

Domestic Product (GDP) at 1980-81 prices also shows a declining trend. The share of agriculture to GDP during 1950-51 to 1952-53 was 55.13 per cent. During 1960-61 to 1962-63 it was 49.18 per cent, 1970-71-1972-73 41.4 per cent and during 1980-81-82-83, it was only 37.37 per cent.<sup>20</sup>

Secondly, .... "if the rate of growth of the non-agricultural sector is increasingly higher than that of agriculture, the decline in the share of agriculture in the growth of total product would be even greater. The percentage rate of growth of manufacturing in India, registered and unregistered together, has been 12.49 per cent during 1950-51, 16.60-61, 9.18 percentage during 1960-61 - 1970-71, 9.26 per cent during 1970-71 - 1980-81 and 14.53 per cent during 1980-81 to 1988-89, against it the share of agriculture in the growth of GDP has been 1.55 per cent, .99 per cent, .77 per cent and 1.00 per cent during the same decades. The overall declining trend is higher in case of agriculture as against the increasing percentage contribution of manufacturing sector.

Thirdly, "if we assume that the rate of growth of country-wide product is constant over-time...and if...the rate of growth of the non-agricultural sector is higher than the rate of growth of agriculture, then either "rb" or "ra" or both, must decline over-time".<sup>23</sup>

Let us now turn from product contribution of agriculture to the growth of country-wide product per worker. This is more useful sectoral analysis. The increment in a country's aggregate product per worker is the sum of: (a) the increment in product per worker in agricultural sector; (b) the increment in product per worker in the non-agricultural sector; and (c) the change in the share of the non-agricultural sector in the labour force which usually shows a rise during the period. According to Kuznets the level and movements of the proportional contribution of agriculture to additions to country-wide product per work may be of three types. Firstly, "this proportional contribution will be larger, the larger the terminal share of agriculture in the country's labour force, and the higher the ratio of product per worker in agriculture to that in non-agricultural sector. And if we permit the rate of growth product per worker in the "A and non-A" sectors to differ, the proportional contribution of the agricultural sector will be larger, the higher the ratio of the rate of growth of product per work in the A-sector to that in the non-A sector".

Secondly, "Insofar as in the course of economic growth the share of agriculture in the labour force declines, there will be a continuous decline in the proportional contribution of agriculture to the growth in the country-wide product per worker"...and

Thirdly, "if we assume that the country-wide product per worker grows at a constant percentage rate, the continuous shift of the labour force from the agricultural sector with its lower product per worker to the non-agricultural sector with its high product per worker must be accompanied by a decline in the rate of growth of product in the agricultural sector, or in the non-agricultural sector, or in both".<sup>24</sup>

These statements and conclusions can be examined on the basis of long-term records on product, labour and product per work in agricultural and non-agricultural sectors. The statistical analysis in most of the developing countries reveals that as such the economics obtain a high rate of economic growth along with structural shift, the proportional contribution of agriculture declines rapidly. Studies based on NSS and CSO data seem to be quite relevant in relation to the conclusion drawn by Kuznets.<sup>25</sup>

Increase in agricultural production is a virtual precondition of sectoral diversification and hence of development itself. A growing surplus of agricultural output is required to: (1) increase supplies of food and raw material at non-inflationary prices; (2) widen the domestic market for industrial goods through increased purchasing power within the rural sector; (3) facilitates inter-sectoral transfers of labour and capital for industrial development; and (4) increase foreign exchange earnings through increasing agricultural exports.

#### Agriculture's Market Contribution

A sector makes a contribution to an economy when it provides opportunities to other sectors to emerge and grow. These opportunities may be provided through the medium of trade where a part of its product, either in domestic or foreign markets, is offered in exchange for goods produced by the other sectors at home or abroad. This may be called market contribution.

The market contribution of agricultural sector as Kuznets explains, can be made by: (1) "Purchasing some production items from other sectors at home and abroad; (2) selling some of its product, not only to pay for the purchases under (i) but also to purchase consumer goods from other sectors or from abroad, or to dispose of the product in any way other than consumption within the sector".<sup>26</sup> Hence, the sectoral terms of trade explains the market contribution of a sector with the other sector.

In the early stages of the economic growth, this market contribution of agriculture to economic growth is found larger as it account for a greater share of the net output of the economy. Hence, the magnitude of the trade with other sectors will also be larger and will have greater

bearing on the economic base of the country. But as the process of growth proceeds and the economy moves towards industrialisation the share of agriculture declines in both product and labour force and as a result the proportionate market contribution of agriculture begins to decline. Thus, agricultural market contribution will be high in the early stage of growth and gradually declines as growth proceeds.

In the process of economic development agriculture provides a market for the product of non-agricultural sectors. Rapid industrialisation itself depends on how rapidly agricultural income is rising and, in turn, is rapidly increasing the demand for industrial goods. In the early stages of economic growth, rising incomes in the agricultural sector expand the market not only for the light consumer goods such as radios, bicycles, kitchen wares, readymade garments, electric appliances and construction materials, but for the agricultural inputs as well such as tractors, pumping sets, electric motors and other machinery, fertilisers, seeds and pesticides. The need to purchase these new goods from other sectors would mean an increasing marketisation of the production process within the agricultural sector. It provides the level of purchases of the agricultural sector from the other sectors.

Agriculture not only expands the market for industrial consumer goods and various modern agricultural inputs, but has been the main supplier of labour, raw material and savings to non-agricultural sector. Various consumer goods industries such as textile, silk, wool, tea, coffee, rubber, tobacco, sugar, edible oil, food processing industries, paper, paints depends upon the crucial raw material supplied by the agricultural sector. Agriculture also provides cheap labour to various non-agricultural sector such as industries, transport and construction.

In this trading process, other economic activities such as research, construction and transport also expand equally. As the market expands, transport, construction, market-research and many other activities receive the full benefits of trading process. Thus, agricultural sectors sell its product, labour and capital to other sectors and in turn purchase some goods and services from them. This trading process expands the market for both and develops transport, research, construction and various marketing and trading institution.

On international market side, agriculture's contribution is also of strategic importance. Each country has some products in which she has a comparative advantage. This is mainly because of the bounty nature. In agriculture natural endowment has greatest weight and such in the initial stages of growth, it remains a major source of export and played a strategic role in expanding international markets and enhancing the export reserves.

### Agriculture Factor Contribution

Factor contribution of agriculture to economic growth occurs when some resources are transferred from agriculture to non-agricultural sectors of the economy.

#### a) Capital Contribution

The factors which are usually transferred from agriculture to non-agricultural sectors are capital and labour. In case of capital, two different types of transfers occur. These may be compulsory or forced or may be voluntary. Sources of capital for economic development are conveniently divided into three categories – foreign-aid, foreign commercial investment and domestic savings. Studies prove that the burden of domestic saving is likely to fall heavily on the agricultural sector. "The greater the extent to which a low-income country chooses not to receive or cannot receive foreign aid and foreign commercial investment the greater the extent to which it must draw upon its own resources, chiefly from the dominant agricultural sector".<sup>27</sup>

The contribution of the agricultural sector to capital formation may be marshaled in four ways. Firstly, it may be extracted by the Government through the medium of taxes such as land tax and agricultural income-tax. Secondly, agricultural production may be increased sufficiently to bring about a relative decline in agricultural prices and hence favour increased profits in the non-farm sector which, in turn, bring about favourable effects on savings and investment in that sector. Thirdly, agriculture may form capital directly within its own sector and minimise its own demands for capital from other sectors. And fourthly, agriculture may invest directly in other sectors – perhaps after its own development has increased demand for products from other sectors.<sup>28</sup>

Among four categories while the first one is the compulsory or forced extraction of capital resources from agriculture, the latter one are voluntary. Japan and the former USSR present the classic example of forced extraction of capital resources from agriculture. In an economy where agricultural sector is poverty stricken and income disparities are large, landless labourers and small land holders are in abundance, forced and compulsory methods of extracting capital may not be called appropriate. In such countries, substantial aggregate capacity for capital contribution lies with only few rich farmers whose percentage is very small. Forced method can only be justified only to that small segment of the rural community. Voluntary categories obviously, go in favour of the majority of the poor peasantry class.

Utilisation of rural savings for the capital formation of other sector is an other important part of capital transfer from rural to non-rural. II

sector. If we have a data on saving and capital formation in agricultural and non-agricultural sectors, there is no problem in measuring the extent to which saving originating in agricultural sector contributes to financing of capital formation in other sectors of the economy. But such data is very scanty in most of the developing countries and we cannot speculate the magnitudes of such contribution. We know that in the initial stage of economic growth the share of agriculture in total GDP is large. And the per capita income is distinctly lower than in the non-agricultural sector. Hence, the share of domestic saving originated in agricultural sector will be a function of: (I) "the share of agriculture in total income, (II) the lower level of real income in agriculture in comparison to other sectors, and (III) the relative propensity to save of rural population and of the other sectors in the economy". If we assume that the share of agricultural sector in total national income is 60 per cent, its share in labour force is 75 per cent and savings is 5 per cent of its income which is only half of the income of non-agricultural sector, the total domestic saving would then amount to 7 per cent of national income of which 4 per cent would be originated in the non-agricultural sector and 3 per cent in the agricultural sector.<sup>29</sup>

The flow of savings out of the agricultural sector for the capital formation of the other sectors depends largely upon the relative needs of these sector for capital. These needs are reflected in differential rates of return. The incremental capital output ratio (ICOR) might suggest how much capital is needed to secure additional output. The available data reveals that in all developed countries the ICOR for the agricultural sector is not too different from the national ratio. If we assume this situation to be valid for the early stages of economic growth, the allocation of savings would largely depend upon the relative rates of growth of the agriculture and non-agricultural sector.<sup>30</sup>

Thus, to know whether or not there will be a flow of savings from the agricultural sector to finance capital formation in the non-agricultural sector, the comparison of two fractions are essential: (i) "the ratio of additions to product of the agricultural sector to additions to the total product of the economy; and (ii) the ratio of savings originating in agriculture to all savings originating in the economy". If we assume that the rate of net saving is 7 per cent, the rate of growth of net product is 3 per cent per annum, the ICOR is 2.3 to 1, and the rate of growth of non-agricultural sector is four times that of the product of the agricultural sector, the required capital formation in the agricultural sector will be only 27 per cent of the total capital formation needed; whereas savings originated in agricultural sector are 43 per cent of the total savings. On this basis a flow of savings originating in the agricultural

sector into the capital formation in the non-agricultural sector would be somewhat less than a quarter of the non-agricultural sector.<sup>31</sup>

This is purely an illustrative example where the variable used in the discussion require an empirical test. The rate of growth of non-A-sector may be more than four times that of sector-A. And the ICOR for sector-A may also be distinctly lower than the ICOR of non-A sector. There are some cases where in some periods agricultural output may increased significantly with little or no capital investment. In all such cases, the flow of savings from agriculture to finance capital formation elsewhere would be relatively larger than what is illustrated in the example.<sup>32</sup>

In India when we look at the growth rate and saving together, we find that growth rate had a tendency to decline a little over the three decades (1950-73) and then jump to higher levels in eighties, while the savings were also rising except the decade eighties.<sup>33</sup> During 1950-51 to 1989-90 the ICOR trend in India has been fluctuating. It was lowest (2.9) during 1950-51 to 1955-56, but increased to 3.40 during 1956-57 - 1960-61 and 5.43 during 1961-62 - 1965-66. During 1966-67 - 1970-71, there was a little decline. It was 3.43 during this period. But again in the two subsequent periods 1971-72 to 1975-76 and 1976-77 - 1980-81. ICOR has been constantly rising. It was 5.80 and 6.70 respectively. The period starting from 1981-82 shows a sudden decline. It was 4.14 during 1981-82 to 1985-86 and slightly above 4, that is 4.04, during 1985-86-1990-91. Thus the decade of eighties shows significantly higher growth rate with significantly lower ICOR.<sup>34</sup>

The development of infrastructure and capabilities over the earlier three decades certainly has been used to advantage in the decade of eighties. Still there is vast scope of utilisation of resources already created particularly in the areas of fertilisers, irrigation, power, credit and transport. If concerted effort is made to improve the utilisation of existing capabilities, ICOR will decline in India and the cost of production will also come down.<sup>34(a)</sup> If this trend continued in future decades, the flow of savings from agriculture to finance capital formation elsewhere would also be larger.

**Labour Contribution:** Migration of labour force from agriculture to non-agricultural sector is another important contribution made by agriculture to the economic growth of a country. Two important aspects have to be discussed. First, the magnitude of the migration and second, the factors involved in such migration.

The feasibility of accelerating development through the transfer of labour from agriculture to industry is subject to the following condi-

tions: (I) The size of surplus reservoir of agricultural labour force; (II) The quality of rural migrants as potential industrial worker; and (III) the supplies and prices of non-labour inputs and other components of the demand for industrial labour.<sup>35</sup>

In many LDCs the rate of migration to cities and towns is higher than the growth of urban and industrial employment. Several development models are based on the mobilisation of surplus agricultural labour force for productive employment outside the agriculture. This "surplus" is supposed to take the form of "disguised unemployment".

A brief survey of some of the important models is as under:

**Lewis Model:** Lewis has made the following important assumptions to develop his model:

- (i) The economy is divided into two sectors. One is backward predominantly rural sector – subsistence sector. And the other is well-developed capitalist sector.
- (ii) The developed capitalist sector utilises capital stock which is reproducible, and capitalists receive payments for such utilisation. On the other hand, the backward agricultural sector utilises non-reproducible capital – for example land.
- (iii) The labour supply in the backward agricultural sector is infinite. Labourers, particularly unskilled are available in abundance. This is a very crucial assumption of the Lewis model. It implies that the real wage in the subsistence agricultural sector is constant and the marginal productivity of labour is approximately equal to zero. It means that some workers are removed from crops producing activities but total output will remain the same.
- (iv) Production technologies differ and as such per capita output is higher in the capitalist sector and low in the backward agricultural sector.
- (v) The economy has very little capital with unlimited supply of unskilled labour. In this situation, it is difficult to promote economic growth as the skill constraint could be very severe. Such constraint, however, can be removed by education and training, that is, by investment in human capital. With limited capital, economic growth can take place through transfer of "surplus" labour from agriculture to industry. It is argued that a rise in the demand for labour in the industrial sector does not raise wages because the supply of labour is infinite and elastic with respect to wages.<sup>37</sup>

The transfer of 'surplus' from subsistence agricultural sector to developed capitalist sector should be beneficial to both. After the transfer, the backward agricultural class experiences an improved land:labour ratio; and the modern capitalist class (industrial sector) obtains labourers which it requires to increase output. The wage in the capitalist sector is determined by what labour earns in the subsistence sector. Capitalist wage is generally higher than the subsistence earnings in order to compensate labour for the cost of transferring and to induce labour to leave the traditional life of the subsistence sector.<sup>38</sup>

The amount of labour that can be transferred will depend upon the amount of capital stock available and the numbers of labour. The rate of transfer will depend upon the rate of growth of profit (or surplus) within the capitalist sector. Lewis argues that profits or surplus generated in the industrial sector are usually invested by the capitalist. This may not be always true. He does recognise the possibility of some "leakages" from the profits, but these "leakages" are supposed to be very small. He emphasises that the key to the process of economic expansion is the use of the capitalist surplus. Following diagram shows the operation of the Lewis model.<sup>39</sup>

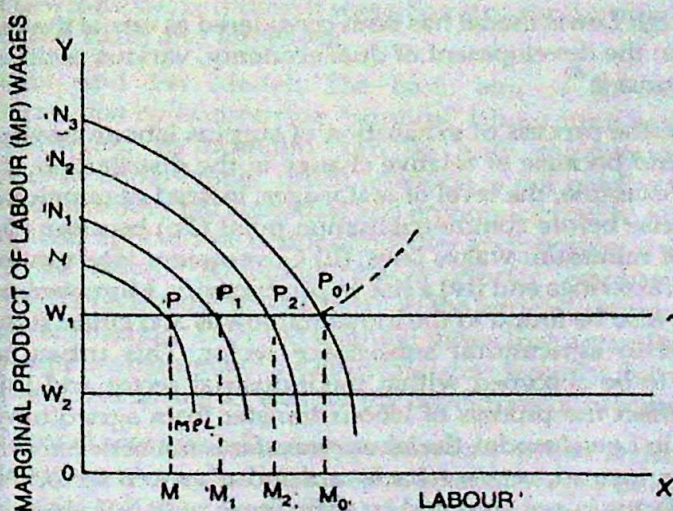


Fig. 1. Marginal Product of Labour (MP) / Wages

In this diagram the horizontal axis measures the amount of industrial labour and the vertical axis measures the marginal productivity and wages. The MP curve measures the marginal productivity of labour. The fixed subsistence wage is shown by  $OW_s$ . The industrial wage is equal to  $OW_1$  where  $OW_1 > OW_s$ . The industrial sector



employed labour up to the point where wages are equal to  $MP_L$ . Here  $P$  is the initial point of equilibrium and  $OM$  amount of labour employed. The size of profit or surplus within the advanced industrial sector is given by the difference between  $ONPM$  and  $OW_1PM$ . That is  $W_1NP$ . This is total wage bill. Hence, profit is equal to  $W_1NP$ .

We assume that capitalists will reinvest all their profits. The marginal productivity curve will shift to  $M_1 P_1$ . Employment will now go up to  $OM_1$  and the size of profits will rise to  $W_1 N_1 P_1$ . The real wage will remain fixed at  $OW_1$ .

The process will continue to operate until all the surplus agricultural labour is absorbed into the industrial sector. The point of exhaustion of surplus labour is  $P_o$  with employment  $OM_o$ . After that point the level of wages will start to rise indicating in the diagram by the dashed line. This implies that after  $P_o$ , the supply of labour from agriculture to the industrial sector will be less than perfectly elastic and it is competing with the industrial sector for more labour. This phase, according to Lewis, is commercialisation of agriculture. Such commercialisation will take place because: (i) of the rise of profits in the capitalist sector, and (ii) the rise of the level of real wages.

Although Lewis model has been considered as one of the pioneering efforts in the development of dual economy, various criticisms are levelled against it.<sup>40</sup>

Firstly, the process of exhaustion of surplus labour may come to an abrupt end because of relative change in the distribution of factor shares. For example, the level of real wages, instead of remaining constant, may rise before commercialisation point ( $P_o$ ) because: (i) of the operation of minimum wages laws; (ii) Government intervention; (iii) trade union activities and (iv) a rise in productivity. Moreover, surplus labour may also be found in the industrial towns and cities. It may not be confined to agricultural subsistence sector. This urban surplus labour has to be absorbed within the industrial sector and this may adversely affect the process of labour transfer from agriculture to industry. But in Lewis model, the labour transfer is not between rural and urban sector, instead, between backward and advanced sector. And the backward sector is not confined to agriculture only but also includes unorganised urban activities.

Secondly, the assumption that the marginal productivity of labour is always near or equal to zero in subsistence sector is also not true. Various empirical studies tend to suggest that the  $MP_L > 0$ .<sup>41</sup> If this is true, then there will be a positive opportunity cost due to transfer of labour from agriculture to industry since such transfer will

reduce the level of agricultural output. However, some empirical studies have suggested that a fall in labour supply has led to a fall in agricultural output. Such studies confirm the Lewis-type-hypothesis of a surplus agricultural labour.<sup>42</sup>

Thirdly, many have raised the question of study of Schultz because: (i) the study is not comprehensive enough; (ii)  $MP_L$  could be positive in some forms and negative in other; (iii)  $MP_L$  could be positive and negative in different seasons of agricultural crop production; (iv) random elements (weather) could probably account for such a fall in output when labour has been displaced.<sup>43</sup>

Fourthly, this is also observed that Lewis-model operates in a specific way which allows employment to grow with reinvestment of surplus or profit. But suppose capitalist, instead of adopting labour-intensive technique, adopts capital-intensive technique of production. In under-developed countries landlords may try to introduce technical progress by mechanisation of agriculture – tractorisation. An increase in capital intensity in under-developed agriculture will rise marginal productivity (MP) per capita and this will shift the MP curve. But this shift may fail to raise the level of employment.<sup>44</sup>

In view of these criticisms others have tried to modify or extend the basis of Lewis-model in different ways. Some major contributions come from Fei and Ranis and Jorgenson.

**Ranis And Fei Model:** The basic aim of RF-model is to demonstrate that by transferring "surplus" labour from agriculture to industrial sector, an economy can be fully commercialised and developed. In Lewis-model, much attention is not paid to the role of agriculture in promoting industrial and economic growth. Actually, the model ignores agricultural sector altogether and consider it as simply a reservoir of labour. RF-model places greater emphasis on the desirability of increasing productivity in the agricultural sector and in its commercialisation. They develop the thesis that agricultural sector not only supplies manpower for industrial development, but a substantial proportion of saving as well for the development process.

RF-model assumes a Lewis-type economy which is characterised by the presence of surplus labour. The level of wages in agricultural sector is assumed to be fixed. The supply curve of labour in the industrial sector is infinitely elastic since the opportunity costs of displacing labour is zero or very small.