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# UNIT 1 AGRICULTURE AND ECONOMIC GROWTH

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## Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Conditions for Agricultural Development: Theoretical Background
  - 1.2.1 Two-Sector Economy Model: The Lewis Argument
  - 1.2.2 Three Phase Linkage to Industrialisation: Fei and Ranis
  - 1.2.3 Necessary Conditions for the Sectoral Shift: Schultz-Jorgenson
  - 1.2.4 Agriculture First Versus Balanced Growth Approach
- 1.3 Determinants of Agricultural Development
- 1.4 Agricultural Development Policies
  - 1.4.1 Goals of Agricultural Development Policy
  - 1.4.2 Classification of Agricultural Development Policies
- 1.5 Agricultural Development: A Prelude to Industrialisation
  - 1.5.1 Contribution of Agriculture to Economic Growth
  - 1.5.2 Agriculture's Dependence on Industry
- 1.6 Let Us Sum Up
- 1.7 Key Words
- 1.8 Suggested Books for Reading
- 1.9 Answers/Hints to Check Your Progress Exercises

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## 1.0 OBJECTIVES

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After reading this unit, you will be able to:

- explain the relationship between agricultural growth and economic development;
- describe some of the theoretical postulations linking agricultural growth with overall economic growth;
- identify the determinants of agricultural development;
- explain the importance of economic policies to agricultural development; and
- relate the importance of agricultural development to industrial growth in particular and overall economic growth in general.

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## 1.1 INTRODUCTION

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Agriculture has been the major source of livelihood in the Indian economy. Notwithstanding the major structural changes in the sectoral distribution of the economy (in terms of their employment and income shares in GDP) over the last

six decades, agriculture continues to be the main source of living for a large section of the labour force in India. Agriculture, therefore, continues to be regarded as an important sector to be focused upon in the overall policy thrust of the country. It is estimated that for every additional rupee generated by agricultural production, the various economic linkages in the rural areas add another three rupees to the income. In addition, its multiplier effects influence many of the secondary and tertiary sectors of the urban economy (e.g. industry, transportation, banking, etc.). Although the relative importance of agricultural sector in the total GDP of the Indian economy has registered a marked decline over the last six decades, even at this juncture, for the much desired double-digit growth of the economy to happen, it is estimated that a growth of Indian agriculture by close to 4 percent is essential. If this is so, then one would like to know the ‘conditions necessary for agricultural development’. For an answer to this, we turn towards some of the important theoretical postulations.

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## 1.2 CONDITIONS FOR AGRICULTURAL DEVELOPMENT: THEORETICAL BACKGROUND

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The role of agriculture in economic development has been recognised and discussed since the time of the ‘physiocrats’ (i.e. the class of French economists prior to the English classical economic theorists). According to the physiocrats, it was only the agricultural sector which produced an economic surplus over and above the cost of production. They considered manufacturing and commerce as non-productive in the sense that, the value of raw materials handled by these sectors was enhanced only enough to pay for the labour and capital used in the process of production. In view of this, the physiocrats considered agriculture as most strategic to economic development.

The classical economists, during the eighteenth and the first half of nineteenth century, also recognised the importance of agriculture in economic development but by duly linking its growth with that of the industry. For instance, Adam Smith’s basic growth model considered the production of an agricultural surplus to support non-farm production essential for overall economic development. An interesting argument of the classical economists in general was the concept of ‘circularity’ characterising the interrelationship between ‘technology, investment and profit’. This implied that the level of technology depends on the level of investment, investment depends on profits, and profits depend partly on the level of technology. The Classical economists, thus, did not focus on agricultural development *per se*. But they considered economic growth to be implicitly dependent on development of agriculture since in the initial phase of economic transition most of the economies (particularly the agrarian developing economies) would be dependent on agriculture to support the majority of their workforce. One can imagine that even in the modern times, where food riots in many countries have been witnessed, importance of agriculture to produce enough to meet the global requirement has to be ensured wherever the production might actually take place. The classical theories of development, however, did not make an exclusive distinction between growth and development but assumed that development would follow growth in its natural course. It was towards the end of World War II, i.e. around 1945, that development by itself became an important field of study. We shall in this section study four

such theories viz. (i) the Lewis's 'two sector' economic model (1954); (ii) the 'three phase linkage to industrialisation' by Fei and Ranis (1961); (iii) the 'necessary conditions for the sectoral shift' framework by Schultz-Jorgenson (1964); and (iv) the 'agriculture first as a development strategy' or 'a balanced growth approach' advanced by a number of contributors who saw the mutually supporting character of sectoral linkages as central to developmental planning.

### 1.2.1 Two-Sector Economy Model: The Lewis Argument

W. Arthur Lewis (1954) based his model on the premise that in many developing countries a large reservoir of labour subsisting on low productive subsistence (agricultural) sector existed. Their marginal productivity was very low (close to zero) and hence the surplus labour available at subsistence-wage level could be transferred to the more productive modern (industrial) sector. The transfer can be effected at a wage rate slightly higher than the subsistence wage of the agricultural sector to overcome the friction of moving from the agricultural sector to the 'capitalist sector'. The capitalist sector would, however, need 'skilled workers' but this constraint was viewed by Lewis as a temporary bottleneck which can be overcome by providing training to the 'unskilled workers' to enhance their skill level.

Owing to higher investment and technology, the marginal productivity of labour in the capitalist sector (i.e. industrial sector or the non-agricultural sector) would be higher than the ruling wage rate in the agricultural sector. This, therefore, leaves behind a capital surplus which could be further invested to result in higher levels of capital formation. This, in turn, would make it possible for the employment of more people from the subsistence sector. The increased investment would further push up the marginal productivity of labour within the capitalist sector. This induces the capitalist employers to stop recruiting the surplus labour from agriculture at a level in which the supply of labour would become wage-inelastic. Some critics have pointed out that Lewis' optimism concerning development by absorption of disguised unemployment from agriculture is unrealistic as it is not possible to transfer a large number of workers without a drop in the agricultural output. The Lewis model, however, is based on the assumptions of *rationality* and *perfect competition*. In view of these assumptions (which rarely prevail in reality as the governance/institutional challenges precisely centre around their establishment to minimise the consequences of their violation), Lewis's argument holds good for large agrarian economies. The successive advancements made by others refine Lewis's two-sector theory making it more conform to the practicalities of the capitalist market based economies.

Lewis, in fact, had visualised that the process of labour transfer cannot continue indefinitely and must come to an end at some time point. He, therefore, argued that when that happens, the process of capital formation can be kept going by stimulating immigration from other labour surplus countries or by encouraging export of capital to countries with abundant supplies of labour at the subsistence wage rate. Lewis' model thus provided a framework complete in itself to understand the process of economic development in general. Nonetheless, certain valid criticisms made against his thesis include: (i) the process of labour transfer would also push the agricultural wages contributing to keeping the rate of profit and rate of capital formation lower than expected; (ii) the capitalist employers may use the surplus for

non-productive purposes instead of ploughing it back for development purposes; (iii) to meet their rising expectations, rural poor also may consume more and save less thereby dampening the pace of development; etc. An improvement on this model was suggested by Ranis and Fei who propounded their theory by first analysing the role of the 'neglected' agricultural sector in a static sense, and then generalised the 'static' analysis by introducing the possibility of an increase in agricultural productivity.

### **1.2.2 Three Phase Linkage to Industrialisation: Fei and Ranis**

Fei and Ranis (1961) spelt out three distinct phases of surplus labour transfer from agriculture to industry. The first phase would last till the pool of 'surplus labour' exist. During this phase, the transfer of labour from agriculture to industry would not result in any adverse effect on the agricultural output. In the second phase, when the surplus labour is close to near exhaustion (called the Lewis's turning point), the marginal productivity of labour in agriculture would begin to rise. At this stage, there is positive opportunity cost for the transfer of labour from agriculture to industry i.e. labour cannot be transferred without a fall in output in agriculture. However, even at this state, so far as the industrial wage rate is still higher than the agricultural wage rate (i.e. as long as there is a gap, howsoever minor, in the two sector-wage rates), labour from agriculture can continue to shift to industry resulting in an aggregate increase in the economy's output albeit with a marginal fall in that of agricultural output. But at a point where the marginal product of agricultural labour becomes equal to the industrial wage (i.e. the third phase), further progress in economic growth becomes conditional to: (i) technological progress; and (ii) the absorptive capacity of the economy (by way of improved infrastructure). The central message flowing from Fei and Ranis's analysis is that while in the early stages of economic transformation, agriculture provides the surplus labour without a dent on the aggregate economic growth, in the latter stages, it is not unconditionally so. While to counter this situation, a balanced growth strategy (i.e. growth of both agriculture and industry) was advanced by many theorists, Schultz-Jorgenson provided a 'necessary condition for the sectoral shift'.

### **1.2.3 Necessary Condition for the Sectoral Shift: Schultz-Jorgenson**

Schultz (1964) argued that any withdrawal of workers from agriculture will result in a reduction of agricultural output i.e. he maintained that the marginal productivity of agriculture is never zero or negative. But he firmly believed that the aggregate value of output in the economy can be raised by utilising the surplus labour in agricultural sector if the two critical issues involved can be answered: (i) what are the conditions under which the surplus labour from agriculture can be transferred without reducing the output in agriculture?; and (ii) what are the requirements of a potential labour force so that it can benefit both the sectors in a mutually complementing manner? Applying the idea of 'human capital' to study the age-earning profiles of population flows, Schultz put forward the theory that education would transform raw or unskilled labour to a 'skilled labour' status which would enable them to cope with external shocks. To illustrate this point, he gave the example of farmers in developing economies who have to 'deal with uncertain economic conditions, which are not of their own making'. He argued that education

would make people better able to process information on the economic environment minimising the exploitation that they would otherwise suffer. Jorgenson (1961), a contemporary of Schultz, looked at the issue from the standpoint of the inter-sectoral flow of resources and stated that the growth of the non-agricultural sector is contingent on a positive and growing 'agricultural surplus'. Jorgenson's major contention was that if technological changes in agriculture are not rapid enough, agriculture can never produce either a food surplus or release its 'surplus labour' productively to the industry. Implicit in the theory advanced by Schultz-Jorgenson is, therefore, the message that simultaneous growth of agriculture and industry is necessary both for the efficient transfer of 'surplus labour' as also for a 'sustained growth' of both the sectors in a mutually complementing manner. Schultz-Jorgenson's argument are thus an important link in realising the potential of labour transfer made by Lewis and advanced by Fei and Ranis. We now turn towards the 'balanced growth approach' model in which a strategy of development keeping 'both agriculture and industry under focus' is advanced.

### 1.2.4 Agriculture First Versus Balanced Growth Approach

An important concern shared by many theorists was related to the stimulation of demand in the economy. It is true that in the early stages of economic transformation, the larger section of the population reside in the rural areas depending for their survival mainly on agriculture. They are poor and less educated and, therefore, increasing their incomes in activities of agriculture-centred occupations is important. Unless this is done, the demand for the products of industrial sector also would be less. To deal with this situation, Rosenstein Rodan (1943) advanced the theory of 'big push' aimed at a coordinated expansion of 'production, employment and consumption' in different sectors of the economy. The 'big push' signified a certain minimum high quantum of investment required to deal with the economic obstacles to development. Such a strategy was meant to facilitate a 'balanced growth' of a large number of interrelated economic activities both in the 'farm' and the 'non-farm' sectors in a mutually complementary manner. The approach would help deal with the critical issue of 'vicious circle of poverty' (which is principally due to a lack of effective demand in the rural poor) on the one hand while simultaneously contributing to broadening the 'socio-economic base of the economy' on the other. Such investments in both agricultural and industrial sectors would ensure the realisation of multi-pronged benefits like: (i) augmenting the rural incomes thereby strengthening the demand for industrial and non-agricultural goods; (ii) increasing the supply of goods suitable to the tastes and income levels of large rural population; and (iii) improving the ability of agriculture to provide for industrial capital through foreign trade; etc. The policy challenge is, therefore, to resolve the conflict between the role of agriculture as a net provider of surplus and also its role in providing effective demand. In effect, therefore, the arguments make a case for prioritising agricultural development by fostering linkages between agriculture and the rest of the economy.

#### Check Your Progress 1 (Answer in about 50 words)

- 1) What is the concept of circularity?

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- 2) Who were ‘Physiocrats’? State in brief their ideas on economic growth.

- 3) What would you identify as common in the theories advanced by Lewis, Fanis and Rae and Schultz-Jorgenson? What holds the key according to Schultz-Jorgenson to realise the potential of ‘surplus labour’ indicated by Lewis?

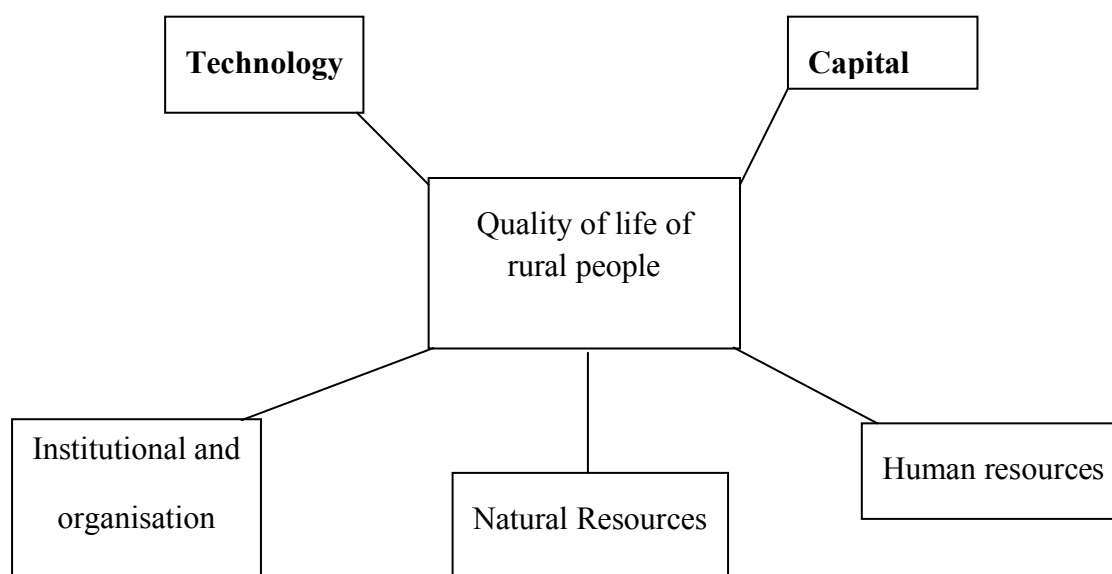
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### 1.3 DETERMINANTS OF AGRICULTURAL DEVELOPMENT

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The factors affecting agricultural development are varied. They encompass: physical, technological, economic, socio-cultural, institutional, organisational and political factors. All these factors operate at different levels like: household, village, district, state, nation and the world as a whole. Depending on how they are managed, these factors can have both favourable and adverse effects on development. For instance, if the human resources of a country are not properly developed by proper nutrition, health care, education and training, they are not productively utilised. Such resources become liabilities and obstacles to development. However, if they are properly developed and utilised, they become great assets and major factors contributing to development. Knowledge about the nature and magnitude of the impact of various determinants on agricultural development is necessary for agricultural development to proceed efficiently and effectively.

At a more specific level, good ‘*rural infrastructure*’ is recognised as critical in enhancing agricultural output and productivity. Under this comes many specific factors like: roads, irrigation, electric supply, banking, communications, etc. A more specific variant of agricultural infrastructure is ‘*social infrastructure*’ encompassing factors like: education and health facilities, extension services and information dissemination systems, participatory mechanisms, investments in agricultural research and technology (R and T), etc. Among the major deficiencies in rural infrastructure affecting the progress of agricultural development, in all developing economies in general, is the inadequate financial institutions for mobilising saving and disbursing *credit*. The role of *public investment* is yet another widely



**Fig. 1.1: Determinants of Agricultural Development**

recognised factor which greatly impacts agricultural development. Public investment in agriculture for establishing facilities like cold storage, marketing outlets, etc. plays a crucial role in developing economies where large proportion of farming community belong to the ‘small and marginal farmers’ class whose income and living conditions border at poverty level. There is acknowledged evidence in the Indian context that in the post-liberalisation period, the proportion of public investment as a proportion of total gross capital formation has declined steeply. In this context, for capital constrained countries, the PPP (public private partnership) models of attracting investment is considered a viable option to improve the infrastructural facilities that are so vitally required for agricultural development.

## 1.4 AGRICULTURAL DEVELOPMENT POLICIES

Broadly, ‘policy’ is defined as a definite course of action selected from among a set of alternatives. In its more general sense, a ‘policy process’ refers to the formulation, promulgation and application of a course of actions specifically defined. Here, we shall concern ourselves with public agricultural development policies by which is meant actions taken by the government in the pursuit of specific objectives of agricultural promotion.

In this context, it is important to distinguish between: (a) policy; (b) programme; and (c) project. Policy is a comprehensive term subsuming many programmes. A ‘programme’, in turn, subsumes many projects. A policy has to be translated into a number of programmes before it can be implemented. A programme specifies what is to be done, how, by whom and where. A project is even more specific and detailed in terms of objectives, location, duration, funds, executing agency, etc. A project thus comes out to be the ultimate ‘unit’ of a policy action. A programme may consist of several projects. An agricultural development project may, therefore, be defined as an investment activity where resources are expended over a period of time to achieve certain pre-set goals.

### 1.4.1 Goals of Agricultural Development Policy

Agricultural development policies are designed to improve the conditions under which the rural people work and live. The goals of policies are governed by what people desire. A 'policy measure' signifies what people think the government can and ought to do to bring about the desired change. This is the theory of public policy. Changes are desired only when people do not like the way things are going. Pressure for public action arises when people feel they cannot individually bring about the desired changes. They have in mind some norm or some image of an ideal situation which they aspire. These norms become the goals of policy towards which the objectives of specific programmes are directed.

From the 'directive principles of state policy' enshrined in the Indian Constitution, it is possible to discern two dominant goals of an economic policy: (i) increasing the national income; and (ii) improving the distribution of national income among the members of the society. These goals are, therefore, reflected in all economic policies that are specified in the 'five year plans'. A goal which seeks to achieve 'inclusive growth' needs to be seen in the context of the four important dimensions of state policy viz.: (i) improvement of 'quality of life' of the citizens; (ii) generation of 'productive employment' opportunities; (iii) establishment of 'balanced regional development'; and (iv) achievement of 'self-reliance'.

Many agricultural development policies are combinations of various goals having different sets of instruments for its implementation. Broken down into several programmes or projects, a particular government agency is designated to pursue its implementation. These agencies may assign specific projects to be implemented by other voluntary and private agencies under its monitoring and control. In order to curb leakages and inefficient usage of resources, they are limited by various conditions. These conditions are thus the decisive factors which together determine the efficient implementation of projects/programmes.

### 1.4.2 Classification of Agricultural Development Policies

Tinbergen distinguishes between a qualitative policy and a quantitative policy. A qualitative policy seeks to change the economic structure through the creation of new institutions, modification of existing institutions and promotion of private firms. A quantitative policy seeks to change the magnitude of certain parameters e.g. change in the tax rate. An example which represents both qualitative and quantitative policy is the introduction of an education system free of charge. It is qualitative because it seeks to bring about a change in the economic structure and is quantitative because it represents a change in the fee charged for a service.

Heady classifies agricultural policies into: (i) development policies and (ii) compensation policies. A development policy seeks to: (i) increase the supply of commodities and resources, and (ii) improve the quality of products and inputs. A compensation policy is aimed at compensating its target group in various manners e.g. subsidies, price support, etc.

#### Check Your Progress 2 (Answer in about 50 words)

- 1) Mention the principal determinants of agricultural development.

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- 2) Policy subsumes projects. Do you agree with this statement.

- 3) Distinguish between development policy and compensation policy with an example for each.

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## 1.5 AGRICULTURAL DEVELOPMENT: A PRELUDE TO INDUSTRIALISATION

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The process of economic transformation theorised by Lewis generally holds for all economies i.e. both developed and developing. The pace of its transformation, however, varies directly with the pace in which the necessary institutional mechanisms are established by a country. Associated with such a transformation, the proportion of workforce dependent on agriculture would decline and those in the non-agriculture sector (i.e. industry and services) would increase. Table 1.1 presents a comparative profile of the relative shares of the three main sectors of economies in employment and income (i.e. national income) for India and the developed economies. While the proportion of workers in the agricultural sector in India is even now around 52 percent, for the developed countries it is in the range of just 1 to 5 percent. The share of industrial employment (in the total employment) of India which is about 14 percent now, is just about half of that in the developed economies. Further, the level of industrial employment over the six decade period of 1950-2010 in India has risen by just about 4 to 5 percentage points (it was about 9-10 percent around 1950s) which speaks of a far lower achievement on the extent of industrialisation achieved in India over the fairly long six decade period. Notwithstanding this, the extent of decline in the share of agricultural employment, over this six decade period is not small: it has declined from as high as 72 percent at the time of independence to 52 percent in the post-2000 years. While this decline indeed supports the hypothesis of labour transfer from agriculture to non-agriculture (i.e. industry + services) as proposed by Lewis, there is still a substantial way to go for India to attain the levels of the developed economies.

**Table 1.1: Structural Composition in Employment (Empt.) and Income for India and Developed Economies**

(percent)

Principal Economic Sectors	Developed Economies post-2000		India (2009-10)	
	Income	Empt.	Income	Empt.
Agriculture	1-4	1-5	14.6	52
Industry	22-30	21-33	28.6	14
Services	68-73	63-74	57.2	34

On the distribution of income by three broad economic sectors, however, both in respect of industries and services India is close to the developed economies level. The trend suggests the need to focus on a more rigorous policy of rural industrialisation programme. You will read more about our rural industrialisation programmes and their achievement in the unit 10 of this course. Meanwhile, it is important for us to know in what way agriculture makes significant contribution to the overall economic development. We now turn to take a look at this below.

### 1.5.1 Contribution of Agriculture to Economic Growth

Kuznets identified four possible types of contribution that the agricultural sector is capable of making to *overall economic development*. These are:

- *product contribution* i.e. making available food and raw materials;
- *market contribution* i.e. providing the market for producer and consumer goods of the non-agricultural sector;
- *factor contribution* i.e. making available labour and capital to the non-agricultural sector; and
- *contribution to trade* and thereby foreign exchange earnings (i.e. capital inflow).

The above contributions of the agricultural sector can be further elaborated as follows.

#### i) Source of Supply of the Basic Wage-goods i.e. Food items

A scarcity of food creates imbalance in the economy which works as a constraint for economic development. In the absence of adequate domestic supply there will be no surplus for exports.

#### ii) Food Scarcity and General Price Level

One of the main reasons why aggregate demand for food products is rising in the developing countries is population growth rate which is around 2.5 percent per annum. At the same time, there is a higher rise in per capita income (about 3.4 percent per annum) and therefore there is a relative rise in the income elasticity of demand for food. Let us denote the percentage change in income by  $Y_{ED}$ . It has

been estimated that the  $Y_{ED}$  for food is approximately 0.5 to 0.6 for most developing countries compared with 0.2 to 0.3 for the developed countries. Under these conditions, the increase in food demand is given by the equation:  $D = P + (Y_{ED}) Y$ ; where  $D$  is the rate of growth of food demand,  $P$  is the rate of population growth and  $Y$  is the rate of growth of per capita income. Substituting these figures in the above equation, we get:  $D = 2.5 + 0.5 (3.4)$  or 4.2 percent, as an approximation of the situation in a 'typical' developing country. If domestic food production is not growing at around this rate, scarcity of food would arise pushing prices of food items upwards. Food items being the basic wage-goods, an increase in food prices is a sufficient justification for a demand for higher wages in the industrial sector. Higher wages in the industry lead to cost escalations, particularly in those industries in which the wage bill is a substantial component of the total cost of production. This results in major macro economic disturbances which is a matter of serious concern for the economic health of any country.

### iii) **Food Scarcity and BOP**

While it is possible to supplement any domestic shortfall of food grains by imports, this could lead to a balance of payment (BOP) problem. This in turn may make it necessary for the country to forego the more essential imports of capital goods like machinery, technical know-how, etc. In such a situation, the growth potential of the economy would be stifled.

### iv) **Food Scarcity and Human Capital Formation**

Until quite recently, economists tended to regard food strictly as consumption good. It is now accepted that a part of food utilisation should be considered as investment as it is vitally needed to maintain the quality of the labour force. In its absence, the consequences of malnutrition would affect the potential human capital resulting also in worker absenteeism and productivity decline. As it is, food consumption in developing countries is deficient not only in calories but also in proteins. This is one of the reasons why labour force is relatively less productive in developing countries.

### v) **Inputs for Industry**

The raw materials required for agro-based industries are entirely to be obtained from the agricultural sector. In spite of all technological and scientific advancements, it has not been possible for industries to adequately obtain the supply of agricultural raw materials like cotton, jute, sugarcane, etc. Also, as we know well by now the increasing demand for labour (consequent to increase in industrialisation) needs to be met, in the transitional years, by drawing upon the surplus labour in the agricultural sector. As more and more workers are released from agriculture, the remaining workers in agriculture must increase their productivity to maintain food supplies. There is thus a spiralling effect of increased inputs to both industry and agriculture. There would be increased need of R and D efforts to increase agricultural output.

### vi) **Source of Foreign Exchange**

In its infant stage, industry earns little foreign exchange but creates strong demand for it in terms of its need for machinery, technology and other inputs not available locally. If agriculture does not provide foreign exchange from exports, the country

would again be confronted with the BOP constraint impeding the industrial progress of the country.

#### vii) **Source of Capital Formation**

A well-developed agriculture can make a net contribution to capital formation in non-agricultural sector. There are three arguments in support of this view: (i) capital-output ratio in agriculture is relatively low compared to industry so that there is greater scope for raising productivity in agriculture requiring only moderate outlays of capital; (ii) there is a relatively stronger tendency for sectoral terms of trade to move in favour of agriculture leading to an increase in farm incomes at a relatively higher rate than the non-farm incomes; and (iii) the consumption levels to which the farm population is traditionally habituated are generally low and these are not likely to increase commensurately with the rise in incomes which accrue with agricultural development.

#### viii) **Market for Industrial Products**

The influence of agricultural development on the consumption of industrial goods through the demand route works in both the directions: (i) increased agricultural production and growing income stimulate demand for industrial goods; and (ii) the terms of trade between the agricultural and the industrial sectors would tilt in favour of agriculture making the industrial goods costlier. The terms of trade effects in rural areas are different for the lower and higher income group persons. While for those in lower income groups, the demand would be inelastic both for the wage goods and the industrial goods, from higher income group persons, there would be differing impact on demand owing to higher income accruing from rising agricultural prices. Thus, agricultural performance can affect the demand for industrial goods both through output effect and the terms of trade effect. To sum up, therefore, increasing agricultural productivity makes an important contribution to the programmes of industrialisation and general economic development. This is, in fact, one of the ***necessary conditions*** which must be fulfilled before an economy gets itself ready for a process of self-sustained growth.

### **1.5.2 Agriculture's Dependence on Industry**

The above review underscores the importance of dovetailing the agricultural development policies and programmes with that of the industrial development programmes. To reinforce this point, we can list out the various ways in which industry contributes to agricultural progress.

- Most of the modern inputs, including fertilisers, pesticides and even water, are made available by industry.
- Industry supplies the machinery required on the farms.
- Agricultural engineering is a significant branch of industry.
- Most of the research that has gone into bringing about '*green revolution*' in India has been undertaken in what can be described as an industrial culture.
- Industry helps raise the necessary infrastructure required for agricultural progress. This may be in the form of: transportation and communication, trade and commerce, banking and marketing channels, etc.

- Industry helps meet the growing demand for consumer goods in the rural sector in the wake of growing population and income in the agricultural sector.

In short, therefore, there is ample justification to support the mutually complementary nature of interdependence between agriculture and industry during the process of economic development and structural transformation. The relative forces of inter-sectoral demand and supply of resources, products and factors not only sets the pace of development but are also a manifestation of the stage of growth. However, the linkages between the sectors are such that for sustained development, a rise in agricultural productivity would have to first precede, and in later stages keep up with the development of the non-agricultural sectors.

**Check Your Progress 3** (Answer in about 50 words)

- 1) In which respect India's progress is closer to that of the developed economies?  
Answer using the distribution of sectoral income shares.

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- 2) What are the four types of contribution identified by Kuznets from the agricultural sector to the overall economic development of a country?

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- 3) How does food scarcity impacts on human capital formation?

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- 4) Increasing agricultural development would need additional R and D efforts to sustain the growth of both agriculture and industry: why?

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## 1.6 LET US SUM UP

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The unit began with a review of major theories which have advanced arguments on how agricultural development is a necessary condition for overall economic development. We noted that paying adequate attention to human development efforts [by way of social sector investment (i.e. on education, health, infrastructure, etc.)] is vital for an all round development of the economy. The importance of policies, programmes and projects in realising the targets and goals set for the sectoral development in general, and agricultural development in particular, was also noted. We saw that: (i) India is at an intermediate stage of development wherein the process of sectoral labour transfer postulated by Lewis and others is working; and (ii) growth of agricultural production to yield an annual 4 percent increase is necessary for sustaining the harmonious economic advancement of the country. Towards the end of the unit, we saw how imperative it is for ensuring the successful implementation of both the agricultural and industrial sectors in a mutually complementing manner.

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## 1.7 KEY WORDS

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- Balanced growth approach** : An approach in which both the agricultural and the industrial sectors are equally focused upon for development.
- Two sector economic model** : A model in which the total economy is considered to be dichotomous with: (i) a low productive agricultural sector shouldering a reservoir of labour force the marginal productivity of whom are very low; and (ii) a more productive non-agricultural sector (i.e. industry + services) whose growth and sustenance depends on a successful agricultural sector. The models built on this premise provide a clarity of the policy focus needed for realising the optimum developmental goals.

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## 1.8 SUGGESTED BOOKS FOR READING

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- 1) Ashok Gulati and Tim Kelley, *Trade Liberalisation and Indian Agriculture*, Oxford, New Delhi, 2003.
- 2) G.S. Bhalla, *Indian Agriculture Since Independence*, NBT, New Delhi, 2007.
- 3) Kartar Singh, *Rural Development: Principles, Policies and Management*, Sage, 3<sup>rd</sup> Edition, 2009.
- 4) Ranis, Gustav (2004), *Arthur Lewis's Contribution to Development Thinking and Policy*, The Manchester School, Volume 72, No. 6, December, pp 712-723.

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## 1.9 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

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### Check Your Progress 1

- 1) Refers to the interrelationship between ‘technology, investment and profit’.  
See section 1.2.
- 2) See Section 1.2 and answer.
- 3) See Sections 1.2.1 to 1.2.3 and answer.

### Check Your Progress 2

- 1) (i) physical/technical/economic/...etc.; (ii) rural/social infrastructure; (iii) credit;  
and (iv) public investment.
- 2) See Section 1.4 and answer.
- 3) See Section 1.4.2 and answer.

### Check Your Progress 3

- 1) See Section 1.5 and Table 1.1 and answer.
- 2) See Section 1.5.1 and answer.
- 3) See Section 1.5.1 (iv) and answer.
- 4) See Section 1.5.1 (v) and answer.