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Poverty among Small and Marginal Farmers in Sangrur District

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Abstract: ***Agriculture is the backbone of Indian economy. According to 2001 Census of India 72.2 per cent of population live in villages. At present, agriculture sector provides livelihood to about 65 per cent to 70 per cent of the total population. Contribution of agriculture in GDP is 22 per cent. Its multiplier effect on whole economy i.e. growth of other sectors and overall economy depends on performance of agriculture to a considerable extent. Although Green Revolution increased food grain production, but it also increased disparities amongst farmers, regions and crops. It is assumed that Green Revolution is not completely green in the sense that New Agriculture Strategy is mainly related to farmers with large holdings. The facilities are not accessible to small and marginal farmers. With the use of this new technique, as the land holding increases, cost per hectare decreases and vice-versa. Price of agricultural output is continuously increasing, but its rate of increase is less than input cost price and price of other goods. In 1991, New Economic Policy was adopted and agriculture was not included in it. Agriculture was included in 1995 under the 8th round of WTO. There was a hope that Indian farmers will get larger gains because they had the potential to increase exports of agricultural products. But it turned out to be a dream. Inclusion of patent regime raised the prices of seeds and on the other hand, prices of agricultural products sharply decreased in the international market. For example in Andhra Pradesh, farmers spent nearly Rs. 1500 to 2500 on BT cotton seeds per acre. Prices of cotton dropped from Rs. 2000-2500 to Rs. 1800 per quintal between 2003-04 and 2004-05.The average size of holding in India is continuously decreasing because according to 2001 Census population level touched the peak at 102.87 crores. In India, joint family system is continuously breaking down, and has resulted in division and fragmentation of land, thereby increasing small and marginal farmers' holdings. These conditions adversely affected the small and marginal farmer as they are vulnerable to crop losses and price fall. Small and marginal farmers are generally poor; they take loan to fulfill their household and agricultural needs. Although the agriculture production has increased significantly after the mid sixties, but the small and marginal farmers are still in the clutches of poverty. So in the present paper it was decided to study income and Poverty among small and marginal farmers in Punjab by taking a sample Sangrur District. The total paper is divided in four sections namely- Introduction, research methodology& review of literature, Data analysis and interpretation followed by conclusions***

Keywords: Poverty, Small and Marginal Farmers, World Bank, Lorenz Curve, Inequality

1. Introduction

Agriculture is the backbone of Indian economy. According to 2001 Census of India 72.2 per cent of population live in villages. At present, agriculture sector provides livelihood to about 65 per cent to 70 per cent of the total population. Contribution of agriculture in GDP is 22 per cent. Its multiplier effect on whole economy i.e. growth of other sectors and overall economy depends on performance of agriculture to a considerable extent.

In the pre-Green Revolution period agriculture was practiced for maintaining the subsistence levels of farmers and they used traditional methods and tools. Five Year Plans were introduced in India in 1950-51 for development. Although the First Five Year Plan gave first priority to agriculture sector but Second Five Year Plan laid more emphasis on industrial sector which resulted in the worsening of conditions of Indian agriculture and shortage of food grains. Conditions of agriculture sector were very poor up to the mid-sixties.

In India, Green Revolution ushered in mid-sixties which included package of high yielding varieties of seeds, assured irrigation, fertilizer, pesticides, weedicides, mechanization and modern agriculture practice. After Green Revolution, subsistence agriculture was transformed into commercial agriculture. Green Revolution solved the problem of food grains shortage by increasing the food grains production.

Total food grains production has increased from 72.0 million tonnes in 1965-66 to 208.6 million tonnes in 2005-06. In food grains, production of rice increased from 30.7 million tonnes in 1965-66 to 69.4 million tonnes in 2005-06. In commercial crops, production of sugarcane has increased from 12.32 million tonnes to 270 million tonnes during 1964-65 to 2005-06. Production of cotton has increased from 5.41 million bales to 18.5 million bales during 1964-65 and 2005-06.

Although Green Revolution increased food grain production, but it also increased disparities amongst farmers, regions and crops. It is assumed that Green Revolution is not completely green in the sense that New Agriculture Strategy is mainly related to farmers with large holdings. The facilities are not accessible to small and marginal farmers. With the use of this new technique, as the land holding increases, cost per hectare decreases and vice-versa. Price of agricultural output is continuously increasing, but its rate of increase is less than input cost price and price of other goods.

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BT cotton seeds per acre. Prices of cotton dropped from Rs. 2000-2500 to Rs. 1800 per quintal between 2003-04 and 2004-05.

The average size of holding in India is continuously decreasing because according to 2001 Census population level touched the peak at 102.87 crores. In India, joint family system is continuously breaking down and has resulted in division and fragmentation of land, thereby increasing small and marginal farmers' holdings.

These conditions adversely affected the small and marginal farmer as they are vulnerable to crop losses and price fall. Small and marginal farmers are generally poor; they take loan to fulfill their household and agricultural needs. They are unable to repay debt from their income, so some farmers are forced to sell their land to repay the loan. Although the agriculture production has increased significantly after the mid sixties, but the small and marginal farmers are still in the clutches of poverty.

2. Research Methodology

2.1 Selection of villages

Poverty is a widespread phenomenon, so we have attempted to cover an appropriate sample of respondents from Sangrur district in the survey, i.e., we selected eight blocks out of 12 blocks in Sangrur district. These blocks represented almost all major areas of the district. One representative village is selected from each block for the analysis. These include Jhuneri (Bhwanigarh), Mann Majra (Malerkotla), Benra (Dhuri), Nangal (Barnala), Chatha Sekhwan (Sangrur), Sehjara (Mehalkalan), Jawaharwala (Lehragaga) and Namol (Sunam).

Table 1.1: Village-wise composition of household

Name of village	*Name of the block*	*Name Of the tehsil*	*No. of farming H.H*	*No. of agri. labour H.H*	*No.of non-agri. H.H*	*No of Artisan H.H*	*No of other H.H*	*Total H.H*
Jhuneri	Bhwanigarh	Sangrur	250	278	70	39	45	682
Mann Majra	Malaerkotla	Malerkotla	64	26	8	4	3	105
Benra	Dhuri	Dhuri	536	238	28	18	32	852
Nangal	Barnala	Barnala	187	92	60	26	30	395
Chatha Sekhwan	Sangrur	Sangrur	379	172	38	22	19	630
Sehjara	Mehal Kalan	Barnala	429	248	13	17	11	718
Jawaharwla	Lehragaga	Sunam	158	118	41	11	20	348
Namol	Sunam	Sunam	512	370	78	32	36	1028
Total			2515	1542	336	169	196	4758

Source: Village Sarpanch and Numberdar

Village-wise composition of rural household is shown in Table 1.1. There are 4758 households in all the eight selected villages including 682 in Jhuneri, 105 in Mann Majra, 852 in Benra, 395 in Nangal, 630 in Chatha Sekhwan, 718 in Sehjara, 348 in Jawaharwala, and 1028 in Namol, respectively.

Table 1.2 shows the village-wise distribution of farm households. There are 2515 households in all the eight villages including 250 farming houehold in Jhuneri, 64 in Mann Majra, 536 in Benra, 1877 in Nangal, 379 in Chatha Sekhwan, 429 in Sehjara, 158 in Jawaharwala and 512 in Namol respectively. The table shows the total number of the marginal and small farming households is 2111.

Table 1.2: Village-wise number and pattern of household investigation of the study

Name of The village	*Total number of farm household*				*All*	*Number of Household investigated*		*All*
	Marginal farmers	Small farmers	Medium farmers	Big farmers		Marginal farmers	Small farmers	
Jhuneri	137	73	25	15	250	9	11	20
Mann Majra	39	22	10	3	64	10	10	20
Benra	290	168	63	15	536	8	12	20
Nangal	90	50	37	10	187	10	10	20
Chatha Skhwan	192	121	53	13	379	8	12	20
Sehjara	288	96	33	12	429	14	6	20
Jawahar wala	72	47	28	11	158	9	11	20
Namol	293	133	69	17	512	12	8	20
Total	1401	710	318	96	2515	80	80	160

Source: Village Sarpanch and Numberdar

Out of the total 2111 households belonging to these categories, 160 households (80 belonging to the marginal farm size category and 80 to the small farm size category) were randomly selected and investigated, by taking 7.57 per cent households from the total number of the small and marginal farmers.

3. Data Source

The primary data base of the study has been supplemented with the secondary data support. Secondary data is collected from the various officials, published reports, population census reports and various issues of Statistical Abstract of Punjab. The study is mainly based on primary data collected from eight blocks of Sangrur district of Punjab.

For this purpose two schedules were prepared, i.e., village survey schedule and household survey schedule. Household has been taken as the unit of analysis. The village survey schedule was prepared for general information about the location of the villages, area of the village, number of households in the village, village population, facilities available in the villages etc. For every village, the village Patwari, Numberdar, Sarpanch and elderly-respected people (Patwante) were consulted to seek the required information about the village. For household survey, the schedule was prepared to enquire about the socio-economic conditions of the individual households. A pilot survey of 10 households was undertaken to test the schedule. Some minor changes were made to facilitate a quick enquiry and to avoid duplications. After preparing the final draft of the schedule, the data was collected from the sampled households using personal interview method.

4. Statistical Techniques

Statistical Techniques used in the current study: apart from depending upon the analysis of data using numbers and percentages of various variables affecting poverty among small and marginal farmers in Sangrur district, the other techniques/tools used are as follows: -

4.1 Mean (Arithmetic Mean):

The most popular and widely used measures of representing the entire data by one value are what the statisticians call the arithmetic mean. Its value is obtained by adding together all the items and by dividing this total by the number of items. (Gupta 2004).

$$\bar{X} = \frac{\sum X}{N}$$

Where $\bar{X}$ = Arithmetic mean
$\sum X$ = Sum of all values of the variable
N = Number of observations

Per Capita Income:

Per Capita income is the average income of the people of a country in a definite period.

$$\text{Per Capita Income} = \frac{\text{National Income}}{\text{Population}}$$

4.2 Lorenz Curve:

The Lorenz curve devised by Max-O. Lorenz, a famous economic statistician, is a graphic method of studying the degree of dispersion. The most common use of this curve is in the degree of inequality in the distribution of income and wealth between countries or between different periods of time. It is a cumulative percentage curve in which the percentages of items are combined with the percentages of other things as income, consumption, wealth etc. While drawing this curve, the cumulative proportion of a given population ranked by increasing size of a given characteristic are plotted on the X-axis, and the proportion of the total magnitude of that characteristic assignable to the proportional groups of total population are plotted on Y-axis. If perfect equality exists, the Lorenz curve coincides with the diagonal line (if the proportions are in percentages and if there is no negative term). Inequality is measured by the area between actual Lorenz curve for a given distribution and the diagonal line of perfect equality. Thus, farther the curves are from the line of equi-distribution and near to the axes it is, greater will be the degree of distribution. In fact, the area between the line of equi-distribution and the Lorenz curve shows the degree of concentration.

4.3 Gini Concentration Ratio

Gini ratio is defined as the ratio of the area that lies between the equi-distribution line and Lorenz curve to the area that lies under the equi-distribution line. If those two areas are equal to each other the Gini ratio would be equal to unity. On the other hand, of the Lorenz curve coincides with the equi-distribution line, the Gini concentration ratio would be zero. Thus the concentration ratio may vary from zero to unity. The coefficient of concentration is used to estimate the degree of inequality. The degree of inequality increases with the value of coefficient of concentration.

4.4 Variables Used

Individual specific variables

- Education, Age, Sex and Occupation

Household specific variables

- Type of households, Electricity facility, Type of family, Land holding, Source of drinking water, Irrigation, Income, Consumption expenditure and Indebtedness
  Description of variables
  Dichotomous variables
- Electricity facility, Type of household and source of drinking water

Other variables

- Income, Consumption expenditure, Indebtedness, Land holding and Size of family

5. Review of Literature

The success of Green Revolution has attracted a great deal of attention of various researchers & policy makers. A large number of studies have been conducted in India and abroad, particularly after the mid-sixties to evaluate the effect of Green Revolution on income, consumption, poverty & indebtedness among the small & marginal farmers. A brief review of these studies is given as under:

5.1 Study related with other country

Hossain et al (2000) studied the income distribution and poverty in rural Philippines. The study assesses the changes in household income distribution and poverty situation between 1985 and 1997 with primary data generated through in depth household surveys in four villages representing the irrigated, favourable rainfed and the upland rice ecosystems in Philippines. An important finding of the study is that increase in agricultural productivity stimulated the growth in

rural non-farm sector, which ultimately grew faster than agriculture cultivator farmer. Major source of higher income inequality are non-farm economic activities whose share in total household income increased from 36 to 60 per cent in 1985-1999. The income from these activities is more unequally distributed than the income from cultivation. The poverty determinant function suggests that rural poverty reduced more by investment in education, reliable irrigation infrastructure and effective implementation of land reforms etc.

The above study shows that non-farm sector is more responsible for income inequalities relative to farm business income.

5.2 Studies Related to India

Dantwala (1989) made an attempt to study the estimate of demand for credit and its role in poverty alleviation. The study shows share of institutional credit in total debt increased from 7.2 per cent in 1951 to 61.2 per cent in 1981. The number of rural branches rose from 1832 in 1969 to 30781 in 1988. Commercial Banks gave short-term credit to farmers. Credit demand for crop production in case of farmers in1989-90: Rs. 27551 crores, 1990-95: Rs. 57316 crores and 1999-2000:Rs.110873 crores. Availability of resources in case of farmers was in 1989-90: Rs. 28694 crores, 1990-95:Rs. 51829 crores and 1999-2000: Rs. 89447 crores respectively. Above data shows that demand of credit is higher than availability of resources. The study argues that government introduces several schemes for reducing poverty such as IRDP, RLEGP, Jawahar Rozgar Yojna etc. But this article shows that farmer faces many problems for taking credit. Above results show that if Government fulfills farmers credit demand, they fulfill the objective of poverty alleviation.

Pattanaik (2007) made an attempt to study the rural poverty and need for primary sector development. The various sources of data used were Human Development Report, National Planning Commission, CSO and NSSO. The study shows that agriculture is the livelihood of rural India and is fundamental to alleviation of rural poverty and hunger. The Green Revolution launched way back in 1960s has become too old and Indian agriculture needs a second Green Revolution in the dry land of the country. Increased poverty among farmers decreases land holdings like (< 0.5 hectares) 38 per cent, (0.5-one hectares) 27 per cent, (one-two hectares) 19 per cent (two-four hectares) 14 per cent respectively. The study highlights that poverty is high among low land holding farmers relative to higher land holding farmers. The study suggests reducing poverty by diversifying agriculture and providing seeds at low prices etc.

The above analysis shows that negative relationship between farm-size and poverty. If the farm-size increases, below poverty line population decreases. Dantwala study gives argument that if government wants to reduce poverty they full fill the objective of farmers credit demand.

5.3 Studies Related to Other States

Gupta (1963) has made an attempt to study the pattern of food consumption among agricultural population, effect of the size of holding on consumption pattern in Budaun district (Uttar Pradesh). The study covers 320 holdings distributed in various size groups of holdings in 36 villages, chosen randomly. The study indicated that the consumption of superior food grains increases with the increase in the size of holding. The average calorie intake of families in different size groups varies from: 215 calories up to one acre, 2325 calories-one to 2.5, 2568 calories-2.5 to five acre, 2750 calories-five to 10 acre, 3011 calories- above 10 acre, 2615 calories for all 320 families. Therefore, in view of calorie intake recommended by the Nutrition Advisory Committee (NAC) for different class of people the ideal is 2800 calories per day, per adult. The study highlights that 'below 10-acre' people are unable to consume minimum required calories.

Lal (1969) made an attempt to address certain issues on the relationship between agriculture income and availability of water in Ahmendnagar district of Maharashtra, which has uncertain rainfall. Two groups of small and large farmers are studied. In securing regular water supply the larger and richer farmers are better placed for two reasons: (a) mainly lending agencies are directly linked to size of land holding, and (b) they are financially better placed to take the risk of digging a well without certain knowledge as to available water table. But it is next to impossible for the small farmer and to take any sensible investment decision or to improve the existing and future allocation of water. The net result is that especially with the influx of new HYV technology, the hiatus between the rich and poor farmers has widened. Small farmers' income is continuously decreasing because they do not have ample money to purchase inputs and assured irrigation that increases productivity.

Shah and Agarwal (1970) made an attempt to study the impact of new technology on the level of income, pattern of income distribution and saving of farmers. The study was conducted in district Budaun of U.P. Two blocks Bisauli and Waziranj were selected on the basis of agriculture performance. 120 progressive and 91 less progressive farmers were selected from the Gaon Sabhas. Progressive small, medium and large farmers gross income was found to be Rs.2031,Rs. 11236 and Rs.22180 respectively and net capital investment was Rs.436.66, 3782 and 12621, respectively and saving turned out to be Rs.1801, Rs.143 and Rs.-1126 respectively. Less progressive small, medium, large farmers' gross income was Rs.2322, Rs.3064 and Rs.5825 respectively, net capital investment was Rs.272, Rs.1678 and Rs.486 respectively and savings turned out to be Rs.–1349, Rs.-3090, and Rs.949 respectively. The study highlighted that income inequalities have raised due to variation in the size of holding.

Ray (1970) made an attempt to study the agriculture income distribution pattern in a dynamic rural economy. The study highlights that increasing income disparities in Indian rural economy in the present phase are largely due to a higher concentration in land use coupled with an already high concentration of resource ownership. From district Burdwan,

which happens to be one of the most progressive agriculture districts in West Bengal nine sample villages were selected. The data has been collected by Agro-Economic Research Center. The effect of two most important factors, land and fertilizer, on agriculture income is studied herein. In most villages (above 77 per cent cases) the disparity in income distribution is higher than land distribution. Above 64 per cent cases, disparities between income was higher those farmers who use fertilizer. A disparity between incomes was less between less and more land holding farmers. It was observed that small farmers do not use those fertilizer products that help increase land productivity mainly because of higher prices.

Saikia and Bora (1975) have analyzed the impact of modern agriculture technology on small farmers. A random sample of 25 farm families of five villages of Sibsagar district of Assam was taken for analysis. Two sets of data were collected for estimating cropping pattern i.e., before the adoption of new technology and after the adoption of new technology. Data shows that before the adoption of new technology average annual income from agriculture is Rs.2737 and after the adoption of new technology average annual income from agriculture is Rs.4018.This study also highlights that per household income is directly related to the size of the operational holding. The study highlights that after the adoption of new technology, small farmer income and production increase from same land holding which is used for cultivation before Green Revolution. The study shows poverty can be reduced by using new technology.

Saini (1976) has made an attempt to study the Green Revolution and the distribution of farm income in Punjab and Uttar Pradesh. Multi-stage random sampling technique was used to select farmers in Ferozepur district Punjab and Muzaffarnagar in Uttar Pradesh. Data was collected for 1955-57 and 1967-69 and the technique of regression and Lorenz Curve were used in the study. It was found that all farm size in Punjab and U.P. had registered an increase in their income but gains were not evenly distributed. High inequalities were prevalent in farm business income of Punjab than that of U.P. because in U.P. labour was used for the production of sugarcane and in Punjab machinery was used for the production of wheat. Alternative approach shows a positive relationship between farm size and machinery. The study result indicates that Green Revolution is unfavorable to new machinery using area.

Pandey and Prasad (1985) have studied the impact of Cooperative Banks financing on poverty of small and marginal farmers. This study was conducted in Itwa block of Basti district, east U.P. Two societies were randomly taken for the purpose of selection of sample farmers. A list of borrowing members were obtained for both the societies separately and borrowers were categorized as small and marginal farmers. Nearly 20 per cent borrowers were selected as sample farmers. Data for pre loan period i.e. July 1976-June 1977 and the post loaning period i.e. July 1980 – June 1981 was collected. In 1976-77 the poverty line for small farmers was Rs. 4288 and that of marginal farmers was Rs. 4203. During this period 60 per cent small farmers were very poor and 40 per cent were poor, 69 per cent marginal farmers were very poor and 31 per cent were poor. In 1980-81, poverty line defined for small farms was Rs. 4306 and for marginal farms was Rs. 4231. During this period, 40 per cent small farmers were found to be living below poverty line. In case of marginal farms 54 per cent were found to be living below poverty line. The study concluded that the difference between small and marginal farmers' income was less in 1976-77:Rs.3612.22, Rs.3503.33 respectively and high in 1980-81:Rs.5899, Rs. 5001.31 respectively i.e., disparities increase after loan.

Sharma, et al (1987) have studied the level and pattern of investment of small and marginal farmers in Ajmer district of Rajasthan Jamaja and Silora blocks were selected which are dominated by the small and marginal farmers. 130 farm household from 10 villages were chosen randomly for collection of necessary data. Data was collected by personal interview and observation method in 1982-83. Multiple linear regression analysis was done to determine the impact of factors on level of investment. The study shows per capita expenditure diminishes with the increase in size of holding. Total investment per farm is found to be positively related with size of holding and per acre investment was found to be negatively related with the size of holding. Small and marginal farmers' per capita expenditure is more in agriculture because they invest more in allied activities to supplement their meager earnings.

Raghunath et al (1987) made an attempt to study the impact of Primary Agriculture Co-operative Societies Finance on marginal and small farmers' economy of a Dry farming district Anantapur of Andhra Pradesh. Study period is 1979-80 to 1983-84. From each selected village, 24 small and 24 marginal borrowers and 26 small and 26 marginal non-borrowers were randomly selected. The study shows cooperative short-term loan enabled the borrowers to invest more in terms of strategic inputs like manures and fertilizers, which helped to increase the productivity and profitability of groundnut crop. The lower level of returns on non-borrowing farmers can be attributed to poor manure and fertilizer application. The study shows if marginal and small farmers take credit, then productivity of land increases and it helps to reduce their poverty.

Chandel and Sharma (1989-90) made an attempt to study the variations in poverty overtime and a comparison was made among different categories of farms. The study pertains to Kangra district of Himachal Pardesh. 10 per cent of the total villages were randomly selected. A sample of 150 cultivators was proportionately allocated in each of the selected villages. The cultivators were divided into three groups-farmers owing 0.564 hectares - small farmers, 1.287 hectares - medium farmers and 2.842 hectares - large farmers. In all 56 small cultivators, 71 medium cultivators and 23 large cultivators were selected. Data was collected from various secondary sources. Different inequality measures like coefficient of variation, Gini ratio, relative mean deviation, standard deviation of income were used to measure poverty. The mean value of existing size of farm was found to be inversely related to per hectare gross margin and positively related to income. All measures shows poverty among small and medium farmers was high relative to large farmers. Fluctuations were higher in rural poverty with low operational holding.

Paul (1990) made an attempt to study the temporal changes in absolute poverty among farm families during the period 1969/70-1982/83 in Haryana. Four measures of poverty namely family count ratio, head count ratio, poverty gap ratio and Sen Index have been estimated using the cross section data for each year. The study used Rs 741 per year expenditure and 2095 calories requirement per day to measure poverty. Highest poverty was found to be prevailing among small farmers (two hectares), next among medium farmer (two to 10 hectares) and no poverty prevailing among the big farmers (above 10 hectares). Poverty was found to be inversely related to irrigation in the region. This implies that an improvement in the irrigation facilities is likely to reduce poverty among farmers.

Singh, et al (1991) made an attempt to study the impact of bank finance or cropping pattern and income of small farmers of Agra district in Uttar Pradesh. In the selected village, 75 borrowers, and 75 non-borrowers were selected randomly. Study period was 1983-84 and data was collected through personal interview. The study shows higher intensity of cropping; greater commercialization and higher level of crop yields had generated substantial additional net income to the borrower farmers as compared to the non-borrower farmers. The study shows with the help of bank credit to small farmers land productivity can be improved and below poverty line population can also be reduced.

Pasha (1991) made an attempt to study the sustainability and viability of small and marginal farmers. The study is based on data collected in three villages of Kolar district, a drought prone region of Karnataka. The study analyses that drought prone small and marginal farmers are poor because their gross return per acre is very less. The study shows poverty can be reduced if small and marginal farmers diversified their economy into animal husbandry (like sheep, goats, buffaloes) so as to maximize the total return on the farm with small physical resources. The study also highlighted that small and marginal farmers' income is very low from agriculture. They can improve their poverty by diversifying from agriculture into animal husbandry.

Rao and Bathian (1993) made an attempt to study the income, consumption and saving behaviour of tribal farmers of Andhra Pardesh. The study was conducted in Huckumpet Mandal of Vishakhapathan district. From this mandal 10 villages and 103 cultivators were selected at random. Simple linear function was used to determine Marginal Propensity to Consume and Marginal propensity to save. The data were collected by interviewing each farmer personally. Per household income, consumption, saving are for: 0-2.80 hectares – 6403.30, 5256.82, and 1146.48 respectively, for 2.51 to five hectares – 8197.42, 6419.22, and 1778.20 respectively, and for above five hectares –17986.03, 9744.96, and 8241.07 respectively. Per capita income, consumption and savings are for: 0-2.5 hectares 1117.50, 917.42 and 200 respectively, for 2.5 to five hectares –141.5, 1108.67 and 307.12, and for above five hectares -2480.83, 1344.13 and 1136.7 respectively. The study highlighted that income increased with the size of holding. The situation of the low landholding farmer is poor relative to that of a higher landholding farmer.

Goyal et al (1993) made an attempt study the repayment capacity of defaulter and non-defaulter borrowers of cooperative societies in Hisar district of Haryana. Three Central Cooperative branches were selected randomly. From each selected branch, two Primary Agriculture Cooperative Credit and Service Societies (PACCSS) were taken. 115 borrowers were selected from each PACCSS. These borrowers are divided into three groups of farms: small - four hectares, medium four-eight hectares, and large above eight hectares. Further all borrowers were divided in to defaulters and non-defaulter. Average size of operational holding of defaulter and non-defaulter farmers was found to be small 2.15, 2.73 respectively, medium 6.24, 6.29 respectively and large 9.33, 12.75 respectively. Average yield may be attributed to more investment on critical inputs and better managerial performance of the non- defaulter borrowers. Non-defaulter had higher value of livestock as compared to defaulter. The average expenditure on edible oil, social ceremonies and education was relatively low of the defaulter and per capita expenditure was high. The percentage of overdue of the amount of loan advanced was the highest in case of the medium farmers than other groups. The repayment capacity was not enough to repay the loan due in case of all groups of defaulter. The study shows poverty is high among small and medium farmers.

Ghosh (1998) has studied the effects of agricultural development and agrarian structure on rural poverty in West Bengal during (1957-58 to 1993-94). The data set used in estimating the equations relate to 15 districts of West Bengal corresponding to four agricultural censuses. The author is of the opinion that agrarian structure seem to have reduced the incidence of poverty among rural marginal and small farmer via agricultural development channel, but at the same time, has generated adverse effects on it via direct distribution channel. The study shows that agricultural performance has alleviated rural poverty through trickle-down effect. The study clearly indicates that labour productivity augmenting growth in agriculture has stronger effect in reducing rural poverty than any other growth process that does not augment labour productivity significantly.

Thakur, et al (2000) made an attempt to study the rural income distribution and poverty in Bihar. The intensive survey (1996-97) in eight villages represented all agro-ecological regions of Bihar. Results indicated that income distribution was less unequal in technologically developed villages than in less developed villages. Agriculture and rice income was more equally distributed than non-agriculture income. Thus the diffusion of modern agriculture technology did not effect the distribution of agricultural income but rather reduced inequality of overall income distribution. The study concluded that rural poverty was relatively lower in technologically developed villages than in less developed villages.

Tuteja (2000) made an attempt to study the distribution of female agriculture workers in family income and their status. Two districts, Ambala a progressive district in an irrigated zone and Bhiwani a non-progressive district in a dry region of Haryana were selected for the study. The primary data has been collected by interview method of 150- rural farm household. Per household income in Ambala and Bhiwani

district are as follows: small farmers – Rs.13524, Rs. 6924 respectively, medium farm – Rs. 34031, Rs. 37032 respectively, big farms Rs.1356966, Rs. 103765. Percentage share of female workers in Ambala and Bhiwani are in small farms – Rs. 4314, Rs.3293, medium farm – Rs.1304, Rs.1919, big farms – Rs.954, Rs.1032. Number of female workers is negatively related with farm size. Income from wage employment is higher in Ambala compared to Bhiwani, per household farm income wages is less in Ambala compared to Bhiwani and share of female workers is less in Ambala compared to Bhiwani. The female agriculture workers do not enjoy the status commensurate to their involvement in the household income. The study shows the small farmers are poor so they are unable to hire labour and engage their family members as labourers and large farmers have money to hire labour.

Deshpande (2002) made an attempt to study suicides by farmers in Karnataka. In the selected villages 99 cases of suicide were interviewed and information was obtained through structured questionnaire and from a large number through personal visits. Published and unpublished literature and media reports were used. The study shows that when small and marginal farmers adopt spurious new technology, they have not enough money owned, as well as they fall into a dept trap. The study shows small and marginal farmers are poor and they were unable to repay the loan and their debt continuously increased, in the end, the only way left is committing suicide. In the end, we can say that small and marginal farmers are poor which becomes the major reason for committing suicides. Giving time-to-time information and facilities to farmers can reduce the rate of suicide.

Jayachandra and Naidu (2006) attempted to study the impact of dairy cooperatives on income, employment and creation of assets of marginal and small farmers. The study covers 60 small and marginal farmers in Rangampet village (Chittor district). The data was collected through personal interview and observations. After joining the milk cooperative society the income of marginal and small farmers increased by 15.07 per cent to 10.84 per cent, dairy income 25.5 per cent to 2.98 per cent, creation of assets 15 per cent to 12.5 per cent respectively. Total employment increased between both male and female. So agriculture alone is unable to provide employment to the poor small and marginal farmers. We conclude by saying that Green Revolution-package of new technology–is in favour of big farmers. This technology being very costly to adopt, benefits mainly the large farmers only. Small and marginal farmers are unable to buy this costly package of technology. It was also found that income inequalities have risen due to variation in the size of holdings. In general, majority of studies recommend diversification of agriculture into allied activities and also imparting proper and timely information to the farmers regarding issues concerning farming and non farming activities.

5.4 Studies related to Punjab

Bhattacharya and Majid (1976) have analyzed the effect of Green Revolution on small and big farmers of Punjab in respect of their participation in technical change, productivity increase, income gain etc. A sample of 10 small farmers (seven acre), there big farmers (10 acre) and 10 landless agricultural labour was selected from each village selected from the 12 districts of Punjab. It was observed that per acre output of big farmer was more than that of small farmers. The per capita income of small and big farmers was calculated to be Rs.320 and Rs.1411 respectively. Cost of per cultivated acre for small and big farmers was respectively Rs.611 and Rs.674 respectively. Per capita farm business income for small and big farmers Rs.320 and Rs.1141 respectively. The author highlights that there exists positive relationship between income and land holdings. Small farmers were poorer than big farmers because large holdings were nearly seven times more than that of small holding.

Shergill and Singh (1995) made an attempt to study poverty in rural Punjab. Data was collected from various NSS Consumer Expenditure survey reports. The study period was from 1960-62 to1990-91. Head count and poverty line [Rs.16 per capita monthly expenditure at 1960-61 prices, and ultra poor were those whose monthly per capita expenditure was less than 80 per cent of the poverty line] were used to measure poverty. The author opines the widely shared view that there has been no significant decline in poverty in Punjab despite the impressive agriculture growth during the last three decades does not match with the observed ground reality in the state's villages. As per the author, the analysis of trends in rural poverty in Punjab shows that there is a decline not only in the proportion of the poor, but also in their absolute numbers.

We conclude by saying that Green Revolution- package of new technology–is in favour of big farmers. The technology being very costly to adopt, benefits mainly the large farmers only. Small and marginal farmers are unable to buy this costly package of technology. It was also found that income inequalities have risen due to variation in the size of holdings. Above analysis shows that positive relationship exists between farm-size and income and negative relationship between farm-size and below poverty line population.

6. Analysis of Poverty among Small and Marginal Farmers in Sangrur District

Poverty can be defined as a social phenomenon in which a section of the society is unable to fulfill even its basic necessities of life. All those people who live below this minimum desirable level of living are said to be living below the poverty line.

In this paper the extent of poverty and inequality in the distribution of income and consumption among small & marginal farmers has been be examined. The analysis is divided into two sections-one deals with poverty among small and marginal farmers and the other deals with the inequality among small and marginal farmers.

In this section poverty among small and marginal farmers will be analyzed using different methods like Dandekar and Rath method, state's per capita income (PCI), both 50 per cent and 40 per cent and World Bank one dollar concept.

The poverty line worked out by Dandekar and Rath is Rs. 180 per capita per annum at 1960-61 prices for the rural areas. We have estimated poverty line by using the general consumer price index for the agricultural labourers for the year 2006-07 i.e. Rs.380. The poverty line comes to be Rs. 3912.48 per capita per annum. All the small and marginal farming households having per capita income and per capita consumption below Rs. 3912.48 have been considered as below poverty line households. The commonest measure of overall poverty is the head-count measure, given by the proportion of the total population that happens to be identified as poor i.e., as falling below the specified poverty line income.

The second method is to define poverty in relation to contemporary living standard by drawing the poverty line at, say half the average income level of the state. Punjab's per capita income at current prices for the year 2006-07 is Rs. 34929. The formula for finding the average income households who will constitute the 'below poverty line' families can be worked out as follows:

$$\text{Cut off income of household} = \frac{\text{PCI of state x (Average size of household)}}{\text{Qualifying as BPL families}}$$

If we go moderate by taking only 40 per cent of per capita income of the state instead of 50 per cent then the below poverty line households in Sangrur district were also identified by the us.

In the most recent literature on the incidence of poverty, World Bank suggested the measure of $ 1 per day to work out poverty line which has been used by us to determine the 'below poverty line' households as under:

Annual per capita income = 1x42.25x365
= Rs. 15421.25/- per year per person
(1$ =Rs. 42.25)

Therefore, cut off income = 15421.25 x Average number of members in a family.

6.1 Incidence of income based poverty

The poverty measure head-count for both the farm-size categories is shown in Table 5.1 where we have worked out poverty measure head count by taking income of Rs. 3922.77 per capita per annum as the poverty level.

The table shows that as many as 4.86 per cent of the small and marginal farmers' households taken together in the rural areas of Sangrur district live below the poverty line. Proportion of population below the poverty line is different for the two categories. For example, it is 8.81 per cent and 1.25 per cent for the marginal and small farm-size categories, respectively. This is an inverse relationship between the population below the poverty line and farm-size.

Table 5.1: Head-count measure for per capita distribution of income level
(Poverty line Rs. 3912.48 per capita, per year)

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Proportion of persons below the poverty line	8.81	1.25	4.86

Source: Primary Survey.

By using the second method i.e., 50 per cent of PCI of the state, the poverty line comes to Rs. 82956, Rs. 79114.18 and Rs. 86798.56 per household per year for the both categories taken together, marginal farm-size, small farm-size and, respectively.

Table 5.2: Measuring poverty by 50 per cent of PCI of the state

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off income of BPL families, per year(in Rs.)	79114.18	86798.56	82956
No. of households below the poverty line	77	65	141
Proportion of households below the poverty line	96.25	81.25	88.12

Source: Primary Survey

Table 5.2 shows that as many as 88.12 per cent of the small and marginal farmers taken together in the rural areas of Sangrur district live below the poverty line. It is 96.25 per cent and 81.25 per cent for the marginal and small farm-size categories, respectively. There is also an inverse relationship between the population below the poverty line and farm-size.

Table 5.3: Measuring poverty by 40 per cent of PCI of the state

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off income of BPL families, per year (in Rs.)	63291.34	69438.85	66365.1
No. of households below the poverty line	76	60	134
Proportion of households below the poverty line	95	75	83.75

Source: Primary Survey

We moderate our analysis by taking only 40 per cent of per capita income of the state instead of 50 per cent, for determining the below poverty line families in Sangrur district. The poverty line comes to be Rs. 63291.34, Rs. 69438.85 and Rs. 66365.1 per household per year for the marginal farm-size, small farm-size and both categories taken together, respectively. Table 5.3 clearly shows that as many as 83.75 per cent of the small and marginal farmers taken together of rural areas of Sangrur district live below the poverty line so determined.

There are considerable variations in the percentage of households living below the poverty line for the two categories. It is 95 per cent and 75 per cent for the marginal and small farm-size categories, respectively. There is also an

inverse relationship between the population below the poverty line and farm-size.

Another method used for determining the poverty line as given by the World Bank is the 1$ per day method. The poverty line is calculated to be Rs. 69858.26, Rs. 76643.61 and Rs. 73250.93 per household per year for the marginal farm-size, small farm-size and both categories taken together respectively. Table 5.4 shows that as many as 85.62 per cent of the farming households in the rural areas of Sangrur district live below the poverty line as determined by this method.

Table 5.4: Measuring poverty by $ 1 method

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off income of BPL families, per year (in Rs.)	69858.26	76643.61	73250.93
No. of households below the poverty line	77	60	137
Proportion of households below the poverty line	96.25	75	85.62

Source: Primary Survey

Proportion of population below the poverty line is 96.25 per cent and 75 per cent for the marginal and small farm-size categories, respectively. There is also an inverse relationship between the population below the poverty line and farm-size.

6.2 Incidence of consumption based poverty

In the previous section we have measured the poverty among the small and marginal farm-size categories on the basis of income. In this section, I propose to work out poverty level on the basis of expenditure levels of the two farm-size categories. The basic criterion for the poverty line remains the same as applied in the previous section. All the farming households having per capita consumption expenditure below Rs. 3912.48 have been treated as poor. So, by this method no household lies below poverty line. The consumption expenditure of all the surveyed households is higher than Rs. 3912.48.

Table 5.5: Measuring poverty by 50 per cent of PCI of the state

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off income of BPL families, per year (in Rs.)	79114.18	86798.56	82956
No. of households below the poverty line	67	64	131
Proportion of households below the poverty line	83.75	80	81.87

Source: Primary Survey

By using the second method i.e., 50 per cent of per capita income of the state, the poverty line comes to Rs. 79114.18, Rs. 86798.56 and Rs. 82956 per household per year for the marginal farm-size, the small farm-size and both categories taken together, respectively. Table 5.5 shows that the proportion of poor persons for both the categories taken together is 81.87 per cent. However, there are considerable variations in the percentage of households living below poverty line for the two categories. It is 83.75 per cent and 80 per cent for the marginal and small farm-size categories respectively.

By taking 40 per cent of PCI of the state for determining the number of households below poverty line, Table 5.6 shows that the proportion of the poor persons for both the categories taken together is 69.37 per cent. Proportion of population below the poverty line is 80 per cent and 66.25 per cent for the marginal and small farm-size categories, respectively.

Table 5.6: Measuring poverty by 40 per cent of PCI of the state

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off consumption of BPL families, per year (in Rs.)	63291.34	69438.85	66365.1
No. of households below the poverty line	64	53	111
Proportion of households below the poverty line	80	66.25	69.37

Source: Primary Survey

The poverty measured by $1 method for both the farm-size categories taken together and for individual farm-size categories is given in Table 5.7.

Table 5.7: Measuring poverty by $ 1 method

Description	*Farm-size categories*		
	Marginal Farmers	*Small Farmers*	*All Categories*
Cut off consumption of BPL families, per year (in Rs.)	69858.26	76643.61	73250.93
No. of households below the poverty line	64	62	122
Proportion of households below the poverty line	80	77.5	76.25

Source: Primary Survey

It is clear from the table that the proportion of the poor persons for both the categories taken together is 76.25 per cent. The proportion of poor persons is 80 per cent for the marginal farm-size category and 77.5 per cent for the small farm-size category. There is an inverse relationship between the population below the poverty line and farm-size.

7. Analysis of Inequalities Prevalent among the Small and Marginal Farmers in Sangrur District:

Many inequalities are prevalent among the small and marginal farmers. All the methods which have been used to measure poverty do not indicate the inequality in income and consumption among the small and marginal farmers. So Lorenz curve and Gini concentration ratio have been used to measure the inequality in the income and consumption pattern of small and marginal farmers with the help of DAD, software used for distributive analysis.

7.1 Incidence of income distribution

Table 5.8 contains the distribution of income among small and marginal farmer households in rural areas of Sangrur district.The bottom 10 percent households share nearly four percent of the total income earned by small and marginal farming households. On the other hand, the above 10 percent households share nearly 24 percent of the income of all households. A clear contrast is obvious from the fact that the bottom 50 percent households account for about 30 percent of total income, whereas, only 20 percent of the total income is earned by all the small and marginal farming households taken together.

Table 5.8: Distribution of income

Cumulative percentage of households	*Cumulative percentage of Income*	*Cumulative percentage of per capita*
10.00	4.33	3.60
20.00	9.61	8.29
30.00	15.35	14.07
40.00	21.99	20.53
50.00	30.16	27.80
60.00	39.64	36.33
70.00	49.98	46.46
80.00	61.19	58.62
90.00	75.68	73.53
100	100	100
Concentration ratio	.289	.328

Source: Primary Survey

In case of per capita income also, the bottom 10 percent share nearly four percent of the total per capita income and top 10 percent share nearly 26 percent of total per capita income. This is nearly six times higher than the per capita income shared by the bottom 10 per cent households. The bottom 50 percent households share nearly 30 per cent of total per capita income where as the top 20 per cent share 41.38 per cent of per capita income. This shows that the inequalities in the distribution of per capita income are higher than the inequalities prevalent in the total income.

The inequalities in the distribution of households' income and household per capita income can be shown with the help of Lorenz curve. For this purpose two Lorenz curves are drawn, for income of households and per capita income of households on distributions. The graph (fig. 5.1) shows the percentile of cumulative frequency of households on X-axis and cumulative percentiles of income levels and per capita income levels on the Y-axis.

With the help of Lorenz curve the concentration ratios have been worked out, which give some interesting results. The income concentration of households is 0.289 and concentration of per capita income of households is 0.328 which clearly shows that the per capita income distribution of households is more concentrated than the income distribution of households.

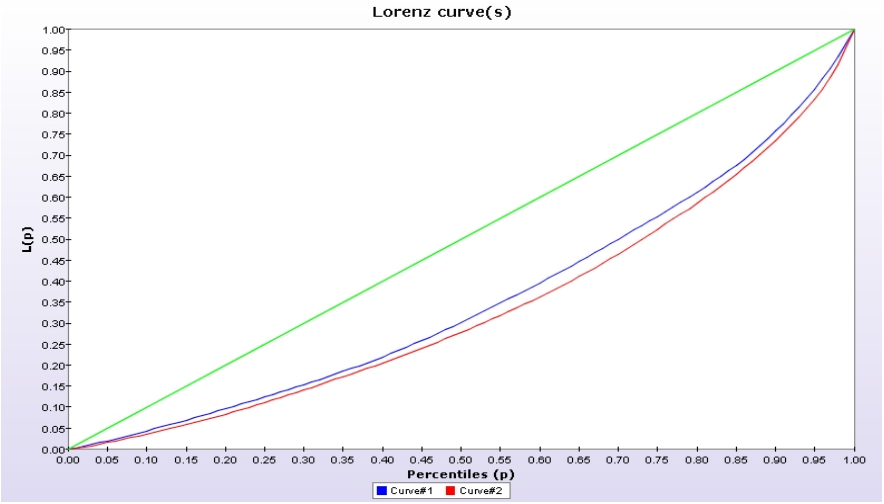

Figure: 5. 1: Lorenz Curve Representing Inequalities in Total and Per Capita Income Distribution Line of Equality

Curve 1: Total Income Curve Curve2: Per Capita Income Curve Incidence of consumption distribution

The distribution of consumption among small and marginal farming households in the rural areas of Sangrur district can be seen from Table 5.9.The bottom 10 percent households share nearly four per cent of the total consumption of all small and marginal farming households. On the other hand, the top 10 per cent households share nearly 25 per cent of the consumption of all small and marginal farming households. This is nearly six times higher than the consumption of bottom 10 per cent households. A clear contrast is obvious from the fact that the bottom 50 percent households account for nearly 35 percent of the total consumption whereas, only 20 per cent of households account for nearly 38 percent of the total consumption of all small and marginal farming households.

Table 5.9: Distribution of consumption

Cumulative percentage of households	Cumulative percentage of Income	Cumulative percentage of per capita
10.00	4.23	6.34
20.00	10.09	12.96
30.00	16.71	19.87
40.00	24.09	27.17
50.00	31.99	35.03
60.00	40.58	43.41
70.00	50.17	52.59
80.00	61.53	62.93
90.00	75.50	75.30
100	100	100
Concentration ratio	.276	.234

Source: Primary Survey

In case of per capita consumption, the bottom 10 percent share nearly six percent and top 10 percent share nearly 25 percent of total per capita consumption. This is nearly four times higher than the per capita consumption shared by the bottom 10 percent households. The per capita share of the bottom 50 percent households is nearly 35 percent of total per capita consumption where as the top 20 percent share nearly 37 per cent of total per capita consumption.

The inequalities in the distribution of consumption of households and per capita consumption of households can be shown with the help of Lorenz curve. For this purpose, two Lorenz curves have been drawn, one each for households consumption and households' per capita consumption distribution. The graph (fig.5.2) shows the percentiles of cumulative frequency of households on X-axis and cumulative percentiles of consumption levels and per capita consumption levels on the Y-axis. With the help of Lorenz curve the concentration ratios have been worked out, which give some interesting results. The households' consumption concentration is 0.276 and households' per capita consumption concentration is 0.234.

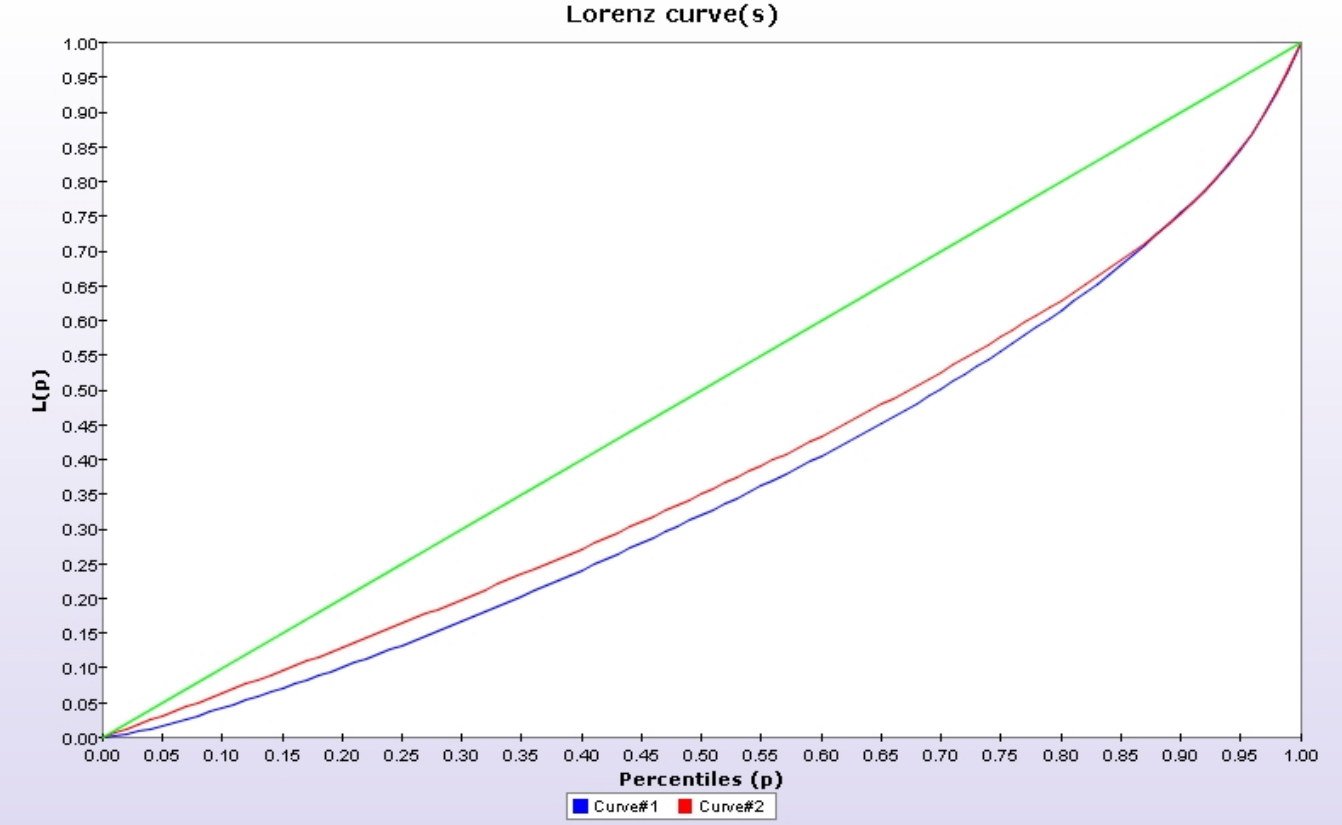

Figure: 5.2: Lorenz Curve Representing Inequalities in Total and Per Capita Consumption Distribution Line of Equality

Curve 1: Total Consumption Curve Curve2: Per Capita Consumption Curve

The above detailed poverty measurement methods show that there is inverse relationship between the population below the poverty line and farm size. In Section II, the coefficient of concentration is used to estimate the degree of inequality. The degree of inequality increases with the value of coefficient of concentration. It is 0.289 and 0.328 in households' income and per capita income. It is 0.276 and 0.234 in households' consumption and per capita consumption expenditure.

8. Future Scope of the Study

In this paper, we have based our entire analysis on the existing approaches of measuring poverty and inequality, which is the World Bank measure of poverty and the Lorenz Curve for observing the inequalities in distribution of income. If possible, the research could further be done to create an entirely new methodology to determine the line of equality which forms the basis of the assessment of the inequalities in income distribution. Also other poverty measuring indices could be created using the information generated so as to have a better analysis o region specific

poverty. Perhaps measures could be suggested to further enhance the value of this kind of work.

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