

ture than in any other industry. Other industries which are more flexible gain remunerative returns on fresh applications of capital and they yield increasing returns.

- (v) Production in agriculture is also highly immobile. Other industries can adjust their production at a short notice in response to the changing pattern of market demand. But this is not possible in agriculture. Here production has its own fixed time and farmer has to wait for it whatever may be the demand position of these products. The economic life of a plant may be 10 years, 20 years, 30 years or even more. Once planted, the planter is in no position to alter the course of production. Hence, according to the changes in prices, costs and demand, a producer is unable to adjust his output, the area of crop or the level of output. In industries, such adjustments are easy and possible. The cost structure may be changed, production level can be adjusted through contraction and expansion and even the output can safely be preserved to take the advantages of market conditions. In agriculture many products are perishable and can't be stored for a longer period. Hence, agriculture faces greater price and demand risks in view of its inability to make quick adjustment in supplies according to change in demand.
- (vi) Agricultural production activity is seasonal. Output comes out only at a specific period and, therefore, turnover is slow. Production in industries are not seasonal. Their production is a continuous flow which may be raised or slowed down according to the changes in demand. On demand side, most of the agricultural products like cereals, pulses show an inelastic demand. The demand for some processed commodities like sugar, butter, and some other commodities like fish, meat, eggs, fruits are comparatively elastic. But the demand for such commodities specially in developing countries is urban-biased. The transportation, storage, distribution and marketing etc. of such commodities create another set of problems in relation to maintain a proper supplies according to the changing pattern of demand.
- (vii) Many agricultural commodities are joint products like wheat, milk, mutton, wool etc. because they are the part of the same plant or the same animal. The costs attributable to the various products cannot be separated as they often can be produced in industry even when several products are

produced in the same plant. Hence, in agriculture it is rarely justifiable to consider the supply of any product in isolation.

- (viii) Agriculture also require far larger proportion of land in relation to its employment of other factors than does industry. Moreover, it is also scattered over a large area with uneconomical and small-size units. This raises organisational problems which are absent in industry. Hence, the benefits of large-scale organisation better known as economies of scale and the division of labour are not possible in agriculture, specially in the agricultural sector of developing countries.
- (ix) Agricultural activities are so complex, varied and diversified that no other activities such as industrial, commercial, trade or business can hardly compete it. It includes not only arable crops but also livestock, plantation, pastures, horticulture, fisheries, forestry, animal-husbandry, poultry, dairy, sheep-farming and cattle-rearing. All have some outstanding features of their own. All have their own culture and contribution to the economy.
- (x) Farming has been the oldest and the chief occupation of mankind the world over. Other occupations evolved in the process of civilization. Even to-day more than half the world's labour force is directly engaged in agricultural occupation. Thus on occupational side, agriculture is the biggest industry of the world.

PLACE OF AGRICULTURE IN DEVELOPMENT ECONOMICS: A HISTORICAL PERSPECTIVE

Economists have traditionally analysed agricultural development in terms of its relationship to the growth of the overall economy. Early theoretical literature on the place of agriculture in development economics can be traced to as far back as the eighteenth century in the writings of the physiocrats. They viewed agriculture as the engine of economic growth, and that agriculture is the only activity capable of generating a surplus large enough to stimulate growth in other sectors of the economy. According to them only agriculture turned out a "net

* This part draws heavily on Eicher C.K. & Staatz J.M. Edited work: *Agricultural Development In The Third World*, The Johns Hopkins University Press, London, 1984, Part I (Agricultural Development Ideas In Historical Prespective) and Part II (Models of Agricultural Development by Ruttan V.W. and Induced Innovation Model of Agricultural Development by Ruttan V.W. and Hayami) pp 3-71

product" over and above its cost of production and it is only in agriculture that nature labours along with man and by her bounty yields not only what the agricultural labourer or the farmer consumes, but also a surplus which nourishes the other classes of society. Hence, agriculture plays the most strategic role in economic development. Manufacture and commerce were regarded as "sterile" class as they enhanced the value of raw material only enough to pay for the labour and capital used in the process of production.

Importance of agriculture in economic development was also recognised by the classical economists such as Adam Smith, Ricardo and Malthus. Adam Smith's basic economic growth model refers only to the agricultural sector.⁵ Food, according to him is the conditional factor in the growth of the economy and hence technical improvement in agriculture is the pivotal point for sparking of development in other sectors of the economy. Ricardo considers agriculture as the most important sector of the economy. The difficulty of providing food for an expanding population serves as the focal point for the entire analysis of both, Ricardo and Malthus. But classical economists believed that diminishing marginal returns to agricultural land would eventually lead to over-all economic stagnation or the "steady-state". Thus, the law of diminishing returns from land dominates the economic scene and governs the fortunes of all classes. Shortage of land, according to Ricardo, would set a limit upon the expansion of agriculture and, hence, upon the whole economy.

Although the problem of economic growth and development has been the subject of serious discussion among the economist since the beginning of mercantilism, development economics as a separate branch of economics has come into existence only since 1950. The history of economic development ideas can roughly and broadly be divided into the two phases:

(i) An era of economic growth and modernisation when the subject of economic development is treated as growth in average per capita output. This growth trend has been found during 1950's and 1960's; and (ii) The era of growth with equity start around 1970. This is growth with social-justice phase where the economist are concerned with broader objectives such as equitable distribution of income and wealth, elimination of unemployment, poverty and hunger and host of other subject. Agriculture's role in economic development has been profoundly changed during these two phases.

AGRICULTURE IN DEVELOPMENT ECONOMICS: 1950-69

Most of the Western economists of 1950's did not pay much attention towards agriculture, they did not view agriculture as an important contributor to economic growth. I.M.D. Little, for instance, comments in his survey of development economics: "It is fairly obvious from the reading their work that the leading development economists of the 1950's knew little about tropical agriculture or rural life". They viewed traditional agriculture as a passive sector that would decline in importance as industrial growth absorbed an increasing share of production and employment.

Economic development was considered as the process of structural transformation of the economy where agriculture's relative share of the national product and of the labour force both declines. Economic development was presumed as a process that facilitates transformation, specially of labour, from traditional agriculture to industry which is considered the engine of growth. Agriculture was treated merely a "black-box from which people, and food to feed them, and perhaps capital could be released".

Ideas on development economics were deeply and strongly influenced by W. Arthur Lewis's article: "Economic Development with unlimited Supplies of Labour" appeared in 1954. He presented a two sector model of expansion of an economy - a modern capitalist exchange sector and a non-capitalist sector dominated by subsistence farming. A fundamental relationship between the two sectors is that when capitalist sector expands, it draws labour from the subsistence sector. The subsistence agricultural sector is described as the "self-employment sector" which did not hire labour or use reproducible capital. This model explains and analyse how the transfer of labour from subsistence agriculture sector, where the marginal productivity of labour is considered to be zero, to the capitalist sector facilitates capitalist expansion through reinvestment of profits. The labour supply facing the capitalist sector has been considered "unlimited". It is unlimited in the sense that when capitalist sector offers additional employment opportunities at the existing wage rate, the numbers willing to work at this wage rate will be greater than the demand. That is the supply curve of labour is infinitely elastic at the ruling wage.

In tracing out the process of economic expansion, Lewis emphasises the reinvestment process of the capitalist system. As the capitalist sector expands labour is withdrawn from capitalist sector into wage employment, the surplus of the capitalist then becomes even larger. There is still more reinvestment of profits and the process continues on, progressively absorbing the surplus labour from the subsistence

sector. This process of capital formation comes to an end when capital accumulation catches up with population, so that there is no longer surplus labour in the subsistence sector left to be absorbed in the industrial sector. Beyond this point real wages no longer remain constant, instead, rise as capital formation occurs. In other words, expansion in the capitalist sector continued until earnings in the two sectors were equated. At this point of equilibrium it will now be in the interest of the producers in the subsistence sector to compete for labour since the marginal product of labour will no longer be below the institutional wage. When this point is reached, the agricultural sector is said to have been commercialised and a dual sector model is no longer relevant. The growth proceeds in one-sector. Lewis model has been later on extended by Ranis, Fei (1961, 1963 and 1964) and Jorgenson (1961).

The relative neglect of agriculture was reinforced by two other developments. Paul Prebisch and Hans Singer independently formulated the thesis that there is a secular tendency for the terms of trade to run against countries that export primary products and import manufacturing goods. This led them to conclude that the scope for development through agriculture and other primary exports was limited and hence the tendency to down-play agriculture's potential role in development was reinforced.

The publication of Albert Hirschman's book: "The Strategy of Economic Development" in 1958 also affected development economist view of agriculture. In this book he introduced the concept of linkages as a tool of investigating how investment in one type of economic activity induced subsequent investment in other income-generating activities. He explained the linkage effect as "the investment-generating forces that are set in motion, through input-output relation, when productive facilities that supply inputs to that (productive) line or utilise its output, are inadequate or non-existent. Backward linkages lead to new investment in input-supplying facilities and forward linkages to investment in out-put using facilities". He asserted that "agriculture certainly stands convicted on the count of its lack of direct stimulus to the setting up new activities through linkage effect the superiority of manufacturing in this respect is crushing". He, therefore, argued that investment in industry would generally lead to more rapid and more broad based economic growth than in agriculture.

The views expressed by the development economists in early 1950's clearly indicates that their main attention was to focus on the contribution of agriculture to over-all economic growth instead on analysing the process of agriculture growth per se. They stressed on inter-sectoral resource transfers, particularly of labour, from traditional

agricultural sector to the modern industrial sector. In this respect, they viewed agricultural sector as a passive sector that declines its importance as industrial growth absorbs an increasing share of production and employment.

In the early 1960, Johnston, Mellor and several other agricultural economist stressed the fundamental role that agriculture potentially could play in economic development and the importance of understanding the process of agricultural growth per se if that potential was to be exploited. Johnston and Mellor drew insight from Lewis model and stressed the importance of agriculture as a motive force in economic growth. They pointed out five important contributions to the structural transformation of third world economies. Agriculture provides labour, capital, foreign exchange and food to a growing industrial sector and also provides a market for industrial goods produced within the economy. Johnston and Mellor's article and W.H. Nicholl's article: "The Place of Agriculture In Economic Development" (1964) were instrumental in encouraging economists to view agriculture as a potential positive force in economic development and helped to stimulate debate on the interdependence of agricultural and industrial growth. This in turn developed growing interest in the empirical measurement of inter-sectoral resource transfers during the course of development.⁶ Numerous attempts were also made to develop specifications of the agricultural sector in economic growth models and to model developed carefully the dynamics of growth within the agricultural sector. A brief survey of these models is given in the next part of this chapter.⁷

The Growth-With-Equity Era Since 1970

Around 1970 development economics began to give greater attention to employment and the distribution of real income. The focus shifted from per capita output growth to more equitable distribution of income, expansion of employment and eradication of poverty. The main reason was a growing awareness among development economist that even in countries where rapid economic growth had not contributed to social turmoil, the benefits or economic growth often were not trickling down to the poor and the income gap between rich and poor was widening. Even where the incomes of the poor were rising, they were rising so slowly that the poor would not be able to afford decent living for at least another generation.

This awareness led them to realise that merely increasing per capita income is not enough to solve the problems of poverty and malnutrition. Economist, political leaders and the leaders of the major donor agencies argued that greater explicit attention is needed towards

employment, income distribution and basic needs such as nutrition, health and housing. This orientation of development economics in the early 1970 implied a much greater role for agriculture in development programmes.

Majority of the population of the Third World Countries is poor and live in rural areas. Food prices, in such countries, are the major determinant of the real income of both the rural and the urban poor. Since the productivity of agriculture in the Third World is low, the income level is also very low and this is a major cause of poverty. Moreover, because urban industry provided few jobs for the rapidly growing labour force, planners concentrated on ways to create productive employment in rural areas. These findings tend to realise that agriculture has to play more important role in development programme. And merely two-sector models of 1950's and 1960's are not enough to understand its contribution. Policy-makers needed a more detailed understanding of rural economies. Consequently the late 1960's and early 1970, there has been a rapid expansion of micro-level research on agricultural production, marketing, farmer decisions, rural factor, markets and rural non-farm employment.⁸

Hayami and Ruttan's induced innovation model of agricultural development was a major contribution of 1970's.⁹ They argued that there are multiple technological paths to agricultural development. Each path indicates different mix of factors of production and changes in relative factor prices can guide to choose the most efficient path. This implies that countries with different factors endowment would have different efficient growth paths and the import of technology in full-scale from industrialised countries to these developing countries would lead to highly inefficient pattern of growth.

1970 also witnessed empirical researches on interdependence between agricultural and non-agricultural growth. In this respect Mellor, Johnston and Kilby's work is noteworthy. Mellor argued that employment-oriented strategies of development inherent in the new high-yielding grain varieties is possible. His analysis is based upon empirical evidence from India. Mellor emphasized that the new varieties could also raise the incomes of foodgrain producers and in turn could generate increased effective demand for a wide variety of labour-intensive products. The potential growth in employment is laying outside the foodgrain sector, producing labour-intensive goods such as dairy product, fruit and other consumer product and agricultural inputs. This expanded employment is made possible by the simultaneous increase in effective demand for these products and the increased supply of expensive wage goods in the form of foodgrains.

Johnston and Kilby focussed their attention on the factors affecting the rate of labour transfer between sectors and the level and composition of inter-sectoral commodity flows. They argued that the size distribution of farms is critical determinant of the demand for industrial products in a developing economy. To them broad-based agricultural growth is more effective than estate production in stimulating the demand for industrial products and speeding structural transformation of the economy. Their analysis supported the view that concentrating agricultural development efforts on the mass of small farmers in developing countries, rather than promoting a bimodal structure of small and large farms, would lead to faster growth rates of both aggregate economic output and employment.

A large number of studies during 1970's have been done on evaluating the performance of labour markets in low-income countries. These studies found that at peak periods of the agricultural cycle there is little unemployment in rural areas, while at other periods, there are labour surpluses. The studies also revealed that earlier researches frequently had overestimated the size of these surpluses because they failed to take account of the time devoted to rural non-farm enterprises.

Rural to urban migration has also been an important area of study during 1960's and 1970's. The rate of rural-to-urban migration in most developing countries far outstripped the rate of growth of urban employment. This is the main reason of urban unemployment. Hence the policy makers shifted their attention from trying to transfer surplus labour from agriculture to industry to reducing excessive expansion of urbanization. In this area Todaro's study (1969) is significant. He proposed a model which was later on extended by Harvis and Todaro in 1970. In this model they argued that a migrant's decision to migrate is motivated primarily by the difference between his/her expected urban income and the prevailing rural wage. The model explains that attempts to reduce urban unemployment by creating more urban jobs actually results more urban unemployment. And this is because the potential migrants believe that their chances of getting an urban job have increased. Hence, urban employment programmes induced greater rural-to-urban migration. Haris and Todaro, therefore, argued that urban unemployment could best be addressed by reducing the incentives to migrate to cities. For example, this could be done by raising rural income via a broad range of agricultural and rural development programmes.

Rapid urbanisation and income growth put increasing pressure on markets for agricultural products, particularly food, during 1960's and 1970's. In response, researches and economists undertook a number of

studies to evaluate the performance of agricultural product markets and suggested improvements. These studies analysed how insufficient infrastructure and lack of reliable public information system often reduced market efficiency and lowered farmer's incentives to specialise for market production. Studies criticise state monopolies in the domestic food trade and suggests that the state should provide public goods — better information system, standardised weights and measures etc. — to facilitate private trading, price stabilisation and regulation of international trade.¹⁰

One more area of interest during the late 1960's and the 1970's has been the farmer's decisions whether or not to adopt new crop varieties and farming practices. This research stressed the need to understand how Government policies could simultaneously affect both the production and the consumption decisions of small farmers. These studies, for example, showed that marketed surplus of a crop might, in some circumstances, actually decline as the crop price was increased, because the price increase would raise farm family income, some of which would be spent on the goods whose price had risen.

1970's also witnessed concentrated efforts towards Integrated Rural Development Programme (IRDP) in almost all developing economies. IRDP attempts to combine in one project elements to increase agricultural production and improve health, education, sanitation and a variety of other social services. Like Community Development Programme (CDP) of 1950's, IRDP of 1970's expanded social services much faster than they expanded the economic base to support them. Moreover, the inability of IRDP projects to increase agricultural production rapidly often suffered by the lack of appropriate technical support. By 1980, many supporting agencies like World Bank and the U.S. Agency for International Development (USAID) had retreated from IRDP or had redesigned these projects to give greater emphasis to agricultural production.¹¹ This led to conclude that the rise and decline of IRDP (1973-80) was in some way very similar to the fate of CDP in the 1950-57.¹²

Another important area of research, a part of IRDP, has been the basic needs approaches for rural development. This approach was popularised by the ILO and by the World Bank economists. The basic needs approach holds that development projects should give priority to increasing the welfare of the poor through improving their nutrition level, education, housing and health, rather than merely focusing on increasing aggregate growth rates. Although investment in health, education, nutrition and housing can contribute to the welfare of the poor and to the rate of growth, the experience with this approach

suggests that low-income countries also need an appropriate economic base to finance these investment. By the early 1980 many economist once again giving greater emphasis to economic growth and to different types of development activities such as investment in irrigation and health. This shift of emphasis does not mean a rejection of the growth-with-equity philosophy of 1970. Instead, it reflects an increasing recognition of the impossibility of achieving a decent living for the rapid growing populations simply by redistributing existing resources. This led World Bank to shift to a more growth-oriented strategy in the early 1980's and the basic needs approach faded into the background.¹³

The broad-based researches done on agricultural growth and rural development during 1970 and early 1980 actually analyses agricultural and rural development issues in broader macro-economic framework. They also encourage to move towards more interdisciplinary approaches to solve the problems. The micro-level researches on different aspect of agricultural and rural development during 1970's contributed to an accumulation of knowledge about the behaviour of farmers, constrain on the expansion of farm and non-farm production, income and employment, the linkages between agricultural researches and extension institutions and the complexity of the agricultural development process. During 1970's and 1980's, it has been realised that agriculture is not a passive sector. It is a major contributor to economic growth and stability.

A Brief Note on Agricultural Development Models

Before 19th century the increase in food production was mainly the function of the area under cultivation. The increase in food production was obtained by bringing new land into cultivation. By the end of this century the increase in food production had become the function of higher yields from increased output per hectare. This transition from a resource-based to a science-based system of agriculture has been occurred within a single century. In a few countries this transition began in the 19th century. In most of the present developed countries it did not start until the first half of this century. In most of the developing countries it started only since mid century. The technology associated with this transition, particularly the new seed - fertilizer technology, has been referred to as the "green-revolution" in the developing world.

The literature on agricultural development can be classified into following six models: (1) the frontier, (2) the conservation, (3) the urban-

* This part draws heavily on: Ruttan W.V., "Models of Agricultural Development". In *Agricultural Development in the Third World* (Edi) op. cit Chapter 2 pp 38-45.