CHAPTER II

ROLE OF AGRICULTURE IN ECONOMIC DEVELOPMENT WITH SPECIAL REFERENCE TO COMMERCIAL CROPS

2.1 MEANING AND DEFINITION

The word agriculture, since long, has been associated with industry of basic food production known as farming. Agriculture and farming were synonymous till farming was not commercialized and was done more or less on subsistence basis. But after the commercialization of agricultural sector, production of food and fiber (farming) has become only one part of scientific agriculture.

Agriculture thus, may be defined as the production, processing, marketing and distribution of crops and livestock. These four activities were previously all farm
centered. However, with improvement in technology, transport and communication developments and specialization of labour, some of these activities have moved away from farm into certain strategic control points. Modern agriculture also includes the farm supporting industries as well as product processing and distribution industries.

2.2 DEFINITIONS:

In a very simple language, agricultural economics may be defined as an applied phase of economics in which attention is given to all aspects of problems related to agriculture. It helps the farmer in deciding about what kind of food should be produced, which crop should be raised to maximize his profits and at what level should he price his products.

In the words of Prof. Gray¹: “agriculture economics may be defined as the science in which the principles and methods of economics are applied to the special conditions of agricultural industry”.

To Jouzier²: “agricultural economics is that branch of agricultural science which treats of the manner of regulating relations of the different elements comprising to resources of the farmer, whether it be the relations to each other or to human beings in order to secure the greatest degree of prosperity to the enterprise”.

Modern agriculture has much wider scope today and it includes the farm supply industries as well as the product processing industries and distribution
industries too. Industries closely related to farming are known as agriculturally related industries or agri-business. The scope of modern agriculture has been explained below.

Agriculture is one sector of the total economy. A number of forces are actively involved in agricultural activities whether it is production, processing, marketing or consumption. Some other forces are biological which include studies by animal and plant physiologists, geneticists, entomologists, pathologists and bacteriologists. Agriculture is also governed by some economic and sociological forces. Agriculture is not only an occupation but also a way of life.

Jouzier looks upon agricultural economics as (i) the science which deals with the principles underlying the co-ordination of all the factors involved in farming (land, labour, equipment and the various lines of production) in such a manner as will enable the farmer to secure the maximum net profits; and (ii) the art of applying these principles on a given farm.

Following are some of the important special features of agriculture

2.2.1 Agriculture is a unique industry in which the mode of life, culture, profession, and business are combined together. This combination does not exist in any other industry or in any other sector. Since agriculture encompasses the whole family it is a way of life rather than merely an industry or business enterprise. It is on this ground that agriculture is more influenced by sociological, political and sentimental factors.
2.2.2 Agriculture is a basic industry as it provides food for all without which nobody can live. It is also true that industrial growth depends on it as it provides major raw materials for their growth and expansion. No other sector takes such strategic responsibility of growth and development. Agriculture is also unique in the sense that it produces net surplus production over cost. However its production activities are marked with uncertainties, limitation and immobilities. Agriculture being a biological activity is always subject to the vagaries of nature. Here man's association with nature is more close, intimate and many sided. Whether, climate, rainfall, temperature, moisture, chemical properties of oil, latitude, altitude all serve a limiting factors in man's efforts to develop agriculture according to his own plan. Man has hardly any control over them. Here nature decides the level of output. When production is not controllable serious maladjustments are likely to occur because at times more production is needed, agriculture fails to produce it. Hence the whole economy suffers with shortages and high prices. When prices are high and farmers wish to produce more he is not capable of producing more. And at other time more products are produced than are required, making the whole production activity unprofitable. This trend refers to the immobility of agriculture.

2.2.3 Like industry, agriculture cannot adjust its output and organisation in accordance with the market fluctuations immediately and hence it is immobile and inflexible. A farmer neither can take immediate advantage of technological changes nor can he benefited from the changes in taste, fashion and mode of life. Besides, factor limitation like area of land also places severe
limitation on the efforts of man to expand his activities, but manufacturing unit does not suffer from such limitations.

2.2.4 Due to these limitations and immobilities the application of law of diminishing returns is more pronounced in agriculture than in other industries which are more flexible, gain remunerative returns on fresh application of capital and they yield increasing returns.

2.2.5 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 cost 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 cannot be stored for a long period. Hence, agriculture faces greater price and demand risks in view of its quantity to make quick adjustment in supplies according to change in demand.

2.2.6 Agricultural production activity is seasonal, output comes out only at specific period and therefore turnover is slow. Productions 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, have shown 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 maintaining proper supplies according to the changing pattern of demand.

2.2.7 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. Hence, in agriculture it is rarely justifiable to consider the supply of any products in isolation.

2.2.8 Agriculture also requires larger production land in relation to its employment of other factors than that of industry. Moreover, it is also scattered over a large area with uneconomical and small size units. This raises organizational problems, which are not present in industry. Hence, the benefits of large-scale organisation better known as economics of scale and the division of labour are not possible in agriculture particularly in developing countries.

2.2.9 Agricultural activities are so complex and diversified that no other activity such as industrial or commercial trade or business can hardly be compared with 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.

2.2.10 Farming has been the oldest and the chief occupation of mankind all over the
world. Other occupations evolved in the process of civilization. Even today
more than half of the world's labour force is directly engaged in agricultural
activities. Thus on the occupational side agriculture is the biggest industry of
the world.

Thus, agriculture does not present a different set of economic principles and
methodology relevant to only agriculture. The general framework of economic theory
is equally applicable to agriculture as it is applicable to any other sector such as
industry. The analysis of demand and supply equilibrium, cost and revenue markets,
maximization of profit etc. Is as valid in agriculture as in industry.

2.3 ROLE OF AGRICULTURE IN ECONOMIC DEVELOPMENT:

Agricultural sector plays a strategic role in the process of economic
development of a country. It has already made a significant contribution to the
economic prosperity of advanced countries and its role in the economic development
of less developed countries is of vital importance. In USA and Japan, agricultural
development has helped to a great extent in the process of their industrialization. It is
learnt that increased agricultural output and productivity tends to contribute
substantially to an overall economic development of a predominantly agricultural
based country and over populated country. In the early stage of the economic
development of the country, it will be rational and appropriate to place greater
emphasis on further development of the agricultural sector. Agricultural production can be raised more rapidly with lesser amount of capital investment in it. To a certain extent, productivity can be increased even without additional capital. The increasing agricultural productivity will make substantial contributions to the general economic development of the country.

The importance of agriculture in the economic development of any country, rich or poor, is borne out by the fact that it is the primary sector of the economy, which provides the basic ingredients necessary for the existence of mankind and also provides most of the raw materials, which when transformed into finished products serve as basic necessities of the human race. In a preponderantly agrarian economy, agriculture plays a most strategic role from several points of view. At the outset farm product must be increased rapidly enough to keep pace with population growth. However in a speedy industrialising economy, this is not enough. Industrialization necessarily brings with it urbanization and a rapid expansion of the industrial labour force. This may then be expected to bring with it a rising per capita demand for food, based on higher urban incomes.

In the development of an economy agriculture literally feeds the process of development. It meets the need for foodgrains on account of rise in incomes. As also of increase in population, self-sufficiency in food gives greater confidence and freedom to a country. The health and nutrition of population also depends on the development of agriculture. With income elasticity of demand for consumer items particularly foodgrains being very high in underdeveloped countries at around 0.6 (as
against 0.2 to 0.3 in the developed countries) and the population growth at over 2 percent the adequate supply of food items is very essential. Further, foodgrains constitute an important wage good in underdeveloped economies. It forms 50 to 60 percent of worker's consumption, as against 20 to 30 percent in developed countries. If the supplies of these goods are not sufficient the costs/prices go up, jeopardizing the very process of development.

In addition to supplying food, agriculture must provide many raw materials for agro-based industries. For instance the fate of textile industry will be crucially affected by the supply of raw cotton. Leather goods industry depends heavily on the availability of hides and skins. Food processing and tobacco manufactures are also dependent on agricultural supplies. These agro-based industries can be established in the rural or semi-rural (or semi-urban or urban) areas. These agro-based industries are not capital intensive and the burden of interest will also be low. Besides, the rate of interest will also not rise because demand for capital will also not be so high. It checks over urbanization and environment pollution as well.

Development of agriculture provides not only cheap food and raw materials but also helps in keeping the wages down. This checks cost-push inflation. When in due course of time industries develop, they do not find lack of purchasing power for their goods.

2.4 CLASSICAL VERSION:

Adam Smith is regarded as the most important of the classical economists. He was primarily concerned with the problem of economic development.
considered agriculture as more productive than commerce and industry, because the forces of nature labour along with man. He also agreed that investment in agriculture was quite in accord with the general interest of society. Hence he may be considered as an agricultural fundamentalist. It is now believed that Adam Smith's basic growth model defends only on the agricultural sector. Food according to Smith is the conditional factor in the growth of an economy.

According to Smith, when by the improvement and cultivation of land the labour of one family can provide food for two families, the labour of half the society becomes sufficient to provide food to the whole society. The other half, therefore, can be employed in providing other things. Thus generating demand for other goods and services, which could be purchased with the excess supply of agricultural products. Therefore, every increase in the surplus brings about more specialization in industry through the division of labour.

Ricardo had scientifically explained the idea of Adam Smith. 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 his entire analysis. In Ricardo's vision of economic society there are three major groups of actors on the economic scene, landlords who provide land, capitalists who provide capital and workers who provide labour.

According to Ricardo, as the society progresses by means of an expansion in population there arises, an increasing scarcity of the more fertile types of land. In order to meet the rising demand for food the successive employment of equal units of
labour and capital on poorer grades of land (together with the more intensive use of labour and capital on better grades of land) brings diminishing returns in terms of agricultural output. As poorer lands are brought under cultivation and diminishing returns due to competition among the capitalists for the better grades of land causes a portion of produce of the land to be transferred to the landlords in terms of rent.

The rate of wages, according to Ricardo, is determined by the cost of subsistence. His assumption is that labourers have to be paid a minimum subsistence wage (food and other necessaries) if the supply of labour in the long run is to be kept intact. This implies that as the population grows wage rate in money terms must rise (because food grains cultivation). This, in turn squeezes the profit rate in agriculture and manufacturing.

Jacob Viner once wrote that is not a case of "agriculture versus industrialization but of 'poverty' and poverty" is due to both poor agriculture and poor industrialization. The path to economic development is through making the population literate, healthy and well fed. No nation can develop if its population does not receive adequate nutrition.

Economic development requires high level of output from agriculture in the early stages of economic development. In fact the demand for agricultural products increases in the early stages of economic development. Failure to expand agricultural supplies in face with the growth of demand shall seriously impede economic growth5.
If food output is low, naturally the food prices rise, trade unions demand higher wages and wage push inflation can get initiated. Besides, this will bring industrial strike and political discontent. Investment may get reduced and this will come in the way of employment generation.

However, agriculture is not only a supplier of goods for domestic and export needs but is also a supplier of production factors such as capital and labour. A rapidly expanding industrial sector necessarily draws of its labour force from the rural areas.

So, agriculture also contributes to development through the supply of labour. As such agriculture is the major source of labour for the development of non-agricultural sectors like industry and services. No doubt with the industrial towns/areas coming into existence, the industrial labour in these places itself becomes a source of labour supply through natural increase in population. Thus, migration from villages continues to meet the rising demand for labour in the new areas of development activity. This permits expansion of industries because with low and constant wages, profits remain high which in turn can be used for further investment. The noted economist W.A Lewis has in fact, discussed in his model of development with such labour treated as unlimited in supply, being available at constant low wages (which may be higher than the subsistence living in the villages) enabling the capitalist sector to make larger profits and use them for further investment.
2.5 LEWIS'S THEORY OF UNLIMITED SUPPLIES OF LABOUR:

Lewis in his well-known article "Economic development with unlimited supplies of labour" presented a two sector model investigating the expansion of the capitalist sector as it is led by supplies of cheap labour from the agriculture sector. According to Lewis, under conditions prevailing in majority of under developed countries the classical assumption of unlimited supplies of labour is more relevant. Due to rapid rise in population in the countries, surplus labour exists in large sectors of economy where marginal productivity of such labour is negligible may be zero or negative.

Lewis analyses the process of economic expansion in a dual economy composed of a "capitalist" sector and a "subsistence" sector. Output per head in subsistence sector is lower than that in the capitalist sector. People in subsistence sector are generally backward, illiterate and unskilled with the result that their average productivity is low. On the other hand, people engaged in capitalist sector are advanced, literate and skilled.

The basic assumption of Lewis, model is that there exists surplus labour in the subsistence sector, such labour is there either with zero marginal productivity or having marginal productivity much less than institutional wage. According to Lewis the surplus labour in the subsistence sector acts as a source from which unlimited supply of labour can be shown for the development of the capitalist sector. "In this situation, new industries can be created or old industries can be expanded without limit at the existing wage, or to put it more exactly shortage of labour is no limit to the creation of new sources of employment."
Fei-Ranis theory:

John Fei and Gustav Ranis in an article entitled "A theory of economic development" (1961) analyse "the transition process through which an underdeveloped economy hopes to move from a condition of stagnation to one of self-sustained growth." Their theory is an improvement over Lewis's theory of unlimited supplies of labour because Lewis failed to present a satisfactory analysis of the growth of the agricultural sector.

Theory:

The theory relates to an underdeveloped labour surplus and resource poor economy in which the vast majority of the population is engaged in agriculture amidst widespread unemployment and high rates of population growth. The agrarian economy is stagnant. People are engaged in traditional agricultural pursuits. A non-agricultural pursuit exists but they are characterised by a modest use of capital. There is also an active and dynamic industrial sector. Development consists of the re-allocation of surplus agricultural workers, whose contribution to output is zero or negligible, to the industrial sector where they become productive at a wage equal to the institutional wage in agriculture.

Fei and Ranis analyse the development of a labour-surplus economy into three phases. In the first phase, the disguised unemployed workers, who are not adding to agricultural output, are transferred to the industrial sector at the constant institutional wage. In the second phase, agricultural workers add to agricultural output but produce less than the institutional wage they get. Such workers are also shifted to the industrial sector. If the migration of workers to the industrial sector
continues, a point is eventually reached when farm workers produce output equal to the institutional wage. This begins the third phase which marks the end of the take-off and the beginning of the self-sustained growth when farm workers produce more than the institutional wage they get. In this phase, the surplus labour is exhausted and the agricultural sector becomes commercialised.

2.6 J.W MELLOR’S THEORY OF AGRICULTURAL DEVELOPMENT:

J.W. Mellor presents his theory of agricultural development in his book entitled “The Economics of Agricultural Development Appeared in 1966”.

Phase I: traditional agriculture or pre-conditions of agricultural development:

Mellor stated that, traditional agriculture is the first phase, which implies backward, primitive and labour intensive agriculture. Technically it is a stagnant phase in which production can be increased through increased application of traditional forms of inputs. Most of the farms in less developed countries are peasant farms on which labour force, management and even capital come from the same household. Generally, these farms are small in size and labour force per farm is much higher as compared to developed countries. Although such changes do not provide a sufficient condition for technological advancement they help to develop a decision-making environment in which farmers accept the possibility of personal gain from improved farming. It will cause the total production to increase but the average production as well as income per labour will decline. Moreover, in this phase some non-traditional inputs viz, fertilizer, seeds the non-traditional inputs have negligible
impact on the total production. Thus, the institutional changes will not be very effective unless they are accompanied by the technological changes. Therefore, Mellor said that in traditional agriculture there is much under employment. It is only due to the reason that in such type of agriculture there is unique distribution of level among the farmers. Apart from this, the farmers working on subsistence farms may be pushing the use of their family labour up to a point where its marginal productivity becomes equal to zero.

Phase II: Rising Agricultural production: Low capital labour-intensive technology

In this phase agriculture plays a pioneering role in the overall economic development. New inputs with high marginal productivity are used in agriculture, which encourages the use of traditional inputs by increasing their marginal productivities. The use of modern inputs shifts the production function for traditional inputs upward. Although, the modern inputs use more capital yet they are not highly capitalized. These inputs are used mainly to increase the productivity per acre. Moreover, in this phase agricultural represents.

a) Large production of the total economy.
b) Demand for agricultural products is rising rapidly.
c) Capital for industrial development is scarce and returns are rising.
d) Farm size cannot be increased.
e) Machinery cannot be used in agriculture due to the availability of cheap labour.
Prof. Mellor says that the following steps are required for the smooth progress of agricultural production in the second phase.

1) **Encouragement of institutions to provide incentives:**

   In less developed countries, small farmers generally have little incentive to raise agricultural production. Thus, motivation to step-up production is very essential under such circumstances. In this regard land reforms can play the best role. Further, various institutional changes can create a favorable environment to increase the production of agricultural sector.

2) **Setting up of institutions:**

   Many ancillary institutions like institutions of distributing modern inputs, marketing, extending credit and servicing agricultural machinery, transport services are required to increase the agricultural production.

3) **Encouragement to Research:**

   To improve the productivity of various inputs research programmes should be encouraged. Sometimes, due to improper use, research findings may prove inadequate for development. Therefore, applied research in the plant and animal science is very important to step-up agricultural productivity.

4) **Development of communication system:**

   In a dynamic agriculture new alternatives always appear. Therefore in order to guide the farmers about the pros and cons of new alternatives, extension services should be set up. Initially, in some geographical regions, high return technological
innovations has been adopted but these become indispensable if the phase second of agricultural development is to be under spread.

5) Supply of new improved physical inputs:

To increase the production new methods and materials are required. For the development of agriculture new crop varieties, improved breeds of livestock's, inorganic fertilizers etc. are very essential.

6) Spread of education:

The final success of a programme depends upon training to farmers. The skill and training helps him to make intelligent decisions regarding proper utilisation of resources.

In short the progress of agriculture in phase second is a continuous process. Production increases because of the re-employment of resources through the use of new innovations back into agricultural sector. The use of new technology is modest.

Phase III: Rising Agricultural production capital intension labour saving technology

Prof Mellor argues that as the second phase becomes imminent. It stipulates that to non-agricultural sector of the economy, which is already developed to some extent. In phase third the increased use of capital and labour saving technology increases labour productivity. Labour productivity is also increased through research in plant and animal production in this phase, sufficient capital is available for investment in agriculture. Moreover, due to the movement of the people out of agriculture sector to non-agriculture sector size of farm has increased to same extent.
But at the same time, the demands of non-agricultural sector on agricultural sector for capital have gone down considerably. In such situation investment in agriculture in the farm of machinery becomes natural. Thus, for smooth progress of agricultural production agricultural sector should follow the above said steps. In addition agriculture must generate export surpluses in order to earn foreign exchange with which to finance the import of capital goods and certain kinds of industrial raw materials.

According to Mellor, the contribution of the agricultural sector to capital formation is may be marshaled in four ways:

1) It may be extracted by the government through the medium of taxes such as land tax, agricultural income tax etc.;

2) 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 favorable efforts on savings and investment in the sector;

3) Agriculture may form capital directly within its own sector and minimise its own demand for capital from other sectors;

4) Agriculture may invest directly in other sector perhaps often its own development has increased demand for products from other sectors.

The transfer of capital from agricultural sector to other non-agricultural sector may be voluntary or compulsory. Compulsory transfer of funds from agricultural sector for the benefit of other sectors is ordinarily done through taxation in which the burden on agriculture is far greater than the services rendered by the government to
agriculture. This kind of tax has played a significant role in the early development of Japan, England and Russia. In Japan, for example in the last two decades of the 19th century, the land tax was over 80 percent of the century government taxation.

Agriculture can contribute to a great deal in earning foreign currencies. The export requirements can be easily met by adding a crop or within the existing crop-pattern and that too with little incentives and with perhaps no additional capital investments. Further, since such exports have to alter to the existing and familiar international markets, no additional costs are involved to discover or nurse new markets. Since exports from any single country constitute a small fraction of the total world supplies such goods face a fairly elastic demand schedule. India has all such advantageous opportunities through the sale of basmati rice, sugar, etc. But all this has come about only recently, we need to pursue a consistent policy of export promotion in this field, and for this purpose we should integrate domestic production with the requirements of the international market, something which we have neglected in the past.

But it needs to be emphasized that dependence on agricultural products alone is not to be pursued as a long-term goal. These products also face stiff competition from other underdeveloped countries, as also from the rising production of agricultural and synthetic production in developed countries. The heavy reliance on these goods can only be a short-term strategy. In the long run, exports can and should be diversified by producing a variety of manufactured goods. India at the movement is in a position to move towards such a diversification. Agricultural products can, however continue to increase the earning of foreign currencies.
Experience of all the developed economies indicates that due to the operation of various pull and push factors contributing to the migration of labour from rural to urban areas, the share of agricultural sector in the total labour force of the country diminishes. Increased earnings of farmers create essential conditions for the adoption and absorption of new agricultural strategy, which in turn contributes to enhanced returns per acre.

Now we can summarize in the following four ways as to how greater agricultural, productivity and production contribute to an economy's development.

1) It helps in faster development by supplying foodstuff to the rapidly increasing population and raw materials to other expanding sectors in the economy;
2) The developing agricultural sector also provides an investible surplus of savings and taxes to support investment in another expanding sector;
3) The rising agricultural income of agricultural sector will raise the demand of the rural population for products of other expanding sectors;
4) It can also contribute to the economic development of an economy by relaxing the foreign exchange constraint by earning foreign exchange through import substitution.

Kuznet summarizes the contributions of agriculture in his book "Economic growth and the contribution of agriculture notes on measurements". He says about these 3 contributions.

I) The production contribution
II) The factor contribution
III) The market contribution

I) The production contribution of agriculture towards an overall economic development takes two forms.

a) Provision of wage goods:

Economic development is characterised by a substantial increase in the demand for agricultural products and failure to expand food supplies in pace with the growth of demand, demand can seriously impede economic growth. Developing phase of an under developed economy results in 1) increased population 2) shifting of labour from rural areas to urban areas and 3) increase in per capita income. All these changes would lead to higher demand for foodstuffs.

b) Provision of industrial raw materials:

Economic history of most of the advanced countries will show that the agro-based industries were first to develop in such countries. These industries, which draw their basic raw material from agricultural sector, will flourish only if a continuous supply of such raw materials is made available to them.

II) Factors contribution:

When some resources are transformed from agriculture to non-agricultural sector of economy, two most important factors, which a developing agricultural sector contributes towards the development of other non-agricultural sectors, are capital and labour.
III) Market contribution:

Kuznets states that "marketing contribution of a sector takes place when" the given sector provides such opportunities by offering part of its product on domestic or foreign markets in exchange for goods produced by the sector at home or abroad.

Thus, agriculture makes a market contribution to economic growth by

1) Purchasing some production items from other sectors at home or abroad.
2) Selling some of its products not only to pay for the purchases listed under, purchasing some production items from other sectors at home or abroad; but also to purchase consumer goods other sectors or from abroad or to dispose off the product in any way other than consumption within the sector. In all these ways, agriculture makes it feasible for other sectors to emerge and grow and for international flows to develop.

An under developed country that is making determined efforts to achieve economic progress faces formidable requirements for capital to finance the creation and expansion of manufacturing enterprises. These requirements are certain to outstrip the supply of funds in most of the underdeveloped countries. "Since there is scope for raising productivity in agriculture by means that require only moderate capital outlays, it is possible for the agricultural sector to make a net contribution to the capital requirements for infrastructure and for industrial expansion without reducing the low level of consumption characteristic of the farm population in an underdeveloped country."
Another important factor contribution of agricultural sector to the non-agricultural sector is the provision of labour. In most of under developed economies, due to rapid rise in population and absence of manufacturing sector, agricultural sector sustain more labour than required. This type of labour is known as disguised labour.

2.7 AGRICULTURE IN DEVELOPING COUNTRIES:

In the developing countries, which are predominantly agricultural, the share of agriculture in national income is quite substantial. As the country starts developing, there is gradual decline in the contribution made by agriculture to national income. As the economy grows and industrial sector develops, two things happen 1) importance of the agricultural sector starts declining; and 2) importance of agriculture sector as the premier sector of production also starts declining.

At the higher stage of development, as industrial sector develops, its dependence on the agricultural sector for the provision of the various factors of production as well as raw materials declines. Industrial sector starts generating its own savings and thus capital begins to be supplied by the industrial sector itself.

The dependence of industrial sector for agricultural raw materials also declines since new technology makes it possible to develop mining industry and many mining based industries come into being similarly need for labour also is cut down since capital intensive technology replaces labour intensive technology.
With the development of the economy, agriculture sector also loses its importance as the main source of national income. In the most of the cases the share of agricultural sector to their national income has declined to very low level as is clear from the table below.

Table 2.1

Selected countries percentages of population engaged in agriculture

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage of working population engaged in agriculture</th>
<th>Percentage of gross Domestic product (at factor cost / originating from agriculture)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>5.2</td>
<td>3.4</td>
</tr>
<tr>
<td>Denmark</td>
<td>8.3</td>
<td>5.7</td>
</tr>
<tr>
<td>France</td>
<td>8.4</td>
<td>4.6</td>
</tr>
<tr>
<td>Japan</td>
<td>9.7</td>
<td>3.4</td>
</tr>
<tr>
<td>U.K</td>
<td>2.7</td>
<td>2.0</td>
</tr>
<tr>
<td>U.S.A</td>
<td>3.6</td>
<td>1.6</td>
</tr>
<tr>
<td>India</td>
<td>55.4</td>
<td>31.4</td>
</tr>
</tbody>
</table>


Prof. Edward Nissan 10 in his recent study has tried to show this fact by providing a simple empirical measurement for various countries. He has drawn data from various World Bank documents (1984-92). Prof. Nissan has adopted the World Bank division of the countries into a) low income b) lower-middle income c) upper-middle income and d) high income, according to levels of income.

2.8 ROLE OF AGRICULTURE IN INDIA:

A flourishing agricultural sector is for more important for the development of Indian economy, since farming is less a business than a tradition in India. Even at this semi-industrialization majority of population lives in the rural areas and directly or indirectly depends on agriculture for its livelihood. The more existence of about 85
crores of person's which are further multiplying at a rate of 2.5 percent per annum
depends on the developed agricultural sector. Further, most of our traditional
industries on whose products depends our bulk of foreign trade and foreign earnings
draw their raw materials from this very sector. It is the surplus generated by this
sector that would help Indian economy to reach the "Golden stage" since the total
savings fund is made up of savings from the industrial sector and savings from the
agricultural sector.

\[ I = S_i + S_a \]

Where \( I \) = total savings fund

\[ S_i = \text{savings from the industrial sector} \]

\[ S_a = \text{savings from the agricultural sector} \]

\( S_i \) is the function of profits generated by the industrial sector, which in turn
depend upon the extent of demand created for industrial products by the agricultural
sector. If the agricultural sector remains undeveloped and fails to generate a
matching demand for industrial products, profits will fall and we will soon be
approaching a stage termed as "stationary state" by classical writers.

We can, thus, say that in the absence of a developed agricultural sector, the
base for "take off" into a mature economy would be weak and Indian economy
characterised by wide spread designated unemployment and a high rate of
population growth is expected to remain in pitiable condition.

The role that the agricultural sector is playing in India at present can precisely
be discussed.
The share of agriculture in national income is a crucial indicator of the role that agriculture plays in the economic development of a country. As the country rides on the wheels of progress, the relative contribution of agriculture in national income declines with the country becoming more and more prosperous. The expending non-agricultural sector diverts surplus manpower from agriculture to industry and the improvements in agriculture enable a smaller number of people to produce for a larger population, with advanced agricultural technology, agricultural products are produced even for exports. To the extent therefore, the share of agriculture in national income declines, it marks a better level of economic advancement. On the other hand agriculture is the single largest contributor to national income. Therefore, a progressive agricultural sector means a higher level of national income, and consequently a higher level of economic development.

The Indian economy is still predominantly agricultural, about a half of the country's national income is derived from agricultural and allied activities, which absorb nearly three-fourths of its work-force.

Table 2.2
Share of Agriculture in Gross domestic product (at 1980-81 prices)

<table>
<thead>
<tr>
<th>Years</th>
<th>National income Rs (crores)</th>
<th>Agricultural income Rs (crores)</th>
<th>Agricultural income as % of total National income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-71</td>
<td>90,426</td>
<td>35,930</td>
<td>39.7</td>
</tr>
<tr>
<td>1980-81</td>
<td>1,22,427</td>
<td>42,466</td>
<td>34.6</td>
</tr>
<tr>
<td>1990-91</td>
<td>2,12,253</td>
<td>60,991</td>
<td>28.7</td>
</tr>
<tr>
<td>1995-96</td>
<td>2,74,209</td>
<td>68,517</td>
<td>24.9</td>
</tr>
</tbody>
</table>

Two facts are being revealed from above one, agriculture and allied industries contribute significantly a high share of the national income. Second as hinted
previously the share of agriculture in national income has decreasing steadily. The fact that agriculture is contributing the largest share to the national income is evident.

The importance of the agricultural sector in India can be borne out from the fact that this sector supplies us the necessities of life. Today, Indian agriculture is feeding about 100 million people besides supplying other necessities of life. India's food production crossed the mark of 200 million tonnes in 1999-2000.

The agricultural sector needed requirements to sustain is also providing. All the fodder that needed to sustain our livestock whose number runs into several crores. About one fourth of the total world's cattle populations live in India. The number of all sorts of live-stock such as cattle population sheep goats, horses, pinies, camels etc was estimated to be 45 crores in 1999-2000. The agricultural sector provided a variety of fodder to feed this large number of various types of animals.

Agriculture has a greater role in economic development in the less developed counties as it provides livelihood to a vast majority of people living in to the country. This figure is not significant in terms of percentages only, but more so in terms of absolute numbers. The agricultural sector provides livelihood to about three fourths of the Indian population, that is seven out of every ten persons in India depend on agriculture.

2.9 ROLE OF COMMERCIAL CROPS IN ECONOMIC DEVELOPMENT:

High yielding variety seeds could be sown in those areas only, which have guarantee of water supply. Otherwise irrigation can make a big difference to
productivity by permitting land to be cropped for a longer period during the year than would be possible on the basis of rainfall alone.

Over the past 50 years a classical amount of around 50,000 crores have been directly invested by the public sector in various categories of water like major and medium irrigation works. Minor irrigation and flood control. As a result the gross irrigation area increased almost four times from around 22 million hectares in pre-plan period to nearly 80 million hectares in 1995-96. Nearly 40 percent of the area under food grains is now under irrigation.

The post-independence development in agriculture has to be studied in three distinct phases viz. 1949-50 to 1964-65, 1967-68 to 1980-81 and 1980-81 to 1996-97. The first phase is the pre green revolution period, the second and the third phases are the post-green revolution periods. But the third phase needs reviewing more seriously as the full evident during this period only resulting in steep growth in productivity and production of all major crops. The compound growth rates of area production and yield of food grains non-food grains and all crops during the three phases are shown below.

Table 2.3
All India compound growth rate of Area, Production and yield of food grains and non-good grains (all crops base TE 1981-82 percent per annum)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>P</td>
<td>Y</td>
</tr>
<tr>
<td>Food grains</td>
<td>1.35</td>
<td>2.82</td>
<td>1.36</td>
</tr>
<tr>
<td>Non-food</td>
<td>2.44</td>
<td>3.74</td>
<td>0.89</td>
</tr>
<tr>
<td>grains</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All crops</td>
<td>1.58</td>
<td>3.15</td>
<td>1.21</td>
</tr>
</tbody>
</table>

Source: Agricultural statistics at a Glance, March 1997-GOI
A= Growth rates of area, P= Growth rates of production Y= Growth rates of yield
The green revolution was mainly directed to increase the production of food grains. It did not affect initially the production of commercial crops or cash crops such as sugarcane, cotton, jute, oilseeds and potatoes did not recorded any significant improvement during 1960-61 to 1973-74.

In the Table 2.4 classified that, along with a food revolution, non-food grain revolution also occurred. But later it which has been improved in per hectare yield. According to Dr. Dharm Narain characterised this situation as “near paralysis in the output of cash crops”. However, significant improvement in the output of sugarcane took place after 1973-74. Like wise there was considerable improvement in the production of other cash crops but the improvement was not such as to be called a revolution.

In plan period also there is tremendous increase in cash crops. Oil seeds growth rate from 1950-51 to 1961-66 was 17.74 percent of sugarcane was 72.72 percent in the same period. It is considered as pre-plan period. And post plan period scenario is a like (alike 1966-69). In this period the growth rate was 219.44 percent for oil seeds, 163.66 percent for sugarcane, 154.54 percent for cotton and 93.87 percent of growth was recorded in jute production respectively. These data shows that along with food grains non-food grain production also recorded their own height in production. Recently it is still increased which is evident for the data.
Table 2.4

Trends in production commercial crops in various plan period (1950-51 to 1996-97) (in million units)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil Seeds</td>
<td>Tonnes</td>
<td>6.2</td>
<td>5.5</td>
<td>6.7</td>
<td>7.3</td>
<td>7.2</td>
<td>8.3</td>
<td>8.9</td>
<td>11.4</td>
<td>13.9</td>
<td>23.0</td>
<td></td>
</tr>
<tr>
<td>Sugarcane</td>
<td>&quot;</td>
<td>57.1</td>
<td>55.3</td>
<td>80.3</td>
<td>109.2</td>
<td>104.3</td>
<td>128.1</td>
<td>153.3</td>
<td>174.9</td>
<td>196.4</td>
<td>275.0</td>
<td></td>
</tr>
<tr>
<td>Cotton</td>
<td>**</td>
<td>3.0</td>
<td>3.9</td>
<td>4.8</td>
<td>5.4</td>
<td>5.5</td>
<td>5.9</td>
<td>6.8</td>
<td>7.5</td>
<td>8.4</td>
<td>14.0</td>
<td></td>
</tr>
<tr>
<td>Jute</td>
<td>***</td>
<td>3.3</td>
<td>3.9</td>
<td>4.4</td>
<td>4.7</td>
<td>4.9</td>
<td>5.5</td>
<td>5.2</td>
<td>6.4</td>
<td>8.9</td>
<td>9.5</td>
<td></td>
</tr>
</tbody>
</table>

Note: * Includes dive major oilseeds viz, groundnuts, rapeseeds and mustard, sesammm, linseed and castor seed for columns (2) to (9) and miger seed, safflower, sun flower, and Soya been also for col (10), (11), (12) and (13).

** Bale = 170 Kgms
*** Bale = 180 Kgms

FYP= Five year plan
2.10 GROWTH RATE IN AREA SINCE 1949-50:

The broad growth trends in area under cultivation despite the fluctuations from year to year because of variation in monsoon and weather conditions. During 1950-65, that is the pre-green revolution period, additional lands were brought under the plough and there was extension of irrigation facilities to barren lands. The annual rate of growth in area under crops during 1950-65 was quite impressive.

**All crops:** 1.6 percent

**Food grains:** 1.4 percent

**Non-food grains:** 2.5 percent

<table>
<thead>
<tr>
<th>SI No</th>
<th>Crops</th>
<th>In million hectares</th>
<th>Annual growth</th>
<th>rate of growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>All food grains</td>
<td>99</td>
<td>118</td>
<td>123</td>
</tr>
<tr>
<td>2)</td>
<td>All non-food grains</td>
<td>23</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Oil seeds</td>
<td>10</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Sugarcane</td>
<td>1.5</td>
<td>2.6</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Cotton</td>
<td>4.9</td>
<td>8.4</td>
<td>7.0</td>
</tr>
<tr>
<td></td>
<td>Potato</td>
<td>0.2</td>
<td>0.4</td>
<td>1.1*</td>
</tr>
<tr>
<td>3)</td>
<td>All crops</td>
<td>122</td>
<td>151</td>
<td>162</td>
</tr>
</tbody>
</table>

* For to year 1993-94

**Source:** 1) GOI, ministry of finance: Economic survey, 1995-96.
2) GOI, ministry of agriculture, annual report 1994-95.
It would be clear from above table (2.5) that extension of cultivable area before 1964-65 was experienced by all crops, without exception. This means that cultivation was extended and hence recorded the highest area growth rate in this period for commercial crops e.g. potato (4.4 percent per year) followed by sugarcane (3.3 percent per year).

After 1967-68 the scope for extension of cultivation gradually declined. During the post-green revolution period (1968-95). The annual growth rate was quite low:

All crops: 0.3 percent
Food grains: 1.2 percent and
Non-food grains: 0.7 percent

During the period 1968-94, under, non-food grains spectacular progress was achieved by potatoes (increase in acreage during this was by 175 percent and the annual area growth rate was 3.9 percent).

2.11 RATE OF GROWTH IN YIELD SINCE 1994-95:

With the extension of irrigation and application of intensive methods of cultivation and after the introduction of modern agricultural practices resulted into the continuous increase in yield per hectare.
Table 2.6
Growth in yield of principal crops since independence

<table>
<thead>
<tr>
<th>SI No</th>
<th>Crops</th>
<th>1949-50</th>
<th>1964-65</th>
<th>1994-92</th>
<th>Annual growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1949-50 to 1964-65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1964-65 to 1994-95</td>
</tr>
<tr>
<td>1</td>
<td>All food grains</td>
<td>5.5</td>
<td>7.6</td>
<td>15.5</td>
<td>1.4</td>
</tr>
<tr>
<td>2</td>
<td>All non-food grains</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Oil seeds (Quintals)</td>
<td>5.2</td>
<td>5.6</td>
<td>8.5</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Sugarcane (Tonnes)</td>
<td>34</td>
<td>47</td>
<td>68</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Cotton (Kgs)</td>
<td>95</td>
<td>122</td>
<td>260</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Potato (Quintals)</td>
<td>66</td>
<td>84</td>
<td>160</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.0</td>
</tr>
</tbody>
</table>

Source: 1) GOI, ministry of finance; economic survey 1995-96
2) GOI, ministry of agriculture; annual report 1994-96

It is not feasible and convenient to lump together yield group of “non-food grains” we see the yield per hectare in selected years for some selected crops.

2.12 Output growth rate since 1949-50:

Table 2.6 shows that, total production of any agricultural product reflects the combined effects of area and yield per hectare. During the first period (1950-65), food grains production had increased at an impressive annual rate of 3.2 percent. The major cereals, viz, rice and wheat recorded high rates of growth (3.5 and 4 percent respectively). But the output growth rate of non-food grains (3.5 percent per year) was also impressive. This impressive growth rate in agricultural production was partly by area growth rate and production growth rate in this period.
Table 2.6
Growth in production of principal crops since independence

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All food grains</td>
<td>55</td>
<td>89</td>
<td>191</td>
<td>3.2</td>
<td>2.6</td>
</tr>
<tr>
<td>2</td>
<td>All non-food grains</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.5</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>Oil seeds</td>
<td>5</td>
<td>9</td>
<td>21</td>
<td>3.3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Sugarcane</td>
<td>50</td>
<td>122</td>
<td>258</td>
<td>4.3</td>
<td>2.9</td>
</tr>
<tr>
<td></td>
<td>Cotton</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>4.6</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Potato</td>
<td>2</td>
<td>4</td>
<td>18*</td>
<td>4.3</td>
<td>5.1</td>
</tr>
<tr>
<td>3</td>
<td>All crops</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3.1</td>
<td>2.6</td>
</tr>
</tbody>
</table>

* For year 1993-94

**Note:** (All crops in million tonnes except cotton which is in million bales of 175 Kg each)

**Source:**
1) GOI, ministry of finance; economic survey 1995-96
2) GOI, ministry of agriculture. Annual report 1994-95

As the beginning of the century, more than 83 percent of land was put under food crops and about 17 percent under non-food crops. By 1950-51 area under food crops had come down to 74 percent and area under non-food crops had increased to 26 percent. This shift in crops from food grains to non-food grains was mainly due to the higher price of non-food grains, commonly known as cash crops. It reflected a change from subsistence cropping to commercial cropping.

The table 2.8 shows that, share of different categories of crop in the total area sown. The acreage figures from 1960-61 show a reversal of the above trend, and a definite shift from non-food grains to food grains. By 1980-81, the ratio of food grains to non-food grains was 80:20.
Two important reasons may be given to explain the importance of food grains as compared to non-food crops.

1) Prices of food grains have been rising quite fast and the farmers have started growing food grains, for the market, in the same way they grow oilseeds, cotton and traditional crops is losing its significance.

2) The cultivation of food grains has become highly remunerative and productive under the impact of the new technology. The traditional commercial crops viz, oil seeds, cotton, jute, sugarcane etc. have made impressive increase in acreage, much more than crops (with the exception of wheat of course), of these the most spectacular was the increase in acreage under potato, viz, by over 300 percent between 1950 and 1991.

The green revolution was confined only to high yielding verities (HYV) cereals mainly wheat, Maize, and Jower, while rice output increased at a relatively slower rate, the singular wheat. The very facts that the cash crops and pulses have not so far been brought within the ambit of new technology forces. The conclusion is that quite a substantial part of the agricultural output has not been even touched by the green revolution.
2.13 CONCLUSIONS:

Agricultural economics explains what type of crop have to growth how much grow and where to market that grown goods? Which is recently considered as agricultural industry. Agriculture industry provides raw materials to Industries, fodder to live stocks and food to human. The agriculture is totally depends on land; labour and capital. The agriculture is important to increase the countries economic condition. Agriculture, according to Smith, was more productive than commerce and industry. This view was also supported by the late economists like Ricardo, Uner etc.

In India also the dependence of population on agriculture is nearly 69 percent. So, agriculture is popular industry in India and also in other developing countries of the world. Recently commercial crops have taken important place in whole agricultural productions. In India sugarcane is the most important commercial crop. In the world also, India is the major producer of sugarcane.
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