

## COMPOSITION AND DISTRIBUTION OF INCOME AMONG THE SHEEP REARING NOMADS

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### ABSTRACT

Farmers of the tribal area of Chamba district in Himachal Pradesh are mainly dependent on sheep rearing for their livelihood which significantly contribute towards the total household income. The variability in agricultural income was quite high on small farms compared to medium and large farms. However, the income variability registered reduction with the introduction of sheep rearing. Relatively more uniform distribution of income was observed in case of large farms.

### INTRODUCTION

Income inequalities and poverty has been with us since ancient times. Through our Five Year Plans we have made efforts to reduce the income inequalities however, with limited success (Paul 1989). Sufficient literature is not available to throw light on the intergroup variations in the distributional pattern of income in the tribal sectors of the economy. The *Raikes* of Rajasthan, the *Bhakarwals* in Kashmir and the *Gaddis* in Himachal Pradesh have sheep and goat rearing as main occupation and lead nomadic life. Due to difficulties regarding availability of arable land, animal husbandry in general and sheep husbandry in particular is the main enterprise for diversification of agriculture by tribals.

About 14 per cent of the total sheep and goat population of Himachal Pradesh lies within the tribal belt which covers an area of 42 per cent of the state. The sheep herds form a major part of the total household income of the tribals (Chauhan et al. 1988). It is generally hypothesised that it helps in reducing the income inequalities in addition to a supplementary sources of income. Considering the peculiar characteristics of tribal inhabitants and their dependence on sheep and goat rearing, the present paper intends to cover the following objectives:

- i) to assess the contribution of sheep to the total household economy,
- ii) to examine the pattern of income distribution with respect to different enterprises, and
- iii) to examine the extent of total income inequalities in the study area.

## METHODS AND MATERIAL

The study pertains to Bharmaur tehsil, a tribal area of Chamba district in H.P. It lies between 32°11'N latitude and 76°22'E longitude. The area of the tehsil is 1,818.3 sq km comprising 131 villages. The study is based on cross-sectional data collected through the survey method with the help of pre-tested schedule specifically designed for collecting comprehensive information. A two-stage stratified random sampling design with villages (10 per cent) as the first stage and farmers with their sheep herd size within the selected villages as the second and final stage of selection was adopted. The farmers i.e. (sheep including goats owners were stratified into three categories viz., small (upto 100 sheep,) medium (101 to 174 sheep) and large (above 175 sheep) on the basis of cumulative cube-root frequency method. In all a sample of 150 farmers was proportionately allocated to each category selected for the agricultural year July 1985 to June 1986.

The sources of household income in the area under study included, sheep and goat rearing, crops, horticulture, cattle, salaries and pension, wages and business (spinning, weaving and sale of medicinal herbs).

The degree of variability in household income with respect to different enterprises like agriculture, agriculture with sheep, non-farm and total household income among various categories of farms was measured with the help of the coefficient of variation.

In order to measure inequality in the distribution of income three measures of inequality were used. These were :

- i) The Lorenz Curve,
- ii) The Gini Concentration Ratio, and
- iii) The coefficient of variation

The extent of inequality of the distribution of income can also be determined by the Gini concentration ratio. The closer the ratio to 1, the greater is the degree of inequality, whereas the closer the ratio to zero, the more even is the distribution of income. The concentration ratio has been computed from the grouped data, using the following formula;

$$\text{GCR} = \frac{\sum_{i=1}^k (p_{i-1}) (q_i)}{\sum_{i=1}^k (q_{i-1}) (p_i)}$$

Where GCR = Gini Concentration ratio

$p_i$  = Cumulative proportion of households receiving income within or below its range

$q_i$  = Cumulative proportion of income received by the households

$k$  = Number of holding groups

The results of this study have been organized around three aspects viz; composition of household income, pattern of variability in household income from different enterprises and household income distribution alongwith different measures of income inequalities. Finally, conclusions and policy implications have been deduced from the results emanating from this study.

## RESULTS AND DISCUSSION

### Composition of household income:

Data on income components in respect of different categories of tribal households are presented in Table 1. Sheep rearing constituted the single most important component of household income claiming 43.3, 72.9 and 80 per cent of the total household income on small, medium and large farms, respectively. Agriculture with 16.3, 10.7 and 13.4 per cent shares and salaries with 13.4, 5.6 and 7.3 per cent formed the next important income generating sources on small, medium and large farms. Inter category variation reflected the increased role of salaries and pension and agriculture on large farms with 7.3 and 5.6 per cent shares were the next in order. In case of small farms the contribution of horticulture component was found to be of some significance as its share was about 6 per cent of the total household income. On the remaining two categories the share of horticulture was less significant. Similarly, the contribution of cattle on all the categories was found to be less significant. The share

Table 1. Composition of household income among different groups of household

Sr. No.	Source	FARMS			
		Small (73)	Medium (45)	Large (32)	All (150)
1.	Sheep rearing	4,209 (43.3)	8,607 (72.9)	14,973 (80.0)	8,198 (66.8)
2.	Agriculture	1,589 (16.3)	1,268 (10.7)	1,040 (5.5)	1,169 (9.5)
3.	Horticulture	572 (5.9)	150 (1.3)	146 (0.8)	328 (2.7)
4.	Cattle	44 (0.4)	130 (1.1)	50 (0.3)	66 (0.5)
5.	Salaries and pension	1,302 (13.4)	672 (5.7)	1,374 (7.3)	1,089 (6.8)
6.	Business, (spinning, weaving and sale of medicinal herbs)	1,226 (12.6)	572 (4.8)	586 (3.1)	838 (6.8)
7.	Wages	778 (8.0)	407 (3.4)	531 (2.8)	583 (4.7)
8.	All sources	9,720 (100)	11,806 (100)	18,700 (100)	12,271 (100)

Note : Figures in the parentheses denote percentages

of wages was found to vary from 2.84 per cent on large farms to 8.00 per cent on small farms. Income generated by business on small, medium and large categories accounted for 12.6, 4.8 and 3.1 per cent of the total income, respectively. For the tribal households as a whole, nearly 67 per cent of the income was contributed by sheep rearing, followed by agriculture (9.5 per cent) and salaries and pension (8.8 per cent). Business (6.8 per cent) and wages (4.7 per cent) were next in order.

The contribution made by horticulture and cattle was 2.6 and 0.5 per cent respectively. It is evident from Table 1 that in case of sheep rearing the income increased as the farm size increased. This can be attributed to the possibility of per unit positive economies of scale associated with large herds.

### Household income distribution and measures of income inequality

It is evident from Table 2 that the coefficient of variation in household income was found to be almost double (60.5 per cent) on small farms as compared to medium (33.6 per cent) and large (31.0 per cent) farms. This may be attributed to greater variations in the non-farm incomes. As far as the farm income from agriculture without sheep is concerned, the variability was high on all the categories of farms. However, with the introduction of sheep, the variability reduced to half. This indicated that sheep rearing with agriculture was helpful in bridging the income gap among the households and thus contributing towards even income distribution.

Table 2. Income variability with different enterprises in sheep rearing households

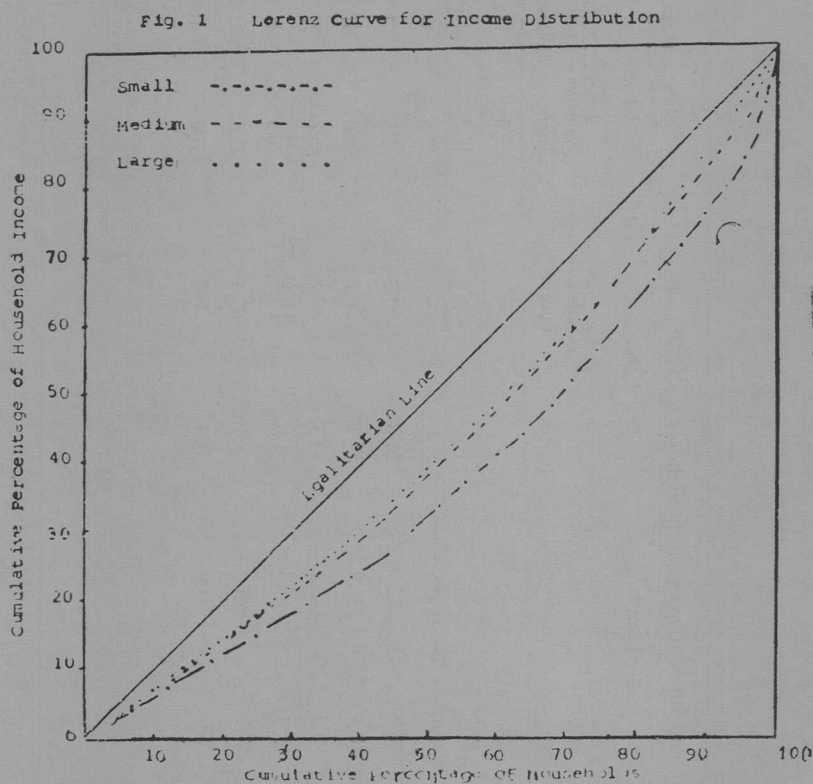
Enterprises	FARMS			
	Small (73)	Medium (45)	Large (32)	All (150)
Agriculture without sheep	94.2	62.4	67.3	80.7
Agriculture with sheep	40.0	29.4	33.4	36.0
Non-farm	150.0	91.0	75.4	136.5
Total Income	60.5	33.6	31.0	81.6

Lorenz curve is a useful tool for graphic presentation. The results of analysis are presented in Table 3 and Fig. 1. The Figure shows that in case of small farms the curve was not nearer to the egalitarian line but was more bowed out as compared to the medium and large farms, indicating that there was more unequal distribution of income. With the increase in herd size the distribution of income was found to be more even. The uniformity in the distribution pattern on large farms can be attributed to number of sheep and goats possessed by these farms and consequently the stable and higher income derived through these animals. In case of small farms where the income distribution pattern was farthest from the egalitarian line, it was observed that on a few households, one or two members of family were engaged in services.

Table 3. Income distribution by Lorenz curve among different groups of households.

Income groups (Rupees '000)	(Percentage)							
	Small (73)		Medium (45)		Large (32)		All (150)	
	Cumulative frequency	Cumulative income	Cumulative frequency	Cumulative income	Cumulative frequency	Cumulative income	Cumulative frequency	Cumulative income
< 8	42.4	25.2	8.8	5.3	—	—	23.3	11.2
8—10	65.7	47.0	37.7	27.0	—	—	43.3	25.9
10—12	80.8	64.6	60.0	47.6	—	—	57.3	38.7
12—14	91.8	79.1	73.3	62.3	21.8	15.3	71.3	53.5
14—16	93.1	81.0	88.8	81.9	37.5	28.2	80.0	61.1
16—18	94.5	83.3	93.3	88.2	59.3	48.1	86.6	73.3
18—20	95.9	86.0	95.5	91.9	74.9	63.7	91.3	80.5
20—22	95.9	86.0	97.7	95.8	78.1	67.1	92.6	82.7
> 22	100	100	100	100	100	100	100	100

This was found to be one of the major reasons for wide fluctuations in the income levels of these farms and hence it affected the distribution pattern.



The different measures of income inequality are given in Table 4. It is evident from the table that the value of concentration ratio was the highest when income distribution as a whole, rather than for individual households categories, is concerned, and it stood at 0.433. The value of concentration ratios were 0.276, 0.163 and 0.157 for small, medium and large farms, respectively. The values of concentration ratio shows that income was high with herd size responsive and most evenly distributed in the case of large house holds as compared with that of medium and small households. The other measures of inequality, such as coefficient of variation of income and the standard deviation of income, appeared to confirm the results.

Table 4. Measures of income inequality in different households

Category	Standard deviation	Coefficient of variation	Gini concentration ratio
Small (73)	0.210	60.5	0.276
Medium (45)	0.126	33.6	0.163
Large (32)	0.118	31.0	0.156
All farms	0.211	81.6	0.433

The policy implications of the findings in this study are that a reduction in income inequalities between the different categories of farms calls for concerted efforts to extend the breed improvement facilities and to speed up the improvement in the existing grazing land and pastures. With a view to promote overall economic development in the study area, special programmes like marketing facilities, support price for wool, market for the sale of live animals and by encouraging the setting up of small scale woollen industries will be of great help to the community.

## REFERENCES

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