Vol XLII
No. 2

APRIL-
JUNE
1988

ISSN 0019-5014

# INDIAN JOURNAL OF AGRICULTURAL ECONOMICS

INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

*Ind. Jn. of Agri. Econ.*
*Vol. 43, No.2,April-June 1988*

# ARTICLES

## INEQUALITIES OF INCOME, LAND OWNERSHIP AND ASSOCIATED ASSETS AMONG CULTIVATING HOUSEHOLDS OF PUNJAB: AN EXERCISE IN DETERMINANT DECOMPOSITION

A.C. Julka and R.N. Soni*

The sequence of events unfolded on the Indian scene since the mid-sixties has evoked renewed interest in the problem of growth and economic inequality in rural communities. Passionate involvement and scientific curiosity have resulted in a mass of logico-empirical studies woven around the socio-economic fall-out of agricultural revolution.[1]

Over these years, many exercises have been conducted to spell out the relationship between agricultural growth (and its impact on economic inequalities), adoption of new technology and emerging agrarian structure. The existing literature, broadly speaking, offers two approaches to the problem — the predictive contemplative and the empirical. This paper follows the latter approach and tries to explore quantitatively the relationship between the flow of income, the stock of productive capital and the fund of labour available with the cultivating households of Punjab.

### CONCEPTS AND DEFINITIONS

*The Concept of Income*

Following Chayanov (1966), Heady (1964) and Shanin (1971), a farming household has been taken as the natural unit of analysis. Accordingly, the concept of income employed here is much broader than farm incomes or operating surpluses.

In the literature on inequality, several definitions of incomes are available. We have Hicks's maximum potential consumption flow, Sen's exchange entitlement, Georgescu-Roegen's psychic flow and Murry's net accretion to economic power, just to name a few.[2]

However, none of these esoteric concepts can be put to use in an empirical study so easily. Most of the entities involved do not permit objective quantification. Therefore, we confine to the use of a computable algebraic sum Net Household Income, that comes closer to Murray's definition. It is taken as the value of crop and dairy output produced during the year less the value of farm produce fed to the livestock, plus income from the sale of labour, hiring out of machinery and renting-out land, minus all actually paid-out costs for inputs and depreciation.

Such a definition of income measures the command (potential) of a household over goods and services, with its productive stocks kept intact. These surpluses can

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be used to mitigate the consumption pressure and augment the scale of production. Therefore, it is appropriate to employ this concept for the study in hand.

In our bid to identify the major contributors of inequality, we shall investigate the variability in net household income as defined above through differences in resource endowment, the levels and manner of utilisation thereof, demographic and societal traits of the units, and finally, the technology and decision-mix as reflected in the variability of farm productivity. Subsequently, the estimated relationship is analysed to locate the prime contributors of inequality, using determinant decomposition procedure.

An understanding of these relationships may not provide a thorough insight into the dynamics of peasantry but it would be a useful key to the current economic inequality.

*Data Base*

A random sample of 252 cultivating households, drawn from one physiographical region of district Patiala (Punjab) enjoying a relatively homogeneous level of agricultural development, forms the prime data base of this study (Courtesy: ICAR Project on The Problems of Marginal and Small Farmers in the Punjab).[3] Information regarding the productive assets, operating expenses and a score of socio-demographic characteristics of the households for the reference year 1979-80, was obtained through seven comprehensive schedules. The survey extended over June 1979 to May 1980 and involved five visits to each sampled household.

## THE ANALYSIS AND THE RESULTS

*Income Ranked Distribution and Sources of Income Inequality*

Preliminary ideas about the principal contributors of inequality can be had through a simplistic procedure of income-ranked distribution. The method involves the arranging of households in an ascending order of net household incomes and obtaining the decile distribution for the accompanying profile of land, workforce, consumption pressure, livestock, draught power, liquidity and various productive assets.[4]

In this study we picked up twenty relevant factors for the purpose and obtained the income-ranked distribution of factor endowments. The results are shown in Table I.

We find that the top ten per cent of the households account for over 38 per cent of net household income, 34 per cent of crop output, 25 per cent of milk output and 35 per cent of total farm output as compared to 0.5 per cent of net household income, four per cent of crop output, seven per cent of milk output and three per cent of farm output in the case of the bottom ten per cent of the households. Given an almost equal proportion of consumers and biological units in the two polar classes, the level of inequalities in per capita disposable income is really appalling.

It may be noted that the bottom ten per cent of the households, in spite of accounting for 3.59 per cent of crop output and 6.60 per cent of milk output account

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Such a definition of income measures the command (potential) of a household over goods and services, with its productive stocks kept intact. These surpluses can

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TABLE I . INCOME - RANKED DISTRIBUTION OF FACTOR ENDOWMENTS: CULTIVATING HOUSEHOLDS, PATIALA DISTRICT (1979-80)

| Characteristic/ Household quantile | | Net household income | Area owned | Area operated | Male family workers | Milch cattle | Literate workers | Liquidity | Draught animals | Traditional productive assets | Engines motors |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| Bottom | 10% | 0.50 | 7.08 | 6.37 | 9.48 | 7.59 | 8.98 | 6.24 | 11.34 | 10.85 | 8.13 ( 7.64)* |
| Bottom | 20% | 2.13 | 11.84 | 11.15 | 18.19 | 14.43 | 15.65 | 20.70 | 18.75 | 17.66 | 14.31 (13.74) |
| Bottom | 30% | 4.48 | 15.51 | 15.11 | 24.84 | 19.67 | 19.42 | 14.51 | 26.60 | 24.03 | 21.30 (19.97) |
| Middle | 40% | 28.65 | 31.79 | 32.01 | 43.90 | 36.19 | 40.29 | 31.03 | 40.41 | 36.83 | 39.51 (39.97) |
| Top | 30% | 66.86 | 52.70 | 52.88 | 31.26 | 44.14 | 40.29 | 54.45 | 33.43 | 39.13 | 39.19 (39.78) |
| Top | 20% | 54.41 | 42.12 | 42.58 | 20.15 | 32.83 | 27.25 | 42.68 | 22.67 | 26.51 | 27.48 (27.81) |
| Top | 10% | 38.35 | 29.70 | 29.69 | 10.24 | 21.66 | 16.52 | 30.35 | 13.52 | 16.68 | 16.75 (18.43) |
| All households | (100%) | | | | | | | | | | |

*(Contd.)*

TABLE I *(Concld.)*

| Characteristic/ Household quantile | Tractors | Modern productive assets | Crop output | Milk output | Farm output | Consumer units to be fed | Biological units to be fed | Family labour used | Hired human labour | Off-farm income | Outstanding debt |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (1) | (12) | (13) | (14) | (15) | (16) | (17) | (18) | (19) | (20) | (21) | (22) |
| Bottom 10% | 0.54 ( 0.53)* | 3.99 | 3.59 | 6.60 | 3.48 | 9.84 | 9.94 | 9.27 | 6.79 | 4.36 | 16.20 |
| Bottom 20% | 0.95 ( 0.93) | 7.22 | 7.13 | 11.41 | 6.70 | 18.66 | 19.01 | 17.24 | 10.93 | 8.11 | 19.78 |
| Bottom 30% | 0.95 ( 0.93) | 9.26 | 10.25 | 16.47 | 9.67 | 26.90 | 27.52 | 24.34 | 14.29 | 15.13 | 21.98 |
| Middle 40% | 32.74 (31.91) | 30.95 | 30.15 | 32.08 | 29.28 | 43.56 | 43.37 | 42.87 | 28.22 | 42.08 | 31.50 |
| Top 30% | 66.31 (67.19) | 59.79 | 59.61 | 51.45 | 61.05 | 29.54 | 29.21 | 32.79 | 57.49 | 42.48 | 46.51 |
| Top 20% | 50.75 (52.96) | 45.26 | 48.26 | 36.29 | 49.20 | 19.07 | 18.94 | 23.03 | 47.03 | 30.99 | 28.68 |
| Top 10% | 37.66 (40.79) | 33.35 | 34.28 | 25.40 | 35.14 | 10.13 | 10.30 | 9.12 | 34.00 | 16.65 | 24.22 |
| All households (100%) | | | | | | | | | | | |

*Source:* Computed.
* Figures in brackets are with respect to horse power.

for just 0.5 per cent of net household income. Such a finding need not surprise us. It is a fact of rural life. Livestock is to be fed, paid-out costs have to be deducted, and once depreciation is accounted for, the potential surpluses with the lowest rung would be too meagre.

Obviously, if the need arose, this section of the population would be living on debts and contracting the scale of production by consuming the depreciation funds. And, if the same state of affairs gets prolonged, then such households would join the ranks of landless labour.

On the endowment side, our top income bracket has 30 per cent of land, 33 per cent of modern productive assets, 22 per cent of milch cattle, 30 per cent of liquidity, 38 per cent of tractors, and 17 per cent of the total engines/motors, whereas the bottom rung of the ladder has just seven per cent of milch cattle, six per cent of liquidity, 0.54 per cent of tractors, eight per cent of engines/motors and a meagre four per cent of modern productive assets.

The above described kaleidoscopic view of rural economy indicates that it is the uneven distribution of land, productive material wealth, demographic traits, quantity and quality of workforce that may account for the yawning inequalities of income in an agricultural economy.

*Decomposing Inequality*

While such an impressionistic work might be convenient as a political ploy, sound policy recommendations presume comprehensive econometeric treatment of the issue. This is all the more important if one has to escape an ambiguity trap emanating from conjectures loaded with ideological biases. Accordingly, in the next section, an attempt is made to decompose inequality through simulation via multiple regression models.

*Alternative approaches for decomposing inequality:* The interest in rigorous treatment of economic inequality and in deciphering various forces at work has led to two approaches to isolate the determinants of inequality.

Whereas Kuznets (1955), Chenery (1960), Chenery and Taylor (1968), Adelman and Morris (1971), Chiswick (1971) and Ahluwalia (1976) engaged themselves in measuring the degree of inequality in a cross-section of nations and related the same to several characteristics of those countries in a bid to arrive at various associates/determinants of inequality, Theil (1967), Fishlow (1972), Fei and Ranis (1974) and Fields (1977, 1979) favoured measurement of inequality within a country and decomposing it by income source, sector or place of economic activity. Such an approach helped these authors obtain a functinal decomposition as well as a micro economic decomposition by income determinants.

The relevance of the latter approach is obvious. For, once the contribution of different factors towards inequality stood quantified, the choice of policy instruments becomes easy and almost automatic. We, therefore, favour this scheme for decomposing overall income inequality in the various determinants thereof.

Even within the domain of this approach, two alternative procedures are available: the comparative $R^2$ regression procedure advocated by Wise(1975) and

the ANOVA procedure recommended by Fields(1979). The availability of the tests of statistical significance and handy computational requirements, no doubt, lend support to both of these methods but unfortunately these tie us down to the 'Variance of Logarithms' as the purposive best measure of inequality.[5] In contrast, the simulation approach,[6] being adopted here, has an intuitive appeal. Further, the choice of inequality measure does not become binding, *i.e.*, the procedure is open to all measures of inequality. It involves setting an income determination equation like:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_m X_m + U$$

where Y is income, $X_i$ are explanatory variables for income and U is the error term, as the first step. After having estimated the parameters directly through classical least squares method, one can use those estimates to obtain the contribution of every independent variable by hypothesising zero variance for it.

By way of illustration, if Atkinson's A(Y) is deemed a worthy measure of inequality, then $A(\hat{Y})$ can be calculated, at the first instance, from the estimated equation. Thereupon, holding $X_i = \bar{x}_i$ (the mean value of $X_i$) for the sample as a whole, predicted income Y can be used for obtaining $A(\hat{Y}_i)$.

The contribution of each $X_i$ to inequality can then be estimated as $A(\hat{Y}) - A(\hat{Y}_i)$. The relative contribution of each of the explanatory variables may be computed as a percentage of $\sum_{i=1}^{m} A(\hat{Y}) - A(\hat{Y}_i)$. These relative contributions are likely to change with a switch-over to alternative measures of inequality but this is no weakness of the procedure itself. The difference stands attributed to the chosen inequality measures by way of its distributional thrust.[7]

***Results of the simulation exercise:*** As described above, estimation of an appropriate income determination regression equation forms the first step in this exercise. Accordingly, we toyed with several alternative specifications using net household income as the dependent variable. The description of regressors employed in alternative formulations and the resulting estimates are shown in Table II.

Though each of the eleven formulations has a theoretical backing, and, in turn, could have been justifiably used for explaining the income variability amongst cultivating households, the very logic of the recommended decomposition procedure goaded us to opt for MM II (see Table II) as the retained equation for further empirical exploration of inequality. Not only does the equation offer maximum explanatory power but also the variables are robust and logical. In this equation, one can notice the strains of the Russian organisation and production school, the neo-classical school and the Marxian school. So we name it as mixed model. The estimated coefficients of this regression equation are employed for decomposition purposes.

TABLE II. DETERMINANTS OF NET HOUSEHOLD INCOMES: CULTIVATING HOUSEHOLDS, PATIALA DISTRICT (1979-80)

| Explanatory variable | | Constant | Area owned (acres) | Area operated (acres) | Number of family farm workers (adult male equiv.) | Number of farm workers (adult male equiv.) | Education of the head | Number of milch cattle (standard units) |
|---|---|---|---|---|---|---|---|---|
| | | | ($x_1$) | ($x_2$) | ($x_3$) | ($x_4$) | ($x_5$) | ($x_6$) |
| Model (1) | Regression coefficient | (2) | $\beta_1$ (3) | $\beta_2$ (4) | $\beta_3$ (5) | $\beta_4$ (6) | $\beta_5$ (7) | $\beta_6$ (8) |
| Basic endowment model | BEM I | −4582.49 | 1585.45 (29.16)* | — | 1969.25 | — | — | — |
| | BEM II | −6107.48 | 1552.90 (28.26)* | — | 21529.63 (3.92)* | — | 583.58 (2.94)* | — |
| Extended endowment model | EEM I | −9373.43 | 1221.75 (16.81)* | — | 2392.68 (4.56)* | — | 531.09 (2.82)* | 748.17 (6.54)* |
| | EEM II | −8047.97 | 1245.24 (17.10)* | — | 2224.00 (4.23)* | — | — | 761.88 (6.61)* |
| | EEM III | −4348.59 | — | 1502.12 (32.74)* | 946.08 (1.83) | — | — | — |
| | EEM IV | −5362.49 | — | 1479.63 (32.56)* | 1094.32 (2.11)* | — | 390.54 (2.12)* | — |
| | EEM V | −9057.29 | — | 1182.95 (20.09)* | 1445.25 (3.00)* | — | 347.49 (2.04)* | 786.28 (8.14) |
| | EEM VI | −17334.42 | — | 1173.01 (20.55)* | — | 1514.14 (3.12)* | 359.60 (2.11)* | 778.46 (8.05)* |
| | EEM VII | −21887.98 | — | 1270.19 (24.55) | — | 1362.38 (3.16)* | 112.22 (0.74) | 563.50 (6.35) |
| Mixed model | MM I | −25769.07 | 1005.58 (13.05)* | — | 4139.50 (7.18)* | — | 157.44 (0.95) | 234.16 (2.30)* |
| | MM II | −26808.19 | — | 1059.62 (14.31)* | — | 1805.97 (3.60)* | 325.45 (2.12)* | 293.40 (3.08)* |

*(Contd.)*

TABLE II *(Contd.)*

| Explanatory variable | | Area irrigated ($x_7$) | Tractor dummy ($x_8$) | Dependency ratio ($x_9$) | Relative position proxy ($x_{10}$) | Off-farm rural employment (number) ($x_{11}$) | Off-farm urban employment (number) ($x_{12}$) | Farm output per acre (Rs.) ($x_{13}$) | $R^2$ | F ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| Model (1) | | $\beta_7$ (9) | $\beta_8$ (10) | $\beta_9$ (11) | $\beta_{10}$ (12) | $\beta_{11}$ (13) | $\beta_{12}$ (14) | $\beta_{13}$ (15) | (16) | (17) |
| Basic endowment model | BEM I | — | — | — | — | — | — | — | 0.72 | 498.62 [2, 249] |
| | BEM II | — | — | — | — | — | — | — | 0.72 | 341.95 [3, 248] |
| Extended endowment model | EEM I | — | — | — | — | — | — | — | 0.74 | 295.29 [4, 247] |
| | EEM II | — | — | — | — | — | — | — | 0.75 | 384.09 [3, 248] |
| | EEM III | — | — | — | — | — | — | — | 0.76 | 622.81 [2, 249] |
| | EEM IV | — | — | — | — | — | — | — | 0.76 | 420.47 [3, 248] |
| | EEM V | — | — | — | — | — | — | — | 0.79 | 385.77 [4, 247] |
| | EEM VI | 77.40 (0.81) | 2221.85 (1.52) | — | — | — | — | — | 0.80 | 258.49 [6, 245] |
| | EEM VII | — | 2318.47 (1.79) | — | — | — | — | 4.97 (9.98)* | 0.84 | 342.39 [6, 245] |
| Mixed model | MM I | — | — | 757.96 (0.18) | 59.87 (9.23)* | 3011.68 (2.04)* | 2447.29 (1.85) | 5.33 (10.25)* | 0.84 | 192.03 [9, 242] |
| | MM II | — | — | 4056.47 (1.07) | 31.56 (5.44)* | 3531.92 (2.60)* | 3542.60 (3.01)* | 5.08 (10.53)* | 0.87 | 231.14 [9, 242] |

*Source:* Computed.

*Notes:*—

1. Figures in brackets represent t-values.
2. Figures in square brackets are degrees of freedom.
3. With such large degrees of freedom $\bar{R}^2 \lesssim R^2$ and therefore not reported separately.

* Denotes significant at 5 per cent level.

For want of a universal agreement on the single 'best' measure of inequality, it is customary to use more than one inequality index in the same study. However, in this study, we have deployed Gini index alone. It does not mean that we consider this measure to be the best or most appropriate. But it is the popularity of this measure which has coaxed us to use the same. The results of our study are shown in Table III.

TABLE III. DECOMPOSITION OF THE GINI COEFFICIENT THROUGH DETERMINANTS OF THE INCOME

| Sr. No. | Description of the control variable | $G(\hat{Y}_i)$ | $\Delta G(\hat{Y}_i) = G(\hat{Y}) - G(\hat{Y}_i)$ | Per cent contribution |
|---|---|---|---|---|
| 1. | Area operated (acres) | 0.36 | 0.24 | 40.68 |
| 2. | Number of farm workers | 0.45 | 0.15 | 25.42 |
| 3. | Number of milch cattle (standard units) | 0.57 | 0.03 | 5.08 |
| 4. | Education of the head | 0.59 | 0.01 | 1.69 |
| 5. | Dependency rate | 0.60 | 0.00 | 0.00 |
| 6. | Relative position of the household (proxy) | 0.50 | 0.10 | 16.95 |
| 7. | Off-farm rural employment (number) | 0.60 | 0.00 | 0.00 |
| 8. | Off-farm urban employment (number) | 0.59 | 0.01 | 1.69 |
| 9. | Productivity (farm output per acre) | 0.55 | 0.05 | 8.48 |
| | Total | – | 0.59 | 99.99 |
| | | | $G(\hat{Y})=0.60$ | |

We find that over 40 per cent of the income inequality gets attributed to land area, with the number of farm workers and milch cattle accounting for another 25 per cent and six per cent respectively. Thus the size related variables together explain the bulk of income inequality—a startling 71 per cent.

Of the remaining variables, the 'Relative Position Proxy' accounts for 17 per cent of income inequality. Thanks, mainly, to the wide diffusion of new technology, the productivity differentials get only eight per cent of relative contribution towards inequality associated with them. Education, dependency rate and off-farm sale of labour prove only minor irritants.

## CONCLUSION

This exercise supports the view that widespread inequalities of incomes in the rural areas have their genesis in an unequal distribution of land and other productive assets. So, any commitment for reducing income inequalities boils down to a pledge for radical redistribution of productive resources. Land distribution, being the single dominant contributory factor to income inequality, needs immediate attention. It also appears that distribution of milch cattle and provision of asssured employment are of limited use as policy measures for reducing income inequalities.

## NOTES

1. There is a vast body of literature on the subject. However, a sample study of the main issues and opposite views are available in Rao (1975), Shah (1976), Chaudhuri (1978) and Rudra (1982).

2. For a lucid account and generalisation of 'exchange entitlement', refer to Meghnad Desai (1984). For other concepts, see Murray (1959) and Georgescu-Roegen (1971).

3. For details about the sample design, scope and coverage, see Bagai and Soni (1984).

4. All other entities are self-explanatory but the variable 'Relative Position Proxy' needs some elaboration. It is defined as the ratio of average land owned per male worker in the household to the average cultivable land per agricultural worker in the village. We feel that this proxy captures the spirit of Marxian thought on economic differentiation of peasantry wherein the cultivator's initial resource position determines his bargaining capacity in the credit, land and labour markets.

5. There is no universal agreement about the 'best' measure of inequality. For alternative formulations and desirable set of conditions/criteria, one can refer to Dalton (1920), Atkinson (1970), Sen (1973), Kolm (1976), Bartels (1977), Fields and Fei (1978) and Kakwani (1980).

6. This procedure was intuitively followed by the first author while carrying out empirical work for his Ph.D. thesis. However, it was a pleasant surprise to find Behrman *et al.*, (1983) independently provide credibility to the author's speculative move.

7. Besides the references cited in note 5 above, one can refer to the first author's Ph.D. thesis (1986) on this point.

## REFERENCES

I. Adelman and C. T. Morris: Economic Growth and Social Equity in Developing Countries, Stanford University Press, Stanford, California, 1971.

M. S. Ahluwalia, "Inequality, Poverty and Developement", *Journal of Developement Economics,* Vol. 3, No. 4, 1976, pp.307-342.

A. B. Atkinson, "On the Measurement of Inequality", *Journal of Economic Theory,* Vol. 2, 1970, reproduced in A. B. Atkinson (Ed.): Wealth, Income and Inequality, Oxford University Press, Oxford, 1980.

O. P. Bagai and R. N. Soni: The Problems of Small Farmers in the Punjab, Department of Statistics, Panjab University, Chandigarh, 1984.

Cornelis P. A. Bartels: Economic Aspects of Regional Welfare, Income Distribution and Unemployment, Nijhott, Hague, 1977.

Jere R. Behrman *et al.*,"A Simulation Alternative to the Comparitive $R^2$ Approach to Decomposing Inequality", *Oxford Bulletin of Economics and Statistics*, Vol. 45, No.3, August 1983, pp. 307-312.

Pramit Chaudhuri: The Indian Economy, Poverty and Development, Vikas Publishing House, New Delhi, 1978.

A. V. Chayanov: The Theory of Peasant Economy, Edited by Daniel Thorner *et al.*, Richard D. Irwin, Inc., Homewood, Illinois, 1966.

H. B. Chenery, "Patterns of Industrial Growth", *The American Economic Review*, Vol. L, No.4, September 1960, pp. 624-654.

H. B. Chenery and L. Taylor, "Development Patterns: Among Countries and Over Time", *The Review of Economics and Statistics*, Vol. L, No.4, November 1968, pp.391-416.

B. R. Chiswick, "Earnings, Inequality and Economic Development", *Quarterly Journal of Economics*, Vol. LXXXV, No.1, February 1971, pp. 21-39.

H. Dalton, "The Measurement of the Inequality of Incomes", *The Economic Journal*, Vol. XXX, September 1920, pp.348-361.

Meghnad Desai, "A General Theory of Poverty : A Review Article", *The Indian Economic Review*, Vol. XIX, No. 2, July-December 1984, pp.157-169.

Meghnad Desai *et al.* (Eds.) : Agrarian Power and Agricultural Productivity in South Asia, Oxford University Press, Delhi, 1984.

J. C. H. Fei and Gustav Ranis, "Income Inequality by Additive Factor Components", Discussion Paper (207), Economic Growth Centre, Yale University, New Haven, 1974.

G. S. Fields, "Income Inequality in Urban Colombia: A Decomposition Analysis", Discussion Paper (No. 267), Economic Growth Centre, Yale University, New Haven, 1977.

G. S. Fields, "Decomposing LDC Inequality", *Oxford Economic Papers*, Vol. 31, No.3, November 1979, pp.437-459.

G. S. Fields and J. C. H. Fei, "On Inequality Comparison", *Econometrica*, Vol. 46, No. 2, April 1978, pp.303-317.

A. Fishlow, "Brazilian Size Distribution of Incomes", *The American Economic Review*, Vol. LXII, No.2, March 1972, pp.391-402.

Nicholas Georgescu-Roegen: The Entropy Law and the Economic Process, Harvard University Press, Cambridge, Massachusetts, 1971, pp. 283-288.

E. O. Heady: Economics of Agricultural Production and Resource Use, Prentice-Hall of India, New Delhi, 1964.

J. R. Hicks, "The Measurement of Real Income", *Oxford Economic Papers*, Vol.10, No.2, June 1958, pp.125-162.

A. C. Julka: A Statistical Analysis of Inequality and Poverty amongst Cultivating Households—A Case Study of District of Patiala (Punjab), Ph.D. Thesis, Panjab University, Chandigarh, 1986.

N. C. Kakwani: Income Inequality and Poverty: Methods of Estimation and Policy Applications, Published for the World Bank, Oxford University Press, Oxford, 1980.

Serge-Christophe Kolm, "Unequal Inequalities - I", *Journal of Economic Theory*, Vol. 12, No. 3, 1976, pp.416-442.

Serge-Christophe Kolm, "Unequal Inequalities - II", *Journal of Economic Theory*, Vol. 13, No.1, 1976, pp.82-111.

S. Kuznets, "Economic Growth and Income Inequality", *The American Economic Review*, Vol. XLV, No. 1, March 1955, pp.1-28.

R. H. Murray, "The Concept of Income—Economic and Legal Aspects", in Readings in the Economics of Taxation, American Economic Association, George Allen and Unwin Ltd., London, 1959.

C. H. Hanumantha Rao: Technological Change and Distribution of Gains in Indian Agriculture, The Macmillan Company of India Ltd., Delhi, 1975.

Ashok Rudra: Indian Agricultural Economics: Myths and Realities, Allied Publishers Pvt. Ltd., Delhi, 1982.

A. K. Sen: On Economic Inequality, Oxford University Press, Oxford, 1973.

C. H. Shah, "Growth and Inequality in Agriculture", *Indian Journal of Agricultural Economics*, Vol. XXXI, No.4, October-December 1976.

Teodor Shanin: The Awkard Class: Political Sociology of Peasantry in a Developing Society: Russia 1910-1925, Clarendon Press, Oxford, 1972.

H. Theil: Economics and Information Theory, North-Holland Press, Amsterdam, 1967.

D. A. Wise, "Academic Achievement and Job Performance", *The American Economic Review*, Vol. LXV, No. 3, May, 1975, pp. 350-366.