2
	Total	**1034.8**	**1161.5**	**-10.9**

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District**.**

4.1.4.2 Temperature

The highest temperature was recorded in the month of May (35^0C), whereas the lowest temperature was recorded in the month of December (17.5^0C). The average highest temperature for the year was recorded as 32.2^0C whereas the average lowest temperature was 23.25^0C.

4.1.4.3 Occupational Distribution

The district has a work force of 9,36,244 (34.64 per cent of the total population), of which cultivators were 1,65,317 (6.12 per cent of the population) and agricultural labour were 7,00,833 (25.93 per cent of the total population), household industry constituted 34,479 members (1.28 per cent of the total population) and other than household industry constituted 3,89,659 members (14.42 per cent of the total population) were presented in tha table 4.4.

Table 4.4 Distribution of population by workers and non-workers in Srikakulam district (2011 census)

S. No.	Particulars	Units In lakhs	Percent to total
1.	Total population	27,03,114	100.00
2.	Total main workers	9,36,244	34.64
3.	Cultivators	1,65,317	6.12
4.	Agricultural labour	7,00,833	25.93
5.	Household industry	34,479	1.28
6.	Other than house hold industry	3,89,659	14.42

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.5 Land utilization Pattern

The total geographical area of the district was 5,83,700 ha. As per 2015-16 estimates given in Table 4.5, the area under forest cover was 68,641 ha, which formed 11.80 per cent of the total geographical area. The net area sown 30,543 ha and it constituted 52.30 per cent of the geographical area and the cultivable waste was accounted with an area of 602 ha and constituted 0.10 per cent of the geographical area. The land not fit for cultivation, comprising barren and uncultivable land formed 8.30 per cent (48,408 ha), land put to non-agricultural land formed 17.50 per cent (1,02,285 ha) and miscellaneous tree crops and grooves formed 1.30 per cent (7,451 ha) of the geographical area. The area under permanent pastures and grazing lands accounts 942 ha which forms 0.20 per cent. The area covered by both current and other fallows was 49,525 ha and this constitutes 8.50 per cent.

Table 4.5 Land utilization pattern in Srikakulam district during 2015-16

S. No.	Particulars	Area (ha)	Per cent to total
1.	Total geographical area	5,83,700	
2.	Area under forests	68,641	11.80
3.	Barren and uncultivable land	48,408	8.30
4.	Land put to non-agricultural uses	1,02,285	17.50
5.	Cultivable waste	602	0.10
6	Permanent pastures and grazing lands	942	0.20
7.	Land under miscellaneous tree crops and grooves not included in net sown area.	7,451	1.30
8.	Current fallows	14,745	2.50
9.	Other fallow lands	34,780	6.00
10.	Net area sown	3,05,432	52.30
11.	Total cropped area	4,08,850	70.00
12.	Area sown more than once	1,03,418	17.70
13.	Fish &Prawn culture	414	0.10

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam

4.1.6 Land holding Particulars

The details of land holding particulars in srikakulam district are given in the table 4.6. Most of the farmers in srikakulam district were marginal farmers (4,27,437), which accounted to 81.2 per cent of the total farmers, followed by small farmers (70,894) which were 13.4, followed by semi medium and medium farmers with 4.15 per cent (21,851) and 0.99 per cent (5,243) respectively. Very meagre per cent of large farmers contributing to 0.08 per cent (445) of the total farmers were present in Srikakulam district of Andhra Pradesh.

Table 4.6 Land holding particulars of Srikakulam district during 2015-16

Particulars	Number	Per cent to total farmers	Area (ha.)
Marginal Farmers (Below 2.47)	4,27,437	81.2	3,88,878
Small Farmers (2.47 to 4.93)	70,894	13.4	2,40,135
Semi-Medium (4.94 to 9.87)	21,851	4.15	1,42,608
Medium (9.88 to 24.7)	5,243	0.99	69,404
Large (24.71 and above)	445	0.08	21,722
Total	5,25,870	100.0	8,62,746.2

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.7 Irrigation Sources

The details of area under irrigation by different sources available in the district are presented in table 4.7. Canals and tanks are the major sources of irrigation in the district accounting for 54.84 and 27.92 per cent respectively of the total irrigated area. Tube wells, dug wells, lift irrigation and other sources of irrigation contributed 6.4 per cent, 8.15 per cent, 1.1 per cent and 1.55 per cent of the gross irrigated area, respectively.

Table 4.7 Irrigated area under different sources in Srikakulam district during 2015-16

S. No.	Source	Area (ha)
		Total
1.	Canals	1,16,148
2.	Tanks	59,137
3.	Tube wells	13,584
4.	Dug wells	17,267
5.	Lift irrigation	2,342
6.	Other sources	3,294
7	Area irrigated more than once	24,774
8	Net area irrigated	1,86,998
9	Gross area irrigated	2,11,772

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.8 Irrigated area particulars

The crop area particulars of the district under irrigation has been presented in the table 4.8.

Table 4.8 Area irrigated under principal crops in Srikakulam district during 2015-16

S. No.	Crop	Area (ha)	Per cent to total Gross Cropped area
1	Paddy	179515	84
2	Maize	6121	2.8
3	Ragi	748	0.35
4	Chillies	1163	0.54
5	Sugarcane	11284	5.32
6	Groundnut	4120	1.94
7	Sunflower	684	0.32
8	Condiments and spices	1163	0.5
9	Total fresh and dry fruits	4098	1.9
10	Onion	357	0.16
11	Total oil seeds	4964	2.34
12	Total vegetables	3822	1.80
13	Total food crops	206765	97.6
14	Total non-food crops	5007	2.36
15	Mulberry trees	30	0.01
16	Gross irrigated area	211772	100

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.9 Soils

Red soils were predominant in the district and occupied an area of 3,44,000 hectares (58.60 %). Brown forest soils, alluvial soils and other soils were spread across in 85,000 hectares (14.60 %), 61,000 hectares (10.31 %) and 50,000 hectares (9.17 %), respectively. Black soils and sandy soils were present in 43,000 hectares *i.e.,* 7.32 percent to the total area.

4.1.10 Principal crops

Season wise area under principal crops grown in Srikakulam district are presented in the table 4.9.The major crops grown were paddy, maize, bajra and ragi among cereals; blackgram and greengram among pulses; sugarcane, cotton, mesta and gingelly among non-food and commercial crops; coconut, fresh and dry fruits among horticultural crops; ridge gourd, bhendi, tomato, green chilli, cauliflower and cabbage among vegetable crops. Vegetables were grown throughout the year in areas of continuous water availability through bore wells

Table 4.9 Season wise area under principal crops in Srikakulam district

Crops	**Kharif (in ha)**	**Rabi (in ha)**
Rice	2,04,003	2791
Jowar	47	0
Bajra	176	0
Maize	10,570	6,121
Ragi	291	748
Minor millets	43	0
Horse gram	0	2,737
Green gram	304	29,610
Black gram	143	41,443
Red gram	634	14
Total pulses	1,081	73,804
Total Food grains	2,16,211	83,464

Crops	Kharif (in ha)	Rabi (in ha)
Chillies	25	1,138
Turmeric	215	0
Total condiments and spices	277	1,138
Sugarcane	6,117	5,167
Fesh and dry fruits	35,787	1,613
Onion	16	342
Total vegetables	2,151	2,373
Total cotton	8,883	0
Total food crops	2,60,543	93,755
Mesta	2,519	0
Groundnut	4,165	4,120
Sesamum	845	4,215
Sunflower	0	684
Coconut	14,397	0
Oil seeds	19,874	9,019
Aromatic & flowers	9	3
Mulberry	51	0
Non food crops	45,473	9,079
Gross sown area	3,06,016	1,02,834
Net sown area	3,05,432	0

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.1.11 Rivers

The Nagavali, vamsadhara, suvarnamukhi, vegavathi, mahendratanaya, gomukhi, champavathi, bahuda, and kumbikotagedda are important rivers of the district. There are ten major and medium irrigation projects in the district, such as BRR vamsadhara project (I&II), madduvalasa, thotapalli, narayanapuram anicut, kalingadala reservoir, dabarsingi reservoir, bondigedda reservoir, Gajjiligedda reservoir, thotapalli reservoir and pydigam project.

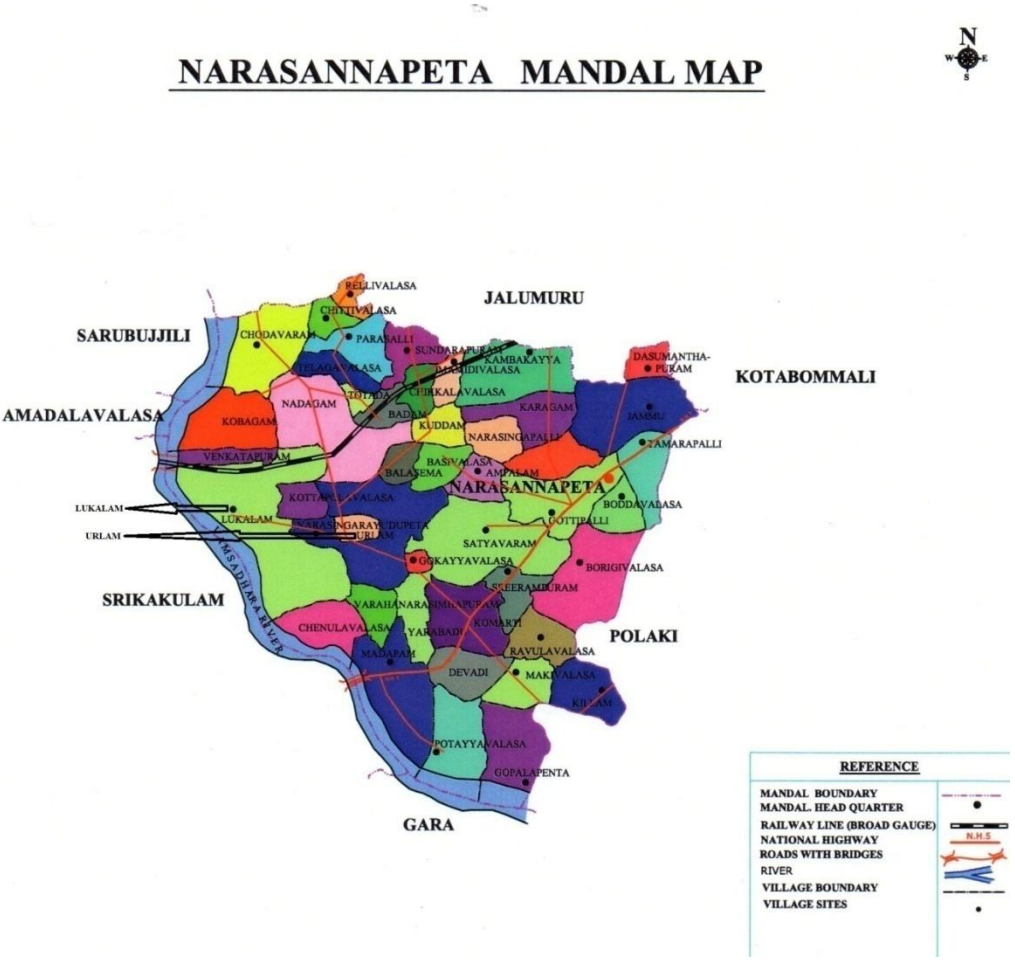

Figure 4.2 Map showing Narasannapeta mandal

Figure 4.3 Map showing Srikakulam mandal

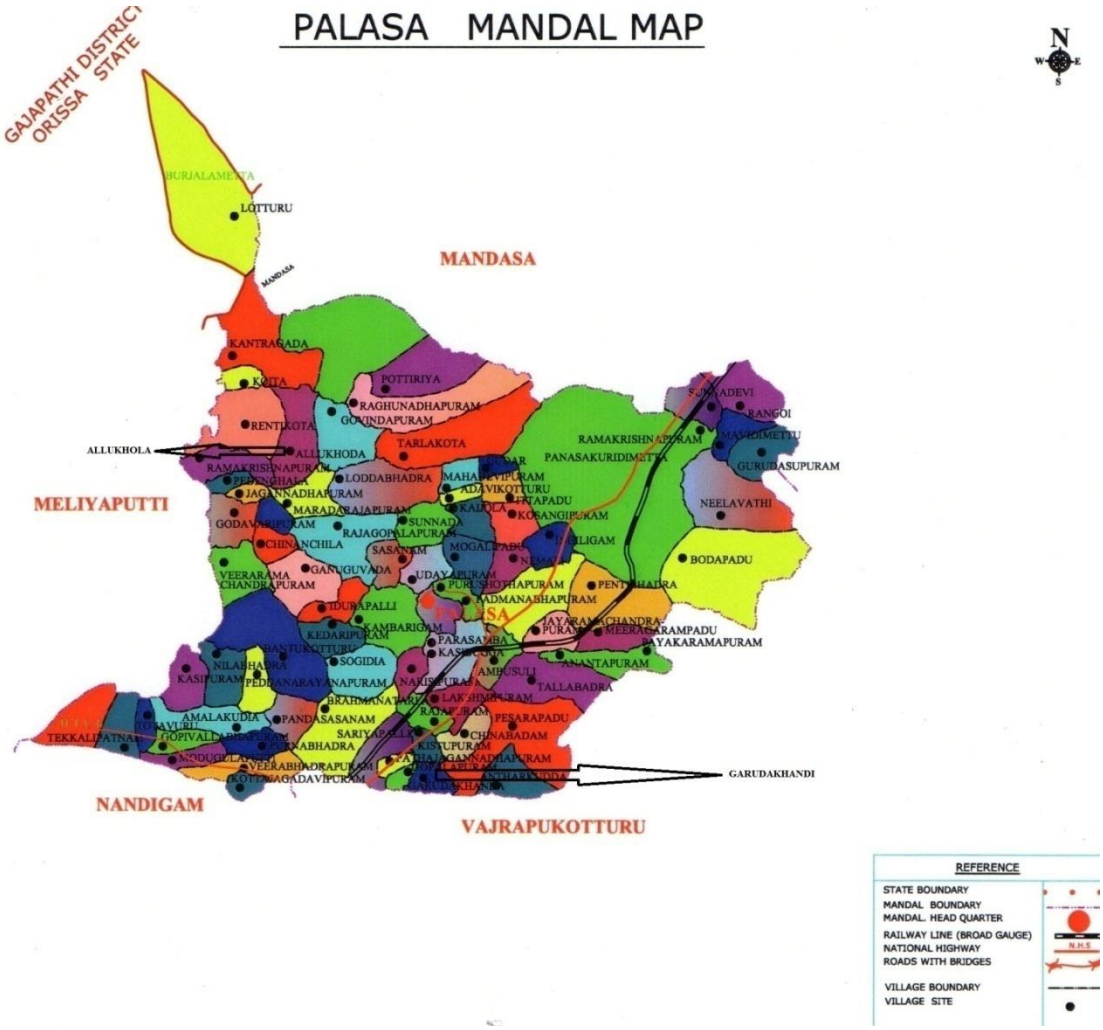

Figure 4.4 Map showing Palasa mandal

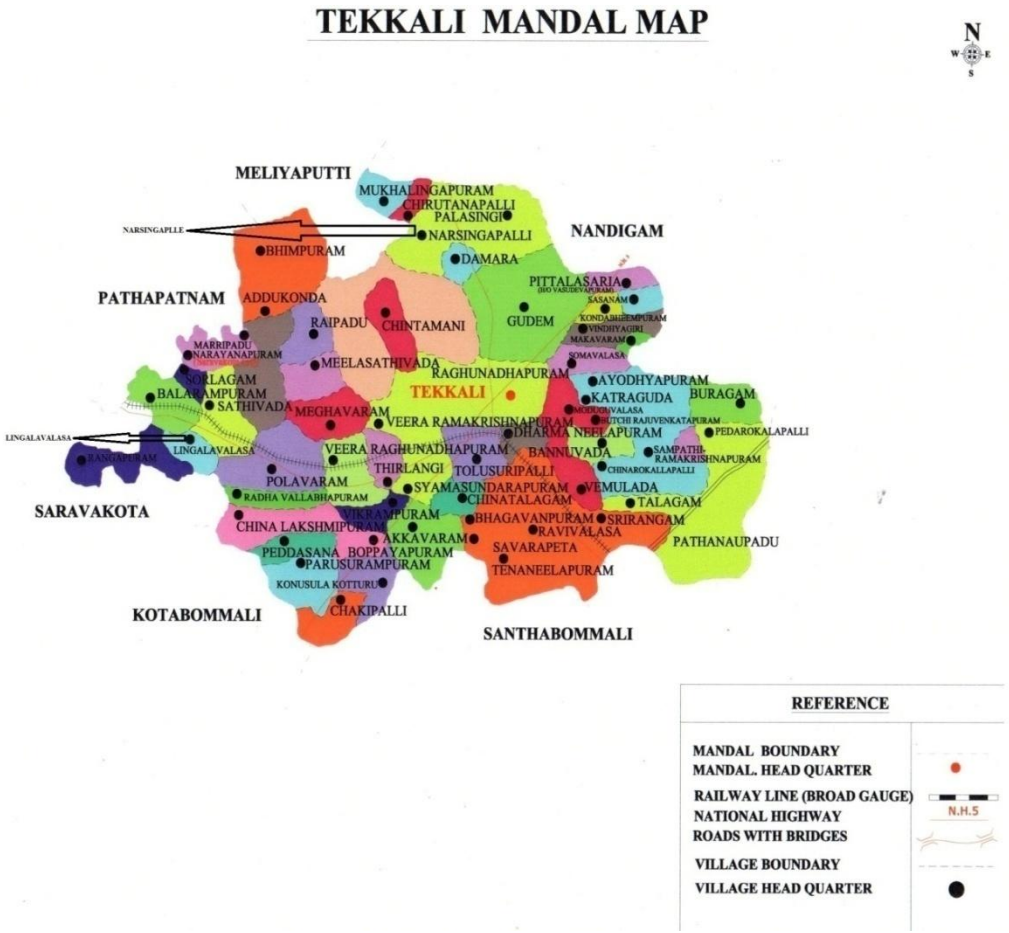

Figure 4.5 Map showing Tekkali mandal

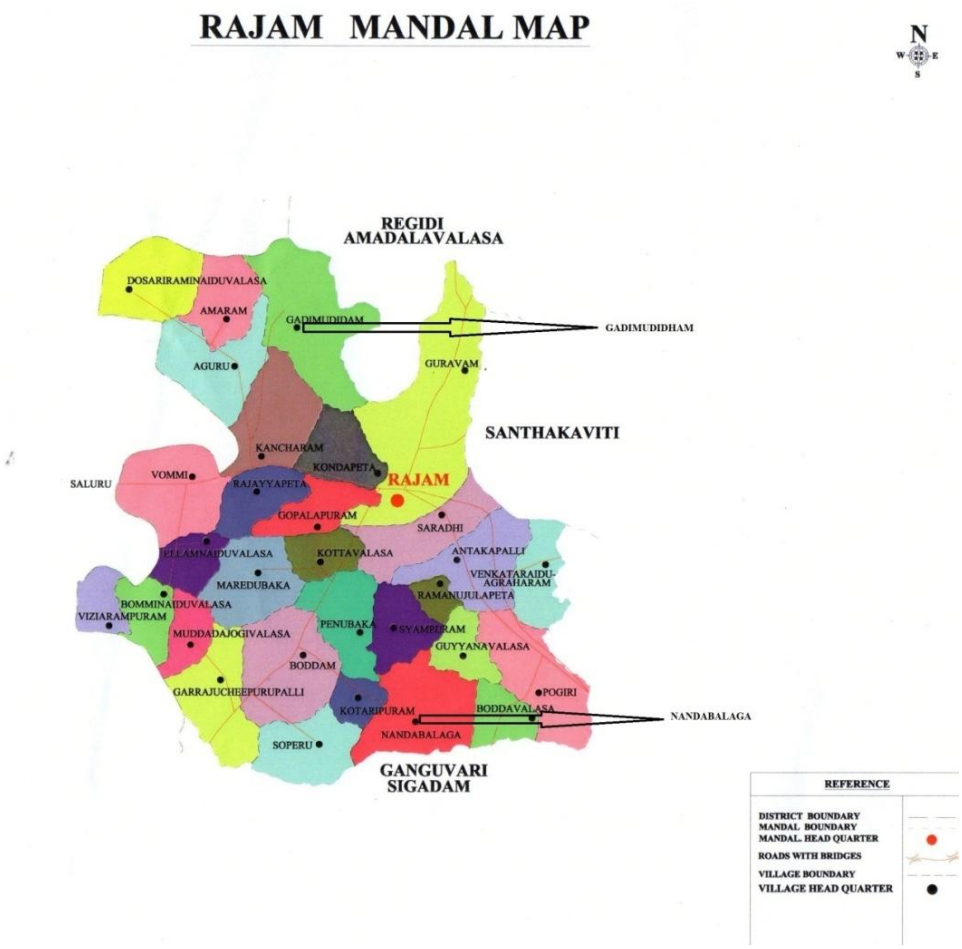

Figure 4.6 Map showing Rajam mandal

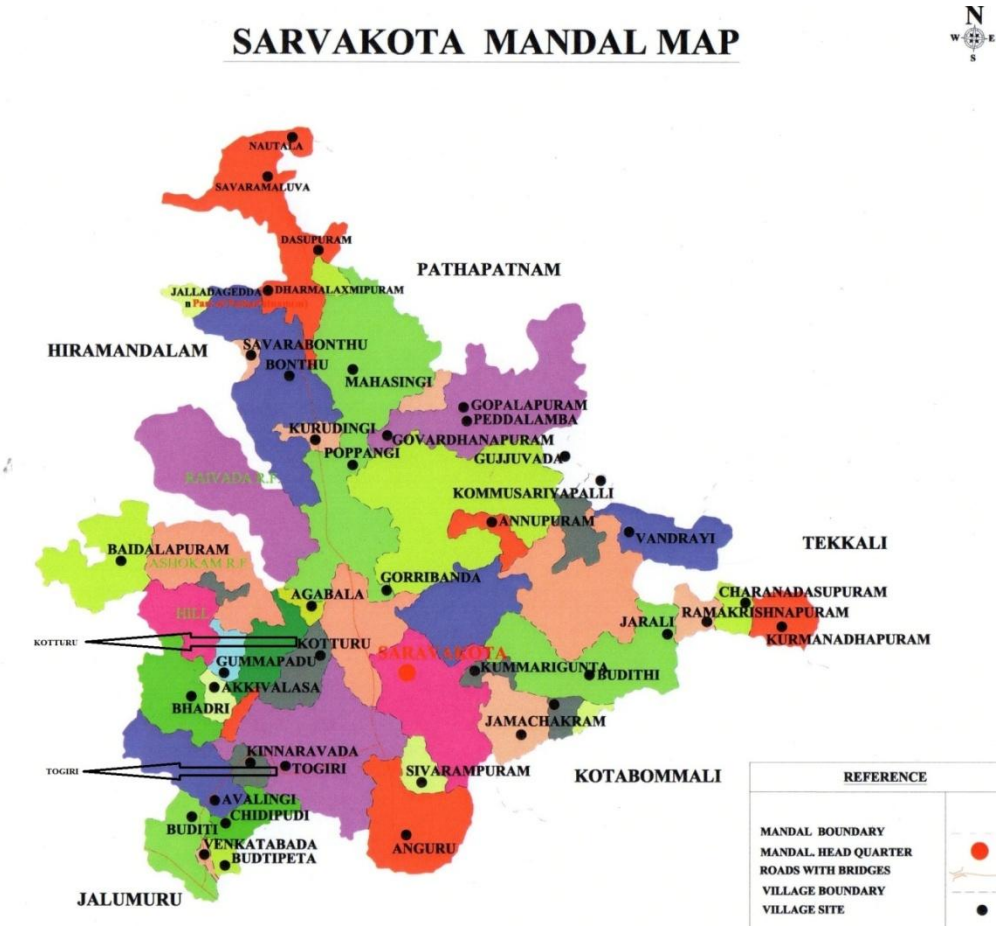

Figure 4.7 Map showing Saravakota Mandal

4.1.12 Animal Husbandry

Animal husbandry is an important allied economic activity to agriculture. Next to draught animals which are main source of energy for agriculture, milch animals, sheep and goat are important for income generation of the rural households. A sizable number of households earn subsidary income by selling milk to Visakha Dairy and in local markets. The total livestock of the district was 17,10,239, of which cattle accounted for 7,93,465, while buffaloes accounted for 1,26,861. Goats and sheep to talling upto 7,85,420 were considered important for the livelihood of the considerable population.

Table 4.10 Particulars of animal husbandry of Srikakulam district during 2015-16 (2012 census)

Particulars	Number
Cattle	7,93,465
Buffaloes	1,26,861
Goats	2,12,299
Sheeps	57,3121
Pig	4,493
Others	44,585
Total livestock	17,10,239
Total poultry	17,16,268

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.2 GENERAL INFORMATION OF SELECTED MANDALS

The Agro Economic features of selected mandals for the present study are presented here under

4.2.1. Demographical information

As per the 2011 census, out of the total population of Narasannapeta males were 47,915 and females were 49,636 with a total number of households of 19,922. The mandal had a population of 77,321 with a density of 656 per sq.km. Urban population

constituted 26,280 (33.9%) and rural population constituted 51,041 (66%) of the total population. In Palasa, out of the total population, males were 47,915 and females were 49,636 with a total number of households of 24,307 . The mandal had a population of 97,551 with a density of 664 per sq.km. Urban population constituted 57,507 and rural population constituted 40,044 of the total population. In Tekkali, males were 36,206 and females were 37,787 with a total number of households of 18,762. The mandal had a population of 73,993 with a density of 535 per sq.km. Urban population constituted 28,631 and rural population constituted 45,362 of the total population. In Rajam, males were 47,017 and females were 47,022 with a total number of households of 23,493. The mandal had a population of 94,039 with a density of per sq.km. Urban population constituted 28,631 and rural population constituted 45,362 of the total population. In Srikakulam, males were 1,09,713 and females were 1,10,619 with a total number of households of 55,095. The mandal had a population of 2,20,332 with a density of 364 per sq.km. Urban population constituted 1,44,438 and rural population constituted 75,894 of the total population. In Saravakota, males were 25,871 and females were 26,371 with a total number of households of 52,243. The mandal had a population of 52,243 with a density of 244 per sq.km. Urban population constituted 0 and rural population constituted 52,243 of the total population.

4.2.2. Literacy rate

In Narasannapeta mandal, maximum educational facilities are available. The literacy rate of the mandal was 66.4 per cent which was higher than the district average literacy rate of 61.74 per cent. In Palasa mandal, the literacy rate of the mandal was 70.28 per cent which was higher than the district average literacy rate of 61.74 per cent. In Tekkali mandal, the literacy rate of the mandal was 66.81 percent which was higher than the district average literacy rate of 61.74 per cent. In Rajam mandal, the literacy rate of the mandal was 61.41 per cent which was lower than the district average literacy rate of 61.74 per cent. In Srikakulam mandal, the literacy rate of the mandal was 76.80 per cent which was higher than the district average literacy rate of 61.74 per cent. In Saravakota mandal, the literacy rate of the mandal was 58.50 per cent which was lower than the district average literacy rate of 61.74 per cent. This was presented in the table 4.11.

Table 4.11. Literacy Rate of the selected mandals

S. No.	Particulars	Narasannapeta		Palasa		Tekkali		Rajam		Sriakulam		Saravakota	
		No.	% to total	No.	% to total	No.	% to total	No.	% to total	No.	% to total	No.	% to total
1.	Total population	46,331	59.9	61,913	63.46	44,437	60.05	51,554	54.82	1,52,916	69.40	27,749	53.11
	Males	25,749	33.30	34,552	35.4	24,864	33.60	29,379	31.2	82,939	37.6	15,972	30.57
	Females	20,582	26.6	27,361	28.04	19,573	26.45	2,175	23.5	69,977	31.75	11,477	21.96
2	No of literates	30,990	40.0	35,638	36.5	29,556	39.94	42,485	45.17	67,416	30.59	3,000	5.74
3	Total population	77,321		97,551		73,993		94,039		2,20,332		52,243	

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

4.2.3 Source of Irrigation

In Narasannapeta mandal during 2015-2016 year, the gross irrigated area was 7,709 ha; area irrigated more than once was 371 ha. The major irrigation source was rain, besides other means of irrigation (7,253ha) like canals, tanks etc. In Palasa the gross irrigated area was 4,577 ha, area irrigated more than once was 273 ha. The major irrigation source was rain, besides other means of irrigation (4,112 ha) like canals, tanks etc. In Rajam mandal the gross irrigated area was 4,402 ha; area irrigated more than once was 903 ha. The major irrigation source was rain, besides other means of irrigation (3,499 ha) like canals, dug wells etc. In Tekkali the gross irrigated area was 5,920 ha; area irrigated more than once was 618 ha. The major irrigation source was rain, besides other means of irrigation (5,302 ha) like canals, dug wells etc. In Srikakulam, the gross irrigated area was 8,578 ha; area irrigated more than once was 635 ha. The major irrigation source was rain, besides other means of irrigation (7,938 ha) like canals, tanks etc. In Saravakota the gross irrigated area was 5,562 ha; area irrigated more than once was 293 ha. The major irrigation source was rain, besides other means of irrigation (4,979 ha) like canals, tanks etc.

4.2.4 Land holding Particulars

Most of the farmers in the selected mandals were marginal farmers. In Narasannapeta mandal marginal farmers (11,461), followed by small farmers (1,902) followed by semi medium and medium farmers with (674) and (140) respectively. In Palasa marginal farmers (14,653), followed by small farmers (1,451) followed by semi medium and medium farmers with (338) and (45) respectively and large farmers (5) were present. In Rajam marginal farmers (10,028), followed by small farmers (1,701) followed by semi medium and medium farmers with (563) and (109). In Tekkali, marginal farmers (12,397), followed by small farmers (1,790) followed by semi medium and medium farmers with (524) and (108) respectively. In Srikakulam, marginal farmers (13,017), followed by small farmers (2,033) followed by semi medium and medium farmers with (597) and (107) respectively. In Saravakota mandal marginal farmers (9,526), followed by small farmers (1,833) followed by semi medium and medium farmers with (640) and (123) respectively. In the selected mandals very meagre per cent of large farmers ranges from 6 to 16 in number.

4.2.5 Rainfall particulars

In Narasannapeta mandal during 2015-2016 year the normal rainfall is 1147.2mm and actual is 884.0 and the percentage of deviation from normal to actual rainfall is -23. In Palasa the normal rainfall is 1285.7mm and actual is 893.1mm and the percentage of deviation from normal to actual rainfall is -31. In Tekkali the normal rainfall is 1272.3mm and actual is 931.0 mm and the percentage of deviation from normal to actual rainfall is -27. In Rajam the normal rainfall is 1029.2 mm and actual is 853.6 mm and the percentage of deviation from normal to actual rainfall is -17. In Srikakulam the normal rainfall is 1022.4 mm and actual is 972.1 mm and the percentage of deviation from normal to actual rainfall is -5. In Saravakota the normal rainfall is 1275.4 mm and actual is 1055.4 mm and the percentage of deviation from normal to actual rainfall is -17.

4.2.6 Agricultural implements

The list and number of various agricultural implements and farm equipment in the selected mandals are explained in Table 4.12.

It is explained from Table 4.12 that the mandals consisted of a maximum number of total ploughs/cultivars followed by wooden ploughs, no.of steel ploughs and sugarcane crushers.

4.2.7 Land utilization Pattern

The total geographical area of the Narasannapeta mandal was 11,781 ha. As per 2015-16 estimates given in, the area under forest cover was 0 ha, which formed 0 per cent of the total geographical area. The net area sown was 8813 ha and it constituted 74.80 per cent of the geographical area .The total geographical area of the Palasa mandal was 14,696 ha the area under forest cover was 1,213 ha, which formed 8.30 per cent of the total geographical area. The net area sown was 7,034 ha and it constituted 47.60 per cent of the geographical area and the cultivable waste was accounted with an area of 0 ha and constituted 0.0 per cent of the geographical area. In Tekkali mandal the total geographical area was 13,827 ha. The net area sown 7,872 ha and it constituted 56.90 per cent of the geographical area. The total geographical area of the Rajam mandal was 12,850 ha. The net area sown was 7,764 ha and it constituted

Table 4.12 Agricultural Implements of the selected mandals

S. No.	Particulars	Narasannapeta	Palasa	Tekkali	Rajam	Sriakulam	Saravakota
1	Wooden ploughs	3,731	2,245	3,552	2,407	4,461	3,100
2	Cultivators	16	6	11	6	15	571
3	Manuallyoperated Sprayers and Dusters	164	32	24	102	651	161
4	Total ploughs/Cultivators	5,427	5,427	5,287	2,485	5,065	3,787
5	Steel ploughs	313	3,176	1,724	72	589	571
6	Sugarcane crushers	11	55	10	43	74	12
7	Power operated sprayers	1	2	0	0	1	0

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District.

60.40 per cent of the geographical area and the cultivable waste was accounted with an area of 7 ha and constituted 0.10 per cent of the geographical area. In Srikakulam mandal the total geographical area was 16,149.The net area sown was 8,726 ha and it constituted 54 per cent of the geographical area and the cultivable waste was accounted with an area of 9 ha and constituted 0.10 per cent of the geographical area. The total geographical area of the Saravakota mandal was 21,415 ha. As per 2015-16 estimates given in, the area under forest cover was 3,090 ha, which formed 14.40 per cent of the total geographical area. The net area sown was 7,568 ha and it constituted 35.30 per cent of the geographical area and the cultivable waste was accounted with an area of 2,245 ha and constituted 10.50 per cent of the geographical area. This was presented in the table 4.13.

Table 4.13 Land Utilization Pattern of the selected mandals

S. No.	Particulars	Narasannapeta		Palasa		Tekkali		Rajam		Sriakulam		Saravakota	
		Area in ha	% to total geographical area	Area in ha	% to total geographical area	Area in ha	% to total geographical area	Area in ha	% to total geographical area	Area in ha	% to total geographical area	Area in ha	% to total geographical area
1	Total geographical area	11,781		14,696		13,827		12,850		16,149		21,415	
2	Area under forests	0	0.0	1,213	8.30	2,012	14.60	0	0.00	0	0.00	3,090	14.40
3	Barren and uncultivable land	39	0.3	1,992	13.6	502	3.60	281	2.20	1,679	10.40	7,568	35.30
4	Land put to non-agricultural uses	2,164	18.40	2,498	17.00	2,284	16.50	1,612	12.50	5,143	31.90	2,245	10.50
5	Cultivable waste	15	0.1	0	0.00	0	0.00	7	0.10	9	0.10	15	0.10
6	Permanent pastures and grazing lands	3	0.0	0	0.00	22	0.20	74	0.60	8	0.10	15	0.10
7	Land under miscellaneous tree crops and grooves not included in net sown area.	48	0.4	16	0.10	0	0.00	1,166	9.10	250	1.60	125	0.60
8	Current fallows	67	0.6	1670	11.40	1,014	7.30	1,794	14.00	15	0.10	20	0.10
9	Other fallow lands	632	5.4	273	1.90	121	0.90	152	1.20	310	1.90	566	2.60
10	Net area sown	8,813	74.80	7,034	47.60	7,872	56.90	7,764	60.40	8,726	54.00	7,771	36.30
11	Total cropped area	13,728	116.50	8,592	58.50	10,535	76.20	10,616	82.60	12,938	80.10	9,818	45.90
12	Area sown more than once	4,915	41.70	1,558	10.60	2,663	19.30	2,852	22.20	4,212	26.10	2,047	9.60
13	Fish &Prawn culture	0	0.00	0	0.00	0	0.00	0	0.00	9	0.10	0	0.00

Source: Hand Book of Statistics 2016, Chief Planning Office, Srikakulam District

Chapter – V

Results and Discussion

Chapter – V

RESULTS AND DISCUSSION

The chapter results and discussion presents the results of analysis, interpretation and discussion in the following various sub–heads for better understanding and convenience.

5.1 Socio economic profile of sample farmers

5.2 Various Tenancy Patterns in the study area

5.3 Costs and returns of Tenant Farming

5.4. Profitability of the Cropping Pattern

5.5 Resource use efficiency of Tenant Farming

5.6 Factors effecting the viability of Tenant Farmers And Tenant Farm Households

5.7 Constraints faced by the Tenant Farmers

5.1 SOCIO ECONOMIC PROFILE OF SAMPLE FARMERS

The socio economic features of tenant farmers and tenant households mainly age, education, farm size, assets, experience in farming practice, etc., are analyzed for their impact as they play a key role in assessment of viability.

5.1.1 Farm Holding

Srikakulam district was reported to have disturbuted loan eligibility cards to 64,000 tenant farmers. A sample of 120 tenant farmers was drawn from the selected 12 villages based on the highest number of LEC cards.The average farm holding of the sample farmers was 0.63 hectares as denoted in table 5.1.

Table 5.1 Farm holding particulars of the sample farmers (n=120)

S. No.	Particulars	Area (ha)
1	Leased- in land	76.36
2.	Leased – out land	0
3.	Total Operational farm holding	76.36
4.	Average farm holding	0.63

Source: Field Survey

The total operational farm holding of the sample farmers was 76.36 hectares, there was no incidence of leased out land by the sample farmers. This indicates agriculture was the main occupation for them and majority of them constituted the marginal farmer category in the study area. This revealed the fact that the tenant farmers constituted to the category of marginal farmers in the study area(GOAP 2015-16).

5.1.2 Family Composition

The family composition of the tenant farmers had a bearing on their livelihood and income generation. The particulars of the sample farmers was depicted in Table 5.2 The average size of the family was 5. Out of the total 120, males constitute 47.36 and females 31.57 while dependent children accounted for 21 per cent.

Table 5.2 Family composition of the sample farmers (n=120)

S. No.	Particulars	No	Per cent to total
1.	Males	270	47.36
2.	Females	180	31.57
3.	Children	120	21.07
	Total	570	100.00
	Average Family size	5	

Source: Field Survey

5.1.3 Age

The experience of the tenant farmers is attributed by his age. The Table 5.3 presents the particulars of the age, about 68 per cent of farmers were between age group of 30 to 60 years because of their skill sets only in farming, while the remaining 32 per cent of the tenant farmers were up to 30 years which indicates that youth have fond of agriculture as an occupation by taking land for lease. There is a disinterest in farmers above 60 years on tenancy due to issues of oldage and health.

Table 5.3 Particulars of age of the sample farmers (n=120)

S. No.	Age in years	No	Per cent to total
1.	Up to 30	38	31.67
2.	30 -60	82	68.33
3.	Above 60 years	0	0
	Total	45	100.00

Source: Field Survey

5.1.4 Literacy Level

Education plays a significant role in the attitude, adoption and gaining knowledge. The literacy level of sample farmers was given in Table 5.4. The sample depicted 91 per cent of literacy of which 52 per cent had secondary education, followed by primary education, which constituted 38 per cent. Higher education constituted 4.16 per cent in tenant farming. The Illiterates accounted for 5.83 per cent. The analysis brings out the fact that with adequate awareness, conduct of training programmes and provision of inputs to the tenant farmers can be moulded for adoption of profitable technology.

Table 5.4 Literacy level of sample farmers (n=120)

S. No.	Particulars	No	Per cent to total
1.	Illiterates	7	5.83
2.	Primary (0-5)	46	38.33
3.	Secondary (5-10)	62	51.68
4.	Higher (10+2)	5	4.16
	Total		100

Source: Field Survey

Thus, it is noted that most of the farmers under tenancy had secondary education followed by primary education.

5.1.5 Structure of Farm Assets

The structure of farm assets of the tenant farmers was presented in Table 5.5. The current value of the existing market price of the implements (sickles, handhoe, plough) and machinery (power operated sprayer) available with the tenant farmers were accounted for 3,24,420. Equipments in the form of power operated sprayer were disturbuted to 26 LEC holders by the department. The tenant farmers utilized the equipment as off farm income.

Table 5.5 Structure of Farm Assets of sample farmers (n=120)

S. No.	Particulars	Value	Per cent to total
1	Implements	77,420	23.86
2.	Equipment	2,47,000	76.14
	Total	3,24,420	100

Source: Field Survey

5.2 TENANCY PATTERN

An overview of tenancy patterns pertaining to the sample tenant farms is presented in table 5.6 There are different types of tenancy pattern based on that the owners extend the leasing of land to the tenants in the study area depicted in Fig 5.1.

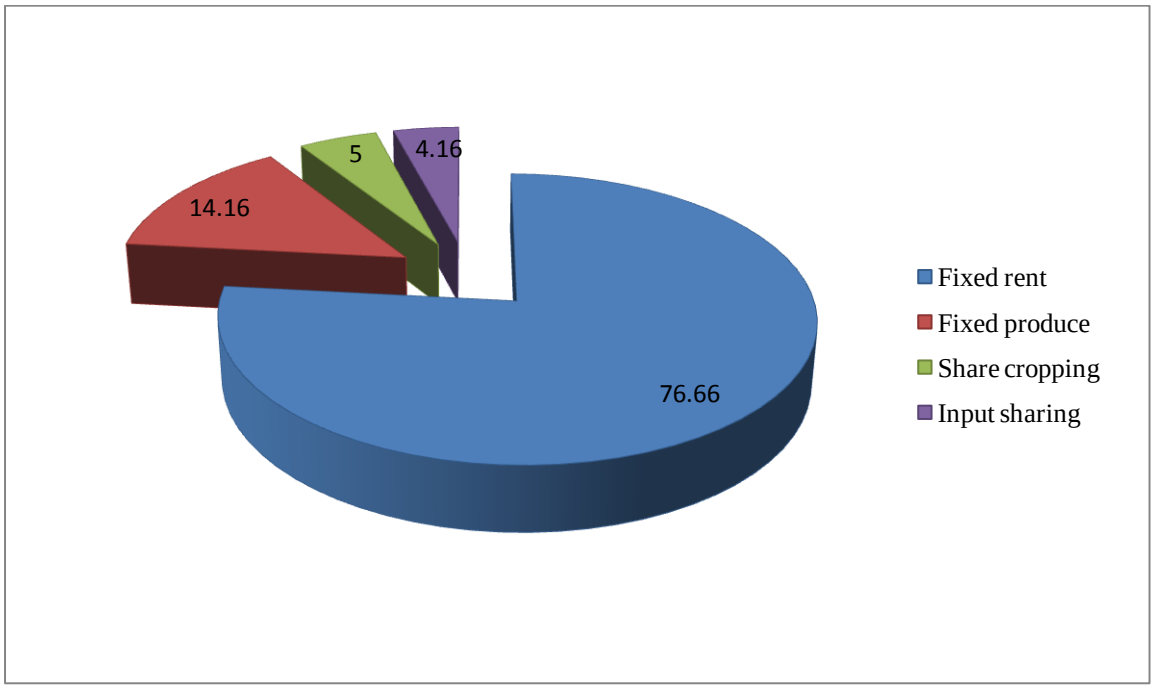

Figure 5.1 Types of Tenancy Pattern of the Sampled Farmers

Table 5.6 Types of Tenancy Pattern (n=120)

Tenancy pattern	Number	Percentage
Fixed rent	92	76.66
Fixed produce	17	14.16
Share cropping	6	5
Input sharing	5	4.16
Total	120	100

Source: Field Survey

From Table 5.6, fixed rent (77) was the most predominant pattern followed by the remaining practices put together account for 23 per cent fixed produce (14), sharecropping (5) and input sharing (4). The above findings were similar to the studies of Sonalbhatt (2008) and reports of NSSO 70 th round (2012-13)

5.3 COST OF CULTIVATION

The essence of studies on cost of cultivation was to asess the profitability of enterprise by sale of the produce and net income or profit derived therefore each crop was considered as an enterprise. Thus the cost of cultivation has been presented for the crops of Rice, Rice fallow Blackgram, Sesamum, Maize.

The variable costs accounted for the major share of the cost of cultivation and accounted for 74 per cent while the fixed costs accounted for 26 per cent. The machine labour constituted to 20 per cent as the tenant farmer had to incur for the rental charges of equipment on hourly basis viz tractor, winnower, threshers.

Table 5.7 Cost of Cultivation of Rice (Rs/ha.)

S. No.	Particulars		
	Variable cost	**Cost**	**Per cent to total cost**
1.	Seeds	2,010.83	3.44
2.	Human labour		
a.	Hired human labour	5,098.61	8.74
b.	Imputed tenant family labour	8,085.04	13.86
c.	Management charges of imputed family labour	5,299.36	9.09
3.	Animal power	0	0
4.	Machine power	11,800	20.24
5.	Manures	1,318.75	2.26
6.	Fertilizers	5,672.29	9.73
7.	Pesticides	1,557.12	2.67
8.	Irrigation charges	1,856.53	3.18
9.	Interest on working capital	515.20	0.88
	Sub total (A)	**43,213.73**	**74.13**
	Fixed cost		
1.	Rental value of leased in land	14,395.83	24.69
2.	Depreciation	125.91	0.21
3.	Interest on fixed capital	557.40	0.95
4.	Land Revenue	-	-
	Sub total (B)	**15,079.14**	**25.86**
	Total cost of cultivation (A+B)	**58,292.87**	100

The tenant farmer has to bear the Rental value of leased in land which contributed to the major share among fixed costs i.e, 24 per cent. Tenant farmer has no role to play in the payment of land revenue.

Cost concepts for the crops of Rice, Rice fallow Blackgram, Sesamum and Maize was computed to work out the Farm income measures. From the Table 5.8 the important costs in paddy cultivation of the sampled farmers are rent paid for leased land 14,395.83 Rs /ha (24.6 %) followed by machine power charges 1,318.75 Rs /ha

(20.24 %), hired human labour 5,098.61 Rs /ha (8.74 %), Fertilizers 5,672.29 Rs /ha (9.73%), irrigation charges 1,856.53 Rs /ha (3.18%), insecticides and pesticides 1,557.12Rs/ha (2.67%).It is evident that Cost A_1 included all the variable costs, depreciation and land revenue which was worked out to be Rs. 29,955.24. Cost A_2 included Cost A_1 and rent paid for leased in land is Rs 44,351.07. Cost B_1 included Cost A1and interest on fixed capital is Rs 44,908.47.Cost B2 included Cost B_1 and rental charges which was worked out to be Rs.44,908.47. Cost C_1 included Cost B_1 and imputed value of family labor which was worked out to be Rs. 52,993.51. As cost B_1 and cost B_2 is equal the cost C_1 and C_2 is equal i.e, Rs. 52,993.51 which is equal to the total cost of cultivation. Cost C_3 was computed with sum of Cost C_2 and 10 % of Cost C_2 which was Rs.58,292 in rice.The cost components of rice is depicted in Fig 5.2.

Table 5.8 Cost concepts of Rice (Rs/ha.)

S. No.	Particulars	Cost	Per cent to total cost C3
1.	Seed	2,010.83	0.03
2.	Hired human labour	5,098.61	8.74
3.	Animal power	0	0
4.	Machine power	11,800	20.24
5.	Manures	1,318.75	2.26
6	Fertilizers	5,672.29	9.73
7	Insecticides and pesticides	1,557.12	2.67
8.	Irrigation	1,856.53	
9.	Depreciation	125.91	0.2
10.	Interest on working capital	515.20	0.88
11.	Land revenue	-	-
I	**Cost A_1**	29,955.24	51.38
12	Rent paid for leased in land	14,395.83	24.6
II	**Cost A_2**	44,351.07	76.39
13.	Interest on fixed capital	557.40	0.95
III	**Cost B_1**	44,908.47	52.34
14	Rental value of owned land	0	0
IV	**Cost B_2**	44,908.47	52.34
15	Imputed value of family labour	8,085.04	13.86
	Cost C_1	52,993.51	90.90
	Cost C_2	52,993.51	90.90
	Cost C_3	**58,292.87**	100

Source: Field Survey

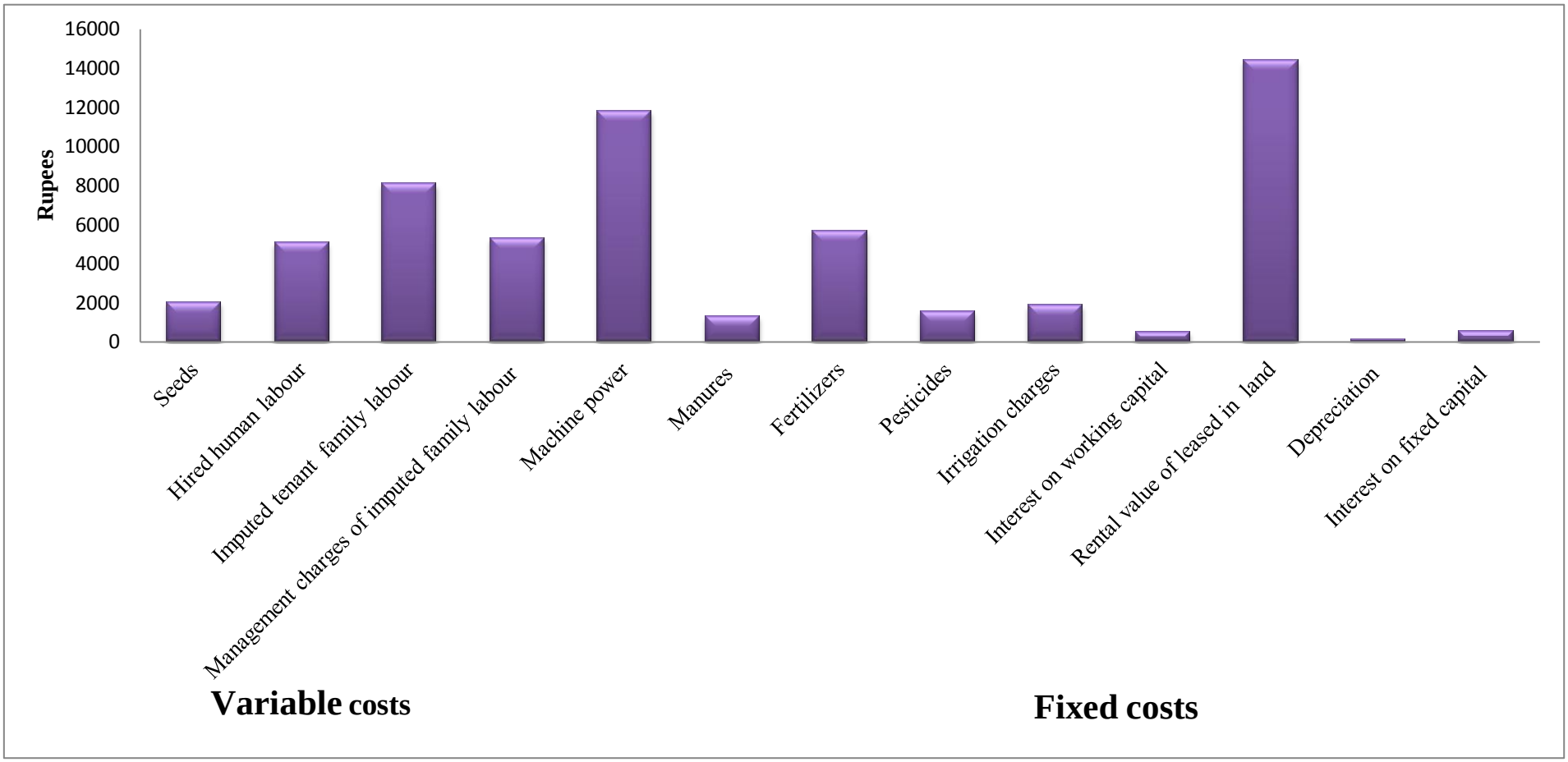

Figure 5.2 Cost components of Cost of cultivation of Rice

The different farm income and profitability measures estimated for each crop which is cultivated in the tenant farm holding. They were Gross income, farm business income, family labour income, Net income, farm investment income, and net benefit cost ratio. From the table 5.9 the gross income is 64,900 Rs/ha, farm business income is 20,549 Rs/ha, family labour income i.e. 19,992 Rs/ha, net income is 6,607 Rs/ha, farm investment income is 557 Rs/ha and net benefit cost i.e. 0.12 for rice.

Table: 5.9 Farm income measures of Rice

S. No.	Particulars	In Rs.
1	Total costs	58,292.00
2	Gross Income	64,900.00
3	Farm Business Income	20,549.00
4	Family Labour Income	19,992.00
5	Net Income	6,607.00
6	Farm Investment Income	557.00
7	Net Benefit Cost Ratio	0.12

Source: Field Survey

Table 5.10 Cost of Cultivation of Rice Fallow Blackgram (Rs/ha.)

S. No.	Particulars		
	Variable Cost	Cost	Per cent to total cost
1.	Seeds	918.91	4.30
2.	Human labour		
a.	Hired human labour	1,655.26	7.75
b.	Imputed family labour	8,276.27	38.79
C	Management charges of the imputed labour	1,939.35	9.09
3.	Animal power	0	0
4.	Machine power	0	0
5.	Manures	0	0
6.	Fertilizers	0	0
7.	Pesticides	895.49	4.19
8.	Irrigation charges	954.95	4.47
9.	Interest on working capital	78.42	0.36
	Sub total (A)	**14,718.65**	**68.99**

S. No.	Particulars		
	Variable Cost	**Cost**	**Per cent to total cost**
	Fixed cost		
1.	Rental value of leased in land	6,000	28.12
2.	Depreciation	56.78	0.26
3.	Interest on fixed capital	557.40	2.61
4.	Land revenue	-	
	Sub total (B)	**6,614.18**	**31.00**
	Total cost of cultivation (A+B)	**21,332.82**	100

From the table 5.11 the important costs in rice fallow Blackgram cultivation of the sampled farmers are rent paid for leased land 6,000Rs /ha (28.12 %) followed by hired human labour 1,655.2 Rs /ha (7.75 %), seed cost 918.91Rs/ha (4.30%), irrigation charges 954.95 Rs /ha (4.47%), insecticides and pesticides 895.49 Rs/ha (4.19%).It is evident that Cost A_1 included all the variable costs, depreciation and land revenue which was worked out to be Rs 4,559.81. Cost A_2 included Cost A_1 and rent paid for leased in land is Rs 10,559.81. Cost B_1 included Cost A_1 and interest on fixed capital is Rs 11,117.21.Cost B_2 included Cost B_1 and rental charges of owned land which was worked out to be Rs.11,117.21 i.e. cost B_2. Cost C_1 included Cost B_1 and imputed value of family labour which was worked out to be Rs. 19,394.48. Cost C_2 is Rs. 19,394.48 which is equal to the total cost of cultivation. Cost C_3 was computed with sum of Cost C_2 and 10 % of Cost C_2 which was Rs.21,333.83 in rice fallow blackgram. The cost components of rice fallow blackgram is depicted in Fig 5.3.

Table 5.11 Cost concepts of Rice Fallow Black gram (Rs/ha)

S. No.	Particulars		
		Cost	Per cent to total cost C3
1.	Seed	918.91	4.30
2.	Hired human labour	1,655.26	7.75
3.	Animal power	0	0’
4.	Machine power	0.00	0
5.	Manures	0.00	0
6	Fertilizers	0	0
7	Insecticides and pesticides	895.49	4.19
8.	Irrigation	954.95	4.47
9.	Depreciation	56.78	0.26
10.	Interest on working capital	78.42	0.36
11.	Land revenue	-	-
	Cost A_1	4,559.81	21.37
12	Rent paid for leased in land	6,000	28.12
	Cost A_2	10,559.81	49.50
13.	Interest on fixed capital	557.40	2.61
	Cost B_1	11,117.21	52.11
	Rental value of owned land	0	0
	Cost B_2	11,117.21	52.11
	Imputed value of family labour	8,276.27	38.7
	Cost C_1	19,393.48	90.90
	Cost C_2	19,393.48	90.90
	Cost C_3	**21,332.83**	100

Source: Field Survey

The farm income measures estimated were Gross income, farm business income, family labour income, Net income, farm investment income, Net benefit cost ratio. From the table 5.12 the gross income is 26,993 Rs/ha, farm business income is 16,433 Rs/ha, family labour income i.e. 15,876 Rs/ha, net income is 5,659 Rs/ha, farm investment income is 557 Rs/ha and net benefit cost i.e.,0.29 for rice fallow blackgram.

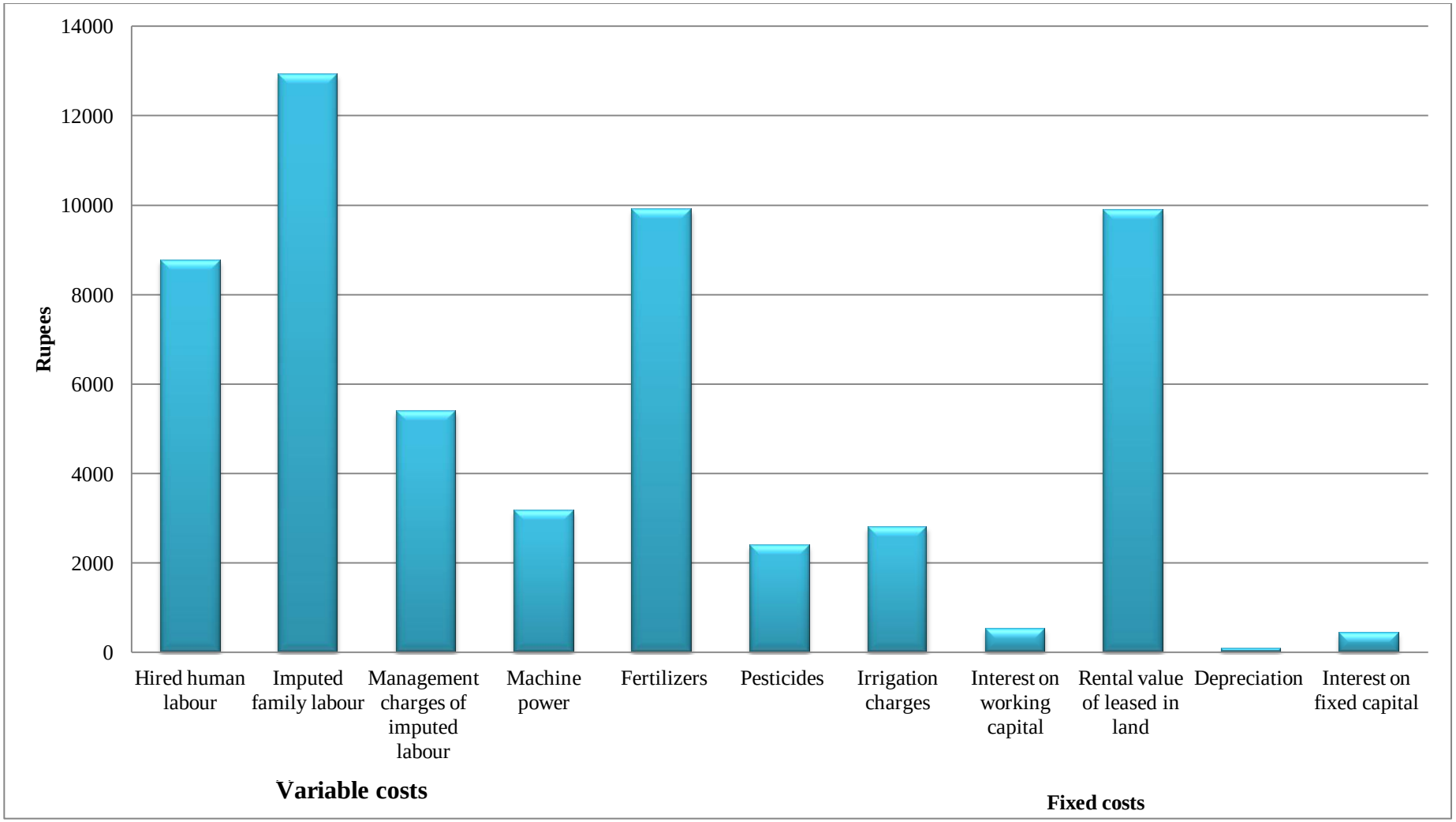

Figure 5.3 Cost components of cost of cultivation of Rice fallow Blackgram

Table 5.12 Farm income measures of rice fallow blackgram

S. No.	Particulars	In Rs.
1	Total Costs	21,333.00
2	Gross Income	26,993.00
3	Farm Business Income	16,433.00
4	Family Labour Income	15,876.00
5	Net Income	5,659.00
6	Farm Investment Income	557.00
7	Net Benefit Cost Ratio	0.29

Source: Field Survey

Table 5.13 Cost of Cultivation of Sesamum (Rs/ha.)

S.No.	Particulars		
	Variable cost	**Cost**	**Per cent to total cost**
1.	Seeds	837.30	2.82
2.	Human labour	-	
a.	Hired human labour	4,104.7	13.83
b.	Imputed family labour	7,623.02	25.70
c.	Management charges of imputed labour	2,696.43	9.09
3.	Animal power	0	0
4.	Machine power	1,231.41	4.15
5.	Manures	0	0
6.	Fertilizers	2,645.23	8.91
7.	Pesticides	1,444.29	4.86
8.	Irrigation charges	880.95	2.97
9.	Interest on working capital	196.17	0.66
	Sub total (A)	**21,659.5**	**73.02**
	Fixed cost		
1.	Rental value of leased in land	7,500	25.28
2.	Depreciation	65.78	0.22
3.	Interest on fixed capital	435.46	1.46
4.	Land revenue	-	
	Sub total (B)	**8,001.24**	**29.97**
	Total cost of cultivation (A+B)	**29660.74**	100

From the table 5.14 the important costs in sesamum cultivation of the sampled farmers are rent paid for leased land 7,500 Rs /ha (25.2 %) followed by hired human labour 4,104.7 Rs /ha (13.8%), machine power charges 1,231.41 Rs/ha (4.15%), seed cost 837.30 Rs/ha (2.82%), fertilizers 2,645.23 Rs/ha (8.91%), irrigation charges 880.95 Rs /ha (2.97%), insecticides and pesticides 1,444.29 Rs/ha (4.86%).It is evident that Cost A_1 included all the variable costs, depreciation and land revenue which was worked out to be Rs 11,405.83. Cost A_2 included Cost A_1 and rent paid for leased in

land is Rs 18,905.83. Cost B_1 included Cost A_1 and interest on fixed capital is Rs 19,341.29.Cost B_2 included Cost B_1 and rental charges on owned land which was worked out to be Rs.19,341.29 i.e. cost B_2.Cost C_1 included Cost B_1 and imputed value of family labour which was worked out to be Rs. 26,964.31. Cost C_2 is Rs. 26,964.31 which is equal to the total cost of cultivation. Cost C_3 was computed with sum of Cost C_2 and 10 % of Cost C_2 which was Rs.29,660.74 in sesamum. The cost components of Sesamum is depicted in Fig 5.4.

Table 5.14 Cost concepts of Sesamum (Rs/ha.)

S. No.	Particulars	Cost	Per cent to total cost C3
1.	Seed	837.30	2.82
2.	Hired human labour	4,104.7	13.8
3.	Animal power	0	0
4.	Machine power	1,231.41	4.15
5.	Manures	0	0
6	Fertilizers	2,645.23	8.91
7	Insecticides and pesticides	1,444.29	4.86
8.	Irrigation	880.95	2.97
9.	Depreciation	65.78	0.22
10.	Interest on working capital	196.17	0.66
11.	Land revenue	-	-
	Cost A_1	11,405.83	38.45
12	Rent paid for leased in land	7,500	25.2
	Cost A_2	18,905.83	63.74
13.	Interest on fixed capital	435.46	1.468
	Cost B_1	19,341.29	65.20
	Rental value of owned land	0	0
	Cost B_2	19,341.29	65.20
	Imputed value of family labour	7,623.02	25.70
	Cost C_1	26,964.31	90.90
	Cost C_2	26,964.31	90.90
	Cost C_3	**29,660.74**	100

Source: Field Survey

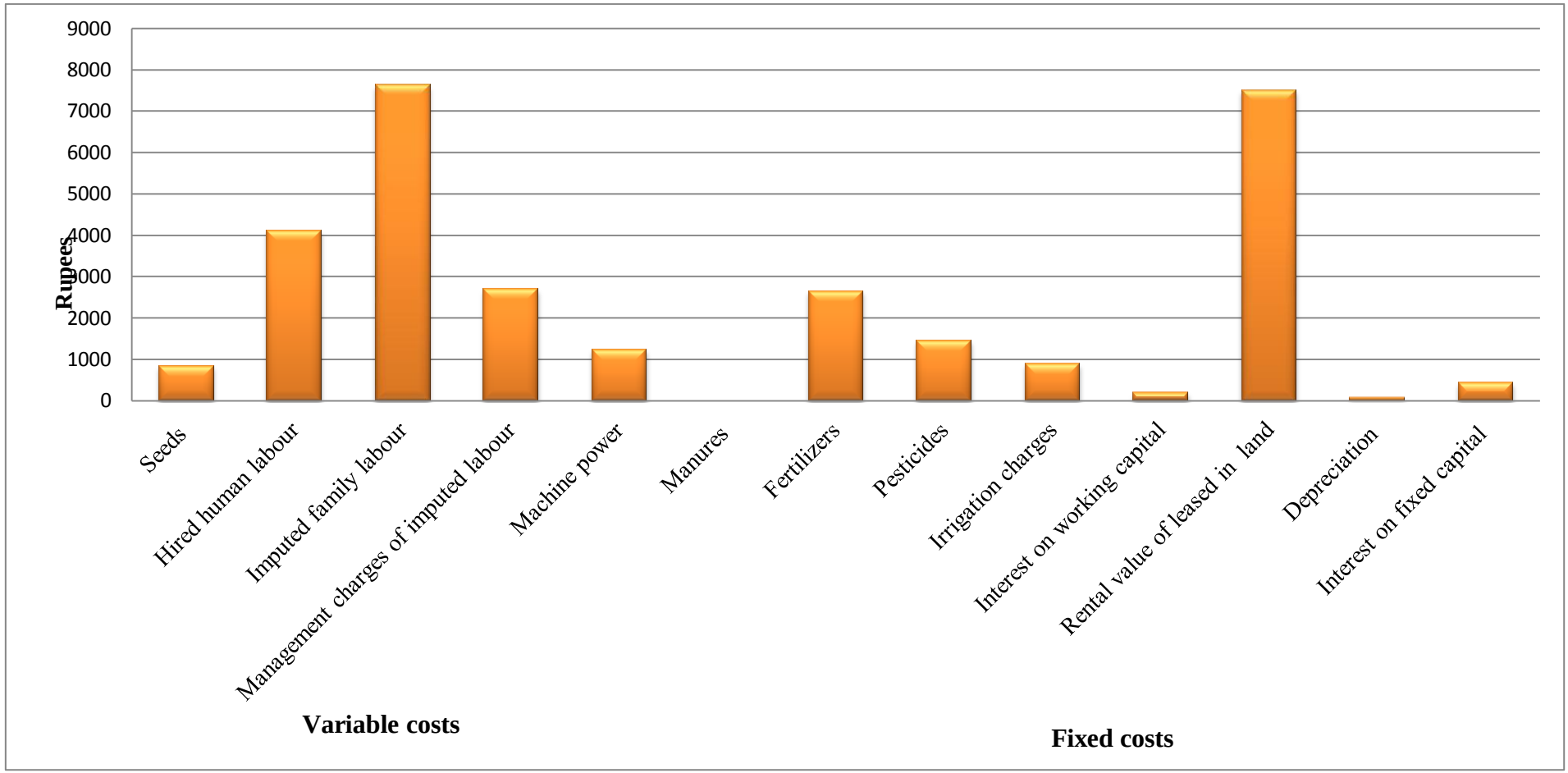

Figure 5.4 Cost components of cost of cultivation of Sesamum

The farm income measures estimated were Gross income, farm business income, family labour income, Net income, farm investment income, net benefit cost ratio. From the table 5.15 the gross income is 35,827 Rs/ha, farm business income is 16,921 Rs/ha, family labour income i.e. 16,486 Rs/ha, net income is 6,167 Rs/ha, farm investment income is 435 Rs/ha and net benefit cost i.e. 0.22 for sesamum.

Table 5.15.Farm income measures of Sesamum

S. No.	Particulars	In Rs.
1	Total Costs	29,660.00
2	Gross Income	35,827.00
3	Farm Business Income	16,921.00
4	Family Labour Income	16,486.00
5	Net Income	6,167.00
6	Farm Investment Income	435.00
7	Net Benefit Cost Ratio	0.22

Source: Field Survey

Table 5.16 Cost of Cultivation of Maize (Rs/ha.)

S. No.	Particulars		
	Variable cost	Cost	Per cent to total cost
1.	Seeds	2,971.62	5.01
2.	Human labour		
a.	Hired human labour	8,759.55	14.77
b.	Imputed family labour	12,926.58	21.80
c.	Management charges of imputed labour	5,388.54	9.09
3.	Animal power	0	
4.	Machine power	3,166.66	5.34
5.	Manures	0	
6.	Fertilizers	9,912.82	16.72
7.	Pesticides	2,390.56	4.03
8.	Irrigation charges	2,807.69	4.73
9.	Interest on working capital	526.69	0.88
	Sub total (A)	**48,850.71**	**82.41**

S. No.	Particulars		
	Variable cost	**Cost**	**Per cent to total cost**
	Fixed cost		
1.	Rental value of leased in land	9900	16.70
2.	Depreciation	87.79	0.14
3.	Interest on fixed capital	435.46	0.73
4.	Land revenue	-	-
	Sub total (B)	**10,423.25**	**17.58**
	Total cost of cultivation (A+B)	**59,273.96**	100

From the table 5.17 the important costs in maize cultivation of the sampled farmers are fertilizers 9,912.82 Rs/ha (16.72%), rent paid for leased land 9,900 Rs /ha (16.70%) followed by hired human labour 8,759.55 Rs /ha (14.77 %), irrigation charges 2,807.69 Rs /ha (9.59 %), machine power charges 3,166.66 Rs/ha (5.34%), seed cost 2,971.62 Rs/ha (5.01%), insecticides and pesticides 2,390.56 Rs/ha (4.03%). It is evident that Cost A_1 included all the variable costs, depreciation and land revenue which was worked out to be Rs.30,623.38. Cost A_2 included Cost A_1 and rent paid for leased in land is Rs 40,523.38. Cost B_1 included Cost A_1 and interest on fixed capital is Rs 40,958.84.Cost B_2 included Cost B_1 and rental charges of owned land which was worked out to be Rs.40,958.84 i.e. cost B_2. Cost C_1 included Cost B_1 and imputed value of family labour which was worked out to be Rs. 43,985.42. Cost C_2 is Rs. 53,885.42 which is equal to the total cost of cultivation. Cost C_3 was computed with sum of Cost C_2 and 10 % of Cost C_2 which was Rs.59,273.96 in maize. The cost components of Maize is depicted in Fig 5.5.

Table 5.17 Cost concepts of Maize (Rs/ha.)

S. No.	Particulars		
		Cost	Per cent to total cost C3
1.	Seed	2,971.62	5.013
2.	Hired human labour	8,759.55	14.77
3.	Animal power	0	0
4.	Machine power	3,166.66	5.34
5.	Manures	0	0
6	Fertilizers	9,912.82	16.72
7	Insecticides and pesticides	2,390.56	4.03
8.	Irrigation	2,807.69	9.59
9.	Depreciation	87.79	0.14
10.	Interest on working capital	526.69	0.88
11.	Land revenue	-	-
	Cost A_1	30,623.38	51.66
12	Rent paid for leased in land	9,900	16.70
	Cost A_2	40,523.38	68.36
13.	Interest on fixed capital	435.46	0.73
	Cost B_1	40,958.84	69.10
	Rental value of owned land	0	0
	Cost B_2	40,958.84	69.10
	Imputed value of family labour	12,926.58	21.80
	Cost C_1	53,885.42	90.90
	Cost C_2	53885.42	90.90
	Cost C_3	**59,273.96**	100

Source: Field Survey

The farm income measures estimated were Gross income, farm business income, family labour income, Net income, farm investment income, net benefit cost ratio. From the table 5.18 the gross income is 88,667 Rs/ha, farm business income is 48,143 Rs/ha, family labour income i.e. 47,708 Rs/ha, net income is 29,393 Rs/ha, farm investment income is 435 Rs/ha and net benefit cost i.e 0.54 for maize.

Table 5.18. Farm income measures of Maize

S. No.	Particulars	In Rs.
1	Total Costs	59,273.00
2	Gross Income	88,667.00
3	Farm Business Income	48,143.00
4	Family Labour Income	47,708.00
5	Net Income	29,393.00
6	Farm Investment Income	435.00
7	Net Benefit Cost Ratio	0.54

Source: Field Survey

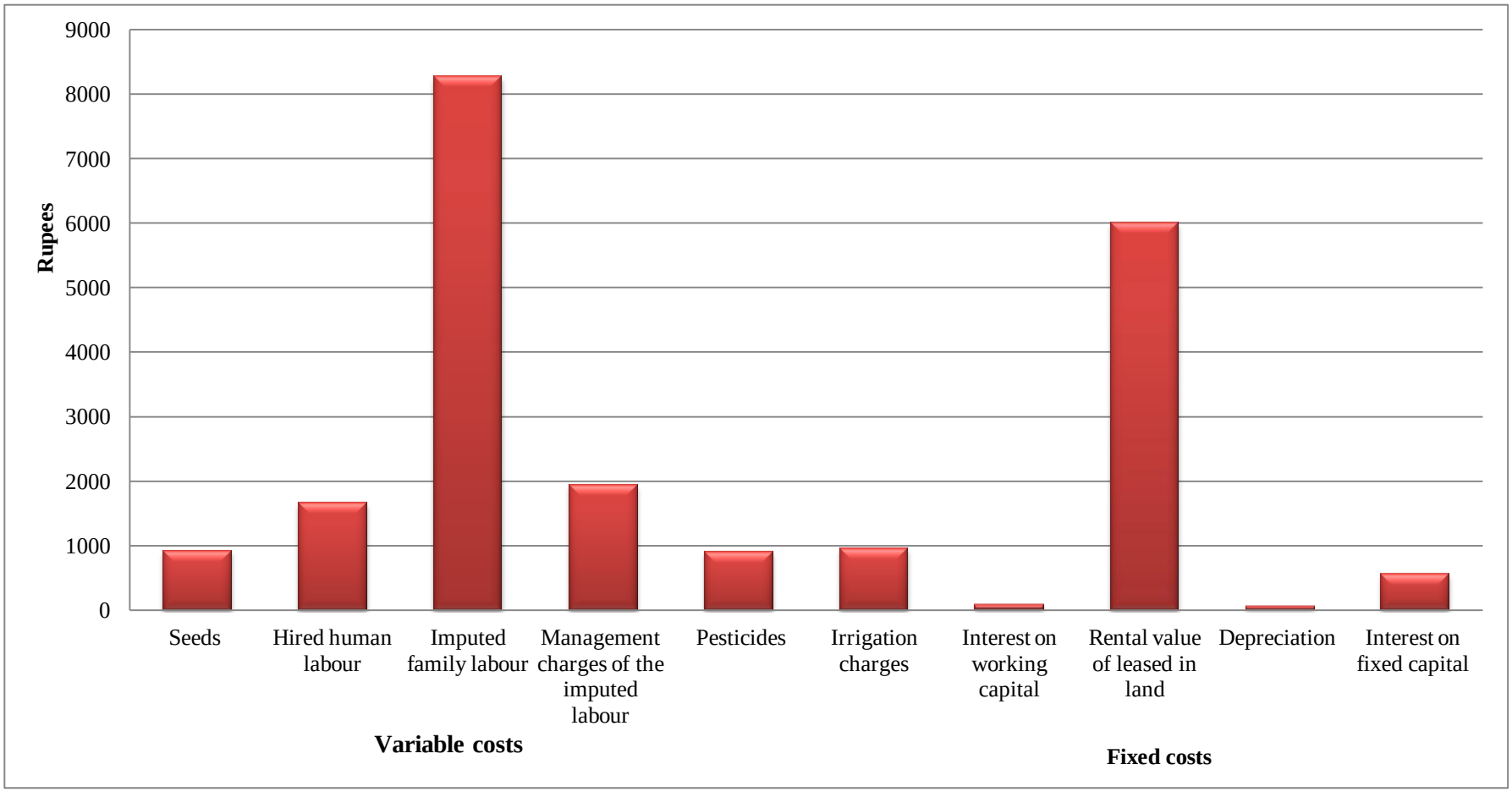

Figure 5.5 Cost components of cost of cultivation of Maize

5.4. Profitability of the Cropping Pattern

From the tables 5.19, 5.20, 5.21, 5.22, 5.23 the Net income was high under the cropping pattern of Rice - Blackgram- Maize is Rs. 41,662, followed by Rice - Maize is Rs. 36,002. The Net income for the cropping pattern Rice - Blackgram - sesamum is Rs.18,345 where as for Rice - Blackgram and Paddy-sesamum is Rs.12,268 and Rs. 12,775.

Table 5.19 Profitability of Rice- Maize

S. No.	Particulars	In Rs.
1	Total costs	1,17,565
2	Gross Income	1,53,567
3	Net Income	36,002
4	Net Benefit Cost Ratio	0.30

Source: Field Survey

Table 5.20 Profitability of Rice -Blackgram - Sesamum

S. No.	Particulars	In Rs.
1	Total costs	1,09,285
2	Gross Income	1,27,720
3	Net Income	18,345
4	Net Benefit Cost Ratio	0.16

Source: Field Survey

Table 5.21 Profitability of Rice -Blackgram -Maize

S. No.	Particulars	In Rs.
1	Total costs	1,38,898
2	Gross Income	1,80,560
3	Net Income	41,662
4	Net Benefit Cost Ratio	0.29

Source: Field Survey

Table 5.22 Profitability of Rice - Blackgram

S. .No.	Particulars	In Rs.
1	Total costs	79,625
2	Gross Income	91,893
3	Net Income	12,268
4	Net Benefit Cost Ratio	0.15

Source: Field Survey

Table 5.23 Profitability Of Rice - Sesamum

S. No.	Particulars	In Rs.
1	Total costs	87,952
2	Gross Income	1,00,727
3	Net Income	12,775
4	Net Benefit Cost Ratio	0.14

Source: Field Survey

5.5. RESOURCE USE EFFICIENCY OF TENANT FARMING

5.5.1 Resource Use Efficiency of Rice

Resource use efficiency was analyzed using Cobb-Douglas production function analysis. This study on resource returns, returns to scale and resource use efficiency of an enterprise clearly reveals whether the inputs are used efficiently in obtaining the output. These estimates include the value and sign of the coefficients, the significance of the coefficients, the R^2 to analyze goodness of fit of the model. The resource use efficiency of rice is presented in Table 5.24.

Table 5.24 Production elasticities of Rice

Variables	Coefficients	P value
Intercept (a)	4.975	0.000***
Seed cost in Rs/ha (X_1)	0.099	0.069
Manures in Rs/ha (X_2)	0.040	0.017***
Machine labour charges in Rs/ha (X_3)	0.198	0.000***
Human labour charges in Rs/ha (X_4)	0.093	0.009***
Irrigation charges in Rs/ha (X_5)	0.080	0.000***
Chemical fertilizers in Rs/ha (X_6)	0.142	0.021**
Plant protection chemicals in Rs/ha (X_7)	0.023	0.157*

Farm size in ha (X_8)	0.002	0.868
Sum of elasticities (Σb_i)	0.68	
R^2	0.95	

***Significant at 1% level of significance
**Significant at 5% level of significance
*Significant at 10% level of significance

The R^2 values indicates the proportion of the total variation in output by independent variables. The co-efficient of multiple determination (R^2) values was 0.95 and indicated that about 95 per cent variations in the gross return was explained by the model using explanatory variables (X_1 to X_8). The high percentage value of R^2 show the good representation of the relationship between farm output and independent variables.

The production elasticities and probability values of all the parameters are tested for the significance at one per cent, five per cent and ten per cent levels i.e. ($P < 0.01$, $P < 0.05$, $P < 0.1$).Seed cost was positively influencing the output and non significant. Machine labour, human labour, irrigation and manures were positively influencing and significant at one per cent level. Chemical fertilizers were positively influencing the gross returns and significant at five per cent level. Plant protection chemicals were positively influencing and significant at one per cent level. Farm size was positively influencing and nonsignificant. Thus these inputs exert great influence on the level of output obtained by the farmers. All the included variables were positively signed. The analysis revealed that one unit increase in the quantity of X_1, X_2, X3,X4,X_5,X_6, X_7, X_8 inputs results in 0.099,0.040,0.198,0.093,0.080,0.142,0.023,0.002 per cent increase in gross returns respectively.

Returns to Scale

The sum of elasticities of production was 0.68 indicating decreasing returns to scale. It means that gross returns of rice decreased proportionately with an increase in the variable factors. The above results were similar to the studies of Phan and Akimi (2012).

5.5.2 Resource use efficiency of Black gram

The results obtained from the table 5.25 revealed that the co-efficient of multiple determination (R^2) values was 0.21 which indicate that about 21 per cent variations in the gross return were explained by the model using explanatory variables (X_1 to X_5).

The low percentage value indicate that the proportion of the total variation in output that is accounted for by the included independent variables were very less in number as it was rice fallow blackgram the farmers used less inputs withan intention to get the output by utilizing residual moisture and nutrients. Regarding the production elasticities of the equation and probability values, the seed cost was significant at one per cent level. Human labour, irrigation, plant protection chemicals and farm size were nonsignificant in that human labour amd farm size were positively influencing the gross returns. Irrigation and plant protection chemicals were negatively influencing and one unit increase in the quantity of X_3, X_4 results in 0.015, 0.538 per cent decrease in gross returns. The analysis revealed that one unit increase in the quantity of X_1, X_2, and X5 results in 0.750, 0.370, and 0.049 per cent increase in gross returns respectively.

Returns to Scale

The sum of elasticities of production was 0.61 indicating decreasing returns to scale. It means that gross returns of pulses decreased proportionately with an increase in the variable factors.

Table 5.25 Production elasticities of Blackgram

Variables	Coefficients	P value
Intercept (a)	5.167	0.046
Seed cost in Rs/ha (X_1)	0.750	0.016***
Human labour charges in Rs/ha (X_2)	0.370	0.316
Irrigation charges in Rs/ha (X_3)	-0.015	0.904
Plant protection chemicals in Rs/ha (X_4)	-0.538	0.251
Farm size in ha(X_5)	0.049	0.703
Sum of elasticities (Σb_i)	0.61	
R^2	0.21	

***Significant at 1% level of significance
**Significant at 5% level of significance
*Significant at 10% level of significance

5.5.3 Resource use efficiency of sesamum

Sesamum is the rabi crop which was grown after rice fallow pulses in the study area. From the table 5.26 the co-efficient of multiple determination (R^2) value was 0.47 which indicates that about 47 per cent variation in the gross returns was explained by the model using explanatory variables (X_1 to X_7).The production elasticities of the variables observed that seed cost was a nonsignificant factor but negatively influencing the gross returns it indicates that farmers were using more seed it leads to increase in cost of seeds. Machine labour, farm size were significant at one per cent level and five per cent level. All the variables were positively signed except irrigation cost and seed cost were negatively influencing the gross returns. In sesamum irrigation was a significant factor at ten per cent level but in our study area farmers are giving more irrigation it leads to increase in irrigation charges these results in reducing yields which will leads to decrease in gross returns.The analysis revealed that one unit increase in the quantity of X_2, X_3, X_5, X_6, X_7 results in 1.128, 0.326, 0.183, 0.174, 0.287 and per cent increase in gross returns respectively.

Returns to Scale

The sum of elasticities of production was 1.52 indicates increasing returns to scale. It means that gross returns of sesamum increased proportionately with an increase in the variable factors.

Table 5.26.Production elasticities of sesamum

Variables	Coefficients	P value
Intercept (a)	0.513	0.912
Seed cost in Rs/ha (X_1)	-0.351	0.282
Machine labour charges in Rs/ha (X_2)	1.128	0.001***
Human labour charges in Rs/ha (X_3)	0.326	0.435
Irrigation charges in Rs/ha (X_4)	-0.219	0.152*
Chemical fertilizers in Rs/ha (X_5)	0.183	0.375
Plant protection chemicals in Rs/ha (X_6)	0.174	0.331
Farm size in ha (X_7)	0.287	0.031**
Sum of Elasticities (Σb_i)	1.52	
R^2	0.47	

***Significant at 1% level of significance
**Significant at 5% level of significance
*Significant at 10% level of significance

5.5.4. RESOURCE USE EFFICIENCY OF MAIZE

According to the results from the table 5.27, the co-efficient of multiple determination (R^2) values was 0.95 it indicates that about 95 per cent variations in the gross returns was explained by the model using explanatory variables (X_1 to X_4). The high percentage values show the equations to give good representation of the relationship between farm output and the included variables. The production elasticities of the variables indicated that irrigation and chemical fertilizers were positively significant at one per cent level. Seed cost was positively influencing and it was nonsignificant. All are positively signed except labour charges significant at five per cent level and plant protection chemicals was nonsignificant and were negatively influencing the gross returns of maize. The analysis revealed that one unit increase in the quantity of X_1, X_3 results in 0.009, 1.164 per cent increase in gross returns respectively. The variables X_2, X_4 results in 0.029, 0.000 per cent decrease in gross returns respectively.

Returns to Scale

The sum of elasticities of production was 1.14 indicates increasing returns to scale. It means that gross returns of maize increased proportionately with an increase in the variable factors. The above results is accordance with the studies of Ebong *et al* (2011), Onubuogu *et al* (2014).

Table 5.27. Production elasticities of Maize

Variables	**coefficients**	**P value**
Intercept (a)	-6.462	0.000
Seed cost in Rs/ha (X_1)	0.009	0.461
Labour charges in Rs/ha (X_2)	-0.029	0.039**
Irrigation charges + Chemical fertilizers in Rs/ha (X_3)	1.164	0.000***
Plant protection chemicals in Rs/ha (X_4)	-0.0007	0.843
Sum of Elasticities (Σb_i)	1.14	
R^2	0.95	

***Significant at 1% level of significance
**Significant at 5% level of significance
*Significant at 10% level of significance

5.6. VIABILITY AND FACTORS INFLUENCING THE VIABILITY OF TENANT FARMERS

To test the viability in the study area viability was calculated by deducting domestic expenditure and debt outstanding from the total income i.e. from crops, dairy, wages, other income from business of the sample farmers.

From the table 5.28 it is observed that the net income of the farmers after deducting family expenditure and debts outstanding the farmers are in very meager surplus i.e. Rs.6,607. Without the off farm income i.e. from dairy and wages the net income is negative (Rs.-24,434).Dairy sector plays a major role in compensating the needs of the farmer by providing supplementary income to repay their loans. Chandra (2001) reported that small farms are not viable unless they are supported with some supplementary income. Singh (2012) suggested that for ensuring sustainable viability of marginal and small farmers, creation of job opportunities in rural areas along with suitable policy support for development of livestock sector and other allied activities especially dairy, goat and sheep farming would be panacea for resource-poor farming community in the future.

Table 5.28. Farm income measures (Average net income from crops, dairy after including off-farm income of farmers in Rs) (n=120)

S. No.	Particulars	Rs. per farm household
1	Total Farm Expenditure (A)	43,404
2	Total Gross Income (B)	85,804
3	Net Farm Income (A-B) = C	42,400
4	Off Farm Income (Dairy + Wages) (D)	31,041
4	Total Family Income (C+D) = E	73,441
5	Family Expenditure (F)	53,280
6	Debt Outstanding (G)	13,554
7	Net Income (E-F-G) = H	6,607
8	Net Income Excluding Off Farm Income (C-F-G)	-24,434

Source: Field Survey

5.6.1.Viability of Farmers

The NITI Aayog 2014 draft suggests four options for tracking the poor. It includes continuing with the Tendulkar poverty line, switching to the Rangarajan or other higher rural and urban poverty lines, tracking progress over time of the bottom 30 per cent of the population or tracking progress along specific components of poverty such as nutrition, housing, drinking water, sanitation, electricity and connectivity.It, however, is quick to add that while the last two options can complement the measurement of poverty using a poverty line, they cannot substitute for it. Tracking reduction in poverty requires a direct measure of poverty. This requires us to choose between the Tendulkar poverty line and the Rangarajan or higher poverty line. The current official measures of poverty are based on the Tendulkar poverty line, fixed at daily expenditure of Rs.28 in rural areas and Rs.33.3 in urban areas.This in turn raised the BPL population in India to 29.5 per cent from 21.9 per cent estimated by the Tendulkar line.

The distribution of tenant farmers into viable and non-viable classes based on economic surplus i.e average net income after deducting domestic expenditure and farm expenditure has been presented in Table 5.29. It was observed that in the sample of 120 farmers, there are 37 viable farmers and 83 non-viable farmers depicted in Fig 5.6 and the classification is based on the Tendulkar committee criteria i.e., the income of the farmers is below Rs.51,600 per farm household was considered as below poverty line. The farmers whose income below Rs.51,600 will come under non viable class and above is taken as viable farmers and it is depicted in Fig 5.7.

Table 5.29. Viability of farmers based on cropping pattern + Livestock income

S. No.	Cropping pattern	No. of farmers	Average Net income
1	Rice +Blackgram+ Without Livestock	4	4,550
2	Rice +Sesamum+ Without Livestock	0	12,472
3	Rice + Maize+ Without Livestock	6	13,560
4	Rice +Blackgram + Sesamum+ Without Livestock	3	15,342
5	Rice + Blackgram +Maize + Without Livestock	3	23,322
6	Rice +Blackgram+ Livestock	14	35,674
7	Rice +Sesamum+ Livestock	34	49,567
8	Rice + Maize+ Livestock	19	51,458
9	Rice +Blackgram + Sesamum+ Livestock	11	53,275 (viable)
10	Rice + Blackgram +Maize + Livestock	26	53,783 (viable)

Source: Field Survey

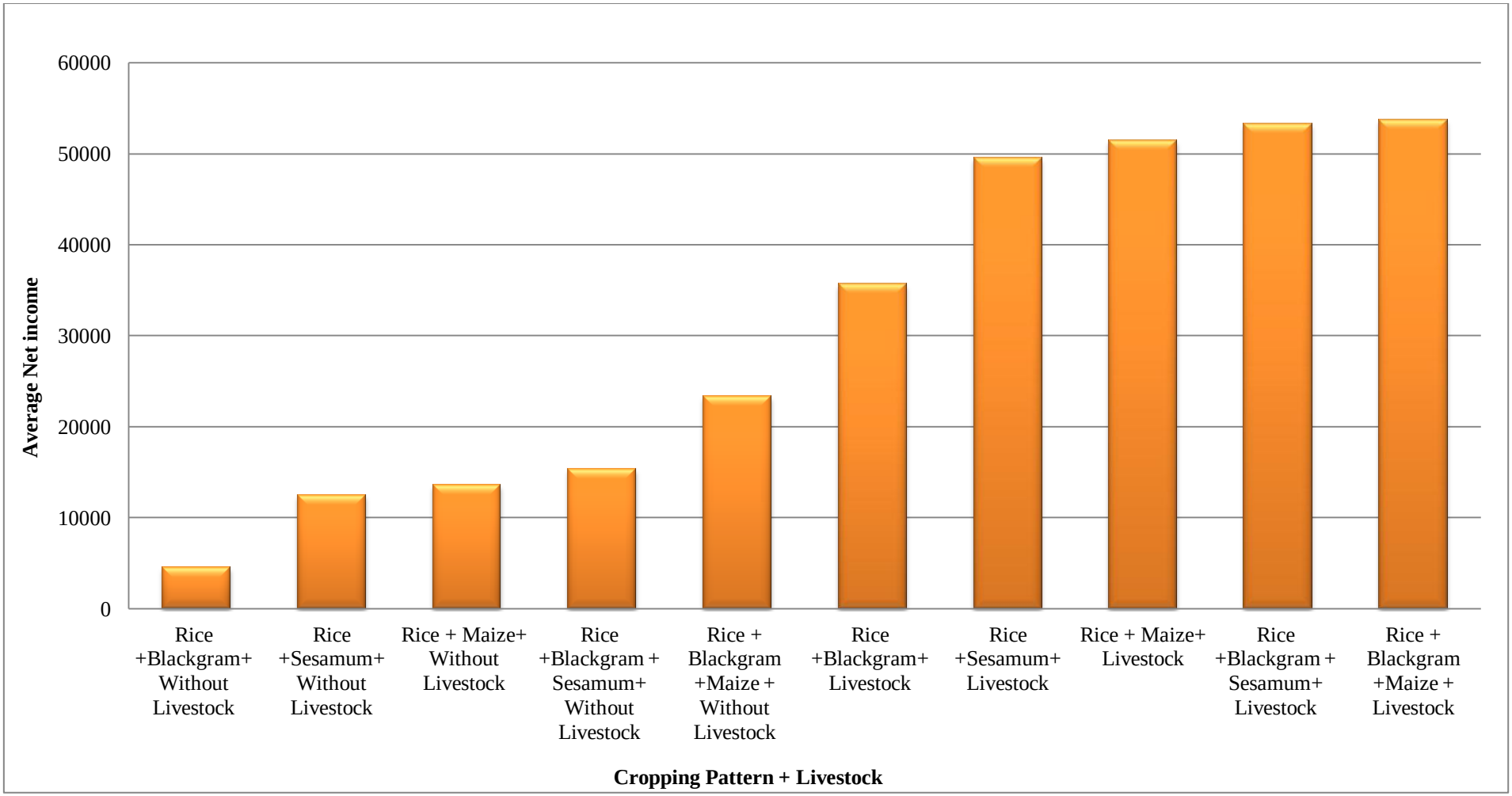

Figure 5.6 Average Net income of the Cropping pattern + Livestock

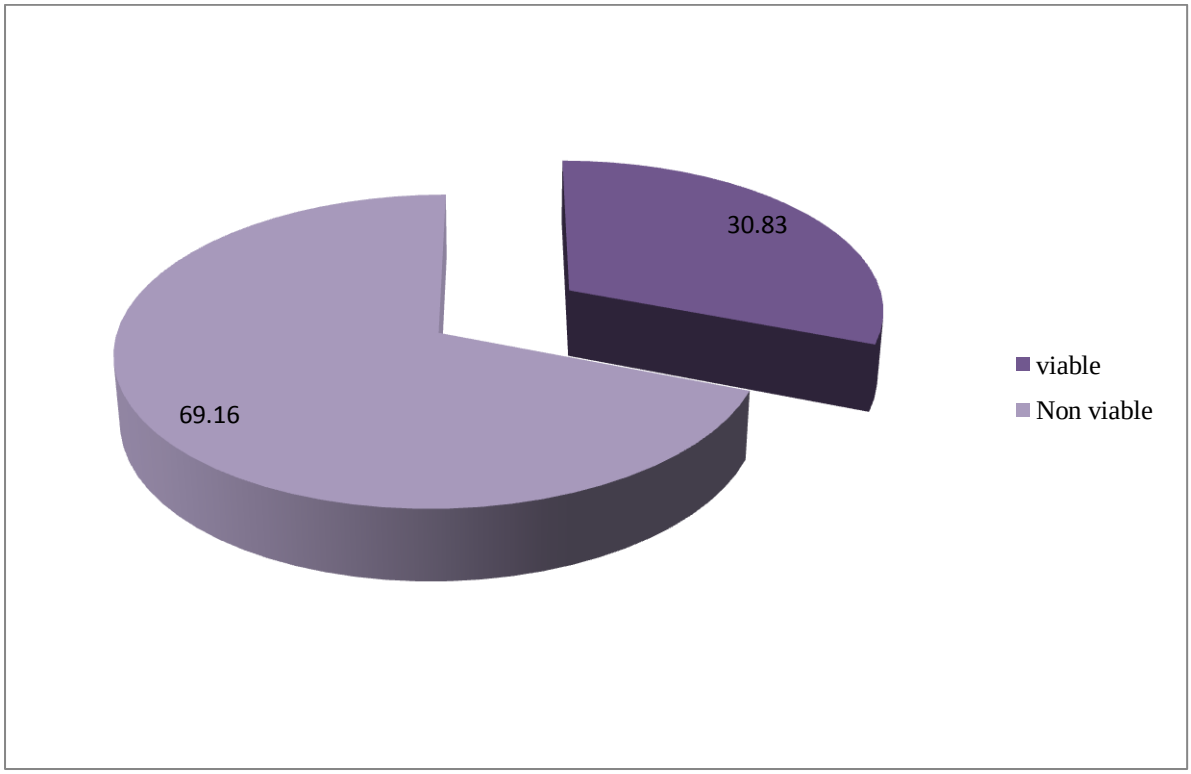

Figure 5.7 Distribution of farmers into Viable and Non viable classes

5.6.2 Factors Influencing Viability of Tenant Farmers and Tenant farm Households

The viability of tenant farmers and tenant farm households was affected by the both quantitative and qualitative factors. The parameters of the multiple linear regression model were estimated and the results are presented in Table.5.30, The influencing factors were Educational status, Farm size, Family size, Farm expenditure, Domestic expenditure, Offfarm income, Farming experience, Debt outstanding and Access to credit. The factors are subjected to Multiple linear regression model and the results are presented in table 5.30

Table 5.30 Factors influencing the Viability of Tenant farmers and Tenant Farm households

S. No.	Particulars	Coefficients	P value
1	Intercept	-20513	0.126*
2	Educational status (years)	216.8	0.726
3	Farm size (ha)	37054	0.000***
4	Family size (number)	2946.51	0.472
5	Domestic expenditure (Rs)	-0.166	0.199*
6	Farm expenditure (Rs)	-1.468	0.000***
7	Off farm income (Rs)	1.012	0.000***
8	Farming experience (years)	373.727	0.709
9	Debt outstanding (Rs)	-0.564	0.630
10	Access to credit	7460.22	0.209
	Coefficient of Multiple Determination (R^2)	0.91	

***Significant at 1% level of significance
**Significant at 5% level of significance
*Significant at 10% level of significance

Table 5.30 revealed that the coefficient of Multiple Determination (R^2) was 0.91. The variables farm size and off farm income was positively significant at one per cent level while Domestic expenditure is negatively influencing at ten per cent level. Farm expenditure was negatively influencing at one per cent level. Education, family size, farming experience were positively influencing and non significant. Debt outstanding is negatively influencing and access to credit was positively influencing but nonsignificant.

The above results are similar with the studies of Raphael *et al* (2016), Arindam and pravat (2011), Anand R.K. (2014), Islam *et. al.* (2014), Onubuogu *et.al.* (2014), Marup Hossain *et.al.*(2016), Mandeep singh *et.al.(*2009).

5.7 CONSTRAINTS OF TENANT FARMING

Constraints faced by the tenant farmers comprised of adverse climatic conditions, fluctuating market prices, lack of irrigation facilities, small size of holding, incidence of pests and diseases, limited access to farm mechanization, timely unavailability of inputs, indebtedness, level of literacy, LEC failed to serve the purpose of credit, red tapism in institutional agencies, non institutional charge, beneficiaries of the government are the actual owners and not tenant farmers, high rates of interest and unforeseen expenditure. These constraints were ranked using Garrett's ranking technique. The analytical findings are presented in the Table 5.31

Table 5.31 Constraints faced by the respondents (n=120)

S. No.	Particulars	Garetts mean score	Rank
1	LEC failed to serve the purpose of credit	0.868	I
2	Beneficiaries of the Government are the actual owners and not tenant farmers	0.854	II
3	Indebtedness	3.048	III
4	Small size of the holding	3.895	IV
5	Timely unavailability of inputs	3.916	V
6	Fluctuating market prices	4.743	VI
7	Incidence of pests and diseases	5.958	VII
8	Limited access to farm mechanization	6.194	VII
9	Adverse climatic conditions	6.701	IX
10	Lack of irrigation facilities	7.5	X
11	Red tapism in institutional agencies	8.236	XI
12	Level of literacy	8.902	XII
13	High rates of interest	10.381	XIII
14	Unforeseen expenditure	10.465	XIV

Source: Field Survey

The opinions of the 120 sample farmers subjected to Garetts ranking and the results revealed that the respondents opined that LEC fail to serve the purpose of credit and ranked first by the respondents and thus it is considered as major constraint. Beneficiaries of the Government are the actual owners not tenant farmers was ranked at second position and indebtedness is at third position. The fourth rank was small size of the holding . The fifth rank was timely unavailability of inputs. The remaining constraints in the order of ranks and the average mean score ranged from 4.74 to 10.46 were fluctuating market prices, incidence of pests and diseases, limited access to farm mechanization, adverse climatic conditions, lack of irrigation facilities, red tapism in institutional agencies, level of literacy, high rates of interest and unforeseen expenditure. The above findings are similar to the studies of Ranjana (2005), Bina Agarwal(2011), Prasad *et.al.* (2012), Annual Report of the Commission on Farmers' Welfare Land relations in Andhra Pradesh (2016-17).

ANGRAU

Chapter – VI

Summary and Conclusions

Chapter – VI

SUMMARY AND CONCLUSIONS

Indian agriculture is predominantly characterized by small and marginal farmers, growing incidence of tenancy, landlessness, high degree of fragmentation and distribution of operated holdings, which have direct impact on farm production and rural household income. The high dependence of the population on agriculture is one of the main reasons for low size of land holding and for low per-capita income as well as high incidence of poverty among agricultural workers. The rural poor would maximize their family income by way of farming on lease, along with access to other farm, off-farm and non-farm employment opportunities. Improved access to land on lease by the poor would help reduce their poverty and enhance economic and social status.

6.1 OBJECTIVES

1. to examine the existing pattern of tenancy in Srikakulam district
2. to analyze the resource use efficiency of tenant farming
3. to study the economic viability and factors affecting the viability of tenant farming and tenant farm households and
4. to identify the constraints faced by tenant farmers

6.2 SAMPLING DESIGN

Multi stage sampling technique was employed for selection of sample at different levels (district, mandals, villages) in the present study. Srikakulam district of Andhra Pradesh was selected purposively. In Andhra Pradesh, Srikakulam district was purposively selected for the research study because the average size of holding is 0.66 ha and out of 5.26 holdings 4.27 holdings were of marginal farmers (Socio Economic Survey). Six mandals were selected based on the highest number of tenant farmers and from each mandal two villages are selected based on the highest number of tenant farmers. From each village ten farmers were selected constituting 120 farmers. Primary data were collected from all selected sample of farmers through a pre-tested

questionnaire developed as per the objectives. The data regarding tenancy pattern, resource use, costs and returns, factors influencing viability and problems faced by the tenant farmers are collected from sample farmers. The secondary data pertaining to the land utilization particulars, socio economic characteristics of the study area were collected from Chief Planning Office (CPO) of Srikakulam for the year 2015-16.

6.3 TOOLS AND TECHNIQUES OF ANALYSIS

To compute the socioeconomic profile of farmers, costs-returns structure, cost concepts and income measures, viability of farmers, problems faced by tenant farmers and tenant farm households, etc., the general tabular analysis was used. Simple arithmetic averages and percentages were worked out in order to find out costs, returns and farm efficiency measures. Cost concepts were used to estimate the cost of cultivation and derive the measures of efficiency *viz.,* farm business income, family labour income, net income and farm investment income. Cobb-Douglas production function was used to estimate the resource use efficiency of various crops. Multiple regression model was employed to analyze the factors determining the viability of farmers and farm households. Constraints faced by the farmers were ranked using Garrett's ranking technique.

6.4 SOCIOECONOMIC PROFILE OF SAMPLE FARMERS

The average farm holding of the selected farmers was 0.63 ha and the total operational farm holding of 120 farmers constituted 76.36 ha. Average size of the family was 5 in tenant farm households. Out of the total 120 family members 47.36 per cent of the members were males, 31.57 per cent were females and the remaining 21.05 per cent were children .The age group of 30 years - 60 years was 68.33 per cent, 38 % of the total farmers were i.e., up to 30 years, there was no farmers above 60 years . The literacy level of sample farmers was 51.66 per cent had secondary level of education, followed by primary education i.e 25.83 per cent and higher education constituted 4.16 per cent. The current value of the existing market price of the implements (sickles, handhoe, plough) and machinery (power operated sprayer) available with the tenant farmers accounted for Rs.3,24,420.

6.5 VARIOUS TENANCY PATTERN

In the study area there are three types of tenancy pattern i.e, Fixed rent is the most prevailing tenancy pattern which has highest percentage i.e, 77 percentage followed by fixed produce, sharecropping and input sharing i.e. 14, 5 and 4 percentage respectively.

6.6 COST OF CULTIVATION AND COST CONCEPTS

For paddy the average cost of cultivation per ha was 58,292/- Cost A1 included all the variable costs, depreciation and land revenue which accounted large share in total cost of cultivation i.e, Rs. 29,955. Cost A2 which included rent paid for leased in land which was an important cost for tenant farmers Rs 44,531. Cost B1 and B2 were 44,908/- Cost C1 included Cost B1 and imputed value of family labor which was worked out to be Rs. 52,993. Cost C2 is Rs.52,993. Cost C3 was Rs.58,292. The gross income was 64,900 Rs/ha, farm business income is 20,549 Rs/ha, family labour income i.e. 19,992 Rs/ha, net income was 6,607 Rs/ha, farm investment income is 557 Rs/ha and net benefit cost was 0.12 for paddy.

In case of Rice fallow blackgram Cost A1 was 4,559. Cost A2 was Rs 10,559, as it included the rent paid for leased land. Cost B1 was Rs 11,117.Cost B2 worked out be Rs.11,117. Cost C1 was Rs.19,393. Cost C2 was Rs 19,393. Cost C3 was Rs.21,332 in rice fallow pulses. The gross income is 26,993 Rs/ha, farm business income is 16,433 Rs/ha, family labour income i.e. 15,876 Rs/ha, net income was 5,659 Rs/ha, farm investment income was 557 Rs/ha and net benefit cost was 0.29 for pulses.

In sesamum Cost A1 was Rs 11,405. Cost A2 included Cost A1 and rent paid for leased in land was Rs 18,905.Cost B1 was Rs.19,341.Cost B2 was Rs.19,341. Cost C1 included Cost B1 and imputed value of family labour which was worked out to be Rs. 26,964. Cost C2 was Rs.26,964. Cost C3 was Rs.29,660. The gross income was 35,827 Rs/ha, farm business income was 16,921 Rs/ha, family labour income i.e. 16,486 Rs/ha, net income was 6,167 Rs/ha, farm investment income was 435 Rs/ha and net benefit cost was 0.22 for sesamum.

In Maize the cost A1 included all the variable costs which was worked out to be Rs 30,623. Cost A2 included Cost A1 and rent paid for leased in land is Rs 40,523. Cost B1 was Rs 40,958 and Cost B2 was Rs.40,958. Cost C1 was Rs.53,885. Cost C2 was Rs. 53,885. Cost C3 which was Rs.59,273. The gross income was 88667 Rs/ha, farm business income was 48,143 Rs/ha, family labour income was 47,708 Rs/ha, net income was 29,393 Rs/ha, farm investment income was 435 Rs/ha and net benefit cost was 0.54 for maize.

The Net income was high under the cropping pattern of Rice - Blackgram-Maize was Rs 41,662, followed by Rice - Maize is Rs 36,002. The Net income for the cropping pattern Rice - Blackgram - sesamum was Rs 18,345 where as for Rice - Blackgram and Rice - sesamum was Rs 12,268 and Rs 12,775.

6.7 RESOURCE USE EFFICIENCY OF TENANT FARMING

In Rice, seed cost was positively influencing the output and nonsignificant. Machine labour, human labour, irrigation and manures, chemical fertilizers and plant protection chemicals were positively influencing and significant. It resulted that R^2 was 0.95 indicated that inputs exert great influence on the level of output obtained by the farmers. The sum of elasticities of production was 0.68 indicating decreasing returns to scale.

In rice fallow pulses the seed cost was significant at one per cent level. Human labour, irrigation, plant protection chemicals and farm size were nonsignificant of which human labour and farm size were positively influencing the gross returns. Irrigation and plant protection chemicals were negatively influencing. R^2 value was 0.21. The sum of elasticities of production was 0.61 indicated decreasing returns to scale.

In sesamum the seed cost was a non significant factor but negatively influencing the gross returns. Machine labour and farm size was positively influencing and significant. All the variables were positively signed except irrigation cost and seed cost which were negatively influencing the gross returns. R^2 value was 0.47 and the sum of elasticities of production was 1.52 indicated increasing returns to scale.

In maize the R^2 value was 0.95. The production elasticities of the variables indicated that irrigation and chemical fertilizers were positively significant. Seed cost was positively influencing and it was non significant. All the variables were positively signed except labour charges significant and plant protection chemicals was nonsignificant which were negatively influencing the gross returns of maize. The sum of elasticities of production was 1.14 indicating increasing returns to scale.

According to the results sesamum and maize were the crops which were grown in *rabi* leading to profit generation and the farmers who selected sesamum and maize as their *rabi* crop were viable.

6.8 VIABILITY AND FACTORS INFLUENCING THE VIABILITY OF TENANT FARMERS

In the sample of 120 farmers, there are 37 viable farmers and 83 non-viable farmers, the classification is based on the Tendulkar committee criteria i.e if annual farm income of the farmers is below Rs.51,600 is considered as below poverty line. The farmers whose annual farm income was below Rs.51,600 would come under non viable class and above is taken as viable farmers. The average net income of the 120 tenant farmers is Rs 6,607 which is very low. Without the off farm income i.e. from dairy and wages the net income is negative (-24,434).Dairy sector played a major role in compensating the needs of the farmer by providing supplementary income to repay their loans

According to the regression analysis the coefficient of Multiple Determination (R^2) was 0.91 and the variables farm size and off farm income were positively significant. Domestic expenditure was negatively influencing and significant. Farm expenditure was negatively influencing and significant. Education, family size, farming experience were positively influencing and non significant. Debt outstanding was negatively influencing and access to credit was positively influencing but non significant.

6.9 CONSTRAINTS FACED BY TENANT FARMERS

LEC failed to serve the purpose of credit and ranked first by the respondents and thus it is considered as major constraint. Beneficiaries of the Government are the actual owners not tenant farmers and ranked at second position and indebtedness is at

third position. The fourth rank was small size of the holding. The fifth rank was timely unavailability of inputs. The remaining constraints in the order of ranks and the average mean score ranged from 4.74 to 10.46 were fluctuating market prices, incidence of pests and diseases, limited accessibility of farm mechanization, adverse climatic conditions, Lack of irrigation facilities, red tapism is prevalent in institutional agencies, level of literacy, non institutional charge, unforeseen expenditure.

6.10 CONCLUSIONS

- Fixed rent was the most prevailing tenancy pattern followed by fixed produce, share cropping and input sharing.
- For Rice the average cost of cultivation per ha was Rs.58,292, in case of Rice fallow blackgram is Rs. 21,333. For rabi sesamum the cost of cultivation was Rs.29,660. For Maize the total cost of cultivation was Rs. 59,273/-
- Rice, pulses, sesamum, maize were the major crops grown in the study area and sesamum, maize are the most profitable crops among them.
- In Rice all the resources used in cultivation i.e, machine labour, human labour, irrigation and manures, chemical fertilizers and plant protection chemicals were positively influencing and significant. Seed is the only non significant factor.
- In Rice fallow blackgram seed was the only significant factor because it is major input for cultivation. Human labour, irrigation, plant protection chemicals and farm size were non significant. All the factors are positively influencing the returns except irrigation and plant protection chemicals.
- In Sesamum all the variables were positively signed except irrigation cost and seed cost were negatively influencing the gross returns. Machine labour, farm size, irrigation were significant factors.
- In maize all the variables were positively signed except labour charges and plant protection chemicals. Labour charges, irrigation, chemical fertilizers were significant factors. Seed and plant protection chemicals were non significant.

- In the sample of 120 farmers, there were 37 viable farmers and 83 non-viable farmers. The income generated from farming activities and livestock by sample farmers which were in surplus or deficit was based on cropping pattern and adoption of livestock sector.

- Offfarm income, farm expenditure, farm size and domestic expenditure were the major significant factors affecting the viability of tenant farmers and tenant farm households.

6.11 POLICY IMPLICATIONS

- For ensuring viability of tenant farmers, creation of job opportunities in rural areas along with suitable policy support for development of livestock sector and other allied activities especially dairy, goat and sheep farming are to be encouraged.

- Access to improved technology in farm mechanization and seed varieties, cropping pattern, credit, insurance, market, price/subsidy, efficient utilization of resources and extension need to be strengthened sufficiently to make the farmers viable.

- Indebtedness is the major problem prevailing, as LEC cards are not accepted to provide the credit to the tenant farmers. The suitability of LEC cards for credit is only upto reports, but not in official gazette manner, which has to be amended by the Government.

- The benefits from the government are not reaching the tenant farmers, so there is a need for providing crop insurance schemes to the tenant farmers also.

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