

# FARMERS' INCOME IN INDIA: EVIDENCE FROM SECONDARY DATA

A STUDY SUBMITTED TO MINISTRY OF AGRICULTURE

BY

THIAGU RANGANATHAN

ASSISTANT PROFESSOR

AGRICULTURAL ECONOMICS RESEARCH UNIT (AERU)

INSTITUTE OF ECONOMIC GROWTH (IEG)

NEW DELHI – 110007



# CONTENTS

EXECUTIVE SUMMARY .....	9
1. Introduction .....	18
1.1. The Survey .....	18
1.2. Definition of Income .....	19
2. Total Incomes of Farm Households .....	21
2.1. All India Farm Household Incomes .....	21
2.2. Farm Household Incomes across Different Principal Income Sources .....	26
2.3. State-wise Farm Household Incomes .....	28
2.4. Farm Household Incomes across Landholding Classes .....	33
2.5. Farm Household Incomes across various Castes.....	36
3. Incomes from Cultivation.....	37
3.1. Income from Cultivation for Farm Households across All India .....	37
3.2. Income from Cultivation for Farm Households in Different States .....	39
3.3. Income from Cultivation for Farm Households for Different Crops.....	43
3.4. Economics of Cultivation for different Landholding Classes .....	48
3.5. Tenancy and its Impact of Economics of Cultivation .....	56
3.6. Diversification and its Impact of Economics of Cultivation .....	62
4. Incomes from Livestock.....	65
5. Incomes from Nonfarm Business .....	66
6. Income from Wages/Salary .....	67
7. Poverty and Inequality in Farm Households .....	70
7.1. Poverty among Farm Households in India .....	70
7.2. Indebtedness among Farm Households in India.....	72
7.3. Inequality among Farm Households in India .....	74
8. Conclusions .....	76
Bibliography .....	81
Appendix A Economics of Cultivation across different Land Classes 2002-03 .....	84
Appendix B Tenancy across States and Land Classes in 2012-13 and 2002-03 .....	86
Appendix C Economics of Cultivation of Tenants 2002-03 .....	88



## LIST OF TABLES

Table 2-1 Annual Incomes of Farm Households.....	21
Table 2-2 Income of Farm Households from July 2012-December 2012.....	24
Table 2-3 Income of Farm Households from January 2013-July 2013.....	24
Table 2-4 Incomes of Farm Households across different Principal Income Sources.....	26
Table 2-5 Incomes of Farm Households across different States .....	28
Table 2-6 State-wise Growth Rates of Different Income Components and Total Income of Farm Households.....	32
Table 2-7 Incomes of Farm Households across different Landholding Classes 2012-13 .....	34
Table 2-8 Incomes of Farm Households across different Castes .....	36
Table 3-1 Economics of Cultivation for Farm Households across India .....	37
Table 3-2 Economics of Cultivation for Farm Households in Different States (Kharif) .....	40
Table 3-3 Economics of Cultivation for Farm Households in Different States (Rabi) .....	41
Table 3-4 Economics of Cultivation for Different Crops (Kharif).....	43
Table 3-5 Economics of Cultivation for Different Crops (Rabi).....	45
Table 3-6 Economics of Cultivation for different Landholding Size Classes (Kharif).....	48
Table 3-7 Changes in Value and Selected Costs from 2002-03 (Kharif).....	51
Table 3-8 Changes in Shares of Selected Costs from 2002-03 (Kharif) .....	52
Table 3-9 Economics of Cultivation for different Landholding Size Classes (Rabi).....	53
Table 3-10 Changes in Value and Selected Costs from 2002-03 (Rabi).....	55
Table 3-11 Changes in Shares of Selected Costs from 2002-03 (Rabi).....	56
Table 3-12 Changes in Tenancy across Different States.....	57
Table 3-13 Changes in Tenancy across Different Land Classes .....	58
Table 3-14 Economics of Cultivation for Tenants (Kharif 2012-13).....	59
Table 3-15 Economics of Cultivation for Tenants (Rabi 2012-13).....	61
Table 3-16 Diversification and Economics of Cultivation (Kharif 2012-13) .....	62
Table 3-17 Diversification and Economics of Cultivation (Rabi 2012-13) .....	63
Table 4-1 Economics of Livestock.....	65
Table 5-1 Nonfarm Business Incomes across different Industries .....	66
Table 6-1 Incomes from Wages/Salaries across different Industries .....	68
Table 6-2 Incomes from Wages/Salaries across different Employment types.....	69
Table 7-1 Farm Households earning less than Poverty Line.....	70
Table 7-2 Decomposition of Gini Coefficient of Income .....	74
Table A- 1 Economics of Cultivation for different Land Classes (Kharif) 2002-03.....	84
Table A- 2 Economics of Cultivation for different Land Classes (Rabi) 2002-03.....	85
Table B- 1 Tenancy across States and Land Classes in 2012-13 .....	86
Table B- 2 Tenancy across States and Land Classes in 2012-13 .....	87
Table C- 1 Economics of Cultivation of Tenants (Kharif) 2002-03.....	88
Table C- 2 Economics of Cultivation of Tenants (Rabi) 2002-03 .....	89



## LIST OF FIGURES

Figure 2-1 Composition of Annual Income of a Farm Household 2012-13 .....	23
Figure 2-2 Composition of Annual Income of a Farm Household 2002-03 .....	23
Figure 2-3 Composition of Annual Household Income of farm household in Kharif .....	25
Figure 2-4 Composition of Annual Household Income of farm household in Rabi .....	25





## **EXECUTIVE SUMMARY**

- The current study estimates and analyses incomes of farm households in India using data from the 70<sup>th</sup> round of National Sample Survey (NSS) conducted in January to December 2013.
- Incomes of farmers are earned through cultivation of crops, livestock, nonfarm business and through wage/salaried employment. The report analyses total income and each of these component incomes.

## **FINDINGS RELATED TO TOTAL INCOME**

- Farm households earned INR 77,888 in the period from July 2012 to June 2013 or INR 6491 per month during this period. During the same period from 2002 to 2003 the earning of the farm households, based on a similar survey by NSS, was INR 2,115 per month. This translates to a CAGR of 3.4% for real household incomes during the period from 2002-03 to 2012-03.
- CAGR for real income from crop cultivation, income from livestock, income from nonfarm business and income from salaried/wage employment for the same period turns out to be 3.7%, 14.3%, -0.1% and 1.4% respectively. While interpreting these growth rates, it has to be kept in mind that 2002-03 was a drought year while 2012-13 was not.
- The growth of income from livestock was very high compared to other incomes and it has increased its share in total income of a farm household from 4% to 13%. The share of nonfarm business income in total income dropped from 11% to 8% during the period and that of wage/salaried income reduced from 39% to 32%.
- Among farm households having different principal income sources, those having nonfarm incomes earned the most – INR 1,04,593 in July 2012- June 2013. But, these

households constitute only 4.7% of total farm households. Households with wage/salaried employment as principal income source earned INR 92,132 in the same period and are 22% of total farm households. 63.5% of farm households have crop cultivation as their primary income source and earn on average INR 74,977 in the period. Households with livestock as primary income source constitute 3.7% of total farm households and earned INR 76,639 in the period.

- Among different states, Chandigarh farm households earned INR 2,60,046 in July 2012 to June 2013 or approximately INR 21,671 per month while farm households in Bihar earned INR 44,172 in the same period or approximately INR 3,681 a month.
- The growth rate of real incomes of farm household across different states indicates that Haryana (8.3%), Rajasthan (8.1%) and Odisha (7.6%) show high growth rates during the period from 2002-03 to 2012-13. The growth in Haryana has been driven by growth in cultivation incomes (8.8%) while growth in Rajasthan and Odisha has been largely due to growth in livestock incomes (45.1% and 36.1% respectively). Assam (-0.3%), Bihar (-0.8%) and West Bengal (-1.3%) show lowest growth rates in income during this period. Assam has shown a deceleration in nonfarm business incomes (-7.8%), Bihar has shown deceleration in all sectors except wage incomes and West Bengal saw a deceleration in crop cultivation income (-5%).
- Across landholding classes, the lowest land class (with less than 0.01 ha land) earned INR 54, 147 in the period while the largest land class (with greater than 10 ha land) earned INR 4,52,299 in the period. The lowest land class earned 1% of their incomes in crop cultivation while the largest earned 86% of their total incomes from crop cultivation. Livestock contributed to 36% of total income for lowest land class and 7% to the highest

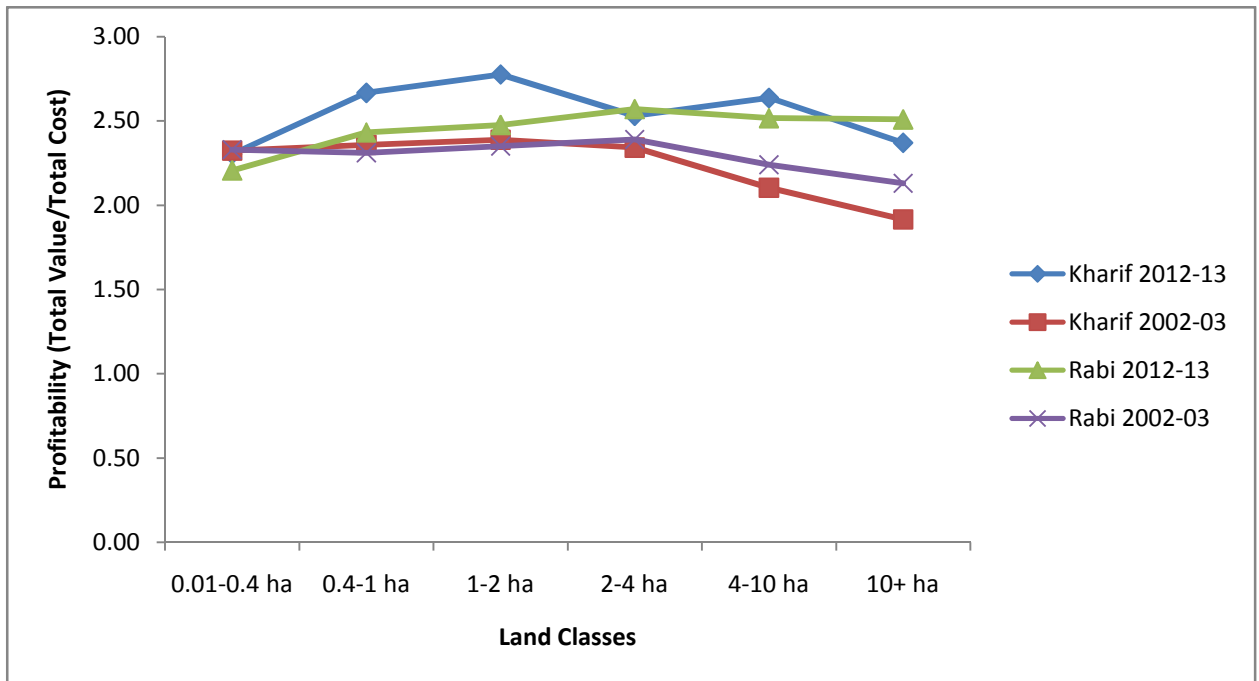
land class. Nonfarm business contributed 10% of total income to lowest land class and 4% to the highest while wage income contributed to 63% to lowest land class and 3% to the highest.

- The ratio of crop cultivation income, livestock income, nonfarm business income, wage income and total income of households possessing more than 2 ha to households possessing less than 1 ha was 7.43, 2.01, 1.47, 0.79 and 2.98 respectively. The same ratios in 2002-03 survey were 6.81, 0.46, 1.41, 0.69 and 2.66 for the respective incomes. It indicates that inequalities on account of landholding might have increased during the period from 2002-03 to 2012-13.
- Across different castes, farm households belonging to Scheduled Castes (SC) earn INR 55,486 in a year while farm households belonging to Scheduled Tribes (ST) earn INR 70,846 in a year. Farm households belonging to Other Backward Castes (OBCs) earn INR 77,448 in a year and Others belonging to other castes and religion other than Hinduism earn INR 97,519 in a year.

## **FINDINGS RELATED TO INCOME FROM CROP CULTIVATION**

- 85.8% of farm households and 70.8% farm households undertake cultivation in Kharif and Rabi seasons respectively. Out of the households that undertook cultivation 59% and 68% households had access to irrigation. The average land cultivated in Kharif and Rabi was 0.944ha and 0.785 ha respectively. The average irrigated and unirrigated land in Kharif was 0.469ha and 0.468 respectively while the same was 0.622 ha and 0.161 ha in Rabi respectively.
- The total value to cost ratio was 2.61 in Kharif and 2.46 in Rabi. The figure for 2002-03 was 2.27 and 2.37 respectively.

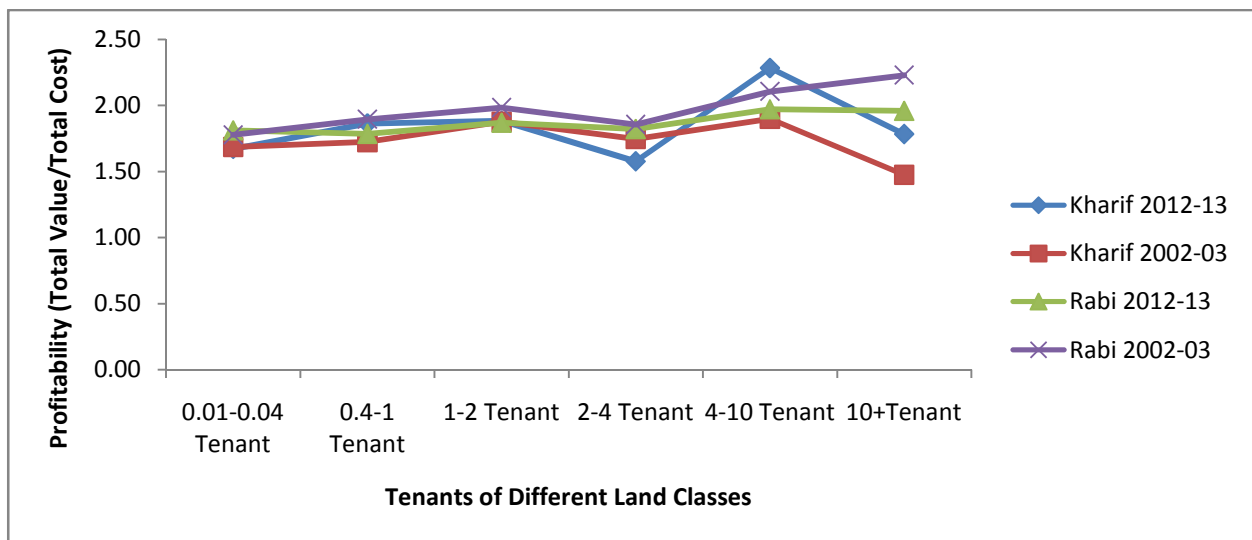
- Irrigation costs (191%), electricity costs (143%), diesel costs (126%), machine hiring costs (120%) and lease rent (106%) were higher in Rabi as compared to Kharif by percentages indicated in brackets. Similarly, animal labour and human labour costs in Rabi were 49% and 80% of the same in Kharif. These findings seem to indicate a higher mechanisation and higher dependence on irrigation in Rabi than in Kharif.
- Across different states, J&K, Chhattisgarh and Assam have high profitability and states of Tamil Nadu, West Bengal and Andhra Pradesh have low profitability.
- Across different crops, sugarcane and soybean have high profitability in Kharif and Sugarcane and Maize show high profitability in Rabi. Jowar has a very low profitability in Kharif while Masur has lowest profitability in Rabi.
- Across six land classes possessing land between 0.01-0.4 ha, 0.4-1 ha, 1-2 ha, 2-4 ha, 4-10 ha and more than 10 ha, the total value to cost ratio in Kharif was 2.30, 2.67, 2.77, 2.53, 2.64 and 2.37 and in Rabi was 2.21, 2.43, 2.48, 2.57, 2.52 and 2.51 respectively. A comparison of these numbers with 2002-03 shows that profitability has reduced for lowest land class in both season while it has increased for all other land classes. The following figure shows the profitability across land classes in both seasons for the years 2002-03 and 2012-13



- The analysis also shows that there are increases in share of money spent by farm households in lease rent across all land classes have increased. It has increased more for larger land classes and seems to indicate increase of reverse tenancy tendencies.
- Incidence of tenancy in terms of households leasing-in land has increased all over India and across many states. The proportion of farm household leasing-in land has increased from 12.76% to 16.42% at all India level. This proportion increased by almost 20% in Andhra Pradesh and West Bengal and almost 10% in Bihar. It decreased by 2% in Maharashtra and Tamil Nadu. Across land classes, the proportion of households leasing-in land increased by 12% and 14% for the largest two land classes.
- The returns per ha in Kharif 2012-13 for farm households leasing in land is 71% of households that do not lease in any land. Profitability for farm households in Kharif 2012-13 leasing in land is 65% of households that do not lease in any land. For the six different land classes, the returns per ha in Kharif 2012-13 for farm households was 64%, 66%, 46%, 61%, 114%, 63% and 71% of returns per ha of households in the land class that do not

lease any land. The numbers for profitability is 66%, 65%, 63%, 54%, 80%, 60% and 65%. In Rabi, the relative returns and profitability of tenants was better with the returns per ha for farmers leasing-in land at 90% of returns per ha of farmers not leasing in any land and profitability at 68% of profitability of farm households not leasing in any land. The figures of returns per ha and profitability across land classes are 84%, 73%, 92%, 105%, 98%, and 89% and 76%, 67%, 69%, 62%, 68% and 62% respectively.

- Profitability for farmers leasing-in land has also decreased for some land classes during the period from 2002-03 to 2012-13. The following figure shows profitability of farm households leasing-in land belonging to different land classes for Kharif and Rabi 2002-03 and 2012-13:



- Diversification seems to increase both returns per ha and profitability. In Kharif, returns per ha of farm households cultivating 2, 3, 4 and 5 crops were 130%, 146%, 120% and 146% of that of households practicing mono-cropping. The profitability in Kharif for farm households cultivating 2, 3, 4 and 5 crops were 110%, 119%, 110% and 119% of that of farm households practicing mono-cropping. In Rabi, the returns per ha for farm

households cultivating 2, 3, 4 and 5 crops were 110%, 110%, 105% and 130% of that of farm households practicing mono-cropping. The profitability in Rabi for farm households cultivating 2, 3, 4 and 5 crops were 107%, 108%, 103% and 102% of that of farm households practicing mono-cropping.

#### **FINDINGS RELATED TO INCOME FROM LIVESTOCK**

- Households undertaking livestock earn INR 8,712 in Kharif and INR 9,131 in Rabi. The profitability (total value/cost ratio) in Kharif is 1.94 while that in Rabi is 2.20. The higher profitability in rabi is due to lower costs in feed.

#### **FINDINGS RELATED TO INCOME FROM NONFARM BUSINESS**

- Households engaged in nonfarm business earn on average INR 6061 a month. All nonfarm businesses seem to have very low profitability. The output to expense ratio for nonfarm business is 1.35.
- Most nonfarm business opportunities are created in wholesale and retail trade, manufacturing and transportation & storage. 41.99%, 27.32% and 12.64% of households engaged in nonfarm business are engaged in the three sectors respectively. The profitability is very low in wholesale and retail trade.
- The low profitability in nonfarm business seems to indicate that farm households enter into these opportunities largely as a last resort than due to high profitability in this sector.

#### **FINDINGS RELATED TO INCOME FROM WAGE/SALARIED EMPLOYMENT**

- 62% and 58% of households earning from wage/salaried employment participate in Agricultural, forestry and fishing industry in Kharif and Rabi respectively. 20% and 24%

of households earning wage/salaried employment participated in Construction in Kharif and Rabi respectively.

- More households participate in agricultural sector in Kharif than in Rabi while more households participate in Construction in Rabi than in Kharif. Construction is the most important source of wage income for farm households after agriculture.

## **FINDINGS RELATED TO POVERTY, INDEBTEDNESS AND INEQUALITY**

- About 53.37% of farm households earn income lesser than poverty line income. Bihar, Uttaranchal, Uttar Pradesh, Puducherry and Jharkhand had more than 60% farm households earning less than poverty line while Telangana, Sikkim, Gujarat, Lakshadweep, Jammu & Kashmir, Haryana, D&N Haveli, Meghalaya, Punjab, Kerala, Chandigarh and Delhi had less than 40% farm households earning below poverty line.
- 52% of farm households were under debt in 2012-13 while 49% farm households were under debt. Andhra Pradesh (93%), Telangana (89%), Tamil Nadu (83%), Kerala (78%), Karnataka (77%), Rajasthan (62%), Odisha (57%), Maharashtra (57%) and Punjab (53%) had higher than All India share (52%) farmers who had outstanding loans.
- The share of farm households having outstanding loans increased by a high percentage in Uttaranchal (44%), Karnataka (16%), Kerala (13%), Arunachal Pradesh (13%), Andhra Pradesh (11%) and Odisha (10%). This share decreased among smaller states, group of union territories, Punjab (12%), Haryana (11%) and Gujarat (9%).
- The average outstanding loan in 2012-13 was INR 46,945 across all households and was above INR 1,00,000 in states of Kerala (INR 2,13,588), Andhra Pradesh (INR 1,23,112), Punjab (INR 1,19,550), and Tamil Nadu (INR 1,15,872). The average outstanding loan



per ha was INR 45,318 across all India. This amount was more than INR 1,00,000 for the states of Kerala (INR 3,57,535) and Tamil Nadu (1,29,369).

- The Gini coefficient of total household income of farm households in India is 0.56. The Gini of income from cultivation, income from livestock, income from wages/salary is 0.74, 0.81, 0.96 and 0.77 respectively. The Gini correlation between the four income components and total income is 0.80, 0.64, 0.70 and 0.66 respectively.
- On decomposing income inequality, we find that increasing share of cultivation income by 1% will increase Gini by 2.7%. Similarly 1% share increase in nonfarm business income will increase Gini by 1.6%. Increasing 1% share of livestock and wage income will decrease Gini by 1.1% and 3.2% respectively.

## **1. Introduction**

This study is an attempt to estimate the incomes earned by farm households in India. The emphasis of the current study is to look in the evidence on this from the data collected in recent years. For this purpose, the study estimates incomes of farm households based on the Situation Assess Survey of farmers conducted during the 70<sup>th</sup> round of National Sample Survey (NSS). This survey was conducted over the period ranging from January 2013 to December 2013 by visiting farm households in various regions of India twice. The survey covered 35,200 farmer households across 36 states and union territories of India in the first visit which spanned from January to July 2013 and collected information of incomes generated by farm households in the reference period of July 2012 to December 2012. In the second round of the survey, 34,907 households which had been covered in the first round were surveyed and information related to incomes generated in the period of January 2013 to June 2013 was collected. The data was made public in December 2014 and thus provides the most recent estimates of incomes earned by farmer households.

The current report provides an analysis of various aspects of incomes of farmer households. A farmer household earns incomes from various sources. The most important source is through cultivation of crops in either the land possessed by the household or in a land leased by it. The other sources of income include wages and salary. The most common source of these wages is through agricultural labour in farms owned by other households. The other source of this income is through either casual labour or regular labour in nonfarm industries. Apart from this households might earn incomes through household nonfarm enterprises. The following subsections provide the background of the survey and the definition of different components of total income of a farm household.

### **1.1.The Survey**

The 70<sup>th</sup> round of NSS had a schedule that looked into the situation of agricultural households. A similar survey was conducted in 2002-03 during the 59<sup>th</sup> round of NSS survey. There are a few minor differences in the sample covered in two surveys. While the first survey used land ownership as a criterion for a

household being referred a farm household, the current survey does not have land ownership as a criterion. Also, the first survey did not have any criterion related to value of agricultural produce of a household. But the current survey only considered households that had a value of agricultural produce above INR 3000. Since possession of land was not required, the recent survey defines agricultural production unit as a household that receives an agricultural produce value greater than INR 3000 and having at least one member self-employed in agriculture either in the principal status or in subsidiary status during 365 days prior to the survey date. In our study, we use farm households to refer to these households.

The survey collected various information related to different aspects of their livelihood from these farm households. Information was collected on various aspects relating to farming and other socio-economic characteristics of agricultural households. Information was collected from households on consumer expenditure, income and productive assets, indebtedness, farming practices and preferences, resource availability, awareness of technological developments and access to modern technology in the field of agriculture, information on crop loss, crop insurance and awareness about Minimum Support Price (GoI, 2014). Our analysis will look primarily into the information related to income of the households. The survey collected information on income from various sources – cultivation, livestock, wages and salary, nonfarm businesses and sale and purchase of assets.

## **1.2. Definition of Income**

A farm household earns its incomes from various sources. The current study will analyse the following sources of income:

- Income from cultivation – This is the income a household earns from cultivation of various crops. These could be seasonal crops or annual crops. Also, some of these will be food crops, a part of which could be used for own consumption of the household. Cultivation yields some by-products which could be sold. The total value from cultivation is the sum of value from sale of primary

products and sale of by-products. The costs incurred in cultivation includes a variety of things like seed costs, fertilizer costs, manure costs, pesticide costs, interest, costs of irrigation, cost incurred in hiring machinery, minor repairs, hired labour, animal labour and so on. The total costs is subtracted from the total value is used to arrive at the total income from farming. Income from this is collected in the survey for two reference periods and so we have information on incomes from cultivation from July 2012-June 2013.

- Income from livestock – This is the income a household earns from sale of various products like milk, eggs and live animals. Total value from this income source is calculated as the total value of milk, eggs, live animals, wool, fish, honey, hides, bones, manure and so on. The costs incurred will include cost of animal ‘seeds’, animal feeds, veterinary charges, interest, lease rent, labour charges and other expenses. The total costs are subtracted from total value to obtain net income from animals. This data was collected for a period of 30 days before the survey in visits one and two. We multiply each of this by 6 and add it together to get the total annual income from livestock for the farm household.
- Income from wages and salary- This is the income derived by various household members employed in labour outside their household –either in other’s fields or in nonfarm enterprises. The wages and salary earned by each of the individuals in the two reference periods was collected in the survey. Information was also collected on the principal and subsidiary industry of the individual and current status in both the industries. The sum of the wages and salaries of all individuals in the household in the two reference periods becomes the total wage and salary income earned by the household.
- Income from nonfarm business – This is the income that the household earns by engaging in nonfarm businesses. Information related to expenses, output and net receipt of up to five nonfarm businesses engaged by households was collected in the NSS survey. The data was collected for a period of 30 days before the survey in the two visits. We multiply the total net receipt from up to

five businesses in each visit by 6 and add it together to arrive at total household income from nonfarm businesses.

All these incomes are added to obtain total annual household income of a farm household. The estimates of all India data are obtained by using appropriate weights presented in the NSS survey. All the summary statistics provided henceforth are obtained using the weights and hence represent population statistics. The report is further structured as follows. Section 2 analyses the total income of farmer households. Section 3 analyses the income of farm households from cultivation. Section 4 looks into the income from livestock. Section 5 analyses the incomes from nonfarm businesses. Section 6 analyses wage and salary income of the farm households. Section 7 provides some description of poverty, inequality and indebtedness prevalent in farm households. Section 8 provides conclusions and policy recommendations from our analysis.

## 2. Total Incomes of Farm Households

This section will look in to the total income of farm households in India. Firstly, we look at incomes at all India level. Then, we will look into the income across households having different principal income sources, land holding sizes, state and caste.

### 2.1. All India Farm Household Incomes

Table 2.1 provides the summary statistics of total income and income components of farm households in India.

**Table 2-1 Annual Incomes of Farm Households**

	<i>2002-03 Mean</i>	Mean
Income from Farming	<i>11628</i>	36960
Income from Livestock	<i>1092</i>	9943
Income from Nonfarm Business	<i>9828</i>	6138
Income from Wages and Salary	<i>11628</i>	24847
TOTAL INCOME	<i>25380</i>	77888

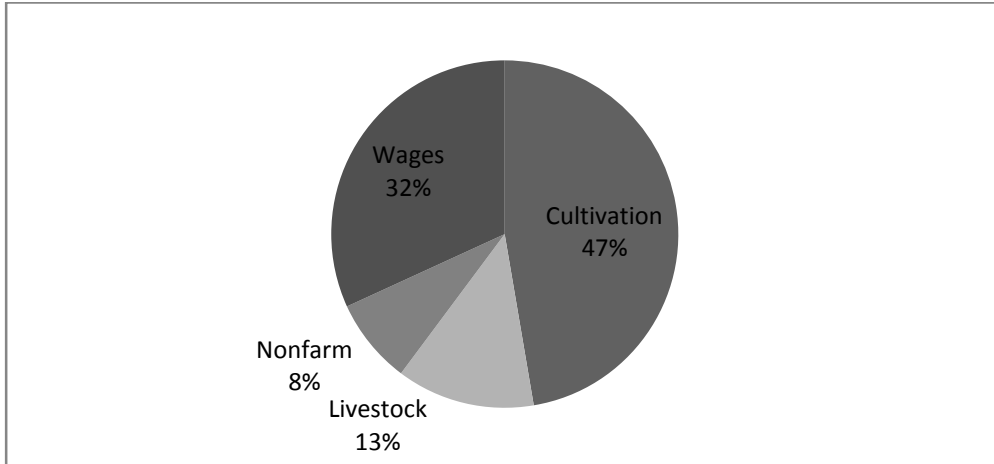
The average total annual income of a farm household is INR 77,888 which roughly turns out to be around INR 6,491 per month. This figure was INR 25,380 per year or INR 2,115 per month in 2002-03 based on a similar survey conducted by NSS (GoI, 2005). This roughly translates to a compound annual growth rate of 3.4% per annum for real income of farm households<sup>1</sup>. The CAGR for farming income, livestock income, wage/salary income and nonfarm business income are 3.7%, 14.3%, 1.4% and -0.1% respectively. We find that livestock incomes have grown at a very high rate during the period under consideration. Non farm incomes and wages/salary of farm households have grown at a much slower rate than cultivation for farm households. A high growth in nonfarm incomes might help farmers move out of agriculture into non-agricultural activities. But, we find that this has not happened and this might be the reason why even with impending agrarian crisis farmers are not leaving cultivation. In the farm survey conducted in 2002-03, a high percentage of farmers had indicated that they would shift out of crop cultivation if provided with an option. One of the reasons this might not have happened is because the growth rate of cultivation and wages have been higher than growth in nonfarm business incomes. The low wage growth is also surprising given the positive effects MGNREGA is supposed to have had on rural wages. In this regard, the negative growth rate of wages in period prior to MGNREGA could have played a role (Gulati, Jain and Satija, 2013). We should also keep in mind while interpreting these growth rates that that the year 2002-03 was a drought year and 2012-13 was not.

In terms of components of total income, the average farming income of the households is highest from farming which comes to INR 36,960. Income from wages and salary is the second highest source of income with the average earning of farm households at INR 24,847. The average income from livestock and nonfarm business are lower and are INR 9,943 and INR 6,138 respectively. Figure 2.1 and Figure 2.2 provide the composition of annual household income for the recent survey and the 2002-03 survey.

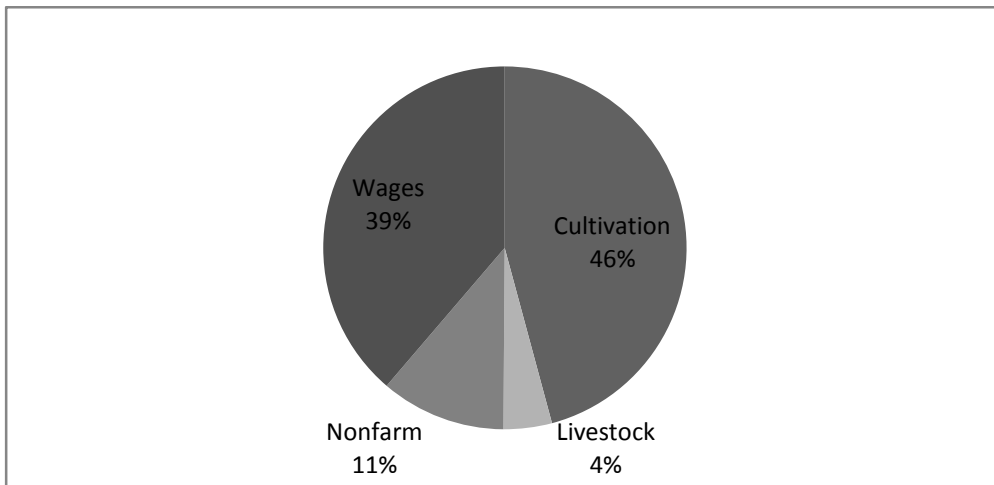
---

<sup>1</sup> We use CPIAL Index from July 2012 to June 2013 and July 2002 and June 2003 to deflate the incomes of 2012-13

**Figure 2-1 Composition of Annual Income of a Farm Household 2012-13**



**Figure 2-2 Composition of Annual Income of a Farm Household 2002-03**



From Figure 2.1, we observe that average income from farming is 47% of the total annual income. Average income from wages and salary are 32% of average annual income. Average income from livestock is 13% of average annual income and nonfarm income average is only 8% of total annual income. Compared to 2002-03, the wages and salary income have shrunk and largest expansion has happened in income from livestock. The nonfarm incomes have also shrunk slightly and there is a slight expansion in the farm income as a percentage of total annual income.

The income as discussed previously is the sum of incomes derived in two reference periods (July – December 2012 and January to June 2013). The breakup of income for two reference periods is provided in Table 2.2 and Table 2.3.

**Table 2-2 Income of Farm Households from July 2012-December 2012**

	Mean
Income from Farming	21489
Income from Livestock	4684
Income from Nonfarm Business	2883
Income from Wages and Salary	11236
TOTAL INCOME	40293

**Table 2-3 Income of Farm Households from January 2013-July 2013**

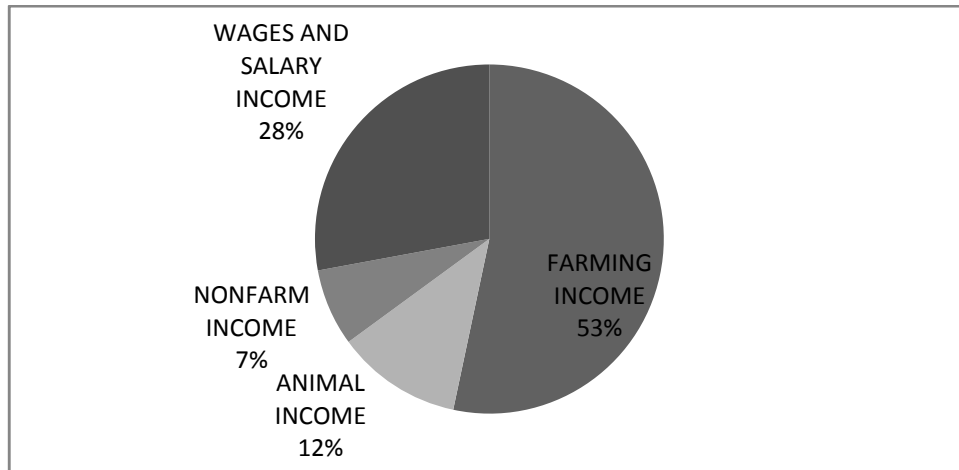
	Mean
Income from Farming	15457
Income from Livestock	5332
Income from Nonfarm Business	3326
Income from Wages and Salary	13565
TOTAL INCOME	37681

From Table 2.2 and Table 2.3, we observe that the households earn slightly more in the first reference period as it coincides with the Kharif period for seasonal crops and also period in which most rainfall in the country occurs. The average income from farming is around INR 6000 more or 40% more in the period as compared to the second reference period. But the average incomes from livestock, nonfarm business and wages/salary are higher in the second reference period. The incomes from livestock, nonfarm business and wages/salary are 12%, 13% and 17% lower in the first reference period as compared to the second reference period respectively. The total income though is still 7% higher than the second reference period during July to December 2012. The composition of total annual income is also different in the two reference periods. We refer to the first and second reference period as kharif and rabi in the report henceforth though they may not exactly correspond to kharif and rabi seasons respectively

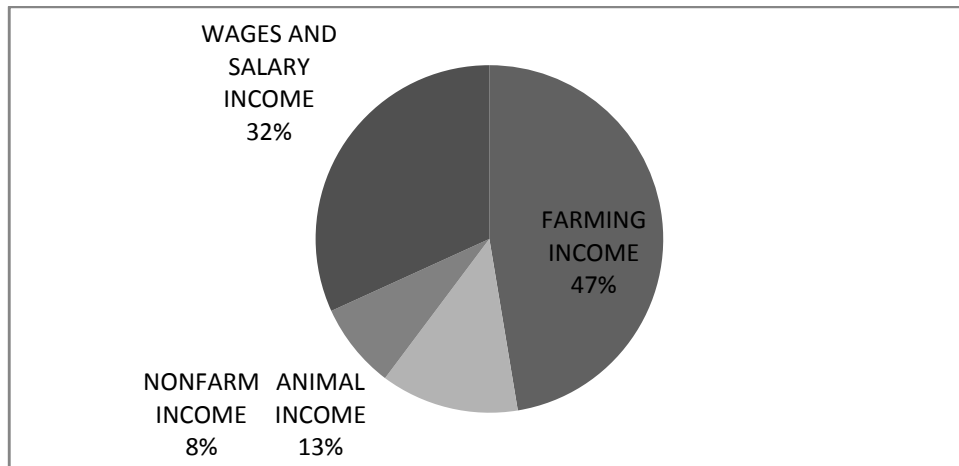


for all agricultural households considered in the study. Figure 2.3 and 2.4 provide the composition of household income for kharif and rabi period respectively.

**Figure 2-3 Composition of Annual Household Income of farm household in Kharif**



**Figure 2-4 Composition of Annual Household Income of farm household in Rabi**



From Figure 2.3 and Figure 2.4, we observe that a average income from livestock and income from nonfarm business as a percentage of average total income is almost similar in both kharif and rabi. The average farm income as a share of total income is higher in kharif compared to rabi and average wage/salary income as a percentage of average total income is lower in kharif compared to rabi. This is expected as farm households might engage more in farming when rainfall happens during months July to December and less in farming and more in labour during the period of January to June.

## 2.2.Farm Household Incomes across Different Principal Income Sources

The incomes and the composition of household incomes will differ based on their principal income sources. Though households are farm households, their principal income sources could be cultivation, livestock, wage/salaried employment, nonfarm enterprises, other agricultural activities, pension, remittances or other activities. Table 2.4 provides the incomes and income composition of farm households having all the different principal income sources.

**Table 2-4 Incomes of Farm Households across different Principal Income Sources**

PRINCIPAL INCOME SOURCE	PROPORTION OF TOTAL FARM HOUSEHOLDS	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/ SALARY	TOTAL ANNUAL INCOME
CULTIVATION	63.5%	50874(68)	9157(12)	3538(5)	11408(15)	74977
WAGE/ SALARIED EMPLOYMENT	22.0%	10596(12)	7906(9)	1540(2)	72089(78)	92132
NON AGRICULTURAL ENTERPRISE	4.7%	14726(14)	6187(6)	72550(69)	11130(11)	104593
LIVESTOCK	3.7%	14218(19)	49465(65)	1632(2)	11324(15)	76639
REMITTANCES	3.3%	8151(53)	4430(29)	410(3)	2418(16)	15409
PENSION	1.1%	20869(42)	5284(11)	6396(13)	17150(35)	49700
OTHER AGRICULTURAL ACTIVITY	1.1%	49572(51)	9673(10)	6574(7)	30739(32)	96558
OTHER	0.7%	12444(29)	6287(15)	5492(13)	18983(44)	43207

Note: Figures in brackets indicates the share of component income in total income

From Table 2.4, we observe that majority of the farm households (64%) have cultivation as their principal income source. A large number (22%) have wage/salaried employment as the principal income source. About 4.7% and 3.7% have nonfarm enterprise and livestock as their principal income source. Remittances also form a principal income source for substantial proportion (3.3%) of farm households. The total income is highest for households having nonfarm enterprises as their principal income source. These households earn about INR 1,04,593 in a year. This is followed by households that have other agricultural activity as their principal income source. They earn about 92% of the incomes earned by households with nonfarm enterprises as principal income source. Households with wage and salaried

employment as the principal income source also earn about 88% of incomes earned by households with non agricultural enterprises as the principal income source. Cultivation and livestock households earn substantially lesser and their incomes are 72% and 73% of annual income of nonfarm household respectively. Pension, other and remittance households earn very less incomes and their incomes come to 48%, 41% and 15% of nonfarm households respectively.

In terms of the components of income, the principal income source contributes to the highest income shares of a household. Agricultural households earn 68% of their incomes through cultivation and wages and livestock incomes contribute to 15% and 12% of the total incomes. Agricultural households with cultivation as principal income source earn about INR 50,874 in a year. Other agricultural activity households also earn similar amounts but all the other households earn much lesser around 16-41% of this income from cultivation. Livestock households earn 65% of their incomes from livestock. They earn 19% and 15% from cultivation and wages. They earn about INR 49,465 from livestock in a year. The other households earn much lesser which accounts to roughly 9-20% of this amount. The nonfarm enterprises households earn 69% of their total income from nonfarm business. They earn 14% and 11% from cultivation and wages respectively. These households roughly earn INR 72,550 in a year from nonfarm businesses. The other households earn much lesser which accounts to roughly 1-9% of this amount. The wage/salaried employment households earn about 78% of their incomes from wages and 12% and 9% from cultivation and livestock. They roughly earn INR72,089 in a year from their principal income sources. The other households earn about 3-43% of this amount in a year. All the other households earn majority of their incomes from cultivation (29-53%) and wages (16-44%). From these observations it seems that all households are able to diversify significantly in cultivation, livestock and wages. But nonfarm businesses are not something that is an income source for many. Nonfarm households earn a high amount from these businesses and other households do seem to earn only a low percentage of this in these businesses. This is unlike wage employment. Though the wage employment households earn significant amount in wages, the other households also earn a reasonable percentage of this amount from

it. One of the reasons for this disparity could be because of entry barriers posed by capital and other requirements in nonfarm businesses. This could also be a reason for slow growth of nonfarm sector among farm households.

### 2.3.State-wise Farm Household Incomes

The incomes and composition will also be different across different states of the country. Table 2.5 provides the state-wise farm household incomes and their composition.

**Table 2-5 Incomes of Farm Households across different States**

STATES	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/ SALARY	TOTAL ANNUAL INCOME
A & N ISLANDS	34922(26)	6693(5)	26475(20)	65898(49)	133988
ANDHRA PRADESH	24209(34)	13025(18)	4534(6)	29760(42)	71528
ARUNACHAL PRADESH	77785(64)	8466(7)	10919(9)	24916(20)	122086
ASSAM	50521(63)	9553(12)	3078(4)	17176(21)	80328
BIHAR	20627(47)	4831(11)	2829(6)	15885(36)	44172
CHANDIGARH	40403(16)	57627(22)	0(0)	162016(62)	260046
CHHATTISGARH	40229(63)	934(1)	14(0)	22177(35)	63354
D & N HAVELI	7272(8)	929(1)	16145(18)	63551(72)	87897
DAMAN & DIU	2479(3)	4626(5)	13861(16)	66983(76)	87949
DELHI	14079(6)	38554(17)	1939(1)	178167(77)	232739
GOA	16893(19)	15097(17)	12243(13)	46865(51)	91098
GUJARAT	35152(37)	24179(25)	4538(5)	32095(33)	95964
HARYANA	94411(54)	32678(19)	5201(3)	41873(24)	174163
HIMACHAL PRADESH	35001(33)	12905(12)	9784(9)	48278(46)	105968
JAMMU & KASHMIR	36635(24)	11129(7)	18081(12)	88220(57)	154065
JHARKHAND	17385(29)	16916(29)	2935(5)	22066(37)	59302
KARNATAKA	59047(55)	8907(8)	7489(7)	32116(30)	107559
KERALA	42479(29)	8303(6)	31303(22)	63211(44)	145296
LAKSHADWEEP	8734(4)	1386(1)	1521(1)	199921(94)	211562
MADHYA PRADESH	48039(64)	9174(12)	1569(2)	15930(21)	74712
MAHARASHTRA	46385(51)	9308(10)	10044(11)	25764(28)	91501
MANIPUR	35059(33)	18470(17)	6835(6)	45743(43)	106107
STATES	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/ SALARY	TOTAL ANNUAL INCOME

MEGHALAYA	77354(54)	9808(7)	10888(8)	45308(32)	143358
MIZORAM	54729(50)	10499(10)	314(0)	43858(40)	109400
NAGALAND	38545(34)	10398(9)	740(1)	64718(57)	114401
ODISHA	16892(28)	15477(26)	6451(11)	20620(35)	59440
PUDUCHERRY	19132(27)	580(1)	3104(4)	48446(68)	71262
PUNJAB	130163(60)	21157(10)	8800(4)	57330(26)	217450
RAJASTHAN	37621(43)	11894(14)	8499(10)	30002(34)	88016
SIKKIM	20350(24)	13536(16)	11986(14)	37361(45)	83233
TAMIL NADU	22989(27)	13623(16)	13646(16)	34772(41)	85030
TELENGANA	50813(66)	6181(8)	3074(4)	17392(22)	77460
TRIPURA	33270(51)	3684(6)	1976(3)	26187(40)	65117
UTTAR PRADESH	34197(57)	7094(12)	4617(8)	13775(23)	59683
UTTARANCHAL	30351(54)	10394(18)	2947(5)	12974(23)	56666
WEST BENGAL	11737(24)	2966(6)	8008(17)	25484(53)	48195

Note: Figures in brackets of other columns indicate the share of income component in total income.

Among the states, farm households in Chandigarh, Delhi and Punjab have the highest incomes while farm households in Bihar West Bengal and Uttaranchal have the lowest total incomes. A farm household in Chandigarh earns INR 2,60,046 in a year or approximately INR 21,671 per month while a farm household in Bihar earn INR 44,172 in a year or approximately INR 3,681 a month. This is just 17% of what a farm household in Chandigarh earns. Delhi and Punjab farm households earn 89% and 84% of Chandigarh farm households respectively while farm households in West Bengal and Uttaranchal earn 19% and 22% of Chandigarh farm households respectively.

With respect to income from farming, Punjab and Haryana earn the highest while Goa, Odisha, Delhi, West Bengal, Lakshdweep, D & N Haveli and Daman & Diu earn the lowest. Average earning from farming of a farm household in Punjab is INR 1,30,163 per year or INR 10,847 per month. For West Bengal, this income is INR 11,737 per year or approximately INR 978 per month. Haryana farm households earn a farm income that is 73% of Punjab farm household's farm income while farm household in Odisha and West Bengal earn farm incomes that is 13% and 7% of Punjab farm household's farm incomes. In terms of shares, Telangana, Arunachal Pradesh, Madhya Pradesh, Assam Chattisgarh

and Punjab have 60% or more of their total income coming from farming while Goa, Chandigarh, D & N Haveli, Delhi, Lakshadweep and Daman & Diu have less than 20% of the total incomes from farming.

In livestock, Chandigarh and Delhi have high incomes while Chattisgarh, D&N Haveli and Puducherry have low incomes. Average income from livestock for a farm household in Chandigarh is INR 57,627 per year or INR 4,802 per month while that for a farm household in Chattisgarh is INR 934 per year or INR 78 per month. Farm households in Delhi earn livestock income that is 67% of livestock income in Chandigarh while a farm household in Chattisgarh earns a livestock income that is only 2% of livestock income of a Chandigarh farm household. In terms of shares, farm households in Chandigarh, Gujarat, Odisha and Jharkhand earn more than 20% of total incomes through livestock while farm households in Chattisgarh, Puducherry, D & N Haveli and Lakshadweep earn less than 1% of their incomes from livestock.

In nonfarm business, farm households in Kerala and A&N Islands earn the highest while those in Chandigarh and Chattisgarh earn the lowest. Average nonfarm income in Kerala is INR 31303 per year or INR 2609 per month while that in Chandigarh is INR 0 per year. In terms of shares, farm households in Kerala and A&N Islands earn more than 20% of their incomes from nonfarm businesses while farm households in Chandigarh, Chattisgarh and Mizoram almost earn no incomes from nonfarm businesses.

In wages and salaries, Lakshadweep, Delhi and Chandigarh farm households earn the highest while Bihar, Uttar Pradesh and Uttaranchal earn the lowest. The average wage/salary income in Lakshadweep is INR 1,99,921 per year or INR 16,660 per month while that in Uttaranchal is INR 12,974 per year or INR 1,081 per month. While wage/salary income of Delhi farm households is 89% of Chandigarh's, Bihar, Uttar Pradesh and Uttaranchal farm households earn wage/salary incomes that 8%, 7% and 6% of Chandigarh's. In terms of shares, Lakshadweep, Delhi and Daman & Diu farm households earn more than 3/4ths of their incomes from wages/salary while households in Haryana, Uttar Pradesh, Uttaranchal,

Telangana, Assam, Madhya Pradesh and Arunachal Pradesh earn less than 1/4<sup>th</sup> of their total incomes from wage/salary.

To observe the relation between income from different sources and total income, we found the correlation between income from different sources and total income of the households across different states. We find that the correlation between income from wage/salaried employment and total income is the highest (0.82) followed by income from livestock (0.65), cultivation (0.37) and nonfarm business (0.08). This means that the incomes of states are driven by wage/salaried employment and livestock than cultivation or nonfarm income. Higher the wage/salaried employment in the state, higher is the farm household income in the state. We also found correlation between shares of component incomes with total income of farm households. Again, we find that the correlation of share of income from wage/salaried employment has the highest and positive correlation (0.37) with total income. All the other shares have negative correlation. The share of cultivation has the highest negative correlation (-0.28) with total income followed by nonfarm business income shares (-0.22) and livestock income shares (-0.01). This means that the higher the share in agriculture of farm households in a state, lower is the income of the state. The stranger finding is a quite high negative correlation between nonfarm income shares and total income. This would mean that the shares of nonfarm business incomes are lower in high income states. As the shares of wage/salaried employment incomes increases in a state, there is an increase of total income of farm households. Livestock income shares do not seem to have much of influence on total income. We also calculated the state-wise compound annual growth rates for 14 major states in India for different components of farm household income and total farm household income over the period 2002-03 to 2012-03. Table 2.6 provides these growth rates.

**Table 2-6 State-wise Growth Rates of Different Income Components and Total Income of Farm Households**

STATES	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/SALARY	TOTAL ANNUAL INCOME
ANDHRA PRADESH	5.89%	14.35%	-0.36%	3.78%	5.45%
ASSAM	0.70%	9.47%	-7.77%	-3.99%	-0.34%
BIHAR	-0.78%	-3.64%	-6.29%	1.95%	-0.75%
CHHATTISGARH	6.34%	---	-52.74%	1.74%	3.98%
GUJARAT	1.40%	7.10%	2.28%	2.81%	3.12%
HARYANA	8.77%	---	-5.87%	2.29%	8.32%
JAMMU & KASHMIR	-5.51%	1.04%	1.04%	4.86%	0.66%
JHARKHAND	-2.53%	20.13%	-6.17%	-0.95%	0.87%
KARNATAKA	5.76%	9.46%	5.28%	1.51%	4.48%
KERALA	3.64%	7.23%	5.05%	1.75%	3.20%
MADHYA PRADESH	6.10%	---	-5.28%	0.83%	6.91%
MAHARASHTRA	3.32%	8.96%	3.97%	2.09%	3.46%
ODISHA	6.48%	36.08%	5.89%	3.13%	7.57%
PUNJAB	5.64%	12.27%	-2.70%	4.00%	5.13%
RAJASTHAN	13.84%	45.11%	4.65%	2.17%	8.10%
TAMIL NADU	2.84%	15.53%	9.64%	1.82%	4.47%
UTTAR PRADESH	4.44%	16.32%	-0.55%	-0.63%	3.31%
WEST BENGAL	-5.01%	3.82%	-2.16%	0.90%	-1.25%

From Table 2.5, we find that growth rates of total income in the decade have been highest in Haryana (8.3%), Rajasthan (8.1%) and Odisha (7.6%) while it is lowest in the states of Assam(-0.3%), Bihar(-0.8%) and West Bengal (-1.3%). Haryana's growth has largely come from incomes from cultivation (8.8%) while that of Rajasthan and Odisha has come through growth in incomes from livestock (45.1% and 36.1% respectively). In the low growth states, Assam has suffered deceleration in nonfarm business incomes (-7.8%) and wage incomes (-4%). Bihar's low income comes from deceleration in all sectors except wage income. West Bengal has seen major deceleration in incomes from cultivation (-5%) and nonfarm business (-2.2%) during this period.



In terms of component wise Growth, the three high growth states based on total income are the highest growing states in income from cultivation as well. In terms of low growth states, the low growing states in total income are among the lowest five states in term of growth rate in income from cultivation as well. Jammu and Jharkhand have also seen deceleration incomes from cultivation (-6% and -3% respectively). This shows that there exists a high correlation of farming incomes growth and total income growth of farm households. Incomes from livestock also show a high correlation with growth rates of total income. Even in this case, the three high growing states in terms of livestock incomes are the three high growing states in terms of total income. On the low income states, Bihar has shown the lowest growth (-3.6%) in livestock incomes. Nonfarm business income growths have been high in Tamil Nadu (9.6%), Odisha (5.9%) and Karnataka (5.3%) and lowest in Bihar (-6.3%), Assam (-7.8%) and Chattisgarh (-52.7%). Wage income growth has been highest in Andhra (3.8%), Jammu (4.9%) and Punjab (4%) and lowest in UP (-0.6%), Jharkhand (-1%) and Assam (-4%). The correlation between different component growth rates and total income growth rates were calculated. Highest correlation with total income growth rate was with cultivation growth rate (0.89) and livestock growth rate (0.77). The correlation of total income growth rate with wage income growth rate was 0.37 while that with nonfarm business income was 0.1. Both incomes from cultivation and livestock are exposed to problems from weather and a high correlation with total incomes of farm households is not necessarily an encouraging one. If the farm households could have opportunities in nonfarm business and non agricultural wage labour during times of distress, these correlation could reduce further.

#### **2.4.Farm Household Incomes across Landholding Classes**

Table 2.7 provides the income and composition of income across different landholding classes. The landholding classification is based on NSS classification on total land possessed.

**Table 2-7 Incomes of Farm Households across different Landholding Classes 2012-13**

SIZE CLASS OF LAND POSSESSED (Ha)	PROPORTION OF TOTAL FARM HOUSEHOLDS	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/SALARY	TOTAL ANNUAL INCOME
<0.01	2.64%(0.005)	356(1)	14557(26)	5366(10)	34825(63)	54147
0.01-0.40	31.86%(0.19)	8232(16)	7685(15)	5505(11)	28629(57)	50193
0.41-1.00	34.92%(0.66)	25726(40)	8467(13)	5546(9)	24135(38)	63791
1.01-2.00	17.16%(1.38)	50501(56)	11090(12)	7113(8)	20735(23)	90036
2.01-4.00	9.31%(2.57)	88297(68)	15155(12)	6643(5)	19882(15)	132335
4.01-10.00	3.72%(5.66)	182916(77)	19112(8)	10338(4)	24377(10)	234938
10.00+	0.39%(15.25%)	428224(86)	33157(7)	21244(4)	15730(3)	452299
All	100% (1.036)	36960(47)	10046(13)	6212(8)	24847(32)	78065

Note: Figures in brackets in first column indicates the average landholding for particular landholding class. Figures in brackets of other columns indicate the share of income component in total income.

From table 2.7, we observe that 69.42% of farm households in India own less than 1 ha land and 86.58% of farm households own less than 2 ha land. The average landholding of farmers with less than 1 ha land is 0.42 ha. The small farmers with 1-2 ha land are 15.87% and their average landholding is 1.38 ha. The semi-medium (possessing 2-4 ha land), medium (possessing 4-10 ha land) and large farmers (possessing land greater than 10 ha) comprise of 9.31%, 3.72% and 0.39% of total with average landholding of 2.57ha, 5.66ha and 15.25 ha. In 2002-03, the percentage of various landholding classes were 3.66%, 28.78%, 32.84%, 18.09%, 10.84%, 4.89% and 0.91% respectively. So, the percentage of farmers possessing less than 1 ha has increased by 4.15% and those possessing land less than 2 ha has increased by 3.23%. The average land possessed was also 1.23 ha in the 2002-03 survey. So the average land possessed also has decreased by 15%. Here again, there is a caveat in interpreting the results. During the 2002-03 survey, only those households which owned some land were surveyed which was not the case in 2012-13. Though this might mean that the extent of marginalisation in terms of households possessing land less than 2 ha and in terms of average land size is lesser than what the figures show, there is no doubt of a trend towards increased marginalisation of land possession among farm households.

For the lowest two landholding classes, wages form the most important source of income contributing to 63% and 57% of household income. Importance of crop cultivation incomes increase along with landholding sizes with it contributing to just 1% of the lowest landholding class and 86% of household income to the largest landholding class. Livestock is more crucial for lower landholding classes with it contributing 26% of household income to lowest landholding class and 7% to highest landholding class. Nonfarm business incomes contribute to 11% and 10% to the lower landholding classes while it contributes to around 4% to largest landholding class. Wages/salary contributes to only 3% of household income of the largest landholding class. This shows that apart from crop cultivation incomes, other incomes are more crucial to households having lesser land and thus policies on improving these incomes could provide an impetus for equitable growth.

We also find that at very low levels of less than 0.4 ha, farm households possessing land less than 0.01 ha on average earn more than those possessing land greater than 0.01 ha but less than 0.4 ha. They do this by earning more in livestock and wages than the farm households in second category. The 0.01 to 0.4 ha land class earn more than the households with less than 0.01 ha in crop cultivation but because of time they put into crop cultivation are not earning as much in wages or livestock. On the nonfarm businesses, households in both the categories earn pretty much the same amount. For households having land greater than 0.4 ha, the average annual household income increases with land sizes. Income from crop cultivation and livestock also increases with land sizes with the households possessing land greater than 0.4 ha and less than 1 ha on average earning INR 25,726 in crop cultivation and INR 8,467 in livestock while a household possessing more than 10 ha earns INR 4,28,224 in crop cultivation and INR 33,157 in livestock. Though both the incomes increase with land sizes, we find that the crop cultivation incomes are highly biased towards large landholders as compared to livestock income. A rough indication of this is that the ratio of average crop cultivation income between those households possessing more than 2 ha to those households possessing less than 1 ha is 7.43, while the same for livestock income is 2.01. The same ratio for nonfarm incomes is 1.47 and the wage income, which is biased towards households possessing

lesser land is 0.79. The ratio for total income is 2.98 which would mean that households possessing land sizes more than 2 ha earn on average 3 times the income of households possessing less than 1 ha. The ratio of average crop cultivation income, livestock income, nonfarm income, wage income and total annual income between households possessing land greater than 2 ha to those possessing land less than 1 ha in 2002-03 was 6.81, 0.46, 1.41, 0.69 and 2.66 respectively. So we observe that inequalities on account of land holding have increased for all income sources and total income as well.

### 2.5.Farm Household Incomes across various Castes

Table 2.8 provides the proportion of different caste households in agriculture and their income and income compositions.

**Table 2-8 Incomes of Farm Households across different Castes**

	PROPORTION OF TOTAL FARM HOUSEHOLDS	INCOME FROM FARMING	INCOME FROM LIVESTOCK	INCOME FROM NONFARM BUSINESS	INCOME FROM WAGES/ SALARY	TOTAL ANNUAL INCOME
ST	13.44%	30734(43)	10598(15)	2084(3)	27431(39)	70846
SC	16.26%	17670(32)	6476(12)	3596(6)	27745(50)	55486
OBC	45.43%	37333(48)	10642(14)	6897(9)	22576(29)	77448
OTHERS	24.87%	52226(54)	10881(11)	8894(9)	25517(26)	97519

Note: Figures in brackets of other columns indicate the share of income component in total income.

From Table 2.5, we observe that 13.44% of farm households belong to Scheduled Tribes, while 16.26%, 45.43% and 24.87% belong to Scheduled Caste, Other Backward Castes and Others belonging to other castes and religion. The income is highest among others, followed by OBC, ST and SC. The others earn INR 97,519 per annum or approximately INR 8,127 per month. Farm households belonging to OBC, ST and SC earn total incomes that are 79%, 73% and 57% of total income of Others. Others earn highest in cultivation, livestock and nonfarm businesses, while SCs earn highest in wages/salary. SCs earn the least in farming followed by STs, OBCs and Others earning the highest in cultivation. The ordering is same for incomes from livestock. In nonfarm business, STs earn the least followed by SCs, OBCs and Others earning the highest. In wage incomes, OBCs earn the least followed by others, STs and SCs earning the

most. Wage income forms a high share of total income for SC and ST farm households while cultivation income forms the high share for OBCs and Others.

### 3. Incomes from Cultivation

This section analyses the incomes from cultivation of the farm households. First, we analyse the cultivation incomes for households across all India. Then we look at the differences in cultivation economics for households across different states, crops and land classes,. We also look into issues related to tenancy and diversification and its implications on crop cultivation incomes.

#### 3.1. Income from Cultivation for Farm Households across All India

The economics of cultivation across the two seasons and households involved in cultivation in the two seasons are not same. So, we present the analysis for two different seasons separately. Table 3.1 provides the economics of cultivation across two seasons for all farming households in India.

**Table 3-1 Economics of Cultivation for Farm Households across India**

	Kharif	Rabi
Households Undertaking Cultivation	85.8%	70.8%
Households having access to Irrigation	59.1%	68.6%
Average Land Owned by Cultivating Households (ha)	1.011	0.956
Average Land Under Cultivation (ha)	0.944	0.785
Average Irrigated Land Under Cultivation (ha)	0.469	0.622
Average Unirrigated Land Under Cultivation (ha)	0.468	0.161
Total Value from Farming (INR) (TV)	40821	36745
Seed Cost	1859(11.9)	1560(10.5)
Fertilizer Cost	3381(21.6)	3231(21.6)
Manure Cost	406(2.6)	327(2.2)
Plant Protection Chemicals Cost	1245(8)	1037(6.9)
Diesel Cost	675(4.3)	850(5.7)
Electricity Cost	242(1.5)	345(2.3)
Human Labour Cost	3559(22.7)	2847(19.1)
Animal Labour Cost	290(1.9)	143(1)
Irrigation Cost	350(2.2)	667(4.5)
Minor Repair Cost	311(2)	299(2)

	Kharif	Rabi
Interest Cost	229(1.5)	214(1.4)
Machine Hiring Cost	1498(9.6)	1794(12)
Lease Rent	1080(6.9)	1144(7.7)
Other Expense	530(3.4)	470(3.1)
Total Cost (TC)	15656(100)	14928(100)
Returns (TV-TC)	25165	21817
GVO/Costs (TV/TC)	2.61	2.46
TV/TC (2002-03)	2.27	2.37
Change in TV/TC	15%	7%

Note: Figures in brackets indicate the percentage of cost component to total cost

From Table 3.1, we observe that 85.8% and 70.8% of total households were involved in cultivation during Kharif and Rabi respectively. As we would expect, more households were involved in cultivation in Kharif period than Rabi. Out of these households that participated in cultivation, 59.1% and 68.1% households had access to irrigation in Kharif and Rabi respectively. Irrigation is required more during the rabi season, so we observe that larger percentage of households cultivating in Rabi have access to irrigation. The average land under cultivation in the two periods are 0.944 ha and 0.785 ha. The average land owned by households undertaking cultivation in Kharif and Rabi is 1.011 has and 0.956 ha. This means that 93% of land owned by households cultivating in Kharif and 82% of land owned by households cultivating in Rabi is put under cultivation. Also, the average irrigated and unirrigated land is almost same in Kharif (0.469 and 0.468 ha respectively) while average irrigated land is much higher in Rabi compared to average unirrigated land (0.622 and 0.161 ha respectively). This again underlines the importance of irrigation in Rabi compared to Kharif for farm households.

The total value realised by farm households in Kharif and Rabi are INR 40,821 and INR 36,745 respectively. The total value realised in Kharif incomes is 11% higher than that realised in Rabi. In terms of cost components in agriculture, human labour (22.7%) forms the highest in Kharif followed by fertilizer costs (21.6%) while in Rabi, fertilizer costs (21.6%) is highest followed by human labour costs (19.1%). Seed cost forms the next highest component (11.9%) in Kharif while machine hiring costs (12%) form the third highest cost component in Rabi. Machine hiring costs (9.6%) is the fourth highest

component in Kharif and seed cost (10.5%) is the fourth highest in Rabi. Plant protection chemical costs (8% and 6.9%), lease rent cost (6.9% and 7.7%) and diesel costs (4.3% and 5.7%) are other significant costs in both Kharif and Rabi. Irrigation costs (4.5%) are significant in Rabi but not so significant (2.2%) in Kharif. The low animal labour costs (1.9% and 1%) and higher machine hiring costs confirm an increasing mechanisation in agriculture and its impact on different land classes might be important to understand. We also find that significant costs are incurred in diesel, machine hiring and irrigation in Rabi indicating a high dependence of electricity subsidy on Rabi returns for farm households than Kharif returns. We also observe that total value of Rabi is 90% of total value of total value of Kharif, but the Rabi returns is lesser at 86% of Kharif net returns. This is because some of the cost components have increased disproportionately in Rabi as compared to total value. If we look closer we find that there were five cost components that are higher in Rabi as compared to Kharif. Irrigation costs (191%), electricity costs (143%), diesel costs (126%), machine hiring costs (120%) and lease rent (106%) are higher in Rabi than Kharif by percentages indicated in brackets. Similarly, animal labour and human labour costs in Rabi are only 49% and 80% of the same in Kharif. Both the findings seem to indicate a higher mechanisation in Rabi than in Kharif.

The returns in both the periods are INR 25,165 and INR 21,817 in Kharif and Rabi respectively. The total value as a ratio of total costs is 2.61 and 2.46 in Kharif and Rabi. This ratio for a farm household in 2002-03 for total farming was 2.27 and 2.37 respectively. The average farm profitability increased by 15% and 7% for crop cultivation as a whole in 2012-13 s compared to 2002-03. We will explore the heterogeneities in this change in the subsequent subsections.

### **3.2. Income from Cultivation for Farm Households in Different States**

Table 3.2 and Table 3.3 provide the cultivation economics across different states for Kharif and Rabi season respectively. The tables provide the data for only 18 major states in the country, but data on other states for the two seasons.

**Table 3-2 Economics of Cultivation for Farm Households in Different States (Kharif)**

STATE	AP	ASSAM	BIHAR	CHH	GUJ	HAR	J&K	JH	KAR	KER	MP	MAH	OD	PUN	RAJ	TN	UP	WB
PROPORTION CULTIVATED (%)	78.7	93.4	87.9	97.6	82.2	70.8	94.4	98.1	94.1	96.8	92.1	91.5	96.3	65.9	89.7	48.4	85.1	89.3
Average Land Cultivated	1.644	0.779	0.563	1.160	1.312	1.633	0.418	0.515	1.385	0.425	1.305	1.363	0.683	2.172	1.285	0.666	0.556	0.380
Total Value	54494	36059	18321	47087	47763	109813	36282	16004	67489	41434	38432	64794	22276	191263	29673	41029	29196	17111
Seed Cost	3878	387	588	1110	3993	5899	290	810	2182	575	2374	4553	333	3929	2446	2831	929	679
Fertilizer Cost	7727(19)	913(18)	1626(20)	2713(25)	3532(19)	5656(14)	1095(24)	1259(28)	6312(26)	2533(17)	2641(21)	7429(29)	2368(27)	10052(13)	1298(13)	4594(23)	2391(23)	2024(18)
Manure Cost	758(2)	196(4)	325(4)	658(6)	271(1)	525(1)	58(1)	143(3)	94(4)	1556(10)	362(3)	645(3)	227(3)	540(1)	304(3)	1147(6)	220(2)	202(2)
Plant Protection Chemicals Cost	4253(10)	322(6)	228(3)	885(8)	1342(7)	5023(12)	402(9)	90(2)	1643(7)	575(4)	1457(11)	2296(9)	583(7)	8842(12)	312(3)	1361(7)	642(6)	508(5)
Diesel Cost	517(1)	148(3)	539(7)	93(1)	930(5)	2773(7)	133(3)	117(3)	364(1)	280	653(5)	300(1)	88(1)	10080(13)	294(3)	808(4)	1166(11)	314(3)
Electricity Cost	790	2(0)	11(0)	37(0)	493(3)	1427(3)	40(1)	2(0)	166(1)	125(1)	333(3)	949(4)	20(0)	54(0)	407(4)	1(0)	178(2)	81(1)
Human Labour Cost	10235(25)	1543(31)	1931(24)	2357(21)	3669(20)	7580(18)	1007(22)	936(21)	6729(28)	7105(47)	1918(15)	4981(19)	2763(31)	12775(17)	1629(16)	5190(26)	1846(17)	4544(41)
Animal Labour Cost	999(2)	147(3)	50(1)	44(0)	293(2)	134(0)	389(9)	175(4)	1046(4)	53(0)	49(0)	1076(4)	188(2)	9(0)	50(0)	291(1)	64(1)	188(2)
Irrigation Cost	203(0)	42(1)	897(11)	84(1)	358(2)	475(1)	17(0)	79(2)	158(1)	51(0)	80(1)	474(2)	80(1)	491(1)	135(1)	217(1)	594(6)	580(5)
Repair	273(1)	61(1)	92(1)	217(2)	336(2)	1499(4)	259(6)	69(2)	520(2)	107(1)	308(2)	466(2)	113(1)	2011(3)	314(3)	478(2)	345(3)	82(1)
Interest	1553(4)	11(0)	24(0)	133(1)	91(1)	400(1)	6(0)	8(0)	698(3)	362(2)	58(0)	101(0)	54(1)	2672(3)	111(1)	233(1)	95(1)	49(0)
Hiring Cost	2935(7)	715(14)	842(11)	1483(13)	1889(10)	4402(11)	338(7)	498(11)	1779(7)	286(2)	1871(15)	1670(7)	863(10)	4851(6)	2390(23)	2287(11)	1008(9)	991(9)
Lease Rent	6995(17)	59(1)	570(7)	635(6)	436(2)	4962(12)	43(1)	56(1)	953(4)	1170(8)	257(2)	78(0)	877(10)	19270(25)	187(2)	201(1)	717(7)	497(5)
Other Expense	943(2)	491(10)	240(3)	564(5)	565(3)	772(2)	458(10)	256(6)	946(4)	443(3)	382(3)	589(2)	259(3)	1092(1)	404(4)	608(3)	416(4)	284(3)
Total Cost	41347	5036	7964	11013	18199	41527	4534	4498	24443	14970	12745	25607	8816	76666	10281	20247	10612	11025
Returns	13148	31023	10357	36074	29564	68286	31748	11506	43047	26464	25687	39188	13460	114597	19392	20782	18585	6086
GYO/Costs	1.32	7.16	2.30	4.28	2.62	2.64	8.00	3.56	2.76	2.77	3.02	2.53	2.53	2.49	2.89	2.03	2.75	1.55



**Table 3-3 Economics of Cultivation for Farm Households in Different States (Rabi)**

STATE	AP	ASSAM	BIHAR	CHH	GUJ	HAR	J&K	JH	KAR	KER	MP	MAH	OD	PUN	RAJ	TN	UP	WB
PROPORTION CULTIVATED (%)	54.18%	89.40%	88.88%	28.83%	48.77%	70.33%	82.75%	77.40%	43.34%	96.69%	83.10%	44.31%	49.08%	66.30%	64.91%	59.24%	89.59%	78.56%
Average Land Cultivated	1.192	0.607	0.582	0.780	1.016	1.579	0.382	0.211	0.920	0.380	1.330	0.994	0.422	2.133	1.261	0.784	0.668	0.339
Total Value	86391	28947	22763	25967	37586	100165	10820	10868	63154	30146	46347	39828	14626	147337	46605	45047	32419	22216
Seed Cost	3396(6)	471(10)	1211(12)	611(8)	2071(14)	3585(10)	456(16)	625(21)	2262(11)	710(6)	1992(12)	2558(16)	449(7)	3744(6)	1805(12)	2960(13)	1299(11)	1587(11)
Fertilizer Cost	9699(16)	1042(21)	2376(24)	2022(27)	2918(19)	6005(17)	719(26)	594(20)	5194(26)	1811(14)	4253(25)	4632(29)	1335(20)	10419(16)	2663(17)	4189(18)	3010(25)	3093(22)
Manure Cost	1021(2)	124(3)	265(3)	203(3)	393(3)	367(1)	39(1)	43(1)	657(3)	1112(9)	433(3)	342(2)	160(2)	242(0)	594(4)	1162(5)	125(1)	203(1)
Plant Protection Chemicals Cost	7610(13)	505(10)	328(3)	1072(14)	1194(8)	2996(9)	106(4)	231(8)	1885(9)	328(3)	948(6)	1101(7)	896(14)	6993(11)	355(2)	1477(6)	514(4)	738(5)
Diesel Cost	620(1)	210(4)	492(5)	57(1)	997(7)	3639(10)	78(3)	190(6)	412(2)	19(0)	1204(7)	218(1)	168(3)	7123(11)	1524(10)	452(2)	1190(10)	305(2)
Electricity Cost	62(0)	20(0)	13(0)	75(1)	895(6)	1210(3)	40(1)	12(0)	196(1)	80(1)	1433(8)	1240(8)	22(0)	8(0)	1009(7)	3(0)	140(1)	57(0)
Human Labour Cost	14722(24)	1309(27)	1714(17)	1756(23)	3115(20)	4537(13)	491(18)	537(18)	5191(26)	5999(47)	1998(12)	2978(19)	1667(25)	5944(9)	2168(14)	6697(29)	1526(13)	4319(30)
Animal Labour Cost	748(1)	179(4)	24(0)	32(0)	94(1)	65(0)	87(3)	49(2)	62(3)	122(1)	15(0)	656(4)	105(2)	18(0)	4(0)	310(1)	26(0)	232(2)
Irrigation Cost	743(1)	12(0)	1099(11)	85(1)	1127(7)	439(1)	3(0)	87(3)	400(2)	23(0)	529(3)	411(3)	191(3)	366(1)	728(5)	374(2)	915(8)	1421(10)
Repair	259(0)	59(1)	118(1)	135(2)	248(2)	1048(3)	143(5)	68(2)	450(2)	94(1)	444(3)	278(2)	63(1)	2143(3)	541(4)	588(3)	302(3)	102(1)
Interest	2050(3)	0(0)	18(0)	106(1)	20(0)	334(1)	1(0)	12(0)	421(2)	702(5)	236(1)	125(1)	87(1)	2581(4)	133(1)	400(2)	79(1)	62(0)
Hiring Cost	4295(7)	476(10)	1390(14)	1023(14)	1760(11)	5786(17)	412(15)	297(10)	1737(9)	326(3)	2791(16)	1051(7)	569(9)	6436(10)	2990(19)	2914(13)	1681(14)	1074(8)
Lease Rent	13429(22)	5(0)	544(6)	33(0)	5(0)	3946(11)	26(1)	58(2)	28(0)	1106(9)	307(2)	47(0)	710(11)	18111(28)	69(0)	698(3)	680(6)	759(5)
Other Expense	1893(3)	437(9)	216(2)	358(5)	487(3)	765(2)	181(7)	197(7)	652(3)	372(3)	385(2)	345(2)	161(2)	938(1)	801(5)	855(4)	403(3)	255(2)
Total Cost	60546	4849	9805	7568	15321	34722	2781	3000	20107	12803	16967	15981	6583	65066	15384	23078	11889	14207
Returns	25844	24099	12958	18399	22265	65443	8039	7867	43047	17342	29380	23847	8043	82271	31221	21969	20530	8009
GYO/Costs	1.43	5.97	2.32	3.43	2.45	2.88	3.89	3.62	3.14	2.35	2.73	2.49	2.22	2.26	3.03	1.95	2.73	1.56

From Table 3.2 and Table 3.3, we find that the total value per unit cost in Kharif is highest in the states of Jammu & Kashmir, (8.00), Assam (7.16) and Chhattisgarh (4.28) and lowest in the states of Tamil Nadu (2.03), West Bengal (1.55) and Andhra Pradesh (1.32). The same ratio in Rabi is highest for the state of Assam (5.97), Jammu & Kashmir (3.89), Jharkhand (3.62) and Chhattisgarh (3.43) and lowest for Tamil Nadu (1.95), West Bengal (1.56) and Andhra Pradesh (1.43). We find that almost the same states figure in both the seasons. Actually, we find the correlation between Kharif GVO/cost ratio and Rabi ratio to be 0.93. Given that the crop profiles in two seasons might not be same for many states, this seems to indicate that GVO/Cost ratio might depend more on state dependent factors than crop dependent factors.

To analyse the impact of various cost component shares on GVO/cost ratio, we found correlations between the GVO/cost ratio and different cost components shares for Kharif and Rabi. For seed cost, we found the correlation to be -0.231 in Kharif and 0.260 in Rabi. This meant that profitability reduced with increase in seed costs shares in Kharif whereas profitability increased with seed cost shares in Rabi. For fertilizer cost shares, the correlations are 0.129 and 0.253 for Kharif and Rabi respectively. This means that GVO/cost responds positively to increased fertilizer cost shares in both season and the response is more positive in Rabi season compared to Kharif. The correlation for manure cost shares and GVO/cost ratio is -0.038 -0.046 for Kharif and Rabi respectively and the correlation for that for pesticide cost share is 0.009 and 0.055 for Kharif and Rabi respectively. This means that there is negligible effect of these cost shares on crop profitability. The correlation for diesel cost share with GVO/cost ratio is -0.117 and 0.086 for Kharif and Rabi respectively. This means that the increase in diesel cost has a negative influence in Kharif while a positive influence on profitability in Rabi. Human labour cost share has a negative insignificant correlation with GVO/cost ratio in Kharif (-0.053) and Rabi (-0.074). Animal labour has a correlation of 0.605 and 0.431 with GVO/cost ratio in Kharif and Rabi respectively. This means that higher share of animal labour cost in total cost increased profitability in farming and more in Kharif compared to Rabi. Irrigation cost shares had a high negative correlation with GVO/cost ratio in Kharif (-0.258) and Rabi (-0.373) respectively. This meant that farm households that had to spend more

share of total costs on irrigation lost out on profitability in both the seasons, but relatively higher in Rabi. Minor repair cost shares had a high positive correlation with GVO/cost ratio in Kharif (0.478) and Rabi (0.211) respectively. The spending on repair could be considered a kind of private investment and it is good to find having positive association with farm profitability in both seasons. Interest cost shares (correlation with GVO/cost in Kharif and Rabi: -0.393 and -0.384) and lease rent cost shares (correlation with GVO/cost in Kharif and Rabi: -0.368 and -0.464) have high negative correlation with GVO/cost in both seasons. Machine hiring costs have a positive correlation of 0.112 and 0.223 with GVO/cost ratio in both the seasons respectively.

### 3.3. Income from Cultivation for Farm Households for Different Crops

The income from cultivation for different crops in both season were calculated for the study. We found out that more than 138 different crops were cultivated by farmers in Kharif and more than 140 crops were cultivated by Indian farm households in Rabi. We have economics of cultivation for all these crops and could be provided on request. In the current report we present the economics of cultivation for 10 crops in Kharif and Rabi. We have only selected those 10 crops which were cultivated by atleast 2% of farm households in the country. Table 3.4 provides the economics of cultivation for the crops in Kharif.

**Table 3-4 Economics of Cultivation for Different Crops (Kharif)**

CROP	PADDY	MAIZE	BAJRA	COTTON	SOYABEAN	JOWAR	SUGARCANE	URAD DAL	TUR DAL	GROUND NUT
Proportion of farmers cultivating the crop	49.5%	10.3%	7.3%	7.0%	5.5%	4.9%	4.5%	3.9%	3.6%	2.59%
Land cultivated by the farmers	0.778	0.885	1.157	2.088	1.865	1.756	1.056	1.093	1.889	1.727
Land under crop	0.629	0.401	0.648	1.189	1.283	0.661	0.598	0.389	0.540	0.836
Irrigated Land under Crop	0.422	0.143	0.211	0.544	0.289	0.178	0.596	0.157	0.086	0.275
Unirrigated Land Under Crop	0.207	0.256	0.437	0.645	0.993	0.481	0.003	0.232	0.454	0.561
Proportion of households having irrigation	68.0%	37.8%	36.2%	44.8%	22.7%	31.8%	99.5%	36.6%	23.0%	40.3%
Yield in Irrigated Land (Kg/ha)	3811	2121	1799	1402	1169	3870	56106	563	860	977
Yield in Unirrigated Land (Kg/ha)	3819	2747	3205	1685	1310	9839	56316	532	819	1390

CROP	PADDY	MAIZE	BAJRA	COTTON	SOYABEAN	JOWAR	SUGARCANE	URAD DAL	TUR DAL	GROUND NUT
Total Value	26554	10535	9500	60489	45385	11501	91675	6453	12102	28493
Seed Cost	712(6)	645(13)	520(11)	5194(19)	3455(20)	723(11)	3151(15)	265(9)	426(7)	4038(29)
Fertilizer Cost	2324(21)	1269(26)	899(19)	6063(22)	3647(21)	1713(26)	5762(28)	597(20)	1507(25)	2508(18)
Manure Cost	253(2)	176(4)	120(3)	529(2)	336(2)	160(2)	443(2)	117(4)	104(2)	279(2)
Plant Protection Chemicals Cost	789(7)	334(7)	179(4)	3156(11)	2020(12)	529(8)	883(4)	292(10)	811(13)	943(7)
Diesel Cost	606(6)	122(2)	150(3)	736(3)	722(4)	254(4)	1283(6)	144(5)	71(1)	253(2)
Electricity Cost	89(1)	122(2)	160(3)	407(1)	276(2)	162(2)	1003(5)	23(1)	52(1)	239(2)
Human Labour Cost	2819(26)	869(18)	727(15)	5209(19)	2901(17)	1296(20)	4088(20)	563(18)	1484(24)	2708(20)
Animal Labour Cost	142(1)	149(3)	70(1)	625(2)	295(2)	278(4)	468(2)	39(1)	243(4)	467(3)
Irrigation Cost	343(3)	101(2)	139(3)	246(1)	91(1)	79(1)	823(4)	73(2)	58(1)	52(0)
Repair	201(2)	115(2)	183(4)	347(1)	384(2)	124(2)	703(3)	158(5)	66(1)	222(2)
Interest	163(1)	52(1)	38(1)	378(1)	135(1)	77(1)	163(1)	38(1)	94(2)	458(3)
Hiring Cost	1108(10)	647(13)	1053(22)	2000(7)	2275(13)	619(10)	1057(5)	532(17)	463(8)	989(7)
Lease Rent	1073(10)	159(3)	302(6)	1959(7)	155(1)	249(4)	569(3)	101(3)	477(8)	282(2)
Other Expense	388(4)	192(4)	179(4)	608(2)	454(3)	229(4)	536(3)	108(4)	207(3)	286(2)
Total Cost	11009	4952	4719	27457	17146	6492	20931	3049	6062	13725
Returns	11095	5074	4987	26781	17032	6850	20455	3147	6604	14767
GVO/Costs	2.41	2.13	2.01	2.20	2.65	1.77	4.38	2.12	2.00	2.08

From the table, we observe that almost 50% of the households cultivate paddy. Maize is cultivated by around 10% of the households, bajra and cotton by around 7% households, soybean, jowar and sugarcane by around 5%, urad and tur dal by around 4% households and groundnut by roughly 3% of households. Farm households cultivating paddy on average have 0.78 ha land under cultivation in Kharif. The total land cultivated by farm households cultivating maize (0.89 ha), bajra (1.16 ha), sugarcane (1.06 ha) and urad dal (1.09 ha) all hover around 1 ha. The total land cultivated by farm household cultivating cotton (2.09 ha), soybean (1.87 ha), jowar (1.76 ha), tur dal (1.89 ha) and groundnut (1.73 ha) are much higher and more in the vicinity of 2 ha. As a percentage of land cultivated under a crop to total land under cultivation, it is above 50% for paddy (81%), soybean (69%), sugarcane (57%), cotton (57%) and bajra (56%) suggesting these might be used more as major crops for farmers doing intercropping. These numbers are less than 50% for groundnut (48%), maize (45%), jowar (38%), urad dal (36%) and tur dal (29%) suggesting these might be used as more as minor crops by farmers doing intercropping. Also, the

percentage of land under irrigation is high for sugarcane (100%), paddy (67%) and cotton (46%) while it is low for jowar (27%), soybean (23%) and groundnut (16%). The irrigated land yield as a percentage of unirrigated land yield is very high for jowar (254%), bajra (178%) and groundnut (142%) and not so high for maize (130%), cotton (120%) and soybean (112%). The irrigated yield is almost the same or lower than unirrigated land yield for paddy (100%), urad dal (95%) and tur dal (94%).

In terms of profitability, sugarcane has the highest GVO/cost ratio of 4.38 while jowar has the lowest GVO/cost ratio of 1.77. On observing the relation between cost component share and GVO/cost ratio, we find that electricity cost has a high correlation (0.77) with GVO/cost ratio. This indicates that crops that have high share of costs in electricity tend to have high profitability. Similarly, irrigation cost (0.63), diesel cost (0.57) and fertilizer cost (0.44) shares also indicate high correlation with GVO/ cost ratio. This would indicate that crops which involve irrigation and which depend on fertilizer are the ones that give high profitability. Also, machine hiring cost has a high negative correlation (-0.40) with GVO/cost ratio. This indicates that crops requiring high share of machine hiring are the ones with low profitability. Pesticide cost also has a high negative correlation (-0.38) with profitability. Table 3.5 shows the economics of cultivation for 10 crops in Rabi.

**Table 3-5 Economics of Cultivation for Different Crops (Rabi)**

CROP	WHEAT	PADDY	RAPESEED & MUSTARD	GRAM	POTATO	MAIZE	COCONUT	SUGAR CANE	MASUR	JOWAR
Proportion of farmers cultivating the crop	38.70%	9.33%	8.83%	6.69%	5.20%	3.00%	2.41%	2.41%	2.07%	1.68%
Land cultivated by the farmers	0.871	0.756	1.031	1.526	0.588	0.835	0.572	1.045	0.893	1.355
Land under crop	0.616	0.594	0.375	0.741	0.177	0.504	0.224	0.548	0.260	0.701
Irrigated Land under Crop	0.584	0.486	0.326	0.438	0.133	0.373	0.145	0.538	0.179	0.151
Unirrigated Land Under Crop	0.032	0.108	0.049	0.303	0.044	0.129	0.076	0.005	0.081	0.547
Proportion of households having irrigation	93%	83%	85%	59%	80%	76%	46%	97%	61%	30%
Yield in Irrigated Land (Kg/ha)	3121	4636	1391	1003	15121	4769	8383	53668	975	3219
Yield in Unirrigated Land (Kg/ha)	1874	4061	958	820	6341	3005	8199	30366	922	1197

CROP	WHEAT	PADDY	RAPESEED & MUSTARD	GRAM	POTATO	MAIZE	COCONUT	SUGAR CANE	MASUR	JOWAR
Total Value	26486	35889	15549	19692	14941	25140	9323	84095	8755	12117
Seed Cost	973(10)	1129(6)	391(7)	1429(17)	1616(25)	1536(11)	70(2)	3127(14)	324(12)	419(8)
Fertilizer Cost	2301(23)	3573(19)	1223(22)	1717(21)	1386(22)	3385(25)	742(18)	6286(28)	681(25)	1455(27)
Manure Cost	193(2)	246(1)	125(2)	126(2)	173(3)	323(2)	316(8)	649(3)	20(1)	133(3)
Plant Protection Chemicals Cost	553(5)	1701(9)	199(4)	644(8)	340(5)	785(6)	182(4)	824(4)	140(5)	212(4)
Diesel Cost	881(9)	341(2)	546(10)	439(5)	146(2)	404(3)	80(2)	1143(5)	236(9)	166(3)
Electricity Cost	290(3)	62(0)	240(4)	380(5)	34(1)	96(1)	40(1)	967(4)	79(3)	177(3)
Human Labour Cost	1312(13)	5094(27)	931(17)	1275(15)	1265(20)	2555(19)	1697(40)	4019(18)	426(15)	1090(21)
Animal Labour Cost	34(0)	209(1)	21(0)	66(1)	152(2)	214(2)	55(1)	491(2)	6(0)	433(8)
Irrigation Cost	591(6)	600(3)	351(6)	230(3)	413(6)	729(5)	206(5)	845(4)	115(4)	117(2)
Repair	259(3)	203(1)	186(3)	153(2)	46(1)	130(1)	52(1)	545(2)	67(2)	133(3)
Interest	123(1)	387(2)	43(1)	95(1)	23(0)	126(1)	204(5)	186(1)	27(1)	41(1)
Hiring Cost	1536(15)	2044(11)	974(18)	1148(14)	418(7)	1567(12)	173(4)	1491(7)	492(18)	519(10)
Lease Rent	815(8)	2458(13)	190(3)	273(3)	206(3)	1170(9)	199(5)	1001(5)	95(3)	187(4)
Other Expense	314(3)	610(3)	123(2)	320(4)	168(3)	412(3)	175(4)	577(3)	46(2)	210(4)
Total Cost	10173	18657	5542	8294	6386	13433	4191	22152	2755	5292
Returns	17232	11708	19236	8727	18555	4252	61943	4922	5662	8555
GVO/Costs	1.92	1.87	2.11	1.91	3.40	2.00	3.80	2.00	1.59	2.34

From Table 3.5, we observe that around 40% farmers cultivate wheat in Rabi. Paddy and rapeseed & mustard are cultivated by around 10% farmers in Rabi as well. Around 7% and 5% farmers cultivate gram and potato in Rabi. Maize, cotton and sugarcane are cultivated in Rabi by around 3% and masur and jowar are cultivated by approximately 2% of farm households in Rabi.

Farm households cultivating wheat on average have 0.87 ha land under cultivation in Rabi. The total land cultivated by farm households cultivating paddy (0.76 ha), rapeseed & mustard (1.03 ha), potato (0.59 ha), maize (0.84 ha), coconut (0.57 ha), sugarcane (1.05 ha) and masur (0.89 ha) all hover around 0.5 to 1 ha. The total land cultivated by farm household cultivating gram (1.53 ha) and jowar (1.36 ha) are higher and more in the vicinity of 1.5 ha. As a percentage of land cultivated under a crop to total land under cultivation, it is above 50% for paddy (79%), wheat (71%), maize (60%), sugarcane (52%) and jowar (52%) suggesting these might be used more as major crops for farmers doing intercropping in Rabi. These

numbers are less than 50% for gram (49%), coconut (39%), rapeseed & mustard (46%), potato (30%) and masur (29%) suggesting these might be used as more as minor crops by farmers doing intercropping in Rabi. Also, the percentage of land under irrigation is high for sugarcane (98%), wheat (95%) and rapeseed & mustard (87%) while it is low for jowar (22%) and gram (59%). The difference between unirrigated and irrigated yield generally seems to be higher in Rabi as compared to Kharif. The irrigated land yield as a percentage of unirrigated land yield is very high for jowar (269%), potato (238%), sugarcane (177%), wheat (167%), maize (159%) and rapeseed & mustard (145%) and not so high for gram (122%), paddy (114%) masur (106%) and coconut (102%).

In terms of profitability, coconut has the highest GVO/cost ratio of 3.80 while masur has the lowest GVO/cost ratio of 1.59. On observing the relation between cost component share and GVO/cost ratio, we find that manure cost share has a high correlation (0.85) with GVO/cost ratio. This indicates that crops that have high share of costs in manure tend to have high profitability. Similarly, human labour cost share (0.72), and interest (0.51) also indicate high correlation with GVO/ cost ratio. This would indicate that crops which involve more human labour cost share in Rabi have higher profitability. Also, machine hiring cost has a high negative correlation (-0.75) with GVO/cost ratio. This indicates that crops requiring high share of machine hiring are the ones with low profitability. Diesel costs (-0.55), fertilizer cost (-0.43), electricity cost (-0.43) and minor repair cost (-0.42) also has a high negative correlation with profitability.

In both Kharif and Rabi, seed cost shares has very low correlation (0.03 & 0.11) with profitability of different crops. But, to understand the influence of seed cost on profitability, we might have to look at how seed costs in each crop varied based on variety of seeds used (hybrid/genetically modified/indigenous seeds). Fertilizer cost shares have positive correlation (0.44) for Kharif crops and high negative correlation (-0.44) for Rabi crops. This might mean high returns to fertilizer usage for Kharif crops and low returns to fertilizer usage for Rabi crops. For manure, we find the reverse with small negative correlation (-0.24) in Kharif and high positive correlation (0.85) in Rabi. Pesticide costs have a high negative correlation (-0.38 and -0.37) in both Kharif and Rabi. This might indicate why farmers

would spend more on seeds which could reduce pesticide costs. The seed cost shares have negligible influence on profitability while pesticide cost shares seem to have a negative impact on profitability. This claim would have to be tested more rigorously. Diesel cost share (0.57 and -0.55), electricity cost share (0.77 and -0.43), minor repair costs (0.13 and -0.42) have positive correlation with profitability in Kharif crops and negative correlation with profitability with Rabi crops. Irrigation cost shares (0.63 and 0.33) and human labour cost shares (0.04 and 0.72) have positive correlation with profitability for both Kharif and Rabi crops. Animal labour cost share (-0.25 and 0.14) and interest (-0.22 and 0.51) have negative correlation with profitability in Kharif and positive correlation with profitability in Rabi. Machine hiring share (-0.40 and -0.75) and lease cost (-0.22 and -0.25) have negative correlation with profitability for both Kharif and Rabi crops. Land and machine ownership would be able to reduce these costs and increase profitability. The criticality of owning means of production (land and machine) needs to be studied in detail for understanding this aspect.

### 3.4.Economics of Cultivation for different Landholding Classes

Table 3.6 shows cultivation economics of farm households belonging to different land classes for Kharif 2012-13. The total value and cost components are expressed in per ha terms for easier comparability. We also ignore farm households which possess less than 0.01 ha from our analysis as it is a very small share of total households and also only a very small proportion of these households are involved in crop cultivation.

**Table 3-6 Economics of Cultivation for different Landholding Size Classes (Kharif)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Proportion of Farm Households	31.86%	34.92%	17.16%	9.31%	3.72%	0.39%	100.00%
%Cultivating	79.3%	91.4%	93.0%	93.4%	93.2%	96.7%	85.8%
Irrigated Land	0.125	0.305	0.617	0.993	2.080	4.473	0.469
Total Land	0.195	0.581	1.240	2.106	4.409	9.963	0.939
Total Value (TV)	49100	43449	40774	42723	45005	48317	43499



Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Seed Cost	2010(9)	1701(10)	1668(11)	2271(13)	2383(14)	2433(12)	2005(12)
Fertilizer Cost	4895(23)	3787(23)	3345(23)	3546(21)	3405(20)	3331(16)	3598(22)
Manure Cost	607(3)	515(3)	399(3)	462(3)	306(2)	341(2)	432(3)
Plant Protection Chemical Cost	1205(6)	1048(6)	1081(7)	1414(8)	1751(10)	1956(10)	1325(8)
Diesel Cost	637(3)	521(3)	522(4)	700(4)	983(6)	1871(9)	719(4)
Electricity Cost	135(1)	296(2)	242(2)	227(1)	260(2)	457(2)	258(2)
Human Labour Cost	4557(21)	3827(23)	3383(23)	3993(24)	3633(21)	4310(21)	3787(23)
Animal labour Cost	492(2)	423(3)	304(2)	290(2)	188(1)	91(0.4)	309(2)
Irrigation Cost	1492(7)	555(3)	301(2)	199(1)	141(1)	176(1)	373(2)
Minor Repair Cost	386(2)	274(2)	286(2)	345(2)	364(2)	586(3)	331(2)
Interest Cost	114(1)	172(1)	216(1)	295(2)	312(2)	348(2)	244(1)
Machine Hiring Cost	2473(12)	1787(11)	1534(10)	1558(9)	1331(8)	1062(5)	1595(10)
Lease Rent Cost	1186(6)	682(4)	848(6)	1106(7)	1660(10)	3165(16)	1150(7)
Other Cost	1139(5)	712(4)	568(4)	484(3)	360(2)	265(1)	564(3)
Total Cost (TC)	21328	16300	14697	16892	17078	20393	16691
TV/TC	2.30	2.67	2.77	2.53	2.64	2.37	2.61
TV/TC 2002-03	2.32	2.36	2.39	2.34	2.10	1.92	2.27
Change in TV/TC Profitability	-1%	13%	16%	8%	25%	24%	15%
TV-TC(per ha)	27772	27149	26077	25831	27927	27925	26808
TV-TC(per ha) 2002-03	8037	7839	7355	6848	5811	3827	6725
Change in TV-TC Returns	246%	246%	255%	277%	381%	630%	299%

From Table 3.6, we find that more than 20% of farm households in the lowest land class do not participate in cultivation. For other land classes it is less than 10% and decreases with land sizes. The total value per hectare decreases with land sizes for first 3 land classes but rises again for the next 3 landholding classes. In 2002-03 survey, the total value per hectare decreased as we moved across lowest to highest land classes (Gaurav & Mishra, 2014)<sup>2</sup>. As far as total costs per ha are concerned, it declines from lowest land class to 1-2 ha land class and then increases thereafter. In 2002-03, the total costs decreased from lowest land class to 2-4 ha land class and then increased for the last two land classes. In effect, the returns per ha decreases as we move from lowest land class to 2-4 ha land class and then increases thereafter. In 2002-03, this returns decreased as we moved from lowest to highest land classes.

<sup>2</sup> The economics of cultivation for 2002-03 Kharif and Rabi season are provided in Table A-1 and Table A-2 of Appendix A

This might indicate that the inverse size class productivity might not be holding in the Indian context and this could be because of increased efficiency of operations in large farms or decreased efficiency of operations in small farms. Profitability in terms of TV/TC increases from lowest land class to 1-2 ha land class and then decreases for 2-4 ha land class, increases again for 4-10 ha land class and decreases for 10+ ha land class. In 2002-03, this ratio increased from lowest to 1-2 ha land class and then decreased thereafter. The lowest land class has lost 1% of this ratio from 2002-03 while the other land classes have improved this ratio. This ratio has improved more for the larger land holding with the land class 4-10 ha and 10+ ha gaining 25% and 24%. All this seems to indicate that the economics of cultivation has deteriorated for the lowest land class and has improved for other land classes and that the largest land classes have gained disproportionately. Looking at the cost structure of the different land classes could indicate us if that is the case.

In terms of cost components, seed cost as a share of total cost increases from lowest to highest land class except the last land class. Fertilizer cost as a share of total cost decreases from lowest to highest land classes. Share of plant protection chemical costs increases from lowest to highest land classes. Diesel cost shares increases from lowest to highest land classes. It contributes to 3% of total cost to lowest two classes and 9% to highest land class. Irrigation cost shares decrease from lowest to highest land classes with it being 7% for lowest land class and 1% for highest land class. Machine hiring costs also decline with land classes and contribute to 12% for lowest land class and 5% to highest land class. Human labour cost shares is almost constant across land classes with the middle land classes having slightly higher shares. Lease rent costs seem to be increasing with land class except for the land class 0.4-1 ha. Particularly, the lease rent cost shares for 4-10 ha and 10+ ha are 10% and 16% respectively. For the lower 4 land classes, human labour, fertilizer, seed and machine hiring costs are the most significant costs. For the upper 2 land classes, human labour, fertilizer, seed, lease rent and plant protection costs are the most significant costs. The findings seem to suggest that there is mechanisation across all land classes and ownership of machines is distributed in favour of higher land classes. This is seen from higher

machine hiring cost shares for the lower land classes. There seems to be some tendency of reverse tenancy as seen from the lease rent cost share of larger land classes. In terms of changes in cost structure from 2002-03 Kharif, we may not be able to make exact comparisons as the cost components collected were different in 2002-03. Also, while 2002-03 costs were referred to as Kharif costs, the costs of 2012-13 was for the particular reference period. Still, a rough comparison is bound to give us some broad trends and we present the changes in value and selected costs in Table 3.7 and changes in shares of the cost components in Table 3.8.

**Table 3-7 Changes in Value and Selected Costs from 2002-03 (Kharif)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Total Value (TV)	248%	219%	222%	257%	306%	503%	262%
Seed Cost	166%	107%	107%	171%	177%	246%	146%
Fertilizer	223%	173%	162%	212%	185%	289%	194%
Plant Protection	248%	161%	159%	217%	241%	365%	203%
Manual Labour	190%	150%	151%	207%	172%	302%	179%
Interest	109%	155%	133%	212%	197%	330%	178%
Lease rent	307%	126%	281%	413%	581%	1056%	361%
Total Cost (TC)	251%	182%	177%	231%	224%	388%	216%
TV/TC	-1%	13%	16%	8%	25%	24%	15%
TV-TC	246%	246%	255%	277%	381%	630%	299%

From Table 3.7, we observe that for farm households as a whole total value increased by 262%, but total costs increased by 216%. So TV/TC increased by 15% and TV-TC(per ha) increased by 299%. Among the different cost, only lease rent costs increased by more than total value (361%) and seed costs showed the smallest increase (146%). For each land class, we observe that the total cost increased by lesser than total value for all land class except the lowest. For the lowest land class, total cost increased by 251% while the total value increased by 248%. Among the various cost components for this land class, plant protection and lease rent cost increased by

248% and 307% respectively. Apart from the 0.4-1 land class, lease rent has increased by more than total value for other classes. This seems to indicate a wide scale increase in either tenancy or rents in tenancy. We will explore this in detail in the next subsection.

**Table 3-8 Changes in Shares of Selected Costs from 2002-03 (Kharif)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Seed Cost	-3%	-4%	-4%	-3%	-2%	-5%	-3%
Fertilizer	-2%	-1%	-1%	-1%	-3%	-4%	-2%
Plant Protection	0%	-1%	-1%	0%	1%	0%	0%
Manual Labour	-5%	-3%	-2%	-2%	-4%	-5%	-3%
Interest	0%	0%	0%	0%	0%	0%	0%
Lease rent	1%	-1%	2%	2%	5%	9%	2%
Other costs including irrigation, electricity, machine hiring, etc	9%	9%	7%	4%	4%	5%	6%

From Table 3.8, we observe that farm households in general are spending lesser shares in seeds (-3%), fertilizers (-2%) and manual labour (-3%) and higher shares in lease rent (+2%) and other costs including machine hiring, irrigation, diesel, electricity, animal labour, marketing, etc (+6%). The seed cost shares have reduced across all land classes by 3-5% and fertilizer cost shares have reduced by 1-4% across all land classes. Plant protection cost and interest cost shares have remained more or less the same. Lease rent shares have increased for all land classes except 0.4-1 ha and it has increased the most for last two land classes by 5% and 9%. This again indicated a tendency towards increasing reverse tenancy. Given total shares of these cost components have shown a general decline the other cost shares must have risen. Though the exact composition of this cost share change cannot be deciphered, what we seem to find is that cost shares including machine hiring, diesel, animal hiring, irrigation, etc., have increased. This means that out of every rupee spent in farming a larger share now goes to mechanization and lease rent

than 2002-03. As we observed previously, these changes in farming seem to have affected farm households belonging to lowest class (0.01-0.4 ha) adversely. We also inquire similar issues for Rabi.

Table 3.9 shows the economics of cultivation for different land classes in Rabi 2012-13.

**Table 3-9 Economics of Cultivation for different Landholding Size Classes (Rabi)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Proportion of Farm Households	31.86%	34.92%	17.16%	9.31%	3.72%	0.39%	100.00%
%Cultivating	71.9%	74.9%	70.3%	72.0%	69.0%	74.5%	70.84%
Irrigated Land	0.168	0.428	0.799	1.566	2.719	6.524	0.622
Total Land	0.200	0.529	1.029	1.979	3.530	8.260	0.785
Total Value (TV)	50775	49220	47781	43386	46537	43021	46917
Seed Cost	2621(11)	2143(11)	2125(11)	1694(10)	1923(10)	1432(8)	2004(11)
Fertilizer Cost	5330(23)	4705(23)	4176(22)	3625(21)	3530(19)	3047(18)	4116(22)
Manure Cost	525(2)	410(2)	481(2)	354(2)	410(2)	273(2)	416(2)
Plant Protection Chemical Cost	1129(5)	1162(6)	1403(7)	1279(8)	1634(9)	1239(7)	1321(7)
Diesel Cost	755(3)	888(4)	964(5)	1102(7)	1508(8)	1758(10)	1083(6)
Electricity Cost	212(1)	462(2)	534(3)	428(3)	431(2)	369(2)	440(2)
Human Labour Cost	3349(15)	3871(19)	3989(21)	3361(20)	3377(18)	3314(19)	3627(19)
Animal labour Cost	283(1)	235(1)	234(1)	132(1)	84(0)	67(0)	182(1)
Irrigation Cost	2440(11)	1199(6)	826(4)	452(3)	289(2)	235(1)	850(4)
Minor Repair Cost	377(2)	321(2)	340(2)	411(2)	472(3)	424(2)	380(2)
Interest Cost	104(0)	143(1)	241(1)	414(2)	344(2)	463(3)	273(1)
Machine Hiring Cost	3413(15)	2898(14)	2344(12)	1760(10)	1668(9)	1566(9)	2287(12)
Lease Rent Cost	1575(7)	1087(5)	998(5)	1389(8)	2387(13)	2594(15)	1457(8)
Other Cost	911(4)	718(4)	642(3)	479(3)	436(2)	366(2)	599(3)
Total Cost (TC)	23023	20242	19297	16879	18493	17148	19035
TV/TC	2.30	2.67	2.77	2.53	2.64	2.37	2.61
TV/TC 2002-03	2.32	2.36	2.39	2.34	2.10	1.92	2.27
Change in TV/TC	-1%	13%	16%	8%	25%	24%	15%
TV-TC(per ha)	27752	28978	28484	26507	28044	25874	27882
TV-TC(per ha) 2002-03	10892	8306	9171	9879	9477	8196	9225
Change in TV-TC(per ha)	155%	249%	211%	168%	196%	216%	202%

From Table 3.9, we find that roughly 25-30% of farm households of all land classes do not participate in cultivation. The total value per hectare decreases with land classes except the 5<sup>th</sup> land class which is higher than 4<sup>th</sup> and 6<sup>th</sup> land class. In 2002-03 survey, the total value per hectare for 0.4-1 ha was lower than that of 0.01-0.4 ha. This value then increased up to 2-4 ha land class and then decreased thereafter. As far as total costs per ha are concerned, it declines from lowest land class to 2-4 ha land class and then increases for 4-10 ha land class and decreases for 10+ha land class. In 2002-03, the total costs decreased from lowest land class to 0.4-1 ha land class and then increased for 1-2 ha and then decreased thereafter. In effect, the returns per ha increases as we move from lowest land class to 1-4 ha land class and then decreases till 2-4 ha and then increases for the last two land classes. In 2002-03, this return decreased as we moved from lowest to 1-2 ha then increased for 2-4 ha and then decreased for last two land classes. Profitability in terms of TV/TC increases from lowest land class to 2-4 ha land class and then decreases for last two land classes. In 2002-03, this ratio decreased from lowest to 0.4-1 ha land class and then increased till 2-4 ha and then decreased for last two land classes. The lowest land class has lost 5% of this ratio from 2002-03 while the other land classes have improved this ratio. This ratio has improved more for the larger land holding with the land class 4-10 ha and 10+ ha gaining 12% and 18%. All this again seems to indicate that the economics of cultivation has deteriorated for the lowest land class and has improved for other land classes and that the largest land classes have gained disproportionately. Looking at the cost structure of the different land classes in Rabi, we find that the trends for most cost components remain the same. Fertilizer cost shares, plant protection chemical cost shares, diesel cost shares all increase from lowest to highest land class. Seed cost shares, unlike in Kharif decreases from lowest to highest land classes. Irrigation cost shares and machine hiring costs decrease from lowest to highest land classes. Human labour cost shares is almost constant across land classes with the middle land classes having slightly higher shares and also households seem to spending lesser share of total costs in human labour in Rabi as compared to Kharif. Lease rent costs seem to be increasing with land class except for the land class 0.4-1 ha and 1-2 ha. Particularly, the lease rent cost shares for 4-10 ha and 10+ ha are 13% and 15% respectively. This again seems to support our hypothesis of increasing reverse tenancy. In terms

of changes in cost structure from 2002-03 Rabi, we present the changes in value and selected costs in Table 3.10 and changes in shares of the cost components in Table 3.11.

**Table 3-10 Changes in Value and Selected Costs from 2002-03 (Rabi)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Total Value (TV)	160%	235%	195%	161%	189%	214%	194%
Seed Cost	72%	92%	76%	45%	82%	59%	74%
Fertilizer	157%	222%	168%	152%	158%	202%	180%
Plant Protection	202%	278%	294%	256%	258%	217%	259%
Manual Labour	132%	243%	216%	170%	157%	154%	190%
Interest	467%	323%	487%	894%	604%	553%	558%
Lease rent	300%	232%	239%	254%	454%	406%	291%
Total Cost (TC)	166%	216%	174%	150%	179%	211%	182%
TV/TC	-5%	5%	5%	8%	12%	18%	7%
TV-TC	155%	249%	211%	168%	196%	216%	202%

From Table 3.10, we observe that for farm households as a whole total value in 2012-13 Rabi increased by 194%, but total costs increased by 182%. So TV/TC increased by 7% and TV-TC(per ha) increased by 202%. Among the different cost components, plant protection chemical cost (259%), interest cost (558%) and lease rent costs (291%) increased by more than total value and seed costs showed the smallest increase (74%). For each land class, we observe that the total cost increased by lesser than total value for all land class except the lowest. For the lowest land class, total cost increased by 166% while the total value increased by 160%. Among the various cost components for this land class, plant protection, interest and lease rent cost increased by 202%, 467% and 300% respectively. Apart from the 0.4-1 land class, lease rent has increased by more than total value for other classes. This again seems to support our conjecture of increased tenancy or tenancy costs.

**Table 3-11 Changes in Shares of Selected Costs from 2002-03 (Rabi)**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Seed Cost	-6%	-7%	-6%	-7%	-6%	-8%	-7%
Fertilizer	-1%	0%	-1%	0%	-2%	-1%	0%
Plant Protection	1%	1%	2%	2%	2%	0%	1%
Manual Labour	-2%	2%	3%	2%	-2%	-4%	1%
Interest	0%	0%	1%	2%	1%	1%	1%
Lease rent	2%	0%	1%	2%	6%	6%	2%
Other costs including irrigation, electricity, machine hiring, etc	6%	3%	0%	-1%	-1%	6%	2%

From Table 3.11, we observe that farm households as a whole are spending lesser shares in seeds (-7%) and higher shares in plant protection chemicals (+1%), manual labour (+1%), interest (+1%) lease rent (+2%) and other costs including machine hiring, irrigation, diesel, electricity, animal labour, marketing, etc (+2%). The seed cost shares in rabi have reduced across all land classes by 6-8% and fertilizer cost shares have reduced by 0-2% across all land classes. Plant protection cost shares increased by 0 to 2%. Lease rent shares have increased for all land classes except 0.4-1 ha and it has increased the most for last two land classes by 6%. Labour shares have increased for 0.4-1 ha, 1-2 ha and 2-4 ha land classes and decreased for other classes. The other cost shares in Rabi have remained the same for 1-2 ha land class, declined by 1% for 2-4 and 4-10 ha and increased for other land classes.

### **3.5.Tenancy and its Impact of Economics of Cultivation**

We observe from the previous section that farmers across all land classes are spending more on lease rent. This could be due to increase in instance of tenancy or due to increase in lease rent amounts. We check on the prevalence of tenancy across different states and land classes. For understanding this, we estimate the



number of farm households that are leasing in land. Table 3.12 shows the proportion of farm households that are leasing in land across different states of India.

**Table 3-12 Changes in Tenancy across Different States**

	Proportion of Farm Households Leasing-in Land in 2012-13	Proportion of Farm Households Leasing-in Land in 2002-03	Change
ALL INDIA	16.42%	12.76%	3.66%
JAMMU & KASHMIR	0.91%	1.00%	-0.10%
HIMACHAL PRADESH	9.30%	8.86%	0.44%
PUNJAB	22.55%	14.76%	7.78%
CHANDIGARH	3.71%	38.78%	-35.07%
UTTARANCHAL	8.78%	5.10%	3.68%
HARYANA	13.91%	14.29%	-0.38%
DELHI	6.28%	2.42%	3.86%
RAJASTHAN	9.38%	5.52%	3.86%
UTTAR PRADESH	16.43%	16.96%	-0.53%
BIHAR	29.28%	19.52%	9.76%
SIKKIM	17.24%	19.32%	-2.09%
ARUNACHAL PRADESH	6.64%	7.40%	-0.76%
NAGALAND	3.25%	1.49%	1.76%
MANIPUR	9.56%	14.60%	-5.03%
MIZORAM	1.89%	1.47%	0.42%
TRIPURA	18.38%	18.12%	0.25%
MEGHALAYA	10.56%	17.70%	-7.15%
ASSAM	11.22%	10.00%	1.22%
WEST BENGAL	37.18%	19.11%	18.07%
JHARKHAND	10.71%	3.87%	6.84%
ODISHA	25.99%	23.39%	2.60%
CHHATTISGARH	17.72%	11.71%	6.00%
MADHYA PRADESH	7.11%	7.26%	-0.15%
GUJARAT	6.24%	3.96%	2.29%
DAMAN & DIU	1.85%	0.00%	1.85%
D & N HAVELI	1.11%	0.05%	1.06%
MAHARASHTRA	5.21%	6.43%	-1.22%
ANDHRA PRADESH	35.59%	16.92%	18.68%
KARNATAKA	9.97%	5.70%	4.27%
GOA	15.41%	20.63%	-5.21%

	Proportion of Farm Households Leasing-in Land in 2012-13	Proportion of Farm Households Leasing-in Land in 2002-03	Changes
LAKSHADWEEP	6.77%	2.63%	4.15%
KERALA	15.86%	7.69%	8.17%
TAMIL NADU	11.30%	13.32%	-2.03%
PUDUCHERRY	14.06%	25.28%	-11.22%
A & N ISLANDS	3.37%	5.25%	-1.88%
TELENGANA	14.14%	---	---

From Table 3.2, we observe that incidence of tenancy has increased at all India level. The percentage of farm households leasing-in land has increased by 3.66% from 12.76% to 16.42%. This increase is highest in Andhra Pradesh and West Bengal. In the two states, percentage of farmers leasing in land increased from 16.92% to 35.59% and 19.11% to 37.18% respectively. In Bihar, percentage of farm households leasing-in land increased from 19.52% to 29.28%. There have been very few major states in which percentage of farmers leasing-in land has decreased. The percentage of farm households leasing-in land decreased from 13.32% to 11.3% in Tamil Nadu while it decreased from 6.43% to 5.21% in Maharashtra.

Table 3.13 presents the percentage of farm households leasing-in land across different land classes and changes from 2002-03.

**Table 3-13 Changes in Tenancy across Different Land Classes**

Land class based on total land possessed	Proportion of Farm Households Leasing-in Land in 2012-13	Proportion of Farm Households Leasing-in Land in 2002-03	Changes
<0.01	1.72%	2.74%	-1.02%
0.01-0.4	17.71%	11.83%	5.88%
0.4-1	15.88%	14.14%	1.74%
1-2	15.10%	13.58%	1.52%
2-4	16.73%	12.77%	3.96%

Land class based on total land possessed	Proportion of Farm Households Leasing-in Land in 2012-13	Proportion of Farm Households Leasing-in Land in 2002-03	Changes
4-10	25.01%	12.99%	12.02%
10+	28.36%	14.49%	13.87%
All	16.42%	12.76%	3.66%

From the Table 3.13, we observe that except for lowest land class, percentage of farm households leasing-in land has increased for all the land classes. The increase is less for 0.4-1` ha and 1-2 ha where the percentage of households leasing-in land increased by 1.74% and 1.52% only. Across 0.01-0.4 ha, the increase was 5.88% while that for 2-4 ha is 3.96%. The highest increase in percentage of farm households leasing-in land is across 4-10 ha and 10+ ha and the increase is 12.02% and 13.87% respectively. This indicates that both tenancy among farm households with very low land and reverse tenancy among farm households with very large land are on rise. The percentage of farm households leasing-in land across different landholding classes for different states for 2012-13 and 2002-03 are presented in Table A-1 and Table A-2 of Appendix A. To reiterate, the comparison has to be made with the caveat in mind that the 2012-13 survey included those households which did not own any land but 2002-03 survey did not. Table 3.14 looks at economics of cultivation for tenants across different land classes in Kharif 2012-13.

**Table 3-14 Economics of Cultivation for Tenants (Kharif 2012-13)**

	Households leasing in land and land class category						
	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Total Value (TV)	47873(97)	40649(92)	28584(65)	45980(109)	54798(132)	46728(95)	43156(99)
Seed Cost	2196(112)	1705(100)	1091(60)	2881(134)	2416(102)	2069(78)	2010(100)
Fertilizer Cost	5005(103)	4016(107)	2699(77)	4566(137)	3917(122)	3770(124)	3815(108)
Manure Cost	365(54)	514(100)	292(69)	665(158)	202(59)	274(71)	382(86)
Plant Protection Chemical Cost	1299(110)	1427(146)	1041(95)	2333(189)	2156(134)	2176(120)	1737(142)

	Households leasing in land and land class category						
	0.01-0.4	0.01-0.4	0.01-0.4	0.01-0.4	0.01-0.4	0.01-0.4	0.01-0.4
Diesel Cost	831(142)	658(133)	343(61)	872(131)	1208(134)	1985(110)	884(131)
Electricity Cost	31(19)	131(40)	171(66)	194(83)	225(83)	134(20)	169(60)
Human Labour Cost	6936(177)	4797(132)	3436(102)	6589(189)	4129(119)	5463(153)	4830(137)
Animal labour Cost	196(34)	326(74)	180(54)	411(154)	192(103)	149(275)	250(77)
Irrigation Cost	1724(121)	791(155)	271(88)	301(168)	138(97)	312(353)	432(121)
Minor Repair Cost	402(105)	192(66)	157(49)	394(118)	482(149)	275(35)	312(93)
Interest Cost	126(114)	188(111)	271(134)	757(371)	424(155)	401(128)	386(186)
Machine Hiring Cost	2859(121)	2194(128)	1179(73)	1777(117)	1785(152)	847(71)	1694(108)
Lease Rent Cost	5646(86447)	4260(29217)	3644(2478)	6668(247391)	6348(10782955)	8089(57106)	5492(13277)
Other Cost	1030(88)	630(87)	406(67)	758(176)	391(112)	265(100)	534(93)
Total Cost (TC)	28646(148)	21830(143)	15184(104)	29167(202)	24012(164)	26211(157)	22927(152)
TV-TC	19228(64)	18819(66)	13400(46)	16813(61)	30786(114)	20517(63)	20229(71)
TV/TC	1.67(66)	1.86(65)	1.88(63)	1.58(54)	2.28(80)	1.78(60)	1.88(65)

Note: Value and Cost figures are in per ha. Figures in brackets indicate the ratio of the statistic for farmers leasing-in land to those not leasing-in land in the same land class

For tenants across all land classes, the total value generated per ha by farm households leasing-in land is INR 43,156 per ha which is almost same as the value generated by farmers who do not lease-in any land. But, the costs incurred by tenant farmers are much higher than that of that of non-tenant farmers. Tenant farmers spend INR 2,29,27 per ha in Kharif which is 152% of non-tenant farm households. As a result the returns for tenant farmers is INR 20,229 per ha which is 71% of the non-tenant farm households. Profitability as measure by TV/TC is 1.88 which is just 65% of that of non-tenant households. Apart from lease rent which is higher for tenant farm households, they also seem to spend more than non-tenants in interest, plant protection chemicals, human labour, diesel, irrigation, machine hiring and fertilizers. They spend lesser in seeds, minor repair, manure, animal labour and electricity. The tenants possessing land in 0.01-0.4 ha spend more in seed costs along with the costs mentioned above and generate 97% of TV as the non-tenants in the same land class. Returns for tenants in this class are 64% of non-tenants in this

class and profitability was 66% of non-tenants in the same land class. For the land classes 0.4-1 ha, 1-2 ha, 2-4 ha, 4-10 ha and 10+ ha, the returns per ha for tenants was 66%, 46%, 61%, 114%, 63% and 71% of the non-tenants in their corresponding land classes. Similarly, the profitability for tenants was 65%, 63%, 54%, 80%, 60% and 65% of the non-tenants in their corresponding land classes. The tenant farm households were able to generate a higher profitability in returns per ha for tenants in relation to non-tenants in Kharif 2002-03. This seems to indicate that along with increasing tenancy, the situation of tenants also has become relatively bad. The economics of cultivation for tenants in Kharif 2002-03 and Rabi 2002-03 are mentioned in Table C-1 and Table C-2 of Appendix C respectively. In 2002-03, tenant households spent more than non-tenant households in all cost components to produce value higher than non-tenants. But, in 2012-13, tenant households are not spending more in some cost heads, probably because of high lease rents, but total costs is higher for these households. Since they do not spend in some heads like fertilizer, manure, seed, etc., they seem to generating value less than non-tenant households. Rabi costs show similar trends, but value generated by tenant farm households is higher than non-tenant households across all land classes. But the high total cost means lower returns per ha and lower profitability for tenant households. Table 3.15 shows the economics of cultivation for tenants in Rabi 2012-13

**Table 3-15 Economics of Cultivation for Tenants (Rabi 2012-13)**

	Households leasing in land and land class category						
	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Total Value (TV)	54371(109)	50333(103)	56927(124)	61062(153)	56156(131)	49177(125)	55218(123)
Seed Cost	3049(122)	2393(115)	2229(106)	2229(140)	2303(129)	1909(167)	2334(121)
Fertilizer Cost	6327(126)	5307(116)	5313(135)	5352(162)	4337(134)	3308(114)	5040(130)
Manure Cost	530(101)	400(97)	316(61)	492(150)	479(124)	268(97)	421(101)
Plant Protection Chemical Cost	1509(149)	1595(149)	3304(327)	2821(287)	2526(194)	1764(191)	2366(223)
Diesel Cost	940(135)	791(87)	761(76)	1294(122)	1562(105)	2005(125)	1163(109)
Electricity Cost	29(11)	153(29)	289(49)	290(64)	261(53)	267(62)	226(46)

	Households leasing in land and land class category						
	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Human Labour Cost	4928(171)	5736(165)	6666(194)	6922(258)	4566(155)	4560(178)	5712(184)
Animal labour Cost	191(62)	217(91)	226(96)	157(123)	139(219)	80(134)	176(96)
Irrigation Cost	3032(134)	1656(151)	1432(204)	571(133)	226(72)	287(141)	1112(142)
Minor Repair Cost	182(42)	274(82)	287(82)	456(113)	512(112)	546(156)	377(99)
Interest Cost	102(98)	224(179)	563(323)	1585(836)	400(124)	977(631)	637(351)
Machine Hiring Cost	3258(94)	3367(120)	2505(108)	1988(116)	2081(137)	1927(143)	2529(114)
Lease Rent Cost	5172(1051)	5431(3751)	5616(12021)	8260(11083)	8641(12110)	6793(9856)	6799(5624)
Other Cost	798(84)	671(92)	963(167)	1126(317)	475(113)	423(128)	763(137)
Total Cost (TC)	30048(144)	28216(152)	30471(179)	33542(245)	28507(193)	25115(203)	29655(181)
TV-TC	24322(84)	22117(73)	26456(92)	27520(105)	27649(98)	24062(89)	25563(90)
TV/TC	1.81(76)	1.78(67)	1.87(69)	1.82(62)	1.97(68)	1.96(62)	1.86(68)

Note: Value and Cost figures are in per ha. Figures in brackets indicate the ratio of the statistic for farmers leasing-in land to those not leasing-in land in the same land class

### 3.6. Diversification and its Impact of Economics of Cultivation

Farm households diversify their crop portfolio by cultivating more than one crop in their fields. In the survey, data on upto 5 crops cultivated by farm households was collected. We analyse the economics of cultivation based on number of crops cultivated by them in Kharif and Rabi 2012-13. Table 3.16 shows diversification and its impact on economics of cultivation for Kharif 2012-13 and Table 3.17 shows the same for Rabi 2012-13.

**Table 3-16 Diversification and Economics of Cultivation (Kharif 2012-13)**

Number of Crops	1	2	3	4	5
% of Cultivating	60.4%	24.3%	9.8%	3.5%	2.0%
TV	38487(100)	47013(122)	50412(131)	43421(113)	50451(131)
Seed Cost	1732(100)	2297(133)	2171(125)	2267(131)	1842(106)
Fertilizer	3490(100)	3600(103)	3663(105)	3924(112)	4238(121)
Manure	426(100)	455(107)	434(102)	308(72)	610(143)
Plant Protection	1102(100)	1434(130)	1678(152)	1618(147)	1113(101)

Number of Crops	1	2	3	4	5
Diesel	499(100)	938(188)	909(182)	856(172)	604(121)
Electricity	191(100)	324(170)	272(142)	342(179)	382(200)
Human Labour	3782(100)	3856(102)	3667(97)	3411(90)	4867(129)
Animal labour	311(100)	315(101)	310(100)	295(95)	237(76)
Irrigation	482(100)	336(70)	239(50)	162(34)	241(50)
Minor Repair	261(100)	394(151)	360(138)	443(170)	395(151)
Interest	185(100)	222(120)	410(222)	364(197)	181(98)
Machine hiring	1760(100)	1543(88)	1439(82)	1293(73)	1014(58)
Lease rent	1065(100)	1310(123)	1361(128)	564(53)	1114(105)
other cost	606(100)	558(92)	520(86)	389(64)	610(101)
total cost	15892(100)	17582(111)	17433(110)	16235(102)	17450(110)
TV-TC(per ha)	22595(100)	29431(130)	32979(146)	27186(120)	33001(146)
TV/TC	2.42(100)	2.67(110)	2.89(119)	2.67(110)	2.89(119)

Note: Value and Cost figures are in per ha. Figures in brackets indicate the ratio of the statistic for farm households cultivating 'n' crops to those cultivating only 1 crop

**Table 3-17 Diversification and Economics of Cultivation (Rabi 2012-13)**

Number of Crops	1	2	3	4	5
% of Cultivating	55.5%	27.5%	9.9%	4.2%	2.9%
TV	45286(100)	47759(105)	47290(104)	46501(103)	57913(128)
Seed Cost	1846(100)	2040(111)	2049(111)	2516(136)	2393(130)
Fertilizer	4199(100)	3978(95)	3999(95)	4214(100)	5052(120)
Manure	496(100)	351(71)	352(71)	292(59)	708(143)
Plant Protection	1383(100)	1336(97)	1249(90)	1068(77)	1244(90)
Diesel	654(100)	1337(204)	1437(220)	1423(218)	1222(187)
Electricity	382(100)	493(129)	448(117)	454(119)	530(139)
Human Labour	3818(100)	3101(81)	3565(93)	4014(105)	6661(174)
animal labour	274(100)	106(39)	126(46)	166(61)	175(64)
Irrigation	1027(100)	793(77)	597(58)	643(63)	959(93)
Minor Repair	284(100)	474(167)	385(135)	437(154)	443(156)
Interest	224(100)	328(147)	232(104)	351(157)	362(162)
Machine hiring	2464(100)	2343(95)	1841(75)	2009(82)	2324(94)
Lease rent	1248(100)	1631(131)	1799(144)	1003(80)	1311(105)
other cost	769(100)	533(69)	377(49)	485(63)	557(72)
total cost	19069(100)	18843(99)	18457(97)	19076(100)	23941(126)
TV-TC(per ha)	26218(100)	28916(110)	28833(110)	27425(105)	33973(130)
TV/TC	2.37(100)	2.53(107)	2.56(108)	2.44(103)	2.42(102)

Note: Value and Cost figures are in per ha. Figures in brackets indicate the ratio of the statistic for farm households cultivating 'n' crops to those cultivating only 1 crop

From Table 3.16 and 3.17 we observe that 60.4% of farmers who cultivate in Kharif and 55.5% of farmers who cultivate in Rabi cultivate only one crop. 24.3% of them in Kharif and 27.5% in Rabi cultivate 2 crops in their farm, 9.8% in Kharif and 9.9% in Rabi cultivate 3 crops. 5.5% of cultivating farm households in Kharif and 7.1% of cultivating farm households in Rabi cultivate 4 or more crops in their farm. This indicates a higher diversification in terms of number of crops cultivated in Rabi. In both Kharif and Rabi, total value generated by farm households per ha is higher among farm households cultivating more than 1 crop as compared to those who are practising mono-cropping. Though the farm households cultivating more than 1 crop also incur more costs in Kharif, the gain in total value is higher than the increased total costs for all n. In rabi, the per ha costs are lower for households cultivating 2 and 3 crops compared to mono-cropping households and higher for farm households cultivating 4 and 5 crops compared to mono-cropping farm households. In effect returns per ha for farm households cultivating 2, 3, 4 and 5 crops is 130%, 146%, 120% and 146% that of farm households who practice mono-cropping in Kharif 2012-13 and 110%, 110%, 105% and 130% that of farm households who practice mono-cropping in Rabi 2012-13. Similarly, profitability (TV/TC) for farm households cultivating 2, 3, 4 and 5 crops is 110%, 119%, 110% and 119% that of farm households who practice mono-cropping in Kharif 2012-13 and 107%, 108%, 103% and 102% that of farm households who practice mono-cropping in Rabi 2012-13. It seems that higher diversification is profitable and provides higher returns per ha than mono-cropping.



#### 4. Incomes from Livestock

This section discusses the economics of livestock for the farm households engaged in it. Farm households earn value from eggs, milks, live animals and other by-products of livestock and spend money on buying the animals ('seeds'), feeds for them, labour, interest and other charges. Table 4.1 below shows the economics of livestock for farm households in Kharif and Rabi. It shows the share of total value earned by households through sale of different products and share of different cost components in total cost for Kharif and Rabi.

**Table 4-1 Economics of Livestock**

	July- December 2012	January – December 2013
Total Value	17940	16761
Egg	129(0.7)	155(0.9)
Milk	12180(67.9)	11611(69.3)
Live Animals	3348(18.7)	2661(15.9)
Wool	80(0.4)	11(0.1)
Fish	318(1.8)	394(2.4)
Honey, Hide, Bone and Manure	1094(6.1)	1136(6.8)
Other	791(4.4)	792(4.7)
Total Cost	9228	7630
Seed' Costs	974(10.6)	524(6.9)
Green Fodder	696(7.5)	454(6)
Dry Fodder	2342(25.4)	1433(18.8)
Concentrates	3662(39.7)	3779(49.5)
Other Feed	381(4.1)	356(4.7)
Veterinary	651(7.1)	631(8.3)
Interest	27(0.3)	12(0.2)
Lease	19(0.2)	27(0.4)
Labour	173(1.9)	173(2.3)
Other	305(3.3)	241(3.2)
Returns	8712	9131
Total Value/ Total Cost	1.94	2.20

From Table 4.1, we observe that households earn a total value of INR 17,940 in Kharif but a lesser total value of INR 16, 761 in Rabi. The Rabi total value is 93% of Kharif total value. This is largely due to reduction in total value in milk and live animals which are 95% and 79% of the respective total values in Kharif. But the reduction in Rabi total value does not reduce the returns as costs are disproportionately lesser in Rabi. The average income in Rabi is INR 9,131 which is 105% of Kharif net income of INR 8,712. If we look at the cost shares concentrate and dry fodder feed are the highest cost items in total cost across two seasons. The total cost in Rabi is only 83% of total cost in Kharif. The reduction is largely due to lesser seed costs, green fodder and dry fodder costs in Rabi. This could also be because green and dry fodder could be obtained as by-products from Kharif cultivation and thus could reduce livestock costs in Rabi. The profitability measured as GVO/cost is 1.94 in Kharif while it is 2.2 in Rabi. Both of these are lesser than that realised in cultivation.

## 5. Incomes from Nonfarm Business

Farm households earn incomes from various nonfarm businesses. Only 8.54% of all the farm households were involved in nonfarm businesses. The nonfarm businesses belonged to various industries. Based on NIC 2008 classification, the farm households were involved in as many as 21 various industry divisions. Out of this, 1 or 2 households were involved in as many as 9 industries. So, we just present the data of output, expenses, net receipt and profitability (output/expenses) for 12 industries only. Table 5.1 provides the data.

**Table 5-1 Nonfarm Business Incomes across different Industries**

Industry	Proportion of households involved in Nonfarm Business	Output	Expenses	Net Receipt	Profitability
Agriculture, forestry and fishing	0.60%	254255	83878	170377	3.03
Mining and Quarrying	0.34%	2132745	1631022	501722	1.31
Manufacturing	27.32%	197160	131433	65727	1.50

Electricity, gas, steam and air-conditioning supply	0.03%	47505	5420	42085	8.76
Water supply, sewerage and waste management	0.02%	998739	748709	250030	1.33
Construction	4.02%	281355	223017	58338	1.26
Industry	Proportion of households involved in Nonfarm Business	Output	Expenses	Net Receipt	Profitability
Wholesale and retail trade	41.99%	394019	329908	64111	1.19
Transportation and storage	12.64%	345566	215553	130013	1.60
Accommodation and food service	4.06%	305992	209651	96342	1.46
Information and Communication	0.23%	157278	107662	49616	1.46
Financial and Insurance Activities	0.75%	193091	96563	96528	2.00
Real estate activities	0.77%	707516	279944	427572	2.53
All Nonfarm Business		281130	208402	72728	1.35

From Table 5.1, we observe that average output from nonfarm businesses is INR 2,81,130 for which the household has to spend INR 2,08,402. The net receipt is INR 72,728. The output per rupee spent is very low as compared to cultivation or livestock at 1.35. This seems to indicate that farm households enter into these businesses more as a last resort than in a lookout for profitable opportunities. Around 42% of households that participate in nonfarm businesses do so in the wholesale and retail industry and it has a very poor profitability of 1.19. Manufacturing and Transportation & Storage industries have slightly better profitability but also slightly lower participation with 27% and 13% of households participating in these industries respectively. Around 4% of households participate in both Construction and Accommodation & Food service and the profitability is 1.26 and 1.46 in these industries respectively.

## 6. Income from Wages/Salary

Farm households earn wages and salary from variety of industries. In Kharif, 43.24% of the farm households participate in activities that provide wages and salary while in Rabi, 49.69% farm households participate in these activities. Higher proportions of households earn wage income in Rabi as compared to Kharif. Table 6.1 provides the data on participation of households and their average incomes related to

wage/salaried employment in Kharif and Rabi. The classification is based on the NIC code of principal activity of the individual which is then added across the individuals in a household to get wage income from a particular industry for households.

**Table 6-1 Incomes from Wages/Salaries across different Industries**

Industry	Proportion of households earning wage incomes in Kharif	Proportion of households earning wage incomes in Rabi	Average wage/salary incomes in Kharif	Average wage/salary incomes in Rabi
Agriculture, forestry and fishing	61.93%	58.40%	13429	15079
Mining and Quarrying	0.85%	0.65%	37449	42963
Manufacturing	7.50%	7.73%	27514	28301
Electricity, gas, steam and air-conditioning supply	0.46%	0.41%	67900	61106
Water supply, sewerage and waste management	0.26%	0.24%	67193	66948
Construction	19.76%	23.99%	22712	22500
Wholesale and retail trade	2.53%	2.97%	27559	27676
Transportation and storage	4.48%	4.39%	39380	38970
Accommodation and food service	0.40%	0.41%	25824	26226
Information and Communication	0.31%	0.25%	41985	49676
Financial and Insurance Activities	0.64%	0.56%	72332	72981
Real estate activities	0.01%	0.00%	47083	19153
Professional, scientific and technical	0.38%	0.34%	69897	72104
Administrative and support services	0.91%	0.83%	54123	48613
Public administration and defence	3.14%	2.74%	70425	83289
Education	5.20%	4.82%	61411	65565
Health	1.01%	0.87%	58999	57046
Arts	0.12%	0.19%	31704	28809
Other Services	0.73%	0.78%	20915	20824
Household activities	0.12%	0.23%	16629	19484
Other Industries	2.33%	3.52%	7521	5754

In terms of participation of households in wage income, 62% and 58% of households earning from wage/salaried employment participate in Agricultural, forestry and fishing industry in Kharif and Rabi

respectively. The next highest participation is in Construction where the proportion is 20% and 24% in Kharif and Rabi respectively. It is then followed by Manufacturing (7.5% and 7.73% in Kharif and Rabi respectively). The other industries in which there is reasonable participation in Kharif and Rabi are Wholesale and retail trade (2.53% and 2.97%), Transportation & storage (4.48% and 4.39%), Education (5.2% and 4.82%) and Public administration and defence (3.14% and 2.74%). The percentage of households participating in wage employment in different industries for Kharif and Rabi remains mostly same except for Agriculture, fishing and forestry and Construction. While more households participate in agricultural sector in Kharif than in Rabi, more households participate in Construction in Rabi than in Kharif. Construction seems to be the most important source of wage income for farm households after agriculture. Manufacturing does not seem to provide enough employment opportunities to these households. In terms of average incomes earned by households in different industries participating in it, construction and agriculture are at bottom while manufacturing does slightly better than these two sectors in this regard.

We also look at the household incomes based on incomes earned by types of employment. For this we categorize individual incomes earned according to status of the principal activity. Table 6.2 below shows the participation of various households and incomes earned by households in each of these occupation categories.

**Table 6-2 Incomes from Wages/Salaries across different Employment types**

Employment type	Proportion of households earning wage incomes in Kharif	Proportion of households earning wage incomes in Rabi	Average wage/salary incomes in Kharif	Average wage/salary incomes in Rabi
Own Account Worker	27.1%	24.2%	7937	8613
Own Account Employer	1.1%	0.5%	9740	11735
Helper in HH Enterprise	16.8%	14.7%	7258	7921
Regular salaried/wage Employment	18.3%	16.6%	52882	57690
Casual labour other than MGNREGA	1.4%	1.4%	13941	15306

MGNREGA	1.5%	1.9%	8706	8050
Other types of casual work	32.0%	37.9%	22159	22065

From Table 6.2, we observe that 32% of households earning wage income in Kharif and 38% of households earning wage income in Rabi have individuals engaged in casual labour. The proportion engaged in MGNREGA is 1.4% and 1.5%. Around 27.1% in Kharif and 24.2% in Rabi have individuals engaged in own account work. Households earn low incomes from own account work, as helpers and MGNREGA while they earn the highest from regular salaried/wage employment. More households have individuals participating in casual work and MGNREGA in Rabi than in Kharif.

## **7. Poverty and Inequality in Farm Households**

Sections 2 to 6 provided the analysis of total income and income components of farm households. This section will analyse the implications of these numbers on poverty, indebtedness and inequality in farm households. Firstly, we will analyse state wise variations in percentage of farm households earning below poverty line. After that, we look into state-wise increases in percentage of farmers having outstanding loans and changes since 2002-03. Then, we will analyse income inequality across farm households in India and decompose the effect of different income components on total income inequality.

### **7.1.Poverty among Farm Households in India**

To estimate the percentage of population earning below poverty line, we use poverty lines for states as defined by the methodology suggested by Rangarajan Committee (Planning commission, 2014). Since the lines were suggested for 2011-12, we convert the incomes to 2011-12 incomes and divide by household size to get per capita incomes of the households. Then, percentage of households earning below poverty line was estimated for different states and union territories.

**Table 7-1 Farm Households earning less than Poverty Line**

Sr. No	State	Per Capita Poverty Line (INR Per Capita Per Month)	Percentage of Population earning Per Capita Incomes below Poverty Line
1	Jammu & Kashmir	12534	32.75%
2	Himachal Pradesh	12799	44.37%
Sr. No	State	Per Capita Poverty Line (INR Per Capita Per Month)	Percentage of Population earning Per Capita Incomes below Poverty Line
3	Punjab	13530	26.38%
4	Chandigarh	15638	16.96%
5	Uttaranchal	12179	66.91%
6	Haryana	13534	32.52%
7	Delhi	17910	9.12%
8	Rajasthan	12432	49.17%
9	Uttar Pradesh	10678	66.78%
10	Bihar	11655	71.88%
11	Sikkim	13515	38.88%
12	Arunachal Pradesh	13812	58.10%
13	Nagaland	14758	53.63%
14	Manipur	14222	54.88%
15	Mizoram	14772	51.61%
16	Tripura	11226	49.41%
17	Meghalaya	13328	30.17%
18	Assam	12080	50.38%
19	West Bengal	11209	56.94%
20	Jharkhand	10848	62.12%
21	Orissa	10517	58.03%
22	Chhattisgarh	10942	51.07%
23	Madhya Pradesh	11300	50.52%
24	Gujarat	13234	34.73%
25	Daman & Diu	14407	46.68%
26	Dadra & Nagar Haveli	12101	30.96%
27	Maharashtra	12940	49.30%
28	Andhra Pradesh	12381	44.30%
29	Karnataka	11705	41.83%
30	Goa	14407	40.22%
31	Lakshadweep	15933	34.49%
32	Kerala	12648	26.31%
33	Tamil Nadu	12983	47.11%
34	Puducherry	13561	65.71%
35	Andaman & Nicobar Islands	15780	47.74%
36	Telangana	12381	39.65%

All India	53.37%
-----------	--------

From the Table 7.1, we find that the overall farm households earning below poverty line is 53.37%. A very high proportion of farm households in Bihar (71.9%), Uttaranchal (66.9%), Uttar Pradesh (66.8%), Puducherry (65.7%) and Jharkhand (62.12%) earn less than poverty line. All these states have more than 60% population earning below poverty line. Some states and union territories have a very low proportion of farm households earning below poverty line. Around 12 states have less than 40% population earning below poverty line. These states and union territories are Telangana (39.7%), Sikkim (38.9%), Gujarat (34.7%), Lakshadweep (34.5%), J&K (32.8%), Haryana (32.5%), D&N Haveli (31%), Meghalaya (30%), Punjab (26.4%), Kerala (26.3%), Chandigarh (17%) and Delhi (9.1%). All the other states have a population 40% to 60% earning below poverty line.

## 7.2. Indebtedness among Farm Households in India

Table 7.2 provides the details on percentage of farm households having outstanding loans, the percentage of farm households which had outstanding loans as on 2002-03, changes since then and the average outstanding loan and average outstanding loan across different states and groups of union territories in India.

**Table 7-3 Indebtedness among Farm Households across Indian States**

	% Farm Households Having Outstanding Loan	% Farm Households Having Outstanding Loan 2002-03	Change in % Households Having Outstanding Loan	Average Outstanding Loan Amount	Average Outstanding Loan Amount per Ha
ANDHRA PRADESH	93%	82%	11%	123112	83363
ARUNACHAL PRADESH	19%	6%	13%	5363	3186
ASSAM	18%	18%	-1%	3436	3836
BIHAR	42%	33%	9%	16333	27375
CHHATTISGARH	37%	40%	-3%	10231	8244
GUJARAT	43%	52%	-9%	38124	29894
HARYANA	42%	53%	-11%	79032	56141



	% Farm Households Having Outstanding Loan	% Farm Households Having Outstanding Loan 2002-03	Change in % Households Having Outstanding Loan	Average Outstanding Loan Amount	Average Outstanding Loan Amount per Ha
HIMACHAL PRADESH	28%	33%	-6%	28039	50028
JAMMU & KASHMIR	31%	32%	-1%	12176	24167
JHARKHAND	29%	21%	8%	5650	9000
KARNATAKA	77%	62%	16%	97205	58848
KERALA	78%	64%	13%	213588	357535
MADHYA PRADESH	46%	51%	-5%	32117	22379
MAHARASHTRA	57%	55%	3%	54733	35111
MANIPUR	24%	25%	-1%	6072	7054
MEGHALAYA	2%	4%	-2%	1375	1299
MIZORAM	6%	24%	-17%	2906	2784
NAGALAND	2%	37%	-34%	601	544
ODISHA	57%	48%	10%	28226	38193
PUNJAB	53%	65%	-12%	119550	77918
RAJASTHAN	62%	52%	9%	70511	39588
SIKKIM	14%	39%	-24%	9864	14645
TAMIL NADU	83%	75%	8%	115872	129369
TELENGANA	89%	---		93450	61157
TRIPURA	23%	49%	-26%	5049	7016
UTTAR PRADESH	44%	40%	4%	27292	41229
UTTARANCHAL	51%	7%	44%	35555	73189
WEST BENGAL	52%	50%	1%	17756	40539
GROUP OF Union Territories	27%	51%	-24%	52316	78010
All India	52%	49%	3%	46945	45318

From Table 7.2, we observe that 52% of farm households were under debt in 2012-13 while 49% farm households were under debt. Andhra Pradesh (93%), Telangana (89%), Tamil Nadu (83%), Kerala (78%), Karnataka (77%), Rajasthan (62%), Odisha (57%), Maharashtra (57%) and Punjab (53%) had higher than All India share (52%) farmers who had outstanding loans. The share of farm households having outstanding loans increased by a high percentage in Uttaranchal (44%), Karnataka (16%), Kerala (13%), Arunachal Pradesh (13%), Andhra Pradesh (11%) and Odisha (10%). This share decreased among smaller states, group of union territories, Punjab (12%), Haryana (11%) and Gujarat (9%). The average outstanding loan in 2012-13 was INR

46,945 across all households and was above INR 1,00,000 in states of Kerala (INR 2,13,588), Andhra Pradesh (INR 1,23,112), Punjab (INR 1,19,550), and Tamil Nadu (INR 1,15,872). The average outstanding loan per ha was INR 45,318 across all India. This amount was more than INR 1,00,000 for the states of Kerala (INR 3,57,535) and Tamil Nadu (1,29,369).

### 7.3. Inequality among Farm Households in India

Income inequality is generally measured by Gini coefficient. We measure income inequality of farm households in India. Also, to understand which the income components that contribute to income inequality more, we decompose Gini coefficient by factor components using method suggested by Lerman and Yitzakhi (1985). The resulting decomposition is presented in Table 7.2.

**Table 7-2 Decomposition of Gini Coefficient of Income**

Source ( $k$ )	Share of Source in Total Income ( $S_k$ )	Source Gini ( $G_k$ )	Gini Correlation ( $R_k$ )	Share $\left(\frac{S_k G_k R_k}{G}\right)$	Percent change $\left(\frac{S_k G_k R_k}{G} - S_k\right)$
INCOME FROM FARMING	0.46	0.74	0.80	0.49	0.027
INCOME FROM LIVESTOCK	0.14	0.81	0.64	0.13	-0.012
INCOME FROM NONFARM BUSINESS	0.08	0.96	0.70	0.10	0.016
INCOME FROM WAGES/ SALARY	0.31	0.77	0.66	0.28	-0.031
HOUSEHOLD ANNUAL INCOME		0.56			

From Table 7.2, we find that the Gini coefficient of total income among farm households in India is 0.56, which is a high number. The Gini among component incomes would be higher as not all households are involved in all activities and the zero incomes would play a role in higher component Gini. The Gini for farming income ( $G_k$ ) is 0.74. The same ( $G_k$ ) for livestock incomes, nonfarm business incomes and wage incomes are 0.81, 0.96, 0.77. The highest Gini is in nonfarm business incomes followed by livestock income, wage income and farming income. This does not mean that the income component with highest

inequality will contribute highest to total income inequality as the share of income and distribution of the income will matter. The share of total income ( $S_k$ ) is highest for farming (46%) followed by wage income (31%), livestock income (14%) and nonfarm business income (8%). Another component needs to be understood before we estimate the impact of a component on income inequality. That is called the Gini correlation ( $R_k$ ). This indicates how correlated is a particular component with total income distribution. If farm households earning high incomes from farming are the ones who earn high total incomes, then the Gini correlation for farming income will be high. If farm households belonging to lower total income strata earn high farming income, then this correlation will be low. So, a low Gini correlation means that a particular income source is biased towards the lower income strata and is likely to reduce income inequality. In this regard, we find that the Gini correlation is highest for farming income (0.80) followed by nonfarm business income (0.70), wage income (0.66) and livestock income (0.64). From these three things (share ( $S_k$ ), component Gini ( $G_k$ ) and Gini correlation ( $R_k$ )) of each component income, we can derive the impact of a particular component on total income inequality.

From the Table we find that the share of a component in income inequality (column 5 of Table 7.2) is highest for farming (49%) and more than its share of income. The share of nonfarm business income in income inequality is 10% which is again higher than its share in income. For wage income and livestock income, the shares in income inequality are lower than their shares in income. For wage income the share in income inequality is 28% while the share in income is 31% while the same for livestock income is 13% and 14% respectively. By subtracting values in column 5 from column 2 we can estimate the impact of income component on total income inequality. The difference is provided in the last column of the table. We find that cultivation incomes and nonfarm business incomes increase income inequality where a 1% increase in share of these incomes will rise inequality by 2.7% and 1.6% respectively. Livestock incomes and wage incomes are inequality decreasing where a 1% increase in the shares of these incomes in total income will reduce income inequality by 1.2% and 3.1% respectively. So wage incomes and livestock

incomes have potential to reduce inequality as lower strata earn more incomes from these sources than the high income strata. But, this is just the current situation. Nonfarm business needs to be made more equitable by reducing entry barriers pertaining to capital, information and education in nonfarm business. Livestock incomes have grown rapidly in the decade under consideration and given that it is more equitable than farming incomes, it could pave way for equitable development among farm households.

## **8. Conclusions**

This study estimates the incomes of farm households in India. For this purpose, the study uses the most recent survey that assesses the situation of farmers in India. The data 70<sup>th</sup> round of National Sample Survey (NSS) conducted from January 2013 to December 2013 was used for the analysis. The survey includes various aspects of farming and pertains to the period from July 2012 to June 2013. The current report primarily focuses on aspects related to incomes of the farmers and particularly income derived from various components – incomes from cultivation, incomes from livestock, incomes from nonfarm business and income from wage or salaried employment. The survey was conducted across 35,200 farm households across 36 states and union territories in the first visit and 34,907 of these households were visited for a second round. The estimates pertain to population of households and we use the weights specified in the NSS for our analysis.

We find that the average annual income of farm households is INR 77,794 per year or INR 6,498 per month. Out of this the households earn INR 36,947 from crop cultivation, INR 24,801 from wage/salaried employment, INR 10,017 from livestock and INR 6,209 from nonfarm business. Compared to 2002-03, the share of livestock incomes in total income has increase from 4% to 13% while incomes from wage and salaried employment have reduced from 39% to around 31%. The livestock incomes in the decade from 2002-03 has seen an annual real CAGR of 14.59%. The CAGR in the same decade for cultivation income, wage income and nonfarm business incomes are 4.29%, 1.98% and 0.58%. The farm household incomes in total grew at a rate of 3.95% in the decade.

Farm households which have nonfarm business enterprises as their principal income source earn the most but they are small in proportion. 4.7% of the farm households have nonfarm business as primary income sources and earn INR 1,04,593 per annum. Farm households in the states of Chandigarh, Delhi and Punjab have the highest incomes while farm households in Bihar, West Bengal and Uttaranchal have the lowest total incomes. We find that the farm households in states having high wage incomes also have high total income. Also, the states in which share of wage income in total income are higher have high total incomes. State-wise growth rates of incomes of farm households from 2002-03 to 2012-13 shows that Haryana, Rajasthan and Odisha have shown high growth with Haryana having high growth from crop cultivation while Rajasthan and Odisha have high growth largely from livestock incomes. Growth rates have been low in Assam, Bihar and West Bengal. All these states have shown very low or negative growth in cultivation incomes and despite high livestock income growth in Assam, the farm household income growths in these states have been disappointing. As a general rule, states showing high growth in cultivation incomes and livestock incomes show high growth in total farm household incomes as well.

An analysis of landholdings shows a growing decline in land sizes and increasing number of marginal farmers. For landless and marginal farmers, income from wage and salary employment has become the highest contributor to their incomes. The growth in real wage income has been quite low in the decade and this low growth will affect large number of farm households if this trend continues. Caste of the household also seems to have a significant influence on the incomes of farm households with SC farm households earning lowest cultivation incomes and livestock incomes. STs earn the lowest nonfarm business income and income from wage and salaried employment. Farm households belonging to Other castes and religion other than Hindu earn the most in all the components of household income.

The analysis of incomes from cultivation shows that the profitability expressed by total value to cost has increased from 2.31 to 2.61 in Kharif and 2.46 in Rabi. The low animal labour costs and high machine hiring costs, electricity costs and irrigation costs indicate a high mechanisation in agriculture. Also, the mechanisation as seen from these costs is higher in Rabi as compared to Kharif. In analysing the incomes

across different landholdings we find that profitability does not increase linearly with land sizes and there might be issues when land is not large enough to exercise economies of scale. For instance, the profitability of medium farmers is lower than semi-medium farmers in Kharif and only slightly higher in Rabi. This is a conjecture that has been suggested by others as well (Sen and Bhatia, 2004). Across states, we find that J&K, Chattisgarh and Assam have highest profitability while Tamil Nadu, West Bengal and Andhra Pradesh have low profitability. Among major crops in Kharif, sugarcane and soybean show high profitability while jowar and tur dal exhibit low profitability. Among major crops in Rabi, maize and sugarcane exhibit high profitability while masur dal and paddy exhibit low profitability. Pesticide costs have a negative correlation with profitability in both seasons. This might indicate that suboptimal usage of pesticides and they might be spending more than optimal amounts. Machine hiring costs and land lease costs also have negative correlation with profitability in both seasons which indicates the importance of land ownership and machine ownership on profitability. If households own land and machine, they might have to spend lesser on machine hiring and land lease rent and have higher profitability. Analysis of profitability and returns show that farm households possessing land between 0.01-0.4 ha and tenant across land classes seem to be doing bad as compared to 2002-03.

The analysis of incomes from livestock shows that profitability expressed as ratio of total value to cost is 1.94 and 2.2 in Kharif and Rabi. The Rabi profitability is higher mainly due to lower costs in feed in rabi. This might be because by-products from Kharif crop cultivation is used as part of feed in Rabi and thus reduces the feed costs.

The analysis of nonfarm business income shows that the profitability expressed as ratio of output to expenses is very low at 1.35. Wholesale and retail trade, manufacturing, transportation & storage, construction and accommodation & food services are the major industries that provide nonfarm business opportunities. The profitability in wholesale and retail trade, the major nonfarm business opportunity provider is very low at 1.19. It is also low for construction at 1.26. The ratio is slightly better for accommodation & food service (1.46), manufacturing (1.50) and transportation & storage (1.60). The

very low profitability in most business indicates that farm households just resort to these for sustainability and not because these business provides profitable opportunities. Whatever growth is happening in this sector could then be only due to distress-driven 'push' factors and not due to growth-driven 'pull' factors. There has been a lot of debate that is unsettled in this regard on the nonfarm expansion over the last two decades in India and we hope our finding might give some evidence on recent trends (Abraham, 2009; Bhalla, 2002; Bhaumik, 2002; Binswanger-Mkhize, 2013; Chadha, 2002; Chadha and Sahu, 2002; Choudhury, 2011; Coppard, 2001; Himanshu, Murgai and Stern, 2013; Lanjouw and Sharriff, 2004; Jatav, 2010; Jatav and Sen, 2013; Jha, 2007; Jha, 2011; Kashyap and Mehta, 2007; Sahu, 2003).

On analysing the income from wage and salaried employment, we find that agriculture and construction are the major industries that provide employment to farm households. Manufacturing, transportation & storage, wholesale & retail trade, education and public administration & defence also provide reasonable employment to farm households. Agriculture provides more opportunities in Kharif while construction provides employment to more farm households in Rabi compared to Kharif. Construction has thus emerged as a leading industry providing nonfarm casual employment to farm households. The low access provided by manufacturing is a disappointment. Households are involved in nonfarm business related to manufacturing. Either impetus should be given to improving profitability of these enterprises should be done or more casual labour should be generated. This is particularly a concern keeping low agricultural labour incomes in mind.

We also performed an analysis of households earning incomes below poverty line. In this regard, we find that Bihar, Uttaranchal, Uttar Pradesh, Puducherry and Jharkhand have very high proportion of farmers earning below poverty line while Punjab, Kerala, Chandigarh and Delhi have very low proportion of farm households earning incomes below poverty line. We also find that indebtedness has increased across the farm households in the country and states of India. The incidence of indebtedness has increased across southern states. Average loan amount outstanding and average outstanding loan per ha are also high for southern states.

We also calculate income inequality among farm households and decompose this into factor components. We find that the Gini of incomes earned by farm households is 0.56, which is a high number. We also find that incomes from cultivation as a leading source of income inequality as it is highly correlated with total income distribution. Nonfarm business incomes also increase inequality while wage income and livestock incomes have inequality decreasing characteristics. Given that livestock incomes have also generated high growth rates in the recent times and provide reasonable profitability compared to agriculture, they must be used as an engine for equitable growth. Changing diet patterns which might lead demand for consumption of food rich in proteins might just provide this impetus.

Few caveats are in place when interpreting the findings of our report. Any estimation of income is a complex issue and since households do not have accounts of receipts and expenses, incomes based on only two visits to a house is always only a raw estimate. The best hope we could have is that the error are not heterogeneous. Also, some income data were collected for 30 day recall period like in case of livestock and nonfarm business while for some incomes 6 month recall period was used. This could also have caused some inconsistencies in income estimation. Also, incomes from cultivation and livestock are very much sensitive to weather and statistics related to growth could be prone to some weather related issues in base and the recent year data used. For example, some states might have seen a good growth in the years from, 2002-03 to 2011-12 and the year 2012-13 could have been a bad year because of the weather. The growth data will not be able to look into this particular aspect. Though this is applicable to all income data, it should be considered with slightly more seriousness when dealing with farm and farmer income data. Cost estimation for certain items in farming were jointly recorded. Crop wise costs were allotted proportional to land allotted to the crop but this may not always be true. This has to be kept in mind while interpreting crop profitability. Some studies like Agrawal and Kumar (2012), Chandrashekar and Ghosh (2011) and Naik et al. (2012) have also raised some issues related to official statistics collected in India and these might also be kept in mind while interpreting the results.



## Bibliography

- Abraham, Vinod. "Employment Growth in rural India: Distress-Driven?" *Economic and Political Weekly* (2009): 97-104.
- Agrawal, Ankush and Vikas Kumar. 2012. "How reliable are India's official statistics?" East Asia Forum: April 06. Available at <http://www.eastasiaforum.org/2012/04/06/nagaland-s-demographic-somersault-howreliable-are-india-s-official-statistics/>
- Bhalla, Sheila. "Rural Non-Farm Employment and the Unorganised Sector in India." *The Indian Journal of Labour Economics* 45, no. 4 (2002): 695-717.
- Bhaumik, S.K. "Employment Diversification in Rural India: A State Level Analysis." *The Indian Journal of Labour Economics* 45, no. 4 (2002): 718-744.
- Binswanger-Mkhize, Hans P. "The stunted structural transformation of the Indian economy." *Economic & Political Weekly* 48, no. 26&27 (2013): 5-13.
- Chadha, G.K. "Rural Non-farm Employment in India: What Does Recent Experience Teach Us?" *The Indian Journal of Labour Economics* 45, no. 4 (2002): 663-694.
- Chadha, G. K., and P. P. Sahu. "Post-reform setbacks in rural employment: issues that need further scrutiny." *Economic and Political Weekly* (2002): 1998-2026.
- Chandrasekhar, C P and Jayati Ghosh. 2011. "Latest employment trends from the NSSO." *The Hindu*, July 12.
- Chowdhury, Subhanil. "Employment in India: What does the latest data show?." *Economic and political weekly* 46, no. 32 (2011): 23-26.
- Coppard, Daniel. "The rural non-farm economy in India: A review of the literature." *Natural Resource Institute, Department for International Development (DFID), World Bank, NRI Report* 2662 (2001).
- Govt of India. 2005. "Some Aspects of Farming: NSS 59th Round (January–December 2003) Report No. 496(59/33/5)." National Sample Survey Organisation, Ministry of Statistics and Programme Implementation: New Delhi
- Govt of India. 2005. "Income, Expenditure and Productive Assets of Farmer Households: NSS 59th Round (January–December 2003), Report No. 497(59/33/5)." National Sample Survey Organisation, Ministry of Statistics and Programme Implementation: New Delhi
- Government of India, 2014. "Key Indicators of Situation of Agricultural Households in India".

- Ministry of Statistics and Programme Implementation. National Sample Survey Office. Planning Commission, 2014. "Report of the Expert Group to review the Methodology for Measurement of Poverty", Government of India.
- Gulati, A., Jain, S and Satija, N. (2013). "Rising Farm Wages in India: The 'Pull' and 'Push' Factors", Discussion Paper No.5, Commission for Agricultural Costs and Prices. Department of Agriculture & Cooperation, Ministry of Agriculture, Government of India.
- Himanshu, Lanjouw, Peter, Rinku Murgai, and Nicholas Stern. "Nonfarm diversification, poverty, economic mobility, and income inequality: a case study in village India." *Agricultural Economics* 44, no. 4-5 (2013): 461-473.
- Lanjouw, Peter, and Abusaleh Shariff. "Rural non-farm employment in India: Access, incomes and poverty impact." *Economic and Political Weekly* (2004): 4429-4446.
- Jatav, Manoj. "Casualisation of Workforce in Rural Non-Farm Sector of India: A Regional Level Analysis across Industries." *The Indian Journal of Labour Economics* 53, no. 3 (2010): 501-16.
- Jatav, Manoj, and Sucharita Sen. "Drivers of non-farm employment in rural India: Evidence from the 2009-10 NSSO Round." *Economic and Political Weekly* 48, no. 26&27 (2013): 14-21.
- Jha, Brajesh. "Policies for Increasing Non-Farm Employment for Farm Households in India." IEG Working Paper Number 310. 2011.
- Jha, Brajesh. 2007. "Is the Role of Agriculture in Rural Diversification Decreasing?" *Indian Journal of Labour Economics* 50(4): 633-642.
- Kashyap, S. P., and Niti Mehta. "Non-farm Sector in India: Temporal and Spatial Aspects." *The Indian Journal of Labour Economics* 50, no. 4 (2007): 611-32.
- Lerman, Robert I., and Shlomo Yitzhaki. "Income inequality effects by income source: a new approach and applications to the United States." *Review of economics and statistics* (1985): 151-156.
- Naik, Gopal, K P Basavaraj, V R Hegde, Vijay Paidi, and Arjunan Subramanian. 2012. "Reliability of agricultural statistics in developing countries: Reflections from a comprehensive village survey on crop area statistics in India." Working Paper No 381. Indian Institute of Management Bangalore: Bangalore.
- Sahu, P.P. "Casualisation of Rural Workforce in India: Analysis of Recent Trends" *The Indian*

*Journal of Labour Economics* 46, no. 4 (2003): 927-939.

Sen, Abhijit and M S Bhatia. 2004. "Volume 14: Cost of Cultivation and Farm Income" in *The State of Indian Farmer: A Millennium Study*. New Delhi: Ministry of Agriculture and Academic Foundation

## Appendix A Economics of Cultivation across different Land Classes 2002-03

**Table A- 1 Economics of Cultivation for different Land Classes (Kharif) 2002-03**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Proportion of Farm Households	28.78%	32.84%	18.09%	10.84%	4.89%	0.91%	100.00%
%Cultivating	82.79%	92.03%	91.53%	91.58%	90.52%	90.26%	86.04%
Total Land	0.225	0.581	1.190	2.173	4.336	10.198	1.067
TV (per ha)	14110	13612	12656	11952	11079	8007	12008
Seed Cost	755(12)	822(14)	807(15)	837(16)	862(16)	703(17)	816(15)
Fertilizer	1517(25)	1388(24)	1279(24)	1138(22)	1195(23)	857(20)	1225(23)
Plant Protection	346(6)	401(7)	417(8)	446(9)	513(10)	421(10)	437(8)
Regular Labour	98(2)	87(1)	87(2)	139(3)	207(4)	310(7)	145(3)
Casual Labour	1473(24)	1444(25)	1259(24)	1164(23)	1126(21)	763(18)	1212(23)
Irrigation	718(12)	541(9)	498(9)	471(9)	414(8)	290(7)	477(9)
Minor Repair	75(1)	94(2)	100(2)	120(2)	110(2)	105(3)	105(2)
Interest	54(1)	67(1)	93(2)	95(2)	105(2)	81(2)	88(2)
Lease rent	292(5)	302(5)	222(4)	215(4)	244(5)	274(7)	250(5)
other cost	748(12)	629(11)	544(10)	480(9)	492(9)	378(9)	531(10)
Total Cost (TC) (per ha)	755(12)	822(14)	807(15)	837(16)	862(16)	703(17)	816(15)
TV-TC (per ha)	8037	7839	7355	6848	5811	3827	6725
TV/TC	2.32	2.36	2.39	2.34	2.10	1.92	2.27

Note: Value and costs are in per ha terms. Figures in brackets indicate the share of a particular cost component in total cost

**Table A- 2 Economics of Cultivation for different Land Classes (Rabi) 2002-03**

Land Class based on Total Land Possessed (in ha)	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
Proportion of Farm Households	28.78%	32.84%	18.09%	10.84%	4.89%	0.91%	100.00%
%Cultivating	65.24%	61.18%	64.09%	62.87%	66.77%	57.57%	61.40%
Total Land	0.202	0.637	0.987	1.645	3.175	7.498	0.874
TV (per ha)	19552	14713	16206	16635	16101	13710	15976
Seed Cost	1177(18)	1527(18)	1118(17)	1211(17)	1166(17)	1059(16)	901(16)
Fertilizer	1358(21)	2071(24)	1459(23)	1559(22)	1437(21)	1370(21)	1010(18)
Plant Protection	192(3)	373(4)	307(5)	356(5)	359(5)	457(7)	390(7)
Regular Labour	28(0)	84(1)	59(1)	88(1)	118(2)	199(3)	339(6)
Casual Labour	810(13)	1359(16)	1070(17)	1174(17)	1125(17)	1112(17)	968(18)
Irrigation	1291(20)	1510(17)	1059(17)	1160(16)	1044(15)	939(14)	613(11)
Minor Repair	47(1)	71(1)	82(1)	128(2)	142(2)	159(2)	132(2)
Interest	13(0)	18(0)	34(1)	41(1)	42(1)	49(1)	71(1)
Lease rent	519(8)	394(5)	328(5)	295(4)	392(6)	431(7)	513(9)
other cost	1039(16)	1253(14)	892(14)	1023(15)	929(14)	850(13)	576(10)
Total Cost (TC) (per ha)	8660	6407	7035	6755	6624	5514	6750
TV-TC (per ha)	10892	8306	9171	9879	9477	8196	9225
TV/TC	2.32	2.36	2.39	2.34	2.10	1.92	2.27

Note: Value and costs are in per ha terms. Figures in brackets indicate the share of a particular cost component in total cost

## Appendix B Tenancy across States and Land Classes in 2012-13 and 2002-03

### Table B- 1 Tenancy across States and Land Classes in 2012-13

	<0.01	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
JAMMU & KASHMIR	3.54%	0.17%	1.64%	2.43%	0.53%	11.15%	0.00%	0.91%
HIMACHAL PRADESH	5.62%	7.43%	10.56%	16.14%	9.55%	2.22%	0.00%	9.30%
PUNJAB	2.84%	14.53%	9.36%	28.56%	29.96%	58.07%	69.74%	22.55%
CHANDIGARH	0.00%	0.00%	2.27%	0.00%	32.75%	0.00%	0.00%	3.71%
UTTARANCHAL	13.98%	10.32%	7.34%	1.96%	0.00%	7.71%	0.00%	8.78%
HARYANA	0.00%	8.80%	13.52%	18.25%	10.80%	36.55%	32.10%	13.91%
DELHI	0.00%	19.35%	0.00%	4.34%	0.00%	87.50%	0.00%	6.28%
RAJASTHAN	1.41%	4.42%	6.07%	6.58%	16.52%	26.59%	11.14%	9.38%
UTTAR PRADESH	0.63%	16.98%	17.50%	15.51%	18.30%	17.95%	36.25%	16.43%
BIHAR	0.00%	32.41%	27.41%	32.64%	16.09%	4.86%	26.09%	29.28%
SIKKIM	0.00%	31.30%	16.34%	5.77%	0.94%	0.00%	0.00%	17.24%
ARUNACHAL PRADESH	2.12%	0.00%	7.84%	2.46%	11.67%	5.24%	0.00%	6.64%
NAGALAND	0.54%	0.23%	2.18%	5.80%	5.51%	6.61%	0.00%	3.25%
MANIPUR	0.00%	7.65%	11.72%	7.94%	12.90%	0.00%	0.00%	9.56%
MIZORAM	0.00%	0.00%	2.33%	0.09%	5.03%	0.00%	0.00%	1.89%
TRIPURA	0.00%	22.38%	18.86%	9.21%	22.84%	0.57%	0.00%	18.38%
MEGHALAYA	16.45%	12.30%	6.09%	11.16%	0.00%	0.00%	0.00%	10.56%
ASSAM	1.33%	3.36%	13.83%	14.74%	10.62%	2.61%	100.00%	11.22%
WEST BENGAL	0.93%	38.22%	35.54%	33.46%	63.26%	20.39%	100.00%	37.18%
JHARKHAND	0.00%	5.56%	16.03%	10.97%	3.92%	5.92%	0.00%	10.71%
ODISHA	5.10%	21.84%	26.52%	33.68%	22.78%	43.22%	89.44%	25.99%
CHHATTISGARH	0.00%	30.60%	16.27%	13.13%	21.13%	23.21%	0.00%	17.72%
MADHYA PRADESH	2.41%	9.46%	3.12%	8.37%	10.76%	14.23%	22.28%	7.11%
GUJARAT	2.16%	0.90%	7.88%	7.57%	11.02%	8.82%	43.85%	6.24%
DAMAN & DIU	0.00%	2.36%	1.09%	0.00%	0.00%	0.00%	0.00%	1.85%
D & N HAVELI	1.14%	0.94%	0.00%	0.00%	75.95%	0.00%	0.00%	1.11%
MAHARASHTRA	3.22%	1.17%	4.66%	5.49%	6.15%	10.02%	15.25%	5.21%
ANDHRA PRADESH	1.10%	13.31%	34.60%	37.92%	49.00%	54.98%	25.45%	35.59%
KARNATAKA	6.73%	2.17%	9.36%	7.59%	8.76%	34.62%	51.81%	9.97%
GOA	19.92%	13.89%	6.08%	6.17%	0.00%	0.00%	0.00%	15.41%
LAKSHADWEEP	6.77%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.77%
KERALA	0.00%	14.68%	16.90%	14.25%	26.45%	20.44%	53.63%	15.86%
TAMIL NADU	2.72%	3.93%	11.14%	21.92%	17.33%	20.24%	12.66%	11.30%
PUDUCHERRY	13.11%	0.41%	15.67%	15.27%	38.21%	40.29%	0.00%	14.06%
A & N ISLANDS	8.55%	1.86%	2.41%	2.94%	1.70%	0.00%	0.00%	3.37%
TELENGANA	0.00%	0.31%	6.07%	18.32%	24.49%	40.10%	47.10%	14.14%

**Table B- 2 Tenancy across States and Land Classes in 2012-13**

	<0.01	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
JAMMU & KASHMIR	0.00%	0.97%	0.84%	2.13%	0.02%	0.00%	0.00%	1.00%
HIMACHAL PRADESH	42.52%	8.05%	8.55%	7.39%	18.43%	2.77%	0.00%	8.86%
PUNJAB	2.76%	4.30%	18.63%	17.17%	30.25%	38.68%	46.23%	14.76%
CHANDIGARH	0.00%	11.76%	79.61%	41.06%	83.05%	76.36%	0.00%	38.78%
UTTARANCHAL	0.00%	4.04%	5.37%	8.56%	12.74%	0.00%	0.00%	5.10%
HARYANA	0.95%	8.38%	8.46%	16.00%	33.25%	35.85%	23.36%	14.29%
DELHI	0.00%	8.10%	0.00%	0.00%	0.00%	0.00%	0.00%	2.42%
RAJASTHAN	0.13%	0.62%	3.96%	6.49%	7.31%	7.98%	16.97%	5.52%
UTTAR PRADESH	1.64%	12.52%	20.39%	23.23%	20.30%	22.45%	11.69%	16.96%
BIHAR	2.62%	19.14%	23.82%	21.12%	9.43%	10.74%	0.00%	19.52%
SIKKIM	5.77%	21.29%	22.62%	9.58%	12.32%	7.31%	0.00%	19.32%
ARUNACHAL PRADESH	0.61%	15.19%	0.82%	4.79%	6.12%	23.23%	100.00%	7.40%
NAGALAND	13.46%	0.00%	1.02%	1.93%	0.46%	0.00%	0.00%	1.49%
MANIPUR	0.00%	10.81%	15.62%	18.23%	28.88%	24.85%	0.00%	14.60%
MIZORAM	0.00%	17.18%	0.60%	2.00%	0.00%	0.00%	0.00%	1.47%
TRIPURA	0.86%	15.94%	19.27%	25.68%	0.00%	0.00%	0.00%	18.12%
MEGHALAYA	7.76%	13.99%	23.57%	19.57%	3.42%	0.00%	0.00%	17.70%
ASSAM	0.00%	4.20%	10.19%	16.42%	7.30%	9.07%	0.00%	10.00%
WEST BENGAL	6.12%	19.26%	21.39%	15.84%	11.34%	8.64%	0.00%	19.11%
JHARKHAND	0.00%	2.91%	4.45%	4.60%	6.55%	0.00%	0.00%	3.87%
ODISHA	10.63%	18.40%	25.01%	29.86%	15.14%	18.48%	100.00%	23.39%
CHHATTISGARH	11.24%	4.87%	11.67%	13.07%	16.24%	7.12%	19.17%	11.71%
MADHYA PRADESH	0.00%	5.86%	8.33%	7.99%	7.12%	3.66%	11.61%	7.26%
GUJARAT	3.03%	3.10%	4.26%	2.27%	4.62%	8.14%	3.45%	3.96%
DAMAN & DIU	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
D & N HAVELI	0.00%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.05%
MAHARASHTRA	3.43%	8.30%	5.40%	4.95%	6.15%	11.43%	10.24%	6.43%
ANDHRA PRADESH	3.08%	10.49%	16.80%	17.65%	24.47%	22.66%	4.09%	16.92%
KARNATAKA	10.17%	4.00%	4.64%	2.38%	9.24%	11.23%	25.36%	5.70%
GOA	24.38%	20.67%	1.44%	0.00%	0.00%	0.00%	0.00%	20.63%
LAKSHADWEEP	2.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.63%
KERALA	78.59%	6.62%	8.89%	10.03%	8.71%	10.97%	5.76%	7.69%
TAMIL NADU	4.44%	14.45%	12.85%	15.79%	15.46%	8.02%	3.20%	13.32%
PUDUCHERRY	1.24%	7.84%	74.64%	0.00%	67.12%	0.00%	0.00%	25.28%
A & N ISLANDS	43.54%	2.42%	9.33%	5.88%	0.00%	0.00%	0.00%	5.25%

## Appendix C Economics of Cultivation of Tenants 2002-03

### Table C- 1 Economics of Cultivation of Tenants (Kharif) 2002-03

	Households leasing in land and land class category						
	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
TV	15915(115)	14483(108)	13100(104)	13356(114)	16442(159)	11038(148)	14014(120)
Seed Cost	992(137)	847(104)	831(103)	914(111)	1011(120)	915(138)	904(113)
Pesticide	403(119)	497(129)	418(100)	637(152)	904(197)	838(244)	620(151)
Fertilizer	1828(124)	1573(116)	1395(111)	1318(118)	1489(129)	1321(171)	1448(122)
Irrigation	935(136)	685(132)	594(123)	650(146)	741(202)	540(222)	665(149)
Minor Repair	70(92)	102(110)	110(111)	141(120)	205(213)	190(214)	140(141)
Interest cost	96(196)	97(155)	141(166)	125(139)	175(184)	104(136)	129(159)
Lease rent	2111(4689)	2054(13818)	1531(18526)	1689(19010)	1857(12368)	1512(3345)	1762(10306)
Regular labour	116(122)	64(71)	50(54)	116(82)	168(79)	617(244)	154(107)
Casual Labour	1963(140)	1743(125)	1270(101)	1462(130)	1418(131)	894(121)	1432(122)
Other Expenses	954(132)	748(123)	648(123)	597(129)	695(150)	557(161)	672(132)
Total Expenses	9446(168)	8409(157)	6986(139)	7650(161)	8664(181)	7488(210)	7925(162)
TV-TC	6470(78)	6074(75)	6114(81)	5706(81)	7778(141)	3549(92)	6089(89)
TV/TC	1.68(68)	1.72(68)	1.88(75)	1.75(71)	1.9(88)	1.47(71)	1.77(74)



**Table C- 2 Economics of Cultivation of Tenants (Rabi) 2002-03**

	Households leasing in land and land class category						
	0.01-0.4	0.4-1	1-2	2-4	4-10	10+	All
TV	20005(103)	17656(124)	17468(109)	18227(111)	20568(135)	15469(117)	18252(117)
Seed Cost	1583(104)	1311(121)	1325(111)	1359(120)	1020(96)	849(93)	1239(109)
Pesticide	491(139)	443(156)	458(136)	447(130)	635(150)	501(138)	494(143)
Fertilizer	2385(118)	1824(131)	1629(105)	1691(121)	1624(123)	972(95)	1670(117)
Irrigation	1706(115)	1384(138)	1226(107)	1241(123)	936(100)	548(87)	1173(114)
Minor Repair	73(103)	72(85)	206(182)	166(120)	224(152)	75(52)	151(129)
Interest cost	43(298)	42(129)	39(94)	89(267)	160(576)	14(17)	71(199)
Lease rent	1886(1278)	1742(2014)	1612(3752)	2140(2251)	2454(5353)	1677(759)	1938(2267)
Regular labour	94(115)	17(26)	85(96)	85(68)	177(87)	142(37)	94(71)
Casual Labour	1587(120)	1374(135)	1241(107)	1304(119)	1490(143)	1366(157)	1367(127)
Other Expenses	1408(115)	1111(130)	987(96)	1305(151)	1049(129)	795(153)	1099(123)
Total Expenses	11256(137)	9319(158)	8807(132)	9826(158)	9768(162)	6941(135)	9296(148)
TV-TC	8749(78)	8337(100)	8661(93)	8401(83)	10800(117)	8528(105)	8956(97)
TV/TC	1.78(75)	1.89(79)	1.98(83)	1.85(71)	2.11(83)	2.23(87)	1.96(79)