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Decline in Relative Income of Agricultural Population in India: Evidence and Casual Factors

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Abstract

Relative income of agricultural population is ratio of per capita income of agricultural population and per capita income of non-agricultural population. Relative income of agricultural population in India declined from 46 percent in 1951-52 to 18 percent in 2011-12. In developed countries also relative income of agricultural population declined upto second world war. Lower return on capital invested in agricultural machinery, lower productivity of permanent labour employed in agriculture, secular decline in agricultural terms of trade, and slow outmigration of surplus agricultural labour to urban jobs, are the main causes of decline in relative income of agricultural population. Relative income of agricultural population was pushed upto parity level in developed countries by closing years of 20th century by active government support policies. In the absence of active government support policies relative income of agricultural population in India will decline further in the coming years.

Key words: Relative income, Income parity, Terms of trade, Surplus labour, Outmigration

JEL Classification: Q40, Q18, D31

Introduction

The relative income of agricultural population is the ratio of per capita income of agricultural population and per capita income of non-agricultural population, expressed usually in the form of a percentage. It indicates the extent of disparity in per capita incomes of these two sections of a country's population. The trend in relative income of agricultural population indicates how gains of economic growth in a country are being shared by agricultural population and non-agricultural population. In all the developed countries relative income of agricultural population declined in their early pre-second world war phase of economic development (Ojala, 1952). The purpose of this paper is to estimate the trend in relative income of agricultural population in India over the post-independence period of steady economic growth. An attempt is also made to identify and explain the role of various factors that result in decline in relative income of agricultural population as an unregulated free market economy develops. The trends in relative income agricultural population in developed countries are briefly summarized in section one to provide the necessary background. The data and methodology used to estimate the relative income of agricultural population in India is explained in section two and the estimates of relative income of agricultural population in post-independence India are given and discussed in section three. The causal factors that result in decline in relative income of agricultural population in a free market unregulated economy as it develops are discussed in section four. The conclusions and policy implications are given at the end.

Trends in Relative Income of Agricultural Population in Developed countries: Brief Overview

The relative income of agricultural population in developed countries declined upto the second world war; but started rising after 1950, and by the closing years of 20th century a rough parity between per capita income of agricultural population and of non-agricultural population was attained in all the developed countries as per Table 1. The parity between agricultural income and non-agriculture income has been maintained since then in all the developed countries (Hayami, 1997; Gardner, 2002; and Smedzik-Ambrozy et al., 2021).

The downward trend in relative income of agricultural population upto the Second World War is clearly visible in all the developed countries on which time series data are available. For example, the relative income of agricultural population in U.K. declined from 100 per cent in 1870 to 61

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per cent in 1930. In Sweden it declined from 40 per cent in 1870 to 29 per cent in 1930 (Ojala, 1952). In U.S.A. relative income of agricultural population declined from 68 per cent in 1910 to 23 per cent in 1932 (Gardner, 2002). In Japan relative income of agricultural population declined from 87 per cent in 1890 to 32 per cent in 1930 (Hayami, 1997). A similar downward trend in relative income of agricultural population was observed in all the other developed counties upto the Second World War (Ojala, 1952).

The relative income of agricultural population in seventeen developed countries on the eve of Second World War (in 1938), is reported in table one. In all the developed countries per capita income of agricultural population was lower than per capita income of non- agricultural population. In most of these countries per capita income of agricultural population was less than half of per capita income of non-agricultural population. By early 1950s, the tendency of relative income of agricultural population to decline with economic development in unregulated free market economies became a widely accepted empirical generalisation (Ojala, 1952; Kuznets, 1955; and Bellerby, 1956).

In all the developed countries the downward trend in relative income of agricultural population was reversed in early 1950's; and relative income of agricultural population started rising in all the developed countries. By the closing years of 20th century a rough parity between per capita income of agricultural population and non-agricultural population was attained in all the developed countries (Hayami, 1997; Gardner, 2002; and Smedzik-Ambrozy et al., 2021). This continuous rise in relative income of agricultural population in developed countries after 1950 was mainly the result of active government intervention to raise agricultural per capita income through minimum support prices, input subsidies, and direct payments to farmers. The fast decline in absolute number of persons engaged in agriculture in all the developed countries after the second world war also contributed to the rise in relative income of agricultural population in the post second world war period (Smedzik-Ambrozy et al., 2021).

Data Sources and Methodology

To estimate the relative income of agricultural population information on per capita income of agricultural population and of non- agricultural population is required. But, in the national income accounts statistics published by government information on per capita income of agricultural and non-agricultural population is not reported. However, information on net domestic product originating in agriculture sector and non-agricultural activities is available. In this study per capita income of agricultural population and of non-agricultural population is proxied by per capita net domestic product originating in agricultural and non- agricultural sectors. This is quite in line with the standard usage in the literature, as information on per capita income of agricultural population and of non-agricultural population is not published in national account statistics of even most developed countries. The net domestic product originating in agriculture and non-agricultural activities at 1999-2000 constant prices is used for this purpose. The data are taken from the standard national income accounts statistics published by Central Statistical Organisation (C.S.O.).

The information on population engaged in agriculture and non-agricultural activities is not directly available in census publications, except for the 1951, Census. For 1961 to 2011 information is available on number of workers engaged in agriculture, (cultivators and agricultural labourers), and in non-agricultural activities. The agricultural population for 1961 to 2011 is estimated by using the following formula:

$$\text{Agricultural Population} = \frac{\text{Rural Population}}{\text{Rural Male Workers}} \times \text{Total Male Workers in Agriculture}$$

On the assumption that population to male workers ratio in rural population as a whole may be same as in its largest component, (the agricultural population),, this formula gives fairly reliable estimate of agricultural population in each census year, from 1961 to 2011. The non- agricultural

Table 1: Relative Income of Agricultural Population in Developed Countries (1938)

Country	Agricultural Per Capita Income As Percentage of Non-Agricultural Per Capita Income	Source
United Kingdom	61	E.M. Ojala (1952) Page 135
Sweden	29	J.R. Bellerby (1956) Page 270
U.S.A.	38	B.L. Gardner (2002) Page 78
Denmark, Germany, Hungry	60-75	J.R. Bellerby (1956) Page 270
Netherlands, Ireland, Norway, Portugal	35-45	J.R. Bellerby (1956) Page 270
Canada, Finland, Italy	45-60	J.R. Bellerby (1956) Page 270
Australia, New Zealand, France	75	J.R. Bellerby (1956) Page 270
Japan	38	Y. Hayami (1997) Page 172

population is computed by subtracting the agricultural population from the total population. The time period is restricted to 1951-2011, because agricultural population for 2021 cannot be estimated for want of 2021 Census data.

For estimating per capita net domestic product of agricultural and non- agricultural population in each census year, the average of net domestic product originating in the sector in three years centered at the census year is used.

Results and Discussion

Growth of Per Capita Income of Agricultural and Non-Agricultural Population (1951-2011)

The estimates of per capita net domestic product originating in agricultural and non- agricultural sectors are presented in Table 2. Over the 1951-52 to 2011-12 period per capita income of agricultural population grew at the rate of 1.28 percent per year; from Rs.4286 in 1951-52 to Rs.9200 in 2011-12. The per capita income of non-agricultural population grew at the rate of 2.89 per cent per year over the same period; from Rs.9420 in 1951-52 to 15120 in 2011-12. Over this period of sixty years per capita income of agricultural population barely doubled; whereas per capita income of non-agricultural population rose more than five-fold. Almost in the middle of this sixty year period Indian economy changed track and shifted from planning/public sector dominated regime to liberalised/globalised market dominated regime in the early 1990's. In the earlier planning/public sector regime period (1951-52/1991-92) agricultural per capita income grew at the rate of 0.79 per cent per year; compared to that per capita income of non-agricultural population grew at the rate of 2.02 per cent per year.

In the liberalisation/globalisation market dominated regime period (1991-92/2011-12) agricultural per capita income grew at the rate of 2.28 per cent per year; compared to that non-agricultural per capita income grew at the rate of 4.65 per cent per year.

Both, agricultural per capita income, as well as, non-agricultural per capita income grew at more than double the rate in the liberalisation/globalisation market dominated regime period compared to planning/public sector regime period. However, in both the regimes per capita income of agricultural population grew at less than half the rate than per capita income of non-agricultural population. The change in economic regime did not make much difference to the relative rate of growth of agricultural per capita income and non-agricultural per capita income.

A conspicuous feature of growth of per capita income of agricultural population visible in table two is that between 1961-62/1981-82 period agricultural per capita income remained stagnant; whereas per capita income of non-agricultural population increased by 38 percent. The stagnation of per capita income of agricultural population over this period (1961-62/1981-82) has also been highlighted in an earlier study (Quizon and Buiswanger, 1986). They found that over this twenty year period per capita income of agricultural population in India increased only by two percent. The stagnation of agricultural per capita income

Table 2: Growth of Per Capita of Agricultural Population and Non-Agricultural Population

(1951-52/2011-12)

Year (Average of Triennium)	**Per Capital Net Domestic Product (1994-2000 Prices (Rupees)**		**Relative Income of Agricultural Population (Per Capita Net Domestic Product (Agriculture) as Percentage of Per Capita Net Domestic Product Non-Agriculture)**
	Agricultural Population	**Non-Agricultural Population**	
1950-51 to 1952-53	4286	9420	45.50
1960-61 to 1962-63	5071	11193	45.31
1970-71 to 1972-73	4736	14800	32.00
1980-81 to 1982-83	5051	15404	32.79
1990-91 to 1992-93	5864	21020	27.90
2000-01 to 2002-03	7486	27568	27.16
2010-11 to 2012-13	9200	52120	17.65
Growth Rate (Percent year)			
(1951 to 2011)	1.28	2.89	(-) 1.59
(1951 to 1991)	0.79	2.02	(-) 1.23
(1991-2011)	2.28	4.65	(-) 2.32
(1961 to 1981)	(-) 0.02	1.61	(-) 1.63

Table 3: Estimates of Agricultural Population and Non-Agricultural Population (1951-2011)

Year	Agricultural Population				Non-Agricultural Population			
			Growth				Growth	
	Number (Crore)	Percentage of Total Population	Number (Crore)	Percentage	Number (Crore)	Percentage of Total Population	Number (Crore)	Percentage of Total Population
1951	25.22	69.84	-	-	10.89	30.16	-	-
1961	28.25	64.35	3.03	12.01	15.65	35.65	4.76	43.71
1971	36.67	66.92	8.42	29.81	18.13	33.08	2.48	15.85
1981	42.93	62.65	6.26	17.07	25.59	37.35	7.46	41.15
1991	50.91	60.16	7.98	18.59	33.72	39.84	8.13	31.77
2001	53.35	51.86	2.44	4.79	49.52	48.14	15.80	46.86
2011	60.79	50.33	7.44	13.95	60.23	49.47	10.71	21.63

over this period is puzzling in view of the fast growth of foodgrains production over 1966-1981 period due to Green Revolution (Quizon and Busiwanger, 1986) attribute the stagnation of agricultural per capita income over this period to the decline in agricultural terms of trade after 1970-71, due to government keeping food grains prices low, once food self-sufficiency has been achieved. Another factor that seems to have contributed to keep agricultural per capita income stagnant during this period was the high absorption of labour by agriculture due to a sudden spurt in agricultural growth caused by Green Revolution (Shigern Ishikawa, 1978). The population engaged in agriculture increased by 14.68 crore over the 1961-1981 period (Table 3). The issue of stagnation of agricultural per capita income over 1961-1981 period, inspite of the Green Revolution, needs a thorough examination; but that cannot be attempted here. It needs a full-fledged study in itself.

Relative Income of Agricultural Population: Trend Over 1951-52/2011-12

The estimates of relative income of agricultural population over 1951-52/2011-12 period are reported in the last column of Table 2. In the early 1950's relative income of agricultural population was 45.50 percent of per capita income of non-agricultural population. Our estimate of relative income of agricultural population in early 1950's is quite close to two earlier estimates of relative income of agricultural population in early 1950's available in the literature. Ojha and Bhatt (1962) found per household income of farm households in 1953/1955 was about 43 percent of the household income of non-farm households. According to Dandekar (1994) in 1950-51 per capita GDP in agriculture was 45.66 percent of per capita GDP in non-agriculture. It seems relative income of agricultural population has been declining in the immediate pre-independence period, because in mid-1930's relative income of agricultural population in India was between 60-75 percent of per capita income of non-agricultural population (Bellerby, 1956).

Over the 1951-52/2011-12 period of steady economic growth relative income of agricultural population declined from 45.50 percent in 1951-52 to 17.65 percent in 2011-12, i.e. at the rate of 1.59 percent per year. The decline in the relative income of agricultural population was faster, (2.32 percent per year), in the liberalisation/globalisation market dominated regime period (1991-92/2011-12), compared to the planning/public sector dominated regime period (1951-52/1991-92), when it declined at the slower rate of 1.23 percent per year. On the basis of estimates given in table two it can be safely said that over the post-independence period relative income of agricultural population declined continuously and by now relative income of agricultural population in India is less than one-fifth of the per capita income of non-agricultural population.

Over this period of steady economic growth relative income of agricultural population in India has fallen to a much lower level, then the lowest level it ever reached in some developed countries; which was about one-third of per capita income of non- agricultural population (Table 1). This faster decline in relative income of agricultural population in India over 1951-52/2011-12 is mainly the result of much greater pressure of population on land in India, than what was experienced by developed countries in their early pre-second World War phase of development (Hayami, 1997). Over the 1951-2011 period number of persons engaged in agriculture increased from 25.22 crore to 60.79 crore i.e. by 35.57 crore (Table 3). The slower absorption of surplus agricultural population by urban Industry due to adoption of capital intensive/labour saving technology has also contributed to it (Hayami, 1997). It is almost certain the decline in relative income of agricultural population in India will continue in the near future as well. In all the developed countries, the downward trend in relative income of agricultural population was reversed in early 1950's, by

active government intervention through minimum support prices, subsidies and direct payments to farmers (Smedzik-Ambrozy *et al*., 2021). The chances of such a reversal in the downward trend in relative income of agricultural population occurring in India in the near future are virtually nil. The absolute number of persons engaged in agriculture in India is not only very large (about 60 crore in 2011), but is also increasing (Table 3). In all the developed countries the absolute number of persons engaged in agriculture had started declining after the First World War (Bicanic, 1969). This decline was speeded up after the second World War. In India active intervention of government in raising relative income of agricultural population in the near future is also ruled out due to large size of the agricultural population, low per capita income of the country, and the urban bias in development policy (Lipton, 1976). The compulsion of the government to provide cheap foodgrains to the urban population stands in the way of halting and reversing the decline in relative price of farm products. So, the decline in the relative income of agricultural population in India will continue in the near future also.

Causal Factors

The causal factors and processes that result in persistent lower relative income of agricultural population in an unregulated free market economy are complex and many. No comprehensive integrated analysis of these causal factors seems to exist in the literature through a partial one is available (Tweeten, 1967). An attempt is made to collate various theories/hypothesis that have been advanted to explain the persistent lower relative income of agricultural population in unregulated free market economies.

(1) The rate of return on capital invested in agricultural machinery is always lower than capital invested in Industrial machinery, due to basic difference in the machine process in farming and Industrial factory (Brewester, 1950). In agriculture due to biological nature of production process each machine is used only for a few weeks in a year. Each agricultural machine remains unused for nine-ten months in a year. This gross and chronic under utilisation of agricultural machinery results in low rate of return on capital invested in agricultural machinery, compared to capital invested in industrial machinery that is continuously used throughout the year (N. Georegescu – Rogen, 1969). The disparity in rate of return on capital invested in agricultural machinery and Industrial machinery increases as more modern bigger machines are introduced in agriculture.

(2) The average earnings of labour engaged in agriculture are always lower than industrial labour due to prolonged periods of seasonal unemployment imposed by biological rhythm of farm production process. The persons permanently engaged in farming are fully employed for a few months in a year, during the sowing, weeding, and harvesting operations. In between these operations, for many months, they are idle/underemployed; as crops are growing on their own and they have little regular work to do on the farm. But, they cannot leave the farm to take up full time jobs in the urban sector. Their continuous availability for farm work, as and when needed, is necessary for successful operation of the farm (N. Georgesen – Rogen, 1969). This problem of seasonal unemployment of farmers has been made more severe by high crop specialisation of modern agriculture, and by destruction of peasant home based cottage industries by cheep factory made substitute products. The chronic seasonal unemployment of farmers results in lower average productivity and low earning per farm worker. The industrial worker is fully employed throughout the year, because factory production is a continuous process.

(3) The absolute number of persons engaged in agriculture is much more in developing countries than what will equate per capita income of agricultural population and non- agricultural population. This was also the situation in all the developed countries in their early first phase of economic development. Inspite of lower relative income surplus agricultural labour is slower in leaving farming to take up urban Industry/Service jobs. Many explanations have been suggested for the slower outmigration of surplus agricultural labour. The fixed resource theory attributes it to the inability of surplus agricultural labour to get urban Industry/Service jobs due to their low education and lack of skills having any use in urban jobs (Johnson, 1956). The lack of information about urban jobs, absence of social contacts in urban sector, and control of trade unions in filling job vacancies in factories also puts the surplus agricultural labour at a disadvantage in availing jobs in urban Industry/services (Hathaway and Perkens, 1968). The reluctance of farmers to leave their secure community living to join anonymous urban society also slows down their outmigration to urban sector (Brewester, 1961). The predominance of family labour farms in agriculture (FAO, 2014) also slows down the outmigration of surplus agricultural labour to urban sector jobs. On family farms family members participate in farm work according to their capacity, and share in farm income according to their needs; they are not paid any fixed wage (Chayanov, 1966). In such an organisational structure surplus labour never takes the form of open unemployment of some family members, and does not generate pressure on surplus family members to leave the farm and outmigrate to urban jobs. The weaker labour absorptive capacity of modern industries in developing counties due to use of highly capital intensive technology also contributes to persistence of surplus labour in agriculture despite low relative earnings (Hayami, 1967).

(4) As an economy develops and per capita income rises, relative price of farm products (Barter Terms of Trade of agriculture), declines. The empirical evidence on secular decline in interms of trade of agriculture is clear and

consistent (Schultz, 1945). The main reason of decline in terms of trade of agriculture is the slow growth of demand for farm products due to their low and declining income elasticity of demand; compared to fast growth of demand for products of Industry and services due to their higher income elasticity of demand, and as a result of continuous introduction of new industrial products and new services. The second reason is that output of farm products is not reduced as relative agricultural prices decline, due to a very large number of farm producers, and almost perfectly competitive atomistic nature of agriculture (Tweeten, 1967).

(5) The continuous introduction of new output increasing technology in agriculture is another factor that keeps relative income of agricultural population lower than per capita income of non- agricultural population. The Tread Mill thesis of Cochrane shows how the cycle of new agricultural technology adoption by farmers, increased output, depressed prices, and further search for new technology to maintain farm income in the face of falling prices has placed farmers in modern agriculture on a Treadmill. Farmers have to tread fast just to keep up, and those who fail to keep up suffer low returns and low income (Cochrane, 1958).

(6) The pressure of population on farm land is much greater in present developing countries than it was in the early phase of development in developed countries. The fall in death rate has occured faster in present developing countries, than the early phase of development of developed countries because dieses prevention and curing medicines and technology was already available when the present developing countries started developing after the Second World War. The birth rate, on the other hand, fell slowly due to poverty, illiteracy and cultural backwardness of population developing countries. As a result population engaged and dependent on agriculture increased in these countries at a fast rate. For example, population engaged in agriculture in India more than doubled between 1951-2011; from 25.22 crore in 1951 to 60.79 crore in 2011 (Table 3). In the developed countries absolute number of persons engaged in agriculture started decreasing after the first world war (Bicanic, 1969). But, the population engaged in agriculture in India is still increasing. As a result the number of surplus persons in agriculture is increasing, rather than decreasing. In the early phase of development of developed countries a high proportion of their surplus agricultural population was absorbed by outmigration to colonies. But, to the present developing countries like India this outmigration channel is not available, and their entire surplus agricultural population has to be ultimately absorbed by local urban Industry/Services to halt the decline in the relative income of the agricultural population. In view of the slow growth of jobs in urban industry/services in developing country, their surplus agricultural population will remain parked in agriculture for a long-time to come.

It is the complex interaction of all such factors that keeps relative income of agricultural population not only low, but also increases the disparity between agricultural and non-agricultural per capita income as the economy develops in a free market unregulated economic environment.

Conclusions and Policy Implications

The decline in relative income of agricultural population as an unregulated free market economy develops is a well established empirical phenomenon. In all the developed countries relative income of agricultural population declined in their early pre-second World War phase of economic development. In India relative income of agricultural population has continuously declined over the post-independence period of steady economic growth. In the early 1950's per capita income of agricultural population was about 46 percent of per capita income of non- agricultural population. By 2011-12 per capita income of agricultural population fell to about 18 percent of per capita income of non- agricultural population. The decline in relative income of agricultural population occured at a faster rate in the liberalised-globalised free market period (1991-92/2011-13), compared to the planning/public sector dominated economy period (1951-52/1991-92).

The main factors that cause decline in relative income of agricultural population in an unregulated free market economy as it develops are: gross under-utilisation of agricultural machinery and prolonged seasonal unemployment of agricultural labour due to biological nature of farm production process and high crop specialisation of modern agriculture; slow outmigration of surplus agricultural labour due to its reluctance to leave its secure community living, its unsuitability for direct employment in urban jobs, and the slow growth of jobs in urban Industry due to use of highly capital intensive technology; secular decline in relative prices (barter terms of trade), of farm products; operation of the technology tread mill compelling farmers to adopt output increasing technology as relative farm product prices fall; and greater pressure of population on land in present developing countries.

In developed countries the downward trend in relative income of agricultural population was reversed in early 1950's by active government intervention through minimum support prices, subsidies and direct payments to farmers, and by the closing years of 20th century a parity in per capita income of agricultural population and non-agricultural population was established in all the developed countries. This parity has been maintained since then, notwithstanding the W.T.O. restrictions on government support to agriculture.

In India reversal in the downward trend in relative income of agricultural population is not likely to occur in the near future. The chances of Government actively intervening to raise relative income of agricultural population are virtually

nil, due to large size of the agricultural population, low per capita income of the country, and compulsion of the Government to provide cheap food grains to the urban population. The Government is not willing even to ensure minimum support prices and assured purchase of all crops, despite continuing agitation by farmers organisation.

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