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that the terms of trade should be moved against the agricultural sector through a negative agricultural price policy or heavy dose of agricultural taxation as it happened in the USSR and Japan respectively in the early stages of their economic development. However, in view of the continued dependence of national income on foodgrains production, it would be more pertinent to examine the factors affecting foodgrains production. Viewed in this perspective what seems more relevant to look into is the impact of the terms of trade defined as the ratio of prices of output to prices of inputs. In a study conducted on the "Impact of Input and Output Prices on Foodgrains Production in Punjab", the ratio of output to input prices was found to affect the production of foodgrains in a significant manner[8] (see Table IV). It follows that in view of the consistently significant interrelationship of foodgrains production to national income, it would be useful to provide assured and cheap supplies of various components of new farm technology like high-yielding varieties of seeds, chemical fertilizers, pesticides, etc., coupled with assured irrigation and training in better farm management to the cultivators. Besides ensuring favourable relationship between input and output prices, the farmers need to be provided parity prices for agricultural products so that their economic welfare does not decline in the wake of the technological break-through.[9] Parity prices can also be justified on the ground that the tempo of agricultural break-through needs to be sustained so that the sluggishness which is otherwise likely to befall on this predominant sector of the economy does not act as a drag on non-agricultural development.

INTER-SECTORAL LINKAGES—FLOW OF SURPLUS FOR FINANCING INVESTMENT

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The economic development plans of the country need large investment funds in various sectors of the economy. The object of this paper is to examine the inter-sectoral linkages in the Indian economy in order to find out the untapped sources of financing investment.

TAX INCIDENCE AND AVERAGE TAX RATES ON AGRICULTURAL AND NON-AGRICULTURAL SECTORS

An examination of the estimates of net national production by industry of origin (Table I) suggests that the agricultural sector is the largest sector in terms of its contribution to net national product. According to the Census of Inda, 1971 estimates, the agricultural sector continues to be the largest

8. A. J. Singh, A. S. Joshi and Inder Sain, "Impact of Input and Output Prices on Foodgrains Production in Punjab", *Economic Affairs* (forthcoming).

9. S. S. Johl, M. V. George and A. J. Singh, "Agricultural Prices in Punjab—A Policy Analysis", *Indian Journal of Agricultural Economics*, Vol. XXV, No. 1, January-March 1970; and K. C. Taluqdar, D. S. Sidhu and A. J. Singh, "An Economic Analysis of Parity Prices in Punjab", *Agricultural Marketing* (forthcoming).

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TABLE I—ESTIMATES OF NET NATIONAL PRODUCT BY INDUSTRY OF ORIGIN: PERCENTAGE DISTRIBUTION (AT 1970-71 PRICES)

Industry group	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. Agriculture, forestry and logging, fishing, mining and quarrying	50·4	49·4	47·0	48·0	46·5	47·4	44·2	45·5
2. Manufacturing, construction, electricity, gas and water supply	20·0	20·2	21·2	20·6	21·0	20·5	22·3	21·7
3. Transport, communications and trade	16·0	16·2	16·8	16·5	16·9	16·9	17·6	17·2
4. Banking and insurance, real estate and ownership of dwellings and business services	4·9	5·1	5·4	5·2	5·1	5·1	5·5	5·5
5. Public administration and defence and other services	9·5	10·0	10·5	10·3	10·8	10·3	10·6	10·3
6. Net domestic product at factor cost	100·8	100·9	100·9	100·6	100·3	100·2	100·2	100·2
7. Net factor income abroad	—0·8	—0·9	—0·9	—0·6	—0·3	—0·2	—0·2	—0·2
8. Net national product at factor cost ..	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* Quick estimates.

Source: Economic Survey, 1978-79, Ministry of Finance, Government of India, New Delhi, 1979.

sector in terms of its employment (at 72 per cent) of working population, and the share of secondary and tertiary sectors in the total working population has been estimated at 11 per cent and 17 per cent respectively. From the objective of inter-sectoral equity it will be useful and interesting to find out the contribution of this sector towards public revenue in relation to the non-agricultural sector. This is also important from the point of view of locating sources of investible surplus for financing developmental programmes. Let us first examine the total tax incidence and average tax rates on the agricultural and non-agricultural sectors for selected years on the basis of available data. In 1951-52, the agricultural sector contributed Rs. 200 crores by way of direct and indirect taxes whereas the non-agricultural sector's contribution was estimated as Rs. 450 crores. Thus the ratio of the contribution of the two sectors was 4:9 in 1951-52. However, the gap in the contribution of the two sectors widened further by 1968-69 as their respective contributions were Rs. 907 crores and Rs. 2,697 crores. Thus the ratio of total tax incidence on the agricultural and non-agricultural sectors for the year 1968-69 was approximately 1:3.

Let us now analyse the average tax rates on the agricultural and non-agricultural sectors. It is evident from available data that the per capita taxes on incomes increased in both the agricultural and non-agricultural sectors during the period 1951-52 to 1968-69 and further, the ratio of taxes to per capita income depicted a progressive tendency in both the agricultural and non-agricultural sectors during this period. However, it is interesting to note that the agricultural sector contributed only 6.5 per cent of its per capita income as compared to 19.1 per cent contributed by the non-agricultural sector in 1968-69. Table II(a) and (b) show the changes in total tax incidence and average tax rates on the agricultural and non-agricultural sectors from 1951-52 to 1968-69.

TABLE II(a)—TOTAL TAX INCIDENCE (1951-52 TO 1968-69)

(*Rs. crores*)

Year	Agricultural sector	Non-agricultural sector
1951-52	200	450
1960-61	399	922
1968-69	907	2,693

TABLE II(b)—AVERAGE TAX RATES

Year	Agricultural sector		Non-agricultural sector	
	Taxes per capita (Rs.)	Ratio of taxes to per capita income	Taxes per capita (Rs.)	Ratio of taxes to per capita income
1951-52	8·0	3·8	41·8	9·5
1960-61	13·4	5·6	68·9	13·0
1968-69	26·4	6·5	174·0	19·1

Source: (1) Ved P. Gandhi: Tax Burden on Indian Agriculture, Harvard University Press, Cambridge, U.S.A., 1966, pp. 35 and 56.
(2) Economic Times Research Bureau, "Taxable Capacity of Farm Sector", *The Economic Times*, April 2, 1969.

It is evident from Table II(a) and (b) that the agricultural sector bears relatively less taxation than the non-agricultural sector. Moreover, according to Ved Gandhi's estimates the additional income accrued to the agricultural sector during the period 1950-51 to 1960-61 was Rs. 1,717 crores but the additional taxation was Rs. 198 crores only. However, during the same period the additional income in the non-agricultural sector was Rs. 2,420 crores but the additional taxation was Rs. 499 crores. Thus the marginal rate of taxation worked out to be 11.5 per cent and 20.6 per cent respectively for the agricultural and non-agricultural sectors during the period under reference. Thus it is evident that additional taxation imposed on the non-agricultural sector was nearly twice of that which was imposed on the agricultural sector during this period. Further, Ved Gandhi's estimates revealed that the marginal burden on the upper classes in the agricultural sector was only 7 per cent and thus the marginal burden on the lower classes would be necessarily higher around 13 per cent. Similarly, in the non-agricultural sector the marginal taxation on the upper classes was estimated to be 13 per cent and the lower income group in the non-agricultural sector had to bear a marginal burden of 24 per cent.

A micro analysis of available data on the incidence of taxation on the agricultural and non-agricultural sectors suggests that while the agricultural sector accounted for about half of the net national product, it bears comparatively much less tax burden than the non-agricultural sector. Also the lower sections in both the agricultural and non-agricultural sectors have to bear a higher burden of marginal taxation and finally, there is a case for increase in agricultural taxation, more particularly upon the higher income section.

TERMS OF TRADE BETWEEN AGRICULTURAL AND NON-AGRICULTURAL SECTORS

With the constant increase in the prices of all foodgrains and some of the commercial crops, the income levels of the farmers have also correspondingly gone up. An increase in the price of any farm product will help the farmers to obtain higher production through the use of such inputs as high-yielding varieties (HYVs) seeds, fertilizers, irrigation, pesticides and mechanization. In a country like India where the increase in the demand for the agricultural commodities is a function of rising incomes and increasing population, prices are not likely to go down even if more production is realised by sufficient increase in the use of inputs and/or by bringing more land under two or three crop rotations. In view of the continuing increase in the demand for different agricultural commodities the stage where marginal cost equals marginal revenue will not be reached for many years to come. The farmers will go on investing in more and better inputs during a period of high prices. The Economic Adviser's index of agricultural prices (base 1952-53) went up from 88 in 1955-56 to 217 by 1968-69 in spite of the success of the new technology—ushering an era of Green Revolution in India. However, the corresponding index of industrial prices increased from 99.7 in 1955-56 to 168.6 in 1968-69. As a result, the ratio of index of agricultural prices to index of industrial prices increased from 88.3 to 128.7 during the period under reference. Even in the later period, the Economic Adviser's index of agricultural commodities (derived series in Reserve Bank of India, base 1961-62) went up from 194.8 in 1969-70 to 350.8 in 1974-75 and the corresponding index for manufactured products increased from 143.5 in 1969-70 to 254.5 in 1974-75.

A comparatively larger rise in the prices of agricultural commodities compared to the non-agricultural commodities has tilted the inter-sectoral terms of trade in favour of the agricultural sector. At the outset, this situation may appear sound because it not only helps in the correction of the past neglect of agriculture but also it is beneficial to farmers in raising their incomes. However, a deeper analysis of this phenomenon suggests that these favourable terms of trade have been only beneficial to the big farmers who have surpluses to sell. The big farmers who have gained as a result of favourable terms of trade have not contributed to investible surplus and have used their additional income on luxury consumption.[1] It is also because of the fact that the agricultural sector being more or less a no-tax sector, as a result these surpluses originating over there, these could not be utilized for development. It will be useful to tabulate the changes in the contribution of two main direct taxes on agriculture to the public exchequer from 1951-52 to 1977-78 for a minute analysis.

TABLE III—SHARE OF LAND REVENUE AND AGRICULTURE INCOME-TAX IN TOTAL STATE TAX REVENUE

Year	Land revenue		Agricultural income-tax	
	(Rs. crores)	As per cent of total State tax revenue	(Rs. crores)	As per cent of total State tax revenue
1951-52	48	17·1	4·3	1·1
1960-61	97	9·6	9·5	1·0
1977-78 (Budget) ..	230	3·7	28·7	0·4

Source: Issues of *Reserve Bank of India Bulletin.*

It may be pointed out that the land tax is more or less a crude acreage tax. The significance of this tax, however, greatly declined because of the inelasticity of this tax and also as a result of the introduction of many new levies. As is evident from Table III, land revenue accounted for 17 per cent of total State tax revenue in 1951-52 but by 1977-78 its share was even less than 4 per cent. Agricultural income-tax is presently levied in some of the States. The rates of agricultural income-tax have generally been lower than those applicable to the urban income-tax. The contribution of agricultural income-tax is more or less insignificant as is evident from the data given in Table III. Its contribution to State tax revenue declined from 1.1 per cent in 1951-52 to 0.4 per cent in 1977-78 (Budget estimates). The low yield of agricultural income-tax is understandable in view of the uneconomic size of most of the operational holdings in the country. The benefits of new technology and the terms of trade in favour of the agricultural

1. M. M. Batra, "The Rationale Behind Taxing the Farm Sector", *Yojana*, Vol. XIII, No. 14, July 27, 1969.

sector have largely gone to the cultivators who own large holdings. On grounds of equity, therefore, this section should be taxed at a higher rate than those who have small holdings. If the benefits of the new technology are to be carried on progressively to a growing proportion of the farm population, the resources needed for this purpose should come from the beneficiaries of the new technology. Should not the agricultural sector bear the costs of its own development? As a result of the development of agriculture brought about by large public investment under the development plans and also because of inter-sectoral terms of trade which remained in favour of the agricultural sector, agricultural incomes have substantially increased but (as is evident from the available data given in Table III) the contribution of agriculture to the public exchequer has not at all been commensurate with the rise in incomes in this sector. Farming has become profitable now not merely with higher yields but also on account of multiple cropping.

IMPACT OF NEW TECHNOLOGY

While larger investment will be necessary to reap the advantage of the new methods and techniques in agriculture, incomes and profits from farming will be correspondingly higher. The empirical research work undertaken by the author on the subject[2] has proved that in spite of the fact that the cost per hectare is higher under the new technology, the cost per quintal is generally lower under it, since the new technology has compensated more than the increase in cost per hectare by bringing about relatively higher increases in production per hectare.

Agriculture as a sector has no dearth of potential investment after the success of HYV programme. The agricultural revolution is on the way. The farmer is gradually becoming highly responsive to improved practices and new inputs. The demand for inputs is increasing, while the supply line is not keeping pace. Even scarcity prices are charged from the farmers for tractors, improved seeds and fertilizers as well as supporting material. A situation has reached where the investment potential is more than the availability of physical resources in the agricultural sector. The farmer has not been able to procure sufficient production requisites with his improved cash resources and simultaneously he is directing a part of his cash into unproductive channel like social ceremonies and in the consumption of luxury goods and accumulation of gold. Thus even with the terms of trade moving in favour of the agricultural sector, the consumption has tended to increase also because of demonstration effect and savings are moving away from the line of investment equilibrium between agriculture and industry.

CONCLUSIONS AND POLICY IMPLICATIONS

The analysis suggests that agriculture constitutes the largest sector in terms of both income and employment. It has also received a significant share of the developmental expenditure. While the Government has been

2. M. M. Batra: Agricultural Production: Prices and Technology, Delhi School of Economics, Monograph No. 4, Allied Publishers Pvt. Ltd., New Delhi, 1978.

investing increasingly larger amounts in agriculture, it has not made parallel efforts to tax a substantial portion of the marginal increment in the agriculturists' income. It is evident from the analysis of available data that the incidence of taxation on the non-agricultural sector is much more compared to that on the agricultural sector. The gains from the HYV seeds and modern methods of farming have brought about a significant improvement in the output. A comparatively larger rise in the prices of agricultural commodities compared to the non-agricultural commodities in most of the years has also made the terms of trade generally favourable to the agricultural sector.

A rational taxation policy for the developing economy must evolve a proper policy for optimum tapping of the taxable capacity which is continuously on the increase. The growing productivity of the rural sector if siphoned off effectively through taxation will not only discourage wasteful expenditure among the rural masses but could also provide ample funds for investment in the non-agricultural sector. Besides, it will tend to reduce the growing tendencies to hoard the marketable surpluses of agricultural crops.

Development in any economy has to be ultimately a self-sustaining process. A small sector of the economy cannot be taxed and taxed over again howsoever elastic it might be. It may be important to point out that until and unless the surplus is generated in the agricultural sector and this surplus is tapped for industrial development, any development effort would not be a self-sustaining process. If a growing level of public expenditure is to be financed by increasing the rates of taxation on the non-agricultural sector this may hit the growth in the industrial sector and the economy as a whole may suffer ultimately.

Agricultural taxation will play a two-fold role in the process of economic development. Besides providing the Government with financial resources for meeting developmental expenditures, it is also expected to supply to the rest of the economy with larger food surpluses. The imposition of compulsory levies on the agricultural sector could enlarge the supply of savings for economic development as stressed by Nicholas Kaldor. It is necessary to take a part of the additional incomes of the agriculturists as also to introduce an element of progression in agricultural taxation. This could be done through the implementation of the Raj Committee's[3] recommendations for imposing a progressive agricultural holdings tax, an integrated taxation of agricultural property, capital gains tax on transfer of agricultural lands and through a combination of measures like withdrawl of concessions on land revenue in normal circumstances, imposition of surcharge on land revenue at graduated rates, greater use of cesses on commercial crops and the imposition of betterment levy. The inter-sectoral equity demands that the agriculturists, particularly the big farmers, who have achieved significant increases in income should provide for investible surplus for financing development in both the agricultural and non-agricultural sectors.

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3. Report of the Committee on Taxation of Agricultural Wealth and Income (Chairman: K. N. Raj), Ministry of Finance, Government of India, New Delhi, 1972.